

Using the DeepSee Analyzer

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Using the DeepSee Analyzer

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About This Book

Important: This book is for DeepSee I. For information on DeepSee II, see [Getting Started with DeepSee II](#), which also lists the other books for DeepSee II.

This book describes how to use DeepSee Analyzer to design and create pivot tables and key performance indicators (KPIs). This book is meant both for implementers and for advanced users who want to create pivot tables to embed in applications — or who simply want to explore their data. It is not necessary to be acquainted with OLAP (online analytical processing) terminology and concepts; nor is any knowledge of SQL needed. In some cases, it is convenient to be familiar with Caché ObjectScript.

This book contains the following sections:

- [Introduction to the DeepSee Analyzer](#)
- [Basics of Creating Pivot Tables](#)
- [Filtering the Data](#)
- [Sorting the Data](#)
- [Defining Measures](#)
- [Defining Computations](#)
- [Adding Alerts \(Conditional Formatting\)](#)
- [Defining Drill Options](#)
- [Linking Pivot Tables for Complex Layouts](#)
- [Creating and Customizing Dimensions](#)
- [Specifying Font and Colors](#)
- [Defining KPIs](#)
- [Other Pivot Table Options](#)
- [Accessing Pivot Tables and KPIs Programmatically](#)
- [Glossary](#)

For a detailed outline, see the [table of contents](#).

For more information, see the following books:

- [Overview of DeepSee](#), an introductory guide for all users who are interested in learning about DeepSee.
- [DeepSee Model Design Guide](#), an introductory guide for implementers and business users.
- [DeepSee Developer Tutorial](#), a tutorial for implementers who are creating DeepSee models, pivot tables, and dashboards.
- [Using the DeepSee Connector](#), a guide for implementers who are using the DeepSee Connector to import externally stored data. Note that the DeepSee Connector is available only with Ensemble.
- [Using the DeepSee Architect](#), a guide for implementers who are setting up a DeepSee model for use in the Analyzer.
- [Using the DeepSee Dashboard Designer](#), a guide for implementers who are using the Dashboard Designer to create dashboards.

- *Expressions and Scripts in DeepSee*, an implementer guide that describes the syntax and options for all formulas, expressions, and scripts supported in DeepSee. This book also lists all the locations where you can use these expressions and scripts.
- *DeepSee Site Configuration and Maintenance Guide*, a guide for implementers and system administrators. This book describes how to configure and maintain a DeepSee site. It also includes a chapter that lists common problems and their solutions.
- *DeepSee User Guide*, a user manual for your end users. This book describes how to work with deployed dashboards and pivot tables.

For general information, see the *InterSystems Documentation Guide*.

1

Introduction to the DeepSee Analyzer

Important: This book is for DeepSee I. For information on DeepSee II, see [Getting Started with DeepSee II](#), which also lists the other books for DeepSee II.

This chapter introduces the DeepSee Analyzer. It includes the following information:

- [Purpose of the Analyzer](#)
- [Required preparation before you can use the Analyzer](#)
- [Summary of your options when defining pivot tables](#)
- [How to log in to DeepSee](#)
- [How to access the DeepSee Analyzer](#)
- [How to switch to another namespace](#)

Be sure to consult *InterSystems Supported Platforms* for information on system requirements.

1.1 Purpose of the Analyzer

DeepSee Analyzer is the core component of InterSystems DeepSee. You use InterSystems DeepSee to embed business intelligence (BI) in your applications. The Analyzer enables you to create and preview pivot tables that slice and dice your DeepSee data. The pivot tables are interactive, real-time views of the data that you can include directly in your application where needed.

1.2 Required Preparation

Before you can use the Analyzer, you (or someone else) must set up a DeepSee model, which includes the following elements:

- BI-enabled classes (which you do not use directly).
- Dimensions based on properties or source expressions using properties of those classes.
- Measures based on properties and source expressions. You can add more measures with the DeepSee Analyzer, which is discussed in [Using the DeepSee Architect](#).
- Detail listing fields based on properties and source expressions.

- Detail listings associated with different user roles, as needed.
- Subject areas associated with different user roles, as needed.

For information on setting up these elements, see [Using the DeepSee Architect](#).

Also, to use the DeepSee Analyzer effectively, make sure that you are reasonably familiar with the data in this subject area or areas, at least in a conceptual way. With DeepSee Analyzer, you do not need to know any table or field names, but you should know what the data represents so that you can make the best use of it.

It is also very helpful if you are acquainted with pivot tables, from the point of view of the end user. That is, you should understand options such as *drill-down*, *drill-through*, and displaying *detail listings*.

Important: If you have not yet used a DeepSee pivot table, it is suggested that you read the book [Overview of DeepSee](#), especially the first chapter.

1.3 Summary of Pivot Table Options

You use the Analyzer to explore your data and to create pivot tables. A *pivot table* displays aggregated data, one row or column for each dimension member used in the pivot table. For example, consider the following pivot table:

Count and Age by City						
Home City	Patient Count	Average Age				
Cedar Falls	27	69.33				
Centerville	27	71.63				
Cypress	33	71.45				
Elm Heights	29	71.69				
Juniper	19	74.37				
Magnolia	29	70.59				
Pine	26	70.81				
Redwood	23	69.74				
Spruce	24	71.50				

This pivot table shows two *measures* (Patient Count and Average Age). The pivot table uses the Home City dimension for rows, and each city is shown in a separate row. A dimension contains *members*, so the cities are members of the Home City dimension.

When you create pivot tables, you can do the following:

- Use any number of dimensions as rows or columns. If you do not use any dimensions, the data in the pivot table is aggregated across the entire subject area.
- Use measures as columns in the pivot table. Every subject area includes a measure called Count, which counts the number of lowest-level records. Any other numeric value can also be used as a measure; you can also have date- and string-valued measures.

- Create computations, which are also displayed in pivot tables, but which are based on other data in the pivot table. Computations are typically numeric, but can also display date and string values.
- Apply filters so that the pivot table represents a subset of the subject area instead of all of it. DeepSee provides an easy-to-use filter mechanism, where you select a dimension and then select members of that dimension. For example, if you selected `Home City` and then selected a couple of cities, you would create a filter that selected data only for those cities.
- Add totals and subtotals.
- Use ranking — that is, show a specified number of the top-ranking or bottom-ranking rows. For example, you could show the top three home cities, ranked by patient count.
- Link multiple pivot tables to create more complex layouts (such as ranked tables shown as sub-tables within a larger pivot table).
- Customize the dimensions used as rows or columns. Here you can control the sort order, the names of dimension members, and the definitions of dimension members themselves. You can, for example, define dimension members that overlap each other.

You can define data-based alerts, which affect the display of pivot tables:

- You can replace values with text or graphics.
- You can also flag values with different colors or fonts.

A full-featured pivot table is not just a view of the data; it is also an interactive tool with which users can further explore the data. Within the DeepSee Analyzer, you define the options that enable data exploration for any given pivot table:

- You can specify which dimensions can be used as drill options for this pivot table.
- You can define drill-downs to use for this pivot table.
- You can add another pivot table to use as a drill-down for this pivot table, as a right-click option.

DeepSee provides a rich set of options that control the display of pivot tables in additional ways:

- You can also specify the initial chart type to show, as well as the initial appearance of that chart type.
- You can define chart themes (color and fill pattern combinations) to use in charts.
- You can specify the fonts and colors to use in the different areas of a pivot table.
- You can display specific dimension members with different fonts and colors.
- You can define dashboards or scripts that the user launches when clicking on a data cell that has an active alert.

1.4 Logging In to DeepSee

To log in to DeepSee:

1. In Internet Explorer, go to the following URL:

```
http://localhost:57772/csp/sys/bi/default.htm
```

Where *localhost* is the server on which Caché is running, and *57772* is the port used by the web server.

If you have not yet specified a namespace, the system displays a page that prompts you for a namespace. Otherwise, the system displays the DeepSee login page.

2. If you are prompted for a namespace, type the name of the namespace you want to work in and then click **Logon to DeepSee**.

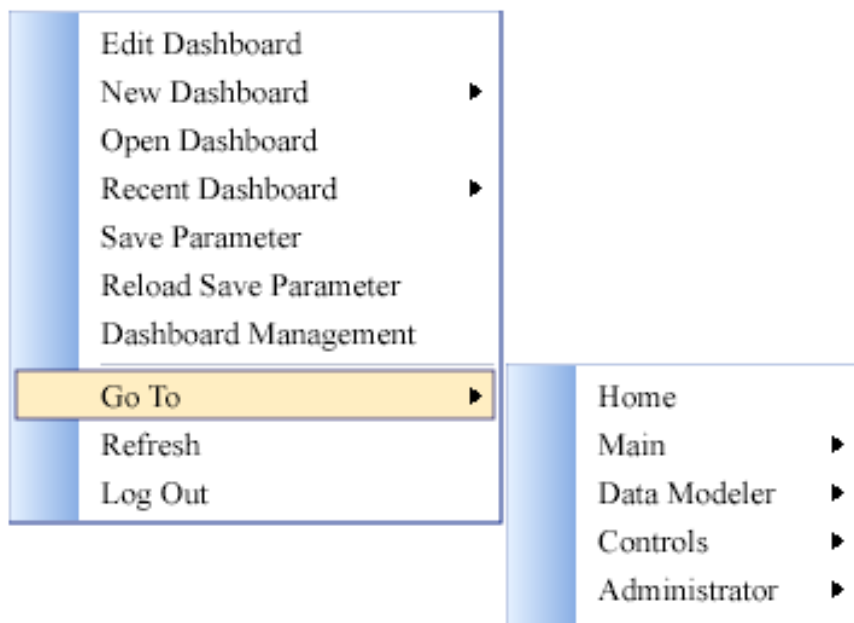
The system then displays the DeepSee login page.

3. On the DeepSee login page, enter a DeepSee username and password. For example, you can use the username demo with the password demo.
4. For **Role**, select demo.
5. Click **Login**.

DeepSee displays the home page, which depends upon the user ID you used to log in. The home page is either a DeepSee module or a dashboard. If the page is a DeepSee module, it has a row of buttons at the top as follows:



If the page is a dashboard, the context menu provides access to all the same options provided by these buttons, in addition to options that apply to dashboards:

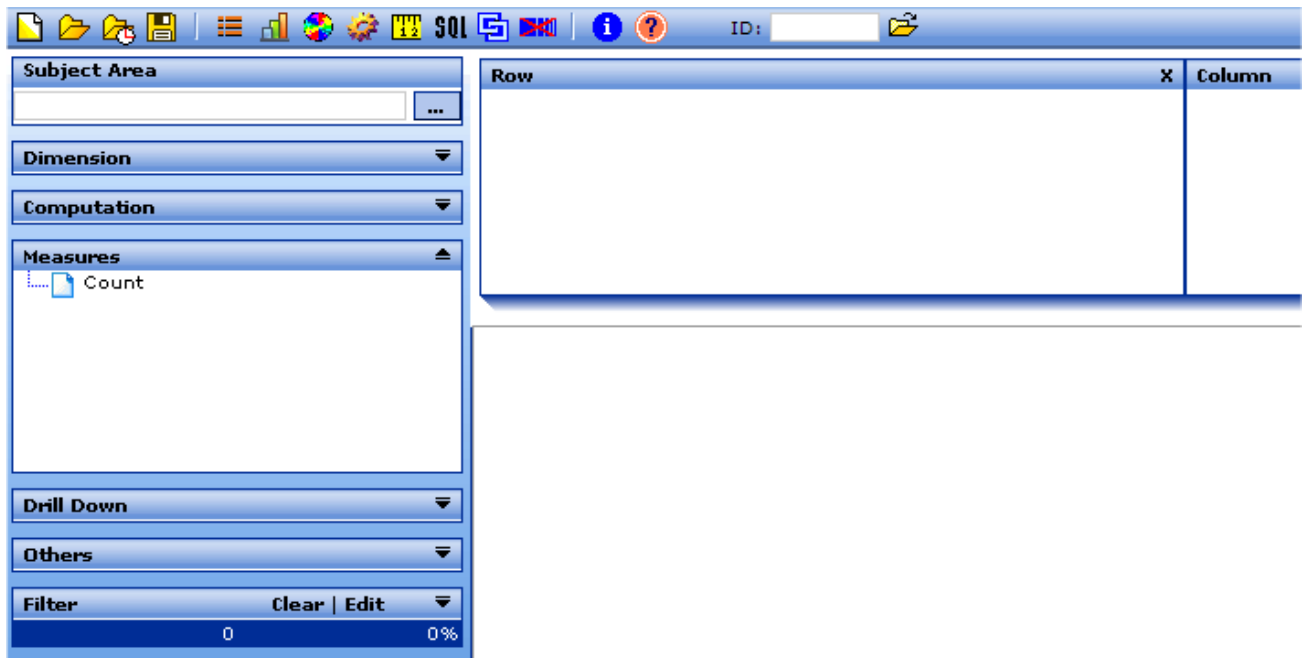


1.5 Accessing the DeepSee Analyzer

To access the Analyzer:

- If you are currently viewing a DeepSee module, click **Main > Analyzer**.
- If you are currently viewing a dashboard, right-click and then click **Go To > Main > Analyzer**.

The Analyzer looks like this:



1.6 Switching to Another Namespace

To switch to a different namespace:

1. Log out. To do so, do one of the following, depending on what you are currently viewing:
 - If you are currently viewing a DeepSee module, click **Log Off** in the upper right.
 - If you are currently viewing a DeepSee dashboard, right-click and then click the **Log Out** option.

The system logs you out of DeepSee.

2. Click **Switch Namespace**.
3. For **Namespace**, type the name of the namespace you want to work in.
4. Click **Logon to DeepSee**.

This displays a login page.

5. Log in as usual.

2

Basics of Creating Pivot Tables

This chapter describes the basic activities of creating, opening, and saving pivot tables. It discusses the following topics:

- [The basic contents of a pivot table](#)
- [How to enable or disable the Analyzer autofind mode](#)
- [How to hide or display the Row, Column, and Metrics panels](#)
- [How to create a pivot table](#)
- [How to open an existing pivot table](#)
- [How to specify the dimensions that a pivot table uses](#)
- [How to specify the measures that a pivot table uses](#)
- [How to specify the computations that a pivot table uses](#)
- [How to modify how measures and computations are used](#)
- [How to add summary lines](#); this applies only when you use dimensions for rows
- [How to rank the items in a pivot table](#), so that they are sorted by the value in a given column, rather than alphabetically by dimension member
- [How to specify the grid setup options](#), which include settings for controlling the display of null rows and columns, the maximum number of rows per page, and so on
- [How to specify the initial chart type](#)
- [How to save a pivot table](#)

2.1 Contents of a Pivot Table

A pivot table displays data (usually aggregated data), broken out and organized by the dimensions used in the pivot table.

This section provides a more formal summary of how pivot tables work. You may find it helpful to start by gaining some firsthand experience creating pivot tables as described in the [DeepSee Developer Tutorial](#).

The following shows an example pivot table:

		Female		Male	
<i>Home ZIP</i>	<i>Home City</i>	Patient Count	Encounter Count	Patient Count	Encounter Count
32006	Juniper	566	0.00	524	0.00
	Spruce	588	0.00	540	0.00
	Sub Total	1,154	0.00	1,064	0.00
32007	Redwood	571	0.00	563	0.00
	Sub Total	571	0.00	563	0.00
34577	Cypress	586	0.00	537	0.00
	Magnolia	550	0.00	522	0.00
	Pine	529	0.00	585	0.00
	Sub Total	1,665	0.00	1,644	0.00
36711	Centerville	513	0.00	591	0.00
	Sub Total	513	0.00	591	0.00
38928	Cedar Falls	579	0.00	539	0.00
	Elm Heights	579	0.00	538	0.00
	Sub Total	1,158	0.00	1,077	0.00
Grand Total		5,061	0.00	4,939	0.00



In general:

- A pivot table can have any number of dimensions, including zero. A pivot table uses each included dimension either as a set of rows or as a set of columns.
- A pivot table includes at least one measure. The measures are shown as columns.
- By default, the green areas show the dimension names, member names, and other captions. The white and off-white cells constitute the body of the pivot table, which usually consists mainly of the data for the measures.
- A pivot table can be filtered, which controls the members shown in the pivot table.
- When a dimension is used for rows, the left area of the pivot table displays captions for each applicable member of that dimension. Correspondingly, the body of the pivot table shows data for those members.
- When a dimension is used for columns, the top area of the pivot table displays captions for each (applicable) member of that dimension. Correspondingly, the body of the pivot table shows data for those members.
- The body of the pivot table can contain summary lines as well. A grand summary summarizes the entire table (and is shown as a row at the bottom). Intermediate summaries summarize separate parts of the pivot table and are shown as rows within the body.

This pivot table contains an intermediate summary line for each ZIP code and one grand summary line.


2.2 Controlling the Analyzer Run Mode

You can control whether the Analyzer automatically retrieves your data and displays it. By default, the Analyzer retrieves the data and displays it only when you click **Find**. You can instead cause the Analyzer to retrieve and display the data each time you make a change in the Analyzer. To do this, you use a button in the toolbar. This button is shown as follows:

Button	Meaning
	Analyzer does not run queries automatically. Click this button to enable the autofind feature.
	Analyzer runs queries automatically. Click this button to disable the autofind feature.

2.3 Hiding or Showing the Row, Column, and Metrics Panels

You can hide the **Row**, **Column**, and **Metrics** panels, to save space.



To do so, click the Hide button  in the upper right of the **Metrics** panel. When you do so, these panels are collapsed. Red asterisks indicate where you have set options. For example, here you can see that options have been set for **Row** and **Metrics** but not for **Column**:

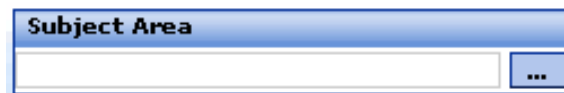


To redisplay the panels, click the Show button  in the upper right of the **Metrics** panel.

2.4 Creating a New Pivot Table

To create a new pivot table, do the following in the Analyzer:

1. Click the New Pivot Table button  on the toolbar.
2. Click the Browse button  in the **Subject Area** panel.



The system displays a list of subject areas that are available to you, according to the roles assigned to your user ID.

3. Click the name of a subject area and then click **OK**. The subject area is then shown in the **Subject Area** panel, and its contents are now available within the Analyzer.
4. Optionally add dimensions to the pivot table, as [described later in this chapter](#).

If you do not add any dimensions, the pivot table is completely aggregated; it shows one number for each measure.




- Optionally add measures to the pivot table, [as described later in this chapter](#).

If you do not add any measures, the **Count** measure is added automatically.

- Optionally click **Find**. The pivot table is displayed in the main area of the Analyzer, to the right of the **Dimension**, **Measures**, and other panels, and below the **Row**, **Column**, and **Metric** panels.
- Save the pivot table as described in “[Saving a Pivot Table](#),” later in this chapter.

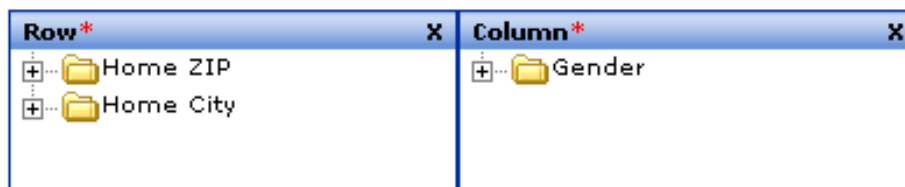
2.5 Opening a Pivot Table

To open an existing pivot table:

- Click the Open Pivot button  or the Open Recent Pivot button .
- If you clicked the Open Pivot button, click the Expand button  next to the folder that contains the desired pivot table. This action expands the folder so that you can see its contents.
- Click the name of the pivot table.
- Click **OK**. DeepSee displays the pivot table definition, but does not automatically run the query (unless you have enabled the autofind option; see “[Controlling the Analyzer Run Mode](#)”).
- Optionally click **Find**. DeepSee runs the query and displays the pivot table results in the main area of the Analyzer, to the right of the **Dimension**, **Measures**, and other panels, and below the **Row**, **Column**, and **Metric** panels.


2.6 Specifying the Dimensions in a Pivot Table

When a pivot table is open in the Analyzer, you can specify the dimensions that it uses. The **Dimensions** panel (on the left) lists the available dimensions. The **Row** and **Column** panels (at the top) lists the dimensions currently used in the pivot table and shows how they are used.

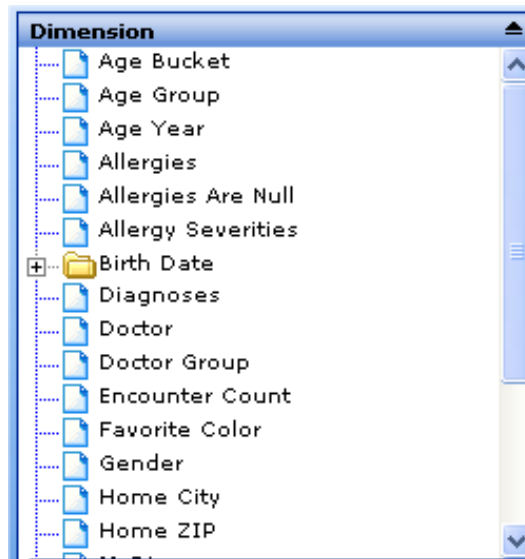


2.6.1 Adding a Dimension

To add a dimension to a pivot table, do the following:

- Open the pivot table so that you modify it.
- If the **Dimension** panel is collapsed, expand it by clicking the Show button  in its upper right.

This panel displays all dimensions available in this subject area:



3. Then do any of the following:
 - Double-click the dimension, within the **Dimension** panel. The dimension is then added to the **Row** panel.
 - Within the **Dimension** panel, right-click the dimension and then click **Add To Row** or **Add To Column**.
 - Drag and drop the dimension from the **Dimension** panel to **Row** panel or to the **Column** panel, depending on where you want to use it.

The rows can contain any number of dimensions (including none). The same is true of the columns.

4. Optionally click **Find** to see the change.
5. Save the pivot table as described in “[Saving a Pivot Table](#),” later in this chapter.


2.6.2 Changing How a Dimension Is Used

To change how a dimension is used in an open pivot table, do any of the following:

- Drag and drop the dimension from the **Row** panel to the **Column** panel or vice versa.
- Right-click in the **Row** panel or the **Column** panel and then click **Swap between Rows and Columns**.
- In either the **Row** panel or the **Column** panel, right-click a dimension and then click **Move Up** or **Move Down**.

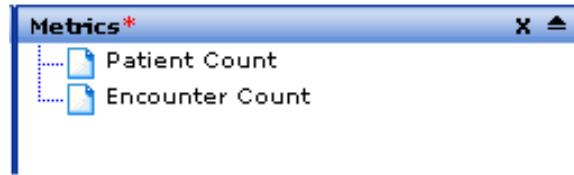
2.6.3 Removing a Dimension

To remove a dimension from a pivot table, do either of the following:

- Right-click the dimension (in the **Row** panel or the **Column** panel) and then click **Delete Node**.
- Click the Clear button  in the upper right of the **Row** panel or the **Column** panel to remove all dimensions from this panel.

2.7 Adding Measures to a Pivot Table


When a pivot table is open in the Analyzer, you can specify the measures that the pivot table uses. The **Measures** panel (on the left) lists the available measures. The **Metrics** panel (at the top) lists the measures currently used in the pivot table, and it shows their order. For example, the following pivot table contains the `Patient Count` and `Encounter Count` measures, in that order from left to right.



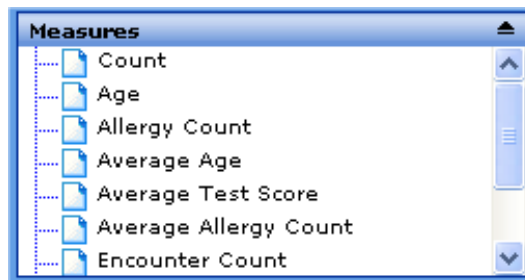
If the **Metrics** is empty, the default `Count` measure is used. This measure is the number of records in the root BI-enabled class, in this subject area, after considering any filters that apply.

2.7.1 Adding a Measure

To add a measure to a pivot table, do the following:

1. Open the pivot table so that you modify it.
2. If the **Measures** panel is collapsed, expand it by clicking the Show button  in its upper right.

This panel displays all measures available in this subject area:



3. Then do any of the following:
 - Double-click the measure, within the **Measures** panel. The measure is then added to the **Metric** panel.
 - Within the **Measures** panel, right-click the measure and then click **Add To Metrics**.
 - Drag and drop the measure from the **Measures** panel to **Metrics** panel.
4. Optionally click **Find** to see the change.
5. Save the pivot table as described in “[Saving a Pivot Table](#),” later in this chapter.

You can also create new measures; see the chapter “[Defining Measures](#).”

2.8 Adding Computations to a Pivot Table

When a pivot table is open in the Analyzer, you can also specify the computations that the pivot table uses.

Computations are discussed more fully in the chapter “[Defining Computations](#)” later in this book. For now, note the following:

- Computations can be used in **Row**, **Column**, or **Metrics**. (Measures can be used only in **Metrics**.)
- Computations are defined in terms of other data in the pivot table. (Measures are defined in terms of source data.)
- The formula for a computation uses Caché ObjectScript. A large selection of functions, macros, and special variables is available, and you can use any Caché ObjectScript expression.
- DeepSee provides several predefined computations such as **Total**, and you can also create new computations
- You can also add totals and subtotals by adding *summary lines*. See the section “[Adding Summary Lines](#),” later in this chapter.

2.8.1 Adding a Computation

To add a computation to an open pivot table, do any of the following:

- Double-click the computation, within the **Computation** panel. The computation is then added to the **Row** panel.
- Right-click the computation, within the **Computation** panel. Then click **Add to Row**, **Add to Column**, or **Add to Metrics**.
- Drag and drop the computation from the **Computation** panel to **Row**, **Column**, or **Metrics** panel.

Then save the pivot table.

2.9 Modifying How Measures and Computations Are Used

This section describes how you can control the order in which these items are shown, as well as remove them.

2.9.1 Controlling the Order of Measures and Computations

The pivot table displays the measure and computations in the same order (left to right) that they are listed (top to bottom) in the **Metrics** panel.


To change this order:

1. Right-click a measure or computation in the **Metrics** panel and then click **Move Up** or **Move Down**, as appropriate.
2. Save the pivot table as described in “[Saving a Pivot Table](#),” later in this chapter.

The position of a computation relative to other items in the pivot table can affect the values returned by the computation. See the chapter “[Defining Computations](#).”

2.9.2 Removing a Measure or Computation

To remove a measure or computation from a pivot table:

1. First, do either of the following:
 - Right-click the measure or computation (in the **Metrics**, **Row**, or **Column** panel) and then click **Delete Node**.
 - Click the Clear button  in the upper right of the **Metrics**, **Row**, or **Column** panel to remove all measures and computations from this panel.

Measures can be shown only in the **Metrics** panel, but computations can be shown in any of these panels.

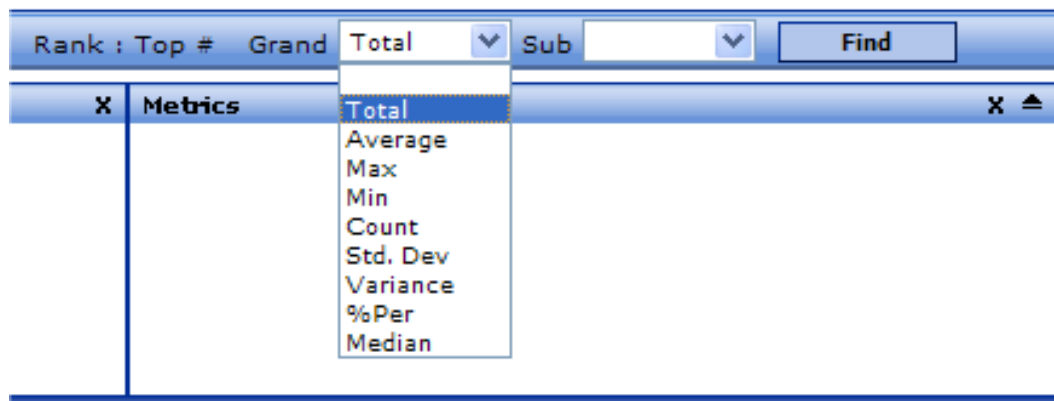
- Save the pivot table as described in “[Saving a Pivot Table](#),” later in this chapter.

2.10 Adding Summary Lines

The body of the pivot table can contain summary lines. A grand summary summarizes the displayed rows of the entire table and is shown as a row at the bottom. Intermediate summaries summarize separate parts of the pivot table and are shown as rows within the body; these are useful only if dimensions are used as rows.

To add summary lines to an open pivot table, do the following:

- In the upper right of the Analyzer page, click either **Grand** (for a grand summary at the bottom of the table) or **Sub** (for intermediate summaries where appropriate in the table). This displays a drop-down menu:



- Select how to summarize:
 - Total** adds the numbers in the column, either for all rows or for the relevant rows, depending on the kind of summary you are creating.
 - Average** averages the relevant numbers.
 - Max** displays the largest value of the relevant numbers.
 - Min** displays the smallest value of the relevant numbers.
 - Count** displays the number of relevant rows.
 - Std. Dev** displays the standard deviation of the relevant numbers.
 - Variance** displays the variance of the relevant numbers.
 - % Per** displays the percentage of the total value that is represented by the relevant rows.
 - Median** displays the median of the relevant numbers.

Note that within the summary line, each cell is computed in the same way.

- Optionally click **Find** to see the results.
- Save the pivot table as described in “[Saving a Pivot Table](#),” later in this chapter.

The following example uses **% Per** for the total summary and the intermediate summaries:

		Female	Male
<i>Home ZIP</i>	<i>Home City</i>	Patient Count	Patient Count
32006	Juniper	566	524
	Spruce	588	540
	Sub Percentage	23	22
32007	Redwood	571	563
	Sub Percentage	11	11
34577	Cypress	586	537
	Magnolia	550	522
	Pine	529	585
	Sub Percentage	33	33
36711	Centerville	513	591
	Sub Percentage	10	12
38928	Cedar Falls	579	539
	Elm Heights	579	538
	Sub Percentage	23	22
Grand Percentage		100	100

Summary lines and sub-summary lines cannot be displayed as columns. You can, however, add computations as columns in order to achieve the same effect. See the chapter [“Defining Computations.”](#)

2.10.1 Usage Notes

These summary options provide a simple way to include summary lines, but their implementation is simple and these options do not handle all cases appropriately. For example:

- If your pivot table is ranked and includes an “Others” item, the value shown for the “Others” item is often much larger than rest of the values. If you include a grand average, that average value will not be as expected, because it is the average includes the “Others” item.
- All measures are treated in the same way, which is not necessarily appropriate. For example, you might have a count in one column, and an average cost in another column. With the summary options, you can include a grand total, so that you get a total count (desirable) and a total of all the average costs (not desirable). Or you can include a grand average, so that you get an average count (possibly desirable) and an average of all the costs (desirable).

Therefore, when you use the summary options, be sure to examine the value in each column to verify that the results are appropriate for your needs. If they are not, use a computation instead. For an example, see [“Examples”](#) in the chapter [“Defining Computations,”](#) later in this book.

2.11 Ranking the Displayed Items

When you use dimensions as rows, the rows are normally sorted in alphabetical order by member name. You can instead sort them according to the value in one of the data columns, and you specify whether the sorting is ascending or descending.

You can also specify the number of rows to display. For the remaining items, one of the following applies:

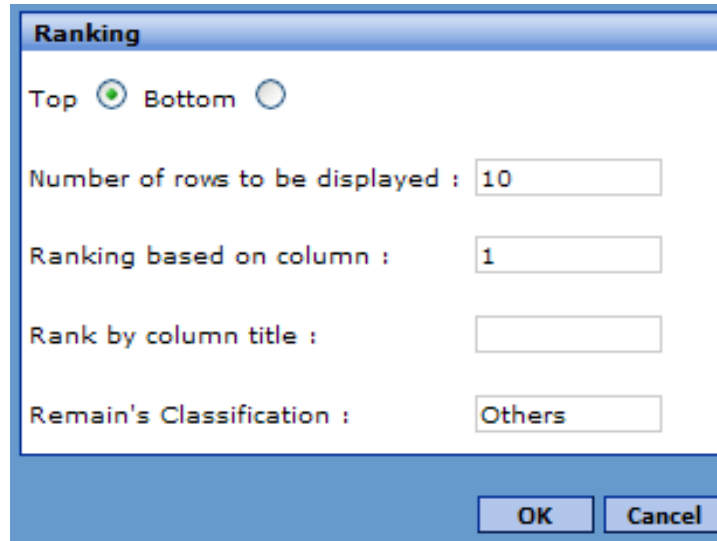
- These items are grouped into a row displayed at the bottom; this row is labeled **Others** by default.
- Or these items are filtered implicitly out of the pivot table.

To rank the displayed items, do the following:

1. Click the **Rank** link in the upper right area (next to the summary options):



The Analyzer then displays the following dialog box (shown here with some options already filled out):



2. In this dialog box, specify how you want to rank the members shown in the pivot table, as well as how you want to classify the leftover members.
 - **Top** or **Bottom** — Select one of these depending on whether you want to display the top-ranking members or the bottom-ranked members.
 - **Number of rows to be displayed** — Specify the number of top-ranked (or bottom-ranked) members that you want to include as rows.

You can also specify this as a percentage (for example 5%), and DeepSee obtains the corresponding percentage of records.

- **Ranking based on column** — Specify an integer or a comma-separated list of integers that indicate the columns to use to rank the members. If you specify this, do not specify **Rank by column title**. The first data column is 1.
- **Rank by column title** — Specify the title of the column or columns to use to rank the members. If you specify this, do not specify **Ranking based on column**.

If you specify multiple column titles, use a carat (^) between each successive pair of titles. For example, specify `Doctor Count^Patient Count` to rank first by the `Doctor Count` column and then by the `Patient Count` column.

- **Remain's Classification** — Specify the caption to use for the members that are excluded from the top or bottom ranking. This has no effect if you do not specify **Number of rows to be displayed** or if that number is larger than the number of rows actually present.

Leave this blank if you want to omit these other members.

3. Optionally click **Find** to see the results.
4. Save the pivot table as described in “[Saving a Pivot Table](#),” later in this chapter.

2.11.1 Example: Top Allergies (by Patient Count)

For example, the following pivot table uses the ranking options shown in the previous steps:

<i>Allergies</i>	Patient Count
No Information Available	3,872
nil known allergies	1,487
tree nuts	465
bee stings	454
wheat	453
additive/coloring agent	449
dairy products	441
shellfish	437
peanuts	435
ant bites	435
Others	2,898

This table groups the patients by their allergies, ranking them in decreasing order by the patient count. Notice that ten allergies are shown, including the No Information Available member and the nil known allergies member. The Others row groups the patients with other allergies.

2.11.2 Ranking When Rows Include Multiple Dimensions

When you use more than one dimension for the rows, and you rank the items, the result is similar, but the details are worth a little examination. In this case, consider the rows that would normally be included in the pivot table. Suppose that the outer dimension is Gender, which has two members: Female and Male. Suppose that the inner dimension is Allergies. If you specify **Number of rows to be displayed** as 10, the pivot table examines the gender-allergy combinations and displays only the top (or only the bottom) ones from that set. For example:

<i>Gender</i>	<i>Allergies</i>	<i>Patient Count</i>
Female	No Information Available	1,976
Male	No Information Available	1,896
	nil known allergies	747
Female	nil known allergies	740
	tree nuts	238
Male	additive/coloring agent	235
Female	ant bites	235
	bee stings	234
	peanuts	233
Male	wheat	231
Others		5,061

2.11.3 Ranking With Percentage

The following pivot table shows the top ages in the subject area. These ages (37, 38, and 36) are the most common ages among the patients and they constitute approximately 5 per cent of the patient set.

Top Ages (Top 5% by Patient Count)	
<i>Age Year</i>	<i>Patient Count</i>
37	186
38	176
36	172
Grand Total	534

This pivot table uses the following ranking options:


- **Top**
- **Number of rows to be displayed** — 5%
- **Ranking based on column** — 1
- **Remain's Classification** — *Blank*

The total number of patients is 10000. The **Grand Total** line indicates that these three ages represent 534 patients, which is a little more than 5 per cent of the total.

2.12 Specifying the Grid Setup Options

The **Setup** dialog box defines a set of options that you use to control the behavior and appearance of a pivot table.

To modify these options for a given pivot table:

1. In Analyzer, click the Grid Setup button  in the tool bar and then click **Grid Setup**.
Or, in the pivot table, right-click anywhere and then click **Setup**.
The system then displays the **Setup** dialog box, which is divided into several different areas, each with different options.
2. Change values as needed. The options are discussed in the following subsections.
3. Click **Save to Pivot** to save the changes to the pivot table and close the dialog box.
Or click **OK**, which applies the changes to the pivot table but does not save the pivot table.
4. Click **Find** to see the resulting pivot table.
5. Save the pivot table as described in “[Saving a Pivot Table](#),” later in this chapter.

2.12.1 Behavior Options

Within the **Behavior** section, you can specify the following options:

- **Do Pivoting On Load** — Select **True** if you want to switch rows and columns (in the same way as you do with **Swap between Rows and Columns**) as soon as the pivot table run. The default is **False**.
- **Max Column Display** — Specify the maximum number of columns.
- **Max Row Display (Data)** — Specify the maximum number of data rows to display, in the entire pivot table. Depending on the data and the **Max Row Display Per Page** setting, the pivot table may extend to multiple pages.
- **Max Row Display (Header)** — Specify the maximum number of header rows to display. This setting affects only the header rows and has no impact on the data rows.
- **Max Row Display Per Page** — Specify the maximum number of data rows to display per page. This setting has no effect on the header rows.
- **Null Replacement** — Specify a string to display in place of any null values.
- **Show Measure** — Select **True** to display the list of drill options (the **Measure List**) to the left of the pivot table.
- **Sorting** — Select a sorting type in order to sort the pivot table: **Generic Ascending**, **Generic Descending**, **Numeric Ascending**, **Numeric Descending**, or **None** (the default).
- **Sorting Column** — Specify the data column by which to sort the rows of the pivot table. Use a number; the first column is 1.
- **Suppress Null Column** — Select **False** if you want to display placeholders to represent the columns that have no data. The default is **True**.

This applies in the situation where you use one or more dimensions as columns. If you suppress null columns, you see rows only for the members of those dimensions that have data. If you do not suppress null columns, the pivot table shows columns for all the members. For example:

	1910		1911		1912	
	Female	Male	Female	Male	Female	Male
	Count	Count	Count	Count	Count	Count
All	4		10		10	

Because the sample contains no male patients born in 1910, 1911, or 1912, these columns are null. These columns would normally be suppressed.

- **Suppress Null Row** — Select **False** if you want to display placeholders to represent the rows that have no data. The default is **True**.

This applies in the situation where you use one or more dimensions as rows. The following figure shows an example of null rows:

<i>Birth Date Year</i>	<i>Gender</i>	<i>Count</i>
1910	Female	4
	Male	
1911	Female	10
	Male	
1912	Female	10
	Male	
1913	Female	8
	Male	
1914	Female	10
	Male	

2.12.2 Excel Output Options

Within the **Excel Output (Grid)** section, you can specify the following options, all of which affect how a pivot table is exported to Microsoft Excel:

- **Header Back Color** — Specify a color to use for the header rows in Excel. When you click this, the system displays a dialog box where you can select a color or type in a color value (in RGB numbers or in hex).
- **Header Font Color** — Specify a color to use for the font in header rows in Excel. When you click this, the system displays a dialog box where you can select a color or type in a color value (in RGB numbers or in hex).
- **Start Column** — Specify the starting column number (in Excel) where the pivot table should be written. The default is for Excel to start writing the pivot table in column 1.
- **Start Row** — Specify the starting row number (in Excel) where the pivot table should be written. The default is for Excel to start writing the pivot table in row 1.
- **Template Excel** and **Template MSWord** — Ignore these options.

2.12.3 Grid Layout Options

Within the **Grid Layout** section, you can specify the following options to fine-tune the appearance of the pivot table:

- **Fix Column Layout** — Specify the width of the fixed columns. If you specify a value that is too small, the value is ignored and discarded.
- **Grid Table Type** — Select **Original** (used throughout this book) or **Simple**. The following table shows both types.

Original	Simple																						
<table> <tr> <th><i>Favorite Color</i></th><th>Count</th></tr> <tr> <td>Blue</td><td>1,229</td></tr> <tr> <td>Green</td><td>1,280</td></tr> <tr> <td>No Data Available</td><td>2,418</td></tr> <tr> <td>Orange</td><td>1,282</td></tr> <tr> <td>Purple</td><td>1,263</td></tr> <tr> <td>Red</td><td>1,258</td></tr> <tr> <td>Yellow</td><td>1,270</td></tr> </table>	<i>Favorite Color</i>	Count	Blue	1,229	Green	1,280	No Data Available	2,418	Orange	1,282	Purple	1,263	Red	1,258	Yellow	1,270	<table> <tr> <th><i>Favorite Color</i></th><th>Count</th></tr> <tr> <td>Blue</td><td>1,229</td></tr> <tr> <td>Green</td><td>1,280</td></tr> </table>	<i>Favorite Color</i>	Count	Blue	1,229	Green	1,280
<i>Favorite Color</i>	Count																						
Blue	1,229																						
Green	1,280																						
No Data Available	2,418																						
Orange	1,282																						
Purple	1,263																						
Red	1,258																						
Yellow	1,270																						
<i>Favorite Color</i>	Count																						
Blue	1,229																						
Green	1,280																						

- **Hide Columns** — Specify the data columns to hide. Type a comma-separated list of column numbers.
- **Other Column Layout** — Specify the width of the data columns. If you specify a value that is too small, the value is ignored and discarded.
- **Row Height** — Specify the height of the rows. The default is 20.
- **Show Dimension Header** — Select **False** if you want to hide the dimension header, as in the following example:

		Count
32006	Juniper	1,090
	Spruce	1,128
32007	Redwood	1,134
34577	Cypress	1,123
	Magnolia	1,072
	Pine	1,114

In this example, there is no caption for the left two columns. The default for **Show Dimension Header** is **True**.

- **Show Top Banner** — Select **False** if you want to hide the banner for the pivot table, which contains the name of the pivot table and buttons for the user. The default is **True**, which displays the banner as follows:

Count and Age by City			< Level 0 of 0 > ... i ≡ 📊			
<i>Home City</i>	Patient Count	Average Age				
Cedar Falls	1,118	35.25				
Centerville	1,104	37.06				


2.12.4 Other Options

The setup dialog box has other options labeled **Knowledge Base** and **Scripting**. Ignore these.


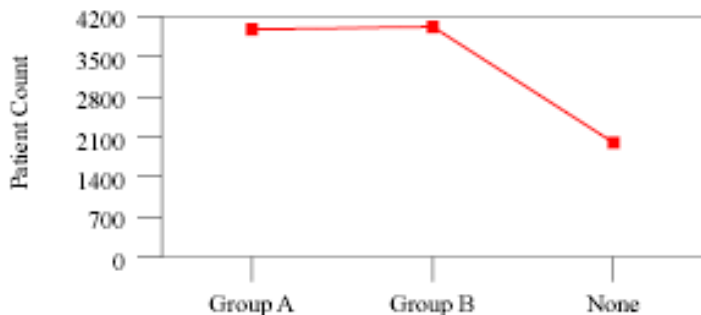

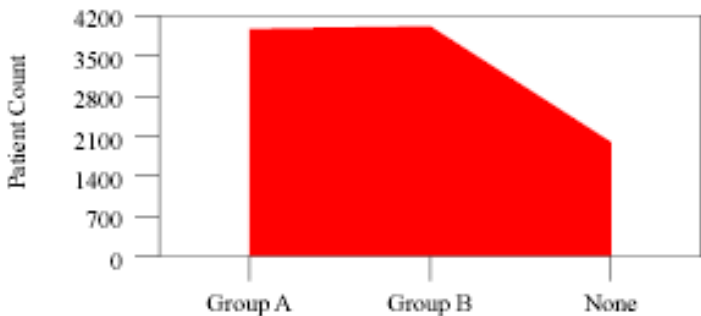
2.13 Specifying the Initial Chart Type


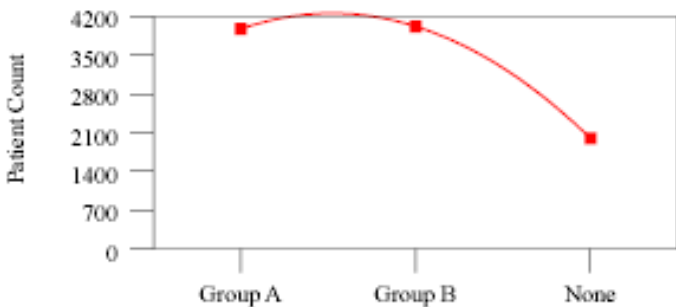

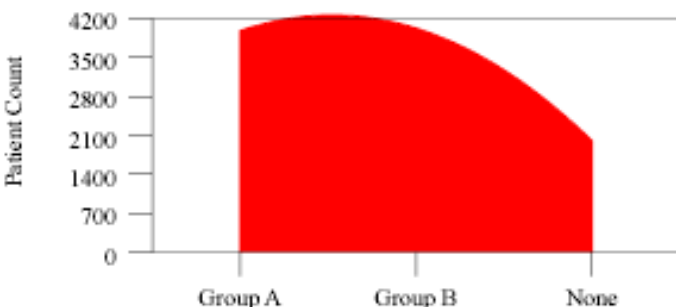

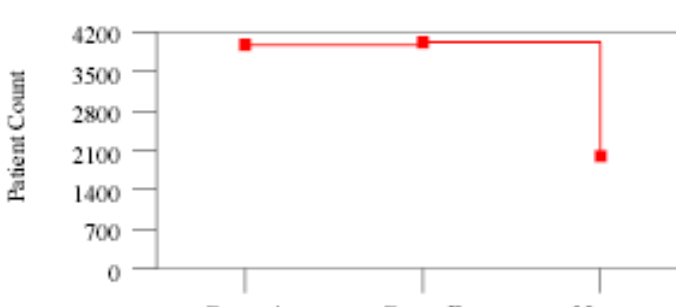

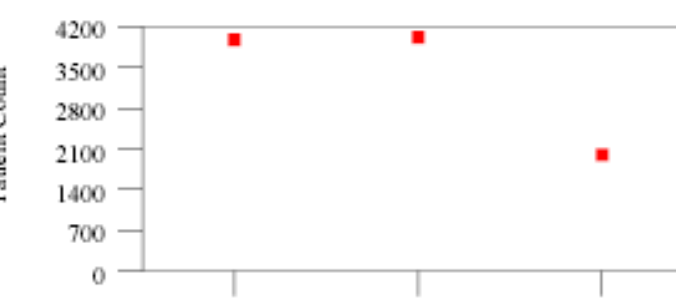
When you display a pivot table in chart format, you have a choice of chart types. By default, the chart is shown as a bar chart.


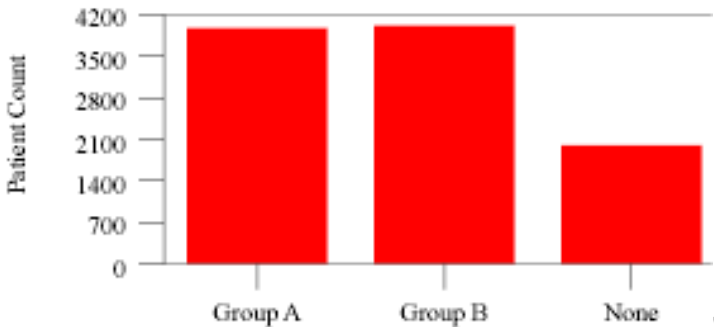

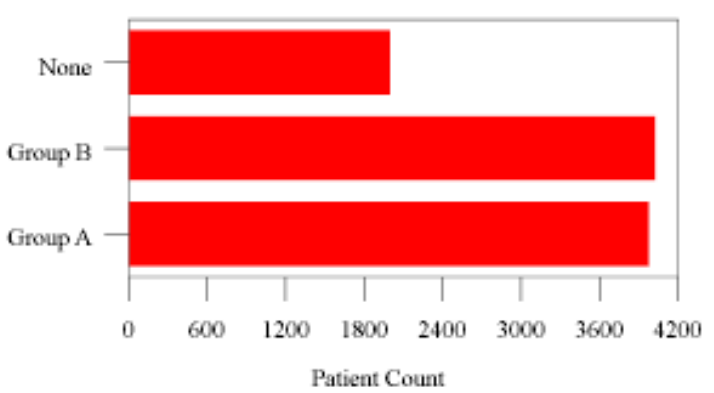

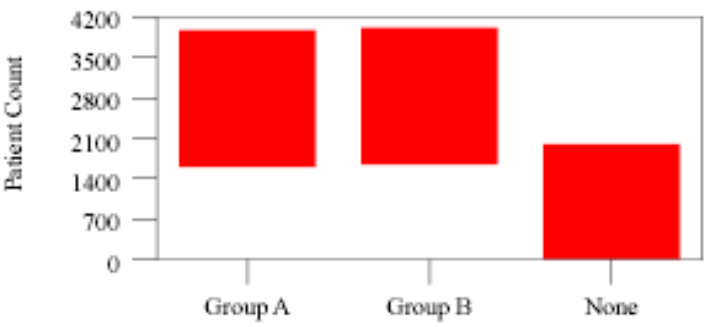


To specify the initial chart type for a pivot table:




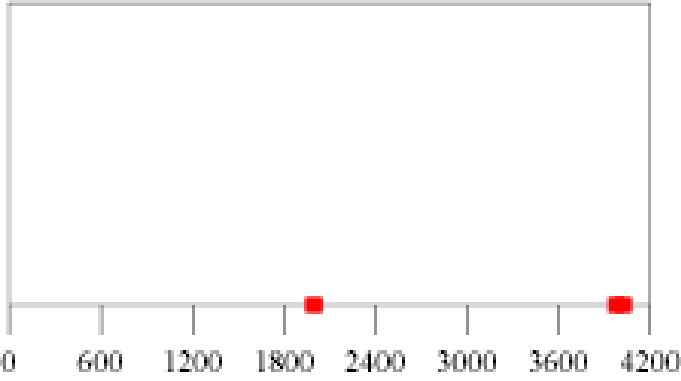

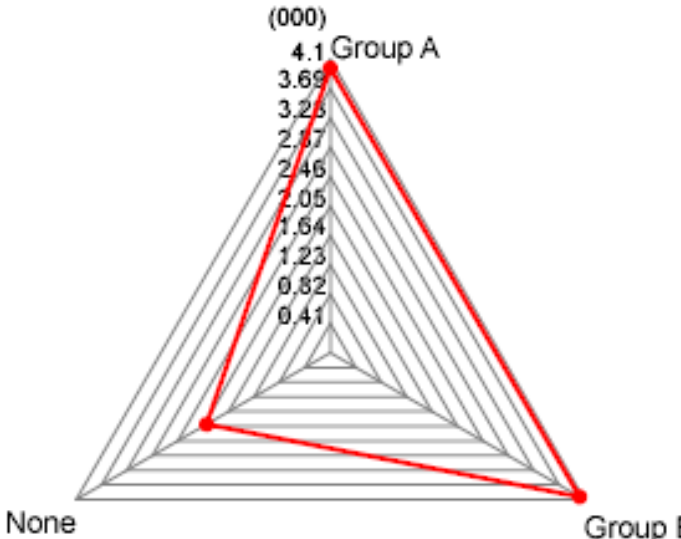
1. Open the pivot table as described earlier in this chapter.
2. Click the Chart Type button . Then click the button for the type of chart you want; see the table later in this section.
3. Save the pivot table as described earlier in this chapter.

The following table shows examples of the chart types:

Button	Chart Type Name	Example								
	Line chart	 <table><caption>Data for Line Chart Example</caption><thead><tr><th>Group</th><th>Patient Count</th></tr></thead><tbody><tr><td>Group A</td><td>4000</td></tr><tr><td>Group B</td><td>4000</td></tr><tr><td>None</td><td>2100</td></tr></tbody></table>	Group	Patient Count	Group A	4000	Group B	4000	None	2100
Group	Patient Count									
Group A	4000									
Group B	4000									
None	2100									
	Area chart	 <table><caption>Data for Area Chart Example</caption><thead><tr><th>Group</th><th>Patient Count</th></tr></thead><tbody><tr><td>Group A</td><td>4000</td></tr><tr><td>Group B</td><td>4000</td></tr><tr><td>None</td><td>2100</td></tr></tbody></table>	Group	Patient Count	Group A	4000	Group B	4000	None	2100
Group	Patient Count									
Group A	4000									
Group B	4000									
None	2100									

Button	Chart Type Name	Example
	Curve	
	Area curve	
	Step	
	Scatter	



Button	Chart Type Name	Example
	Bar	 <p>Bar chart showing Patient Count for Group A, Group B, and None. The y-axis ranges from 0 to 4200. Group A and Group B have counts around 4000, while None is around 2100.</p>
	Gantt	 <p>Gantt chart showing Patient Count for Group A, Group B, and None. The x-axis ranges from 0 to 4200. Group A and Group B have counts around 4000, while None is around 2100.</p>
	Cube	 <p>Cube chart showing Patient Count for Group A, Group B, and None. The y-axis ranges from 0 to 4200. Group A and Group B have counts around 4000, while None is around 2100.</p>
	Pie	 <p>Pie chart showing Patient Count for Group A, Group B, and None. The chart is divided into three segments: red (Group A), yellow (Group B), and blue (None).</p>

Button	Chart Type Name	Example
	Doughnut	 <p>Patient Count</p>
	Coordinate	 <p>Patient Count</p>
	Radar	 <p>(000) 4.1 Group A 3.69 3.28 2.87 2.46 2.05 1.64 1.23 0.82 0.41</p> <p>None Group B</p>

2.14 Saving a Pivot Table

When you save a pivot table, DeepSee saves the underlying query that retrieves the data, along with the information needed to display it the way you chose. This action does not store the data.

To save a pivot table:

1. Click the Save button  and then click **Save Pivot**.
Or click **Save As Pivot** to save with a new name.
2. For **Name**, type the name of this pivot table.
3. For **Notes**, optionally type any notes.
4. Click the Browse button  next to **Folder** and select a folder such as **Default**. Then click **OK**.
5. Click **OK** to accept the name.
6. Click **OK** on the confirmation dialog box.

3


Filtering the Data

This chapter describes how to filter data using the interactive filter editor. It includes the following topics:

- [A tutorial](#)
- [How to apply a filter to a pivot table](#)
- [Information about the filter expressions you can use](#)
- [How to use the Edit Filter dialog box in detail](#)
- [How to remove a filter](#)

3.1 Tutorial

It is useful to try working with the filter editor to get a feel for it. This tutorial steps you through a simple filter procedure.


1. Click the New button  to create a new pivot table.
2. Open a subject area if you do not have one open yet.
3. Click **Find**. The Analyzer displays a completely aggregated pivot table, which shows the total number of records in this subject area:

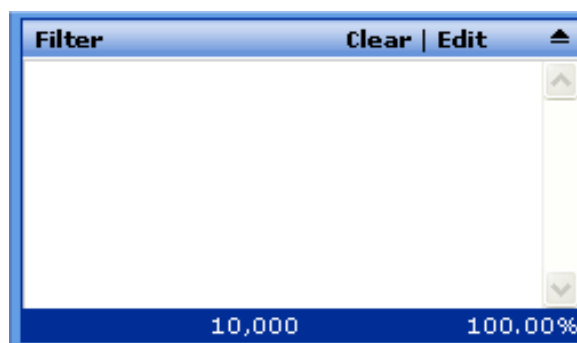
	Count
All	10,000

4. On the left side of the Analyzer, look at the **Filter** panel:

Filter	Clear Edit	
10,000	100.00%	

The numbers here indicate the number of records currently included in this pivot table (10000 in this example) and the percentage (100% in this example) that those records represent of the total number of records in the subject area.

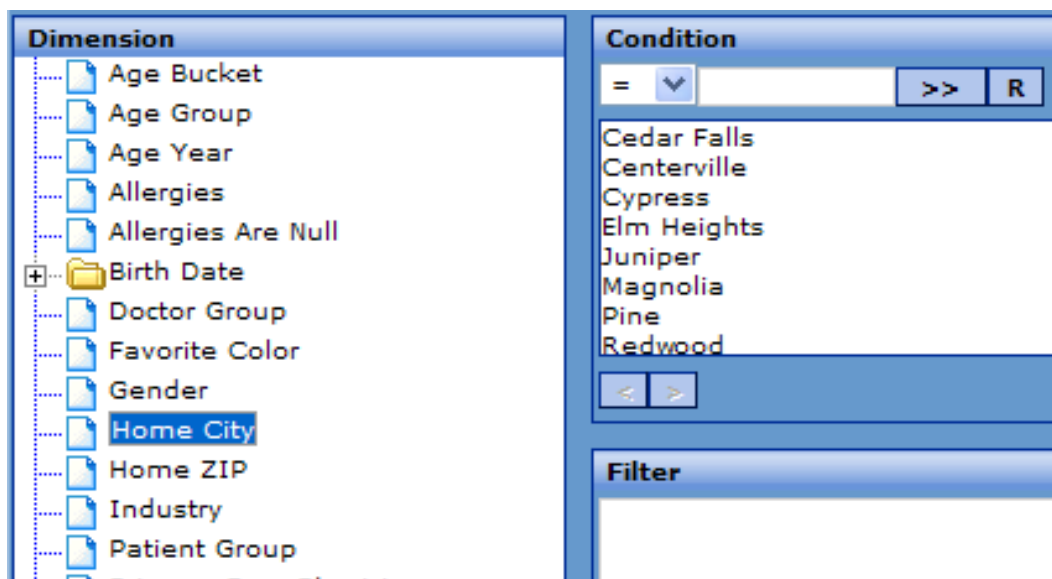
5. Click the Show button  in the upper right of this panel, to expand it and display the current filter expression, which is empty:



6. Click the **Edit** option in the **Filter** panel.

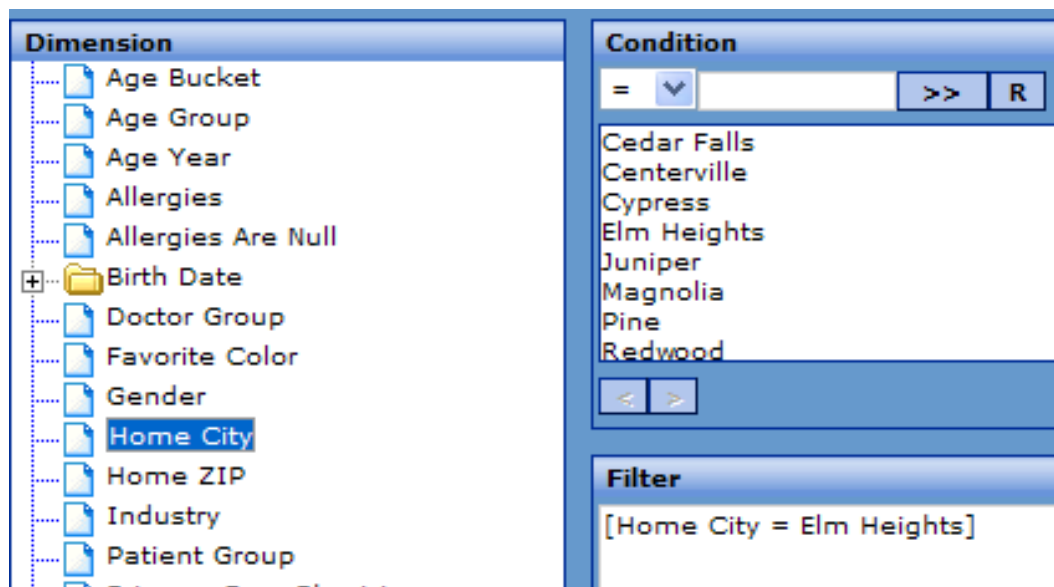
The Analyzer then displays a dialog box where you can specify how to filter the pivot table. Here, you construct a boolean expression. The pivot table will include only source records for which this expression is true.

7. Double-click the **Home City** dimension in the left area. The dialog box then displays the members of this dimension in the list in the upper right, as follows:



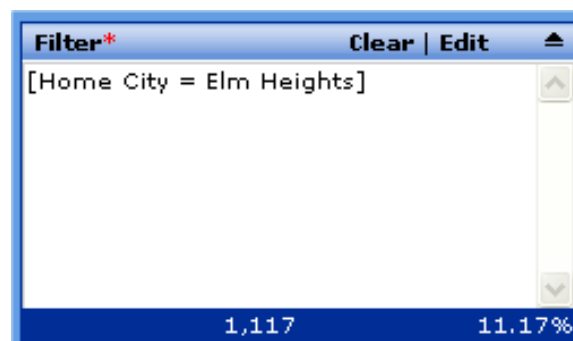
The members you see here are the members that are *currently* present in your data. No separate lookup table is involved.

8. Double-click the member **Elm Heights** in the upper right. The dialog box then adds an item to the expression within the **Filter** area, as follows:



9. Click **OK** to accept this filter and close this dialog box.

Now the **Filter** panel looks like this:



10. Click **Find**. The pivot table now looks like this:

	Count
All	1,117

The pivot table now contains 1117 records, which is about 11% of the total number of records in this subject area.

3.2 Applying a Filter to a Pivot Table

To define and apply a filter to a pivot table, use the following procedure:

1. If the pivot table is not currently open, open it.
2. Click the **Edit** option in the **Filter** panel.

The Analyzer then displays a dialog box where you can specify how to filter the pivot table. Here, you construct a boolean expression. The pivot table includes only source records for which this expression is true.

The following sections [describe the filter expressions](#) and then the [mechanics of using this dialog box](#).

3. Specify the filter as described in the following sections.
4. Click **OK**.
5. To see the new results, click **Find**.
6. Save the pivot table.

The filter is saved as part of the pivot table definition.

3.3 Overview of Filter Expressions

You use the **Edit Filter** dialog box to construct a boolean expression; the pivot table uses only source data for which this condition is true.

3.3.1 Basic Syntax for Filter Expressions

A filter expression has the following syntax:

```
[DimensionName = String]
```

Here:

- *DimensionName* is the name of a dimension, without quotes.
- *String* is an unquoted string that typically equals the name of a member of that dimension, or the start of a name.

Notes:

- The spaces before and after the operator are required.
- The names of dimensions and members are case-sensitive.
- You can use other operators instead of the equals sign (=). The operators you can use are as follows:

Operator	Meaning
=	The filter expression is true only for records that belong to the given member.
>	The filter expression is true for records that belong to members that are sorted after the given member by default. For string values, DeepSee sorts in ascending alphanumeric order. However, for string values that contain only numbers, DeepSee sorts in ascending numeric order (when it evaluates filter expressions).
>=	The filter expression is true for records that belong to the given member and for all members that are sorted after that member by default.
<	The filter expression is true for records that belong to members that are sorted before the given member by default.
<=	The filter expression is true for records that belong to the given member and for all members that are sorted before that member by default.
IN	The filter expression is true for records that belong to any of the given members. See “Filter Expressions Using IN,” next.
?=	The filter expression is true for records that belong to members whose name match the given pattern. See “Filter Expressions Using Pattern Matching.”

- You can combine filter expressions by using the logical operators NOT, AND, and OR. For example:

```
[Favorite Color = Blue] OR [Favorite Color = Red] OR [Favorite Color = Yellow]
```

Use brackets to control the precedence.

- Filter expressions use the internal names of dimensions and members. By default, the external name of a dimension is the same as the internal name; similarly, the external name of a member is the same as the internal name. This means that if you have renamed dimensions or members, the filter editor still shows the original names.

For information on renaming dimensions and members, see the chapter “[Creating and Customizing Dimensions](#).”

- The dimension and the members that you use in a filter expression are not required to have any relationship to the current context. For example, if a pivot table groups records by doctor and home city, you can filter by any dimension, not necessarily just by doctor and home city.

3.3.2 Filter Expressions Using IN

A filter expression can have the following syntax:

```
[DimensionName IN String1,String2,String3,...]
```

Do not include spaces before or after the commas in this list; any such space is treated as part of a member name.

For example:

```
[Favorite Color IN Blue,Red,Yellow]
```

This expression is true for all records that belong to the Blue, Red, or Yellow members of the Favorite Color dimension.

3.3.3 Filter Expressions Using Pattern Matching

A filter expression can have the following syntax:

```
[DimensionName ?= String]
```

Where *String* is an unquoted string that includes one or more asterisk characters (*), each of which is a wildcard that can represent any number of characters.

For example:

```
[Doctor ?= *an*]
```

This expression is true for all records where the doctor’s name includes the string “an.” For example:

<i>Doctor</i>	Count
Alexandra Alton	16
Alexandra Levinson	23
Alexandra Winters	22
Alfred Goldman	22
Alice Bachman	30
Amanda Orwell	17
Amanda Pybus	17
Andrew Ingleman	22
Angelo Ulman	13
Ashley Hanson	19

3.3.4 Filter Expressions and Dates

When you create a dimension based on a date, DeepSee creates a set of dimension variants, which you can use separately or in combination. For example, if you create a date dimension called *Birth Date*, DeepSee creates the variants *Birth Date Year*, *Birth Date Quarter*, *Birth Date Month*, and so on. The *Birth Date Year* variant uses only the year part of the date, *Birth Date Quarter* uses only the quarter number, and so on.

3.3.4.1 Using Part of the Date

You can use the dimension variants in the same way as any other dimensions, including using them in filters. For example, consider the following filter expression:

```
[Birth Date Quarter >= Q3]
```

This expression filters out records associated with quarters Q1 and Q2, in any year. The result might be as follows:

<i>Birth Date Quarter</i>	Count
Q3	2,485
Q4	2,588

3.3.4.2 Using the Full Date

When you filter by date, you often want the filter to consider a complete date rather than just an isolated segment of it. For example, you might want to filter a subject area to show only the data that falls within a particular ten-year span of time.

To do so, you can use the base date dimension name without any of the automatically generated suffixes. For example:

```
[Birth Date > 01/01/1980] AND [Birth Date < 01/01/1990]
```

The dates must be in the format *DD/MM/YYYY* or *DD/MM/YY*, where *DD* is a two-digit day, *MM* is a two-digit month, *YY* is a two-digit year, and *YYYY* is a four-digit year.

Tip: To refer to today's date in the required format, use the following expression:

```
$ZDATE($HOROLOG,4)
```

For example:

```
[Birth Date = {$ZDATE($HOROLOG,4)}]
```

For information on the \$ZDATE function and the \$HOROLOG special variable, see the *Caché ObjectScript Reference*.

3.3.5 Filter Expressions with Embedded Caché ObjectScript

A filter expression can include an embedded Caché ObjectScript expression. The syntax is as follows:

```
[DimensionName = {COS expression}]
```

An extremely simple example is as follows:

```
[Favorite Color = {"R_"ed"}]
```

3.3.5.1 Example: Using a Variable Specified at Runtime

In a filter expression, use the following syntax to use a variable as a member name:

```
[DimensionName = {variable_name}]
```

Or:

```
[DimensionName = {COS expression that includes variable_name}]
```

You can provide a default value as follows:

```
[DimensionName = {$GET(variable_name,default_value)}]
```

For information on setting values of variables at runtime, see [Using the DeepSee Dashboard Designer](#).

3.3.5.2 Example: Using Session Data

In a Caché ObjectScript expression in DeepSee, you can refer to the current DeepSee username or the current DeepSee user role, as follows:

```
%session.Data("CurrUser")
%session.Data("CurrRole")
```

For example, you could use the current DeepSee role to specify the filter that you apply to a subject area:

```
[Region Name = {$CASE(%session.Data("CurrRole"),"role1":"North","role2":"South","role3":"West",:"East")}]
```

3.3.6 Filter Expressions as Caché ObjectScript Expressions

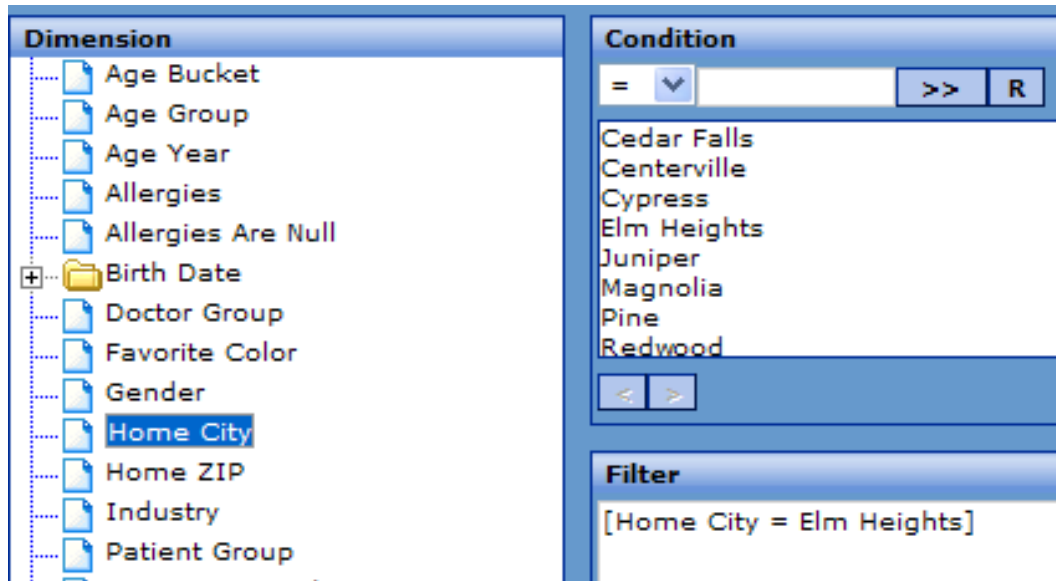
In the most general case, you can use a Caché ObjectScript expression as the entire filter expression. That is, in place of the normal filter expression, use the following:

```
{COS expression}
```

The Caché ObjectScript expression must return a valid filter expression.

3.4 Using the Edit Filter Dialog Box

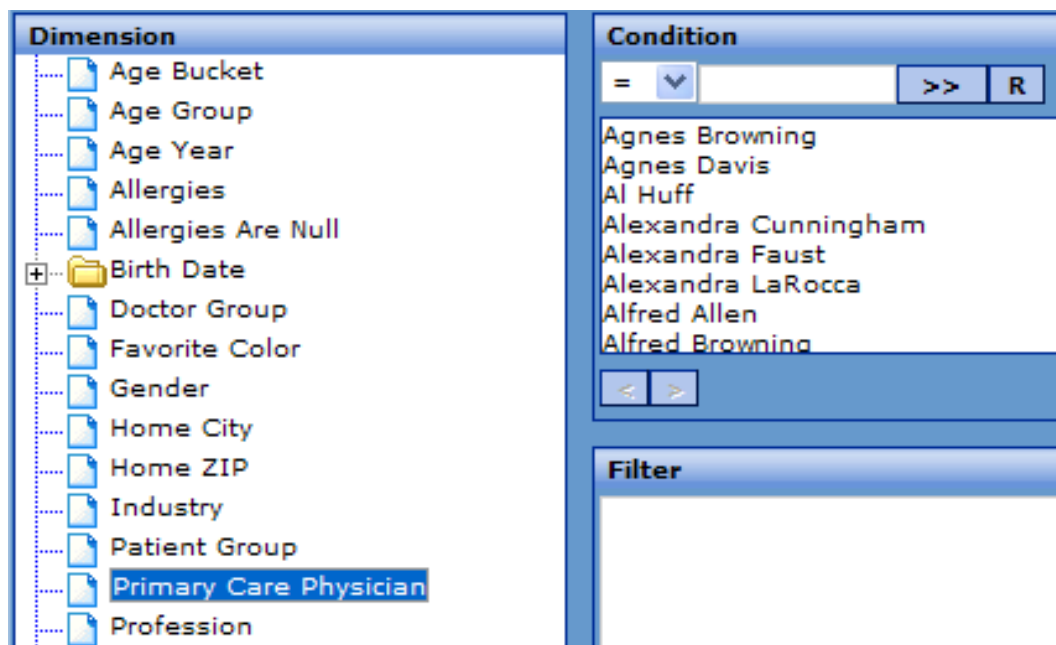
As discussed in the previous section, you use the **Edit Filter** dialog box to define a filter for a pivot table. This section describes the mechanics of working with this dialog box.



At all times, the **Filter** area shows the filter expression, which you can also edit directly.

3.4.1 Displaying Members

To display the members of a dimension on this dialog box, click the dimension name in the **Dimension** panel. The members are immediately listed in the large box below the **Condition** label, as follows:



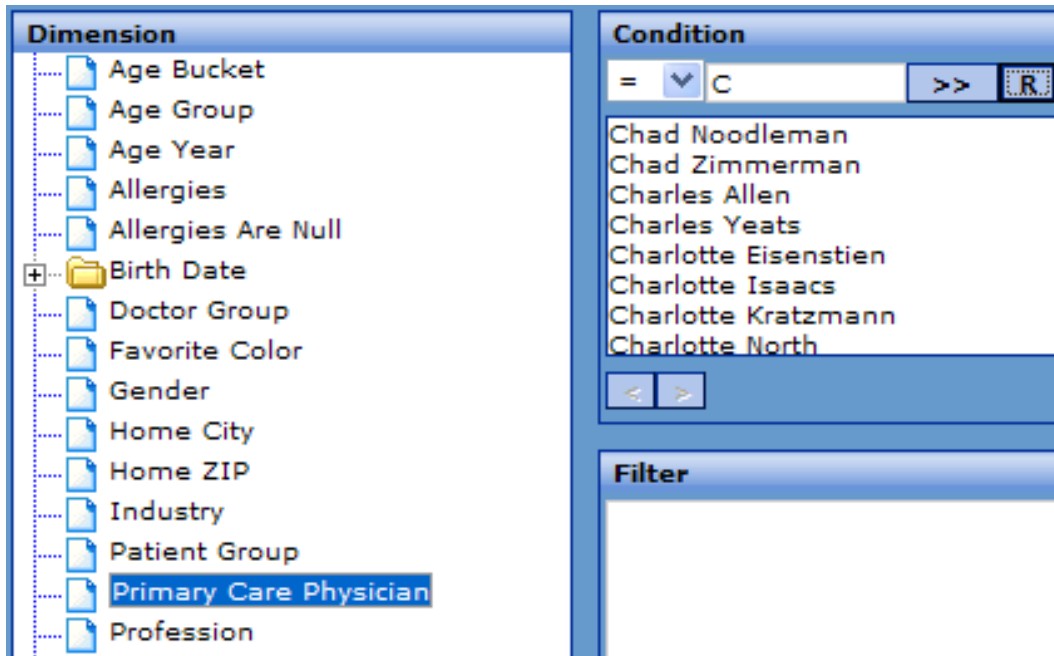
As noted earlier, these members are the ones that are *currently* present in your data. If you delete old data from your application or if you add new business areas, for example, the set can change.

If there are many members, they are not displayed all at the same time; in this case, the left and right arrow buttons are enabled, and you can page through the set.

To restrict the members that are displayed here:

1. Select an operator from the operator drop-down.
2. Type a value into the box next to the operator.
3. Click **R** to refresh the display.

Now you see something like this:



Notice that the filter expression is unchanged.

3.4.2 Adding to the Filter

To add to the filter expression, do any of the following:

- Double-click a member name. This adds an item to the filter of the following form:

```
[DimensionName operator MemberName]
```

For example:

```
[Allergy = bee stings]
```

If this is not the first expression in the filter, it is automatically preceded by a logical operator, depending on which of the options (**Not**, **And**, or **Or**) you have currently selected.

- Click **Not**, **And**, or **Or** to specify which operator to use when you add the next expression to the filter. More formally, if the filter expression currently is [*Expression 1*] and you add a second expression [*Expression 2*], the result is as follows, depending on the currently selected logical operator:
 - If **Or** is currently selected, the result is:


```
[ Expression 1 ] OR [ Expression 2 ]
```
 - If **And** is currently selected, the result is:

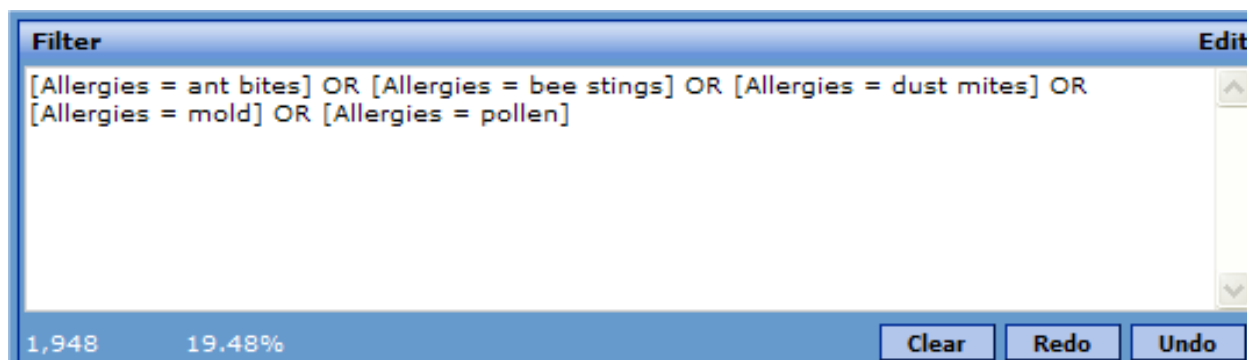
```
[ Expression 1] AND [ Expression 2]
```

- If **Not** is currently selected, the result is:

```
[ Expression 1] AND [NOT[ Expression 2]]
```

Ignore the **Multipass** option.

Any of these actions updates the **Filter** area. For example:



The lower left area indicates the number of records currently retrieved by the filter, as well as the percentage of total number of available records.

Here you can use several other buttons:

- **Edit** — Click this to display another dialog box, in which you can create advanced filter expressions.
- **Clear** — Click this to clear all selections and all typing on this dialog box.
- **Redo** — Click this to redo the last action.
- **Undo** — Click this to undo the last action.

3.4.3 Advanced Options

When you view the **Edit Filter** dialog box, if you click the **Edit** option, the Analyzer displays a dialog box that you can use to create filter expressions that use embedded Caché ObjectScript. The dialog box looks like this:

Important: You can type any valid Caché ObjectScript expressions, which can use any methods, routines, functions, or other elements, including your own. You are not restricted to use the elements provided within the user interface shown here. InterSystems suggests that you write your own functions wherever possible rather than use the elements that are specific to DeepSee.

See the book *Expressions and Scripts in DeepSee*.

3.5 Removing a Filter

To remove the filter from a pivot table:

1. Click the **Clear** option in the **Filter** panel of the Analyzer.
2. Save the pivot table.

4

Sorting the Data

For convenience, this chapter describes all the ways to sort the data in a pivot table. This chapter discusses the following topics:

- [How pivot tables are sorted by default](#)
- [How you can sort a pivot table in the Analyzer](#)
- [How users can sort a pivot table](#)
- [Precedence among the sorting options](#)

4.1 Default Sorting of a Pivot Table


The definition of a pivot table can include dimensions used as rows, dimensions used as columns, or both. That definition determines the overall structure of the pivot table. For example, if two dimensions (*Birth Date Year* and *Gender*) are used as rows, the first dimension becomes the outer set of rows, and the second dimension is nested within it:

<i>Birth Date Year</i>	<i>Gender</i>	Count
1910	Female	4
	Male	
1911	Female	10
	Male	
1912	Female	10
	Male	
1913	Female	8
	Male	
1914	Female	10
	Male	

In all cases, when a dimension is included as rows or columns, the dimension members are shown in increasing alphanumeric order from top to bottom (or from left to right, as appropriate). The values in the data columns do not have any effect on the default sort order.

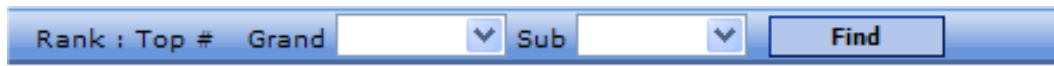
4.2 Sort Options

For each pivot table, you can use any of the following options to sort that pivot table in a different way:


- By using the sort options within the **Setup** dialog box. These enable you to sort the rows according to the value in a data column of the pivot table.
 - In Analyzer, click the Grid Setup button  in the tool bar and then click **Grid Setup**.
Or, in the pivot table, right-click anywhere and then click **Setup**.
The system then displays the **Setup** dialog box.
 - Specify values for **Sorting** and **Sorting Column**, as described in “[Behavior Options](#),” earlier in this book.
 - Click **Save to Pivot** to save the changes to the pivot table and close the dialog box.

Unlike the other options described in this section, this option has no effect on the pivot table when displayed in chart format.

- By applying an overall ranking that refers to a data column of the pivot table. Typically, you use this to display a set of top-ranked or bottom-ranked items.
 - Click the **Rank** link in the upper right area:



The system then display a dialog box where you specify how to rank the rows of the pivot table.

- In the dialog box, specify the options as described in the section “[Ranking the Displayed Items](#),” earlier in this book.
- By changing the order of the members within the dimension, as shown in this pivot table.
 - Click the Expand button  next to the dimension name, within the **Row** or **Column** panel above the pivot table.
 - Right-click **All Condition** and then click **Edit Condition**.
 - Continue as described in the section “[Specifying How to Sort the Members](#),” later in this book.

You can also temporarily sort any column by clicking the column header; that change is not saved as part of the pivot table definition and does not affect the chart.

4.3 User Options

A user can sort a pivot table in a different way as follows:

- By using the sort options within the **Setup** dialog box. See “[Behavior Options](#),” earlier in this book.

- By clicking a column header.

These options do not affect the pivot table when displayed as a chart.

4.4 Precedence Among the Sorting Options

The following list describes the precedence relationships among the sorting options, for pivot tables and for charts as seen by the users:

For a pivot table:

1. If the user clicks a column header to sort the pivot table, that sorting is applied and any other sorting options are ignored.
You can also sort a pivot table this way in the Analyzer, but you cannot save this change as part of the pivot table definition.
2. If the pivot table is sorted via the **Setup** dialog box, that sorting takes precedence and any other sorting options are ignored.
3. Otherwise, if the pivot table is sorted by the **Rank** option, that sorting takes precedence and any other sorting option is ignored.
4. Otherwise, if the pivot table is sorted by the **Edit Condition** option, that sorting is used.
5. Otherwise, the pivot table is displayed in default sort order.

When you display a pivot table as a chart, the chart considers only the **Rank** and **Edit Condition** options. The **Rank** option takes precedence.

For a chart, there is only one way to sort according to the values of a data column. To do this, use the **Rank** option and choose the column to sort by, as usual. When specifying the number of rows to display, use a number larger than the number of expected rows, to ensure that all rows are displayed.

5

Defining Measures

This chapter describes how to define measures. It discusses the following topics:

- [An overview of measures](#)
- [How to define or redefine a measure defined in a subject area](#)
- [How to define or redefine a measure in a pivot table](#)
- [How to use the Measure Editor](#)
- [How to apply a filter to a measure](#)
- [How to delete a measure](#)
- [Examples of some measure definitions](#)

Also see the chapter “[Defining Computations](#).”

5.1 Overview of Measures

Measures are the data displayed in the main body of a pivot table (the white and off-white cells). When InterSystems DeepSee computes the value for a measure in a given table cell, it performs two actions:

1. It identifies all the source records associated with that data cell. This depends on the dimensions used in the pivot table, how the dimensions are used, any filtering that has been applied to the pivot table, and any filtering that has been applied to the subject area.
2. It summarizes those records with a single value. It does this in one of two ways, depending on the measure formula:
 - It aggregates the separate measure values (one per record) to a single value. For example, it might add up the values.
 - Or it counts the number of times a given dimension is represented in distinct form within those records. For example, it might count the number of distinct regions associated with this pivot table cell.

For a fuller discussion, see [Overview of DeepSee](#).

5.1.1 Measures and Pivot Tables


Within the Analyzer, you create and manage measures in two places:

- You can define (or redefine) the measures within a pivot table. In this case, you are creating or redefining the measure only for this pivot table. These are called *temporary measures*. As you will see in the next item, all measures in a pivot table are temporary measures.
- You can define (or redefine) measures within the **Measures** panel. In this case, you are creating or redefining a measure that is available to the entire subject area.

Usually, you define measures in the **Measures** panel so that you can easily drag and drop them to any pivot tables that need them. It is critical to understand the following: when you add a measure to a pivot table by getting the measure from the **Measures** panel, you are making a *copy* of the measure. The measure that appears in the pivot table has the same name and same definition as the one you chose, but it is a temporary measure. Therefore, if you delete or modify the original measure (the one in the **Measures** panel), no pivot tables are affected.

5.2 Defining or Redefining a Measure in a Subject Area

To define or redefine a measure in a subject area:

1. Open the subject area.
2. If the **Measures** panel is collapsed, expand it by clicking the Show button  in its upper right.
3. In the **Measures** panel, do one of the following:
 - Right-click and select **Add Measure**.
 - Right-click a measure (other than Count, which cannot be changed) and select **Edit Measure**.

This displays the **Metrics Editor** page.

4. In the **Metric Name** field at the top of the page, specify the name of this measure.
5. In the rest of the page, specify how this measure is calculated, optionally filtered, and displayed. See “[Using the Metrics Editor](#),” later in this chapter.
6. Click **Save**.

The new or changed measure is now available for any pivot table in this subject area.

Note: If you redefined a measure that you have already used, there is no change to those pivot tables that currently use it.

5.3 Defining or Redefining a Temporary Measure in a Pivot Table

To define or redefine a temporary measure:

1. Open the pivot table in which the temporary measure is defined.
2. In the **Metrics** panel on the top, do one of the following:
 - Right-click and select **Add Temp. Metric**.
 - Right-click a measure and select **Edit Temp. Metric**.

This displays the **Metrics Editor** dialog box.

3. In the **Metric Name** field at the top, specify the name of this measure.
4. In the rest of the page, specify how this measure is calculated, optionally filtered, and displayed. See “[Using the Metrics Editor](#),” later in this chapter.
5. Click **Save** to close the dialog box.
6. Save the pivot table to save your changes.

The new or changed measure is now included in this pivot table. It is not accessible to any other pivot tables.

5.4 Using the Metrics Editor

You use the **Metrics Editor** dialog box to define measures and temporary measures. This page looks something like the following, depending on your data:

Metric Name: Patient Count

Measure

- [Count]
- [Age]
- [Allergy Count]
- [Birth Date]
- [Encounter Count]
- [Test Score]

Dimension Distinct

- [Age.Distinct]
- [Age Bucket.Distinct]
- [Age Group.Distinct]
- [Age Year.Distinct]
- [Allergies.Distinct]
- [Allergies Are Null.Distinct]
- [Allergy Count.Distinct]
- [Birth Date.Distinct]
- [Birth Date Day.Distinct]

Functions

- .Sum
- .Average
- .Distinct
- .Max
- .Min
- .FirstDate
- .LastDate
- .Median

Formula

[Count]

Filter Edit

Display Style: Number ▼ Dec. Place:

OK Cancel

On this screen, you can do the following:

- **Metric Name** — Specify the name of the measure you are defining or editing.
- **Formula** — Specify an expression that returns the data for the measure, as described in the [following subsection](#) and the examples after it.

This expression is a Caché ObjectScript expression in which the syntax `[measure formula]` represents a measure formula.

- **Filter** — Optionally apply a filter to this measure. Normally a measure aggregates data for all records associated with a given pivot cell. If the measure uses a filter, the measure considers only a subset of those records.

See the sections “[Overview of Filter Expressions](#)” and “[Using the Edit Filter Dialog Box](#),” earlier in this book. For an example of a filtered measure, see “[Example 2: A Filtered Measure](#),” later in this chapter.

Note: If you filter a measure, it is important for the measure name to clearly indicate that the measure is filtered; otherwise you may mislead or confuse the users.

- **Display Style** — Choose a display style for this measure. For details and examples, see the section “[Specifying a Display Style](#),” later in this section.
- **Dec Point** — If the measure uses a numeric style, specify the number of decimal places it uses (0 by default).

5.4.1 Specifying the Formula for a Measure

To specify a formula, you can double-click the items in **Measures**, **Dimension Distinct**, and **Functions**; type the formula directly into the **Formula** box; or do both. When you double-click an item in **Measures**, **Dimension Distinct**, or **Functions**, it is added to the appropriate part of the formula (if that can be inferred) or to the end of the formula.

A formula must specify the source data to use, as well as how to aggregate it. Typically you specify a formula in one of the following ways:

- By using a *base measure* and (if needed) an aggregating function. For example: `[Count], [Test Score.Average], [Birth Date.LastDate]`

In this case, you use elements in the following panels:

- The **Measures** panel lists all the base measures, which are defined in the Architect. The formula for a base measure has the following form: `[MeasureName]`

Each base measure is either numeric or date-typed. Every subject area includes the default measure, `Count`, the base measure that counts the records in the base class. Other than `Count`, each base measure is based on values in the raw data and is calculated at index build time.

- The **Functions** panel lists all the available aggregating functions.

For numeric values, you can use the following functions: `.Sum`, `.Average`, `.Distinct`, `.Max`, `.Min`, `.Median`, `.StdDev`, and `.Variance`. The default is `.Sum`; that is `[Total Revenue]` is equivalent to `[Total Revenue.Sum]`

For date values, you can use the `.FirstDate` and `.LastDate` functions. There is no default aggregation for date values.

Note: These functions treat null values as zeros.

- By using an item in **Dimension Distinct**, which represents the count of the distinct values for a given dimension. For example, `Doctor.Distinct` represents the number of unique doctors who are the primary care physicians for a selected group of patients.

5.4.2 Specifying a Display Style

In the **Metrics Editor** dialog box and in several other parts of the Analyzer, you can select a display format. The choices are as follows:

- **Number** — Display as a number, using the number of decimal places specified by the separate **Dec Point** option.
- **String** — Display as a string.
- **Currency** — Display as a currency value, using the number of decimal places specified by the separate **Dec Point** option.
- **Date** — Display as a date as in the following example: 04/07/2005
- **Medium Date** — Display as a date as in the following example: Jul 4, 2005
- **Long Date** — Display as a date as in the following example: July 4, 2005
- **Details Date** — Display as a date as in the following example: Monday July 4, 2005
- **Time** — Display the time part of a date-time field, as in the following example: 04:41:25PM
- **Percentage** — Display the value as a percentage. For example, display the value 250 as 25,000%
- **(Currency)** — Display as a currency value and enclose negative values within parentheses. For example, display the value -255 as (\$255)
- **Custom** — Use your custom display style.

Note: The currency symbol is set system-wide, within another DeepSee module. The same module enables you to specify the thousands and decimal separators. See the [DeepSee Site Configuration and Maintenance Guide](#).

5.5 Applying a Filter to a Measure

As noted previously, you can also apply a filter to a measure. To do so:

1. Edit the filter by using the **Metrics Editor** dialog box, as described earlier in this book.
2. Click the **Edit** option above the **Filter** panel.
3. Specify the filter as described in the [previous chapter](#).
4. Click **OK**.
5. If you modified a measure in a pivot table, save the pivot table.

5.6 Removing a Measure

To remove a measure:

- To remove a measure from the subject area, right-click it in the **Measures** panel and then click **Delete Measure**. Note that this change does not affect any pivot tables.

You can remove any measure from a subject area except for **Count**.

- To remove a measure from a pivot table, right-click it in the **Metrics** panel and then click **Delete Node**. Then save the pivot table.

5.7 Examples

This section provides examples of some measure definitions.

5.7.1 Example 1: Using Average

Suppose that we define a measure called `Average Test Score` with the following formula:

```
[Test Score.Average]
```

For this measure, we specify **Dec Place** as 2; the default is 0.

We could then use this measure in a pivot table as follows:

Home City	Patient Count	Average Test Score
Cedar Falls	1,155	61.50
Centerville	1,071	58.56
Cypress	1,094	58.49
Elm Heights	1,086	58.37

This tell us, for example, that for the 1155 patients who live in Cedar Falls, the average test score was 61.50.

5.7.2 Example 2: Defining a Filtered Measure

Normally a measure aggregates data for all records associated with a given pivot cell. However, when you define a measure, you can apply a filter to it so that it uses only a subset of those records.

In the previous example, we defined a measure that computes the average test score. Not all patients have test scores, however. In this context DeepSee treats the null scores as zeros, which is a problem in this case because in the sample the lowest possible score is 50, rather than 0. In order to compute the average test scores correctly, we must filter out the patients that have no test score.

To do this, we define the measure `Average Test Score(Corrected)`, which has the formula `[Test Score.Average]` and the filter `[Tested? = Yes]`. Let us compare this measure to the one in the previous example:

Home City	Patient Count	Average Test Score	Average Test Score (Corrected)
Cedar Falls	1,155	61.50	74.15
Centerville	1,071	58.56	74.49
Cypress	1,094	58.49	74.14
Elm Heights	1,086	58.37	73.89

(As a reminder, the `Tested?` dimension has two members, `Yes` and `No`, which refer to the patients who have a test score and those who do not, respectively. See the [DeepSee Developer Tutorial](#).)

5.7.3 Example 3: Using Dimension Distinct

The **Dimension Distinct** options enable you to define measures that count the number of distinct members of a level. Suppose that we define a measure called `Doctor Count` with the following formula:

```
[Doctor.Distinct]
```

We could then use this measure in a pivot table as follows:

<i>Home City</i>	<i>Patient Count</i>	<i>Doctor Count</i>
Cedar Falls	1,155	362
Centerville	1,071	359
Cypress	1,094	358
Elm Heights	1,086	359

This tells us, for example, that the 1155 patients who live in Cedar Falls have 362 doctors (as primary care physicians).

5.7.4 Example 4: Count of Shipped Orders

It is important to realize that the meaning of a measure might depend on the pivot table in which it is used. For example, compare the following two tables, shown side by side for comparison:

<i>Order Date Year</i>	<i>Order Date Quarter</i>	<i>Placed Orders</i>	<i>Shipped Date Year</i>	<i>Shipped Date Quarter</i>	<i>Shipped Orders</i>
2005	Q3	70	2005	Q3	61
	Q4	82		Q4	82
2006	Q1	92	2006	Q1	92
	Q2	93		Q2	92
	Q3	103		Q3	105
	Q4	120		Q4	109
2007	Q1	182	2007	Q1	178
	Q2	88		Q2	90

In these two tables, the measures `Placed Orders` and `Shipped Orders` both have the same definition:

```
[Count]
```

In the two tables, the measures display different numbers (and have different meanings) purely because of how the rows are defined.

- In the first table, data is grouped by order date, so `Placed Orders` represents the number of orders placed.
- In the second table, data is grouped by ship date, so `Shipped Orders` represents the number of orders shipped.

This means that if you want to see both these measures in the same table, it is necessary to create separate tables and link them side by side. For information, see the chapter “[Linking Pivot Tables for Complex Layouts](#).”

6

Defining Computations

Computations are another kind of number that you can display in a pivot table. Unlike measures, computations are defined in terms of other data in the pivot table or in terms of KPIs.

This chapter describes how to define computations. It discusses the following topics:

- [An overview of computations](#)
- [How to define or redefine a computation in a subject area](#)
- [How to define or redefine a computation in a pivot table](#)
- [How to use the Compute Editor](#)
- [How to remove a computation](#)
- [How to control the processing order for the computations in a pivot table](#)
- [How to nest a computation within a dimension row or column](#)
- [Additional examples](#)

For information on measures, see the chapter “[Defining Measures](#).”

6.1 Overview of Computations

Like measures, computations are data displayed in a pivot table. In contrast to measures, however:

- Computations are usually defined in terms of other data in the pivot table. (Measures are defined in terms of source data.)
- Computations can be used in **Row**, **Column**, or **Metrics**. (Measures can be used only in **Metrics**.)
- For use in computations, DeepSee provides a set of functions and special variables that you can use to refer to other cells in a pivot table.

6.1.1 Predefined Computations

InterSystems DeepSee provides several predefined computations:

- **Total** displays a total. When you use this computation as a row, each cell displays the sum of all values in the column, as shown in the example after this list. When you use this computation as a column, each cell displays the sum of all values in the row.

- Average displays the average value of a column or row, in the same way. That is, when you use it as a row, each cell displays the average of all values in the column. When you use it as a column, each cell displays the average of all values in the row.
- Forecast displays a forecast value, in the same way. The forecast is calculated as the moving average of the numbers.

6.1.1.1 Total as a Row

The following example uses the `Total` computation as a row:

<i>Doctor Group</i>	Patient Count	Encounter Count
I	2,144	1,126
II	2,364	1,122
III	2,128	999
None	3,364	1,598
Total	10000	4845

6.1.1.2 Total as a Column

The following example uses the `Total` computation as a column:

	Female	Male	Total
<i>Favorite Color</i>	Patient Count	Patient Count	
Blue	590	639	1229
Green	662	618	1280
No Data Available	1,258	1,160	2418
Orange	657	625	1282
Purple	626	637	1263
Red	634	624	1258
Yellow	634	636	1270

6.1.2 Custom Computations

With the Analyzer, you can define and use your own computations as well, which can use Caché ObjectScript functions, macros (including macros that refer to columns, rows, and cells), and special variables.

You can create and manage computations in two places:

- You can define (or redefine) the computations within a pivot table. In this case, you are creating or redefining the computation only for this pivot table. These are called *temporary computations*. As you will see in the next item, all computations in a pivot table are temporary computations.
- You can define (or redefine) computations within the **Computation** panel. In this case, you are creating or redefining a computation that is available to the entire subject area.

In many cases, you define computations in the **Computation** panel so that you can easily drag and drop them to any pivot tables that need them. It is critical to understand the following: when you add a computation to a pivot table by getting the computation from the **Computation** panel, you are making a *copy* of the computation. The computation that appears in the pivot table has the same name and same definition as the one you chose, but it is a temporary computation. Therefore, if you delete or modify the original computation (the one in the **Computation** panel), no pivot tables are affected.

6.1.3 Computations and Hidden Rows or Columns


When performing complex computations, sometimes it is convenient to use intermediate computations. DeepSee supports this practice via two features:

- You can hide columns and rows (by using the context menu in the pivot table grid).
- A computation can refer to a hidden cell, and it works exactly the same as it would otherwise.

This means that you can include measures or intermediate computations in a pivot table, and then hide them.

6.2 Defining or Redefining a Computation in a Subject Area

To define or redefine a computation in a subject area:

1. Open the subject area.
2. If the **Computations** panel is collapsed, expand it by clicking the Show button  in its upper right.
3. In the **Computations** panel, do one of the following:
 - Right-click and select **Add Computation**.
 - Right-click an existing custom computation and click **Edit Computation**.

This displays the **Compute Editor** page.

4. In the **Compute Name** field at the top of the page, specify the name of this computation.
5. In the rest of the page, specify how this computation is calculated and displayed. See “[Using the Compute Editor](#),” later in this chapter.
6. Click **Save**.

The new computation is now available for any pivot table in this subject area.

Note: If you redefined a computation that you have already used, there is no change to those pivot tables that currently use it.

6.3 Defining or Redefining a Temporary Computation in a Pivot Table

To define or redefine a temporary computation:

1. Open the pivot table in which the temporary computation is defined.
2. In the **Row**, **Column**, or **Metrics** panel on the top, do one of the following:
 - Right-click and select **Add Temp. Computation**.
 - Right-click a computation and select **Edit Temp. Computation**.

This displays the **Compute Editor** page.

3. In the **Computation Name** field at the top of the page, specify the name of this computation.
4. In the rest of the page, specify how this computation is calculated and displayed. See “[Using the Compute Editor](#),” later in this chapter.
5. Click **Save** to close the computation editor.
6. Save the pivot table.

The new or changed computation is now included in this pivot table. It is not accessible to any other pivot tables.

6.4 Using the Compute Editor

You use the **Compute Editor** dialog box to define computations and temporary computations. This page looks something like the following:

Compute Name : ☐ Member

Formula Edit

`$$COL(1)+$$CELL(THISROW-1,THISCOL)`

Post Formula Edit

KPI : ... Drill Down ? ☐

Display : Processing Order :

Dec. Place :

On this screen, you can do the following:

- **Compute Name** — Specify the name of the computation you are adding or editing.
- **Member** — Select this check box if you want any summary or sub-summary lines to treat this computation as a member. If this computation is treated as a member, its value is included in the summary and sub-summaries. If not, its value is ignored in the summary and sub-summaries.
- **Formula** — Specify the formula for the computation, as described in [the following subsection](#). Specify a Caché ObjectScript expression that returns the value in a cell, typically based on values in other cells. If you use this option, do not specify a value for **KPI**.
- **Post-Formula** — Specify optional Caché ObjectScript statements to override the initial value of a given cell.

You use post-formula scripts when you want to reprocess the original value, to change formatting, for example, or perhaps to simplify computation by breaking it into multiple steps. The script can refer to the variable *val*, which is the original value, and it must set the variable *val* as needed. See [Expressions and Scripts in DeepSee](#).

- **KPI** — Select an existing KPI to use as the computation. If you use this option, do not specify a value for **Formula**. For information on defining KPIs, see the chapter “[Defining KPIs](#),” later in this book.
- **Drill Down?** — This option applies only if the computation uses a KPI. Select this option to enable users to drill down on a cell that displays this computation.

For a computation based on a KPI, the default is not to enable drill-down. (For other computations, drill-down is always enabled; see the chapter “[Adding Drill Options](#)” for information on configuring the options.)

- **Display Style** — Choose a display style for this computation. See “[Specifying a Display Style](#),” in the previous chapter.
- **Processing Order** — Usually, you leave this option blank, which means this computation is performed within the default sequence. By default, the cells are processed one at a time, from left to right, top to bottom.

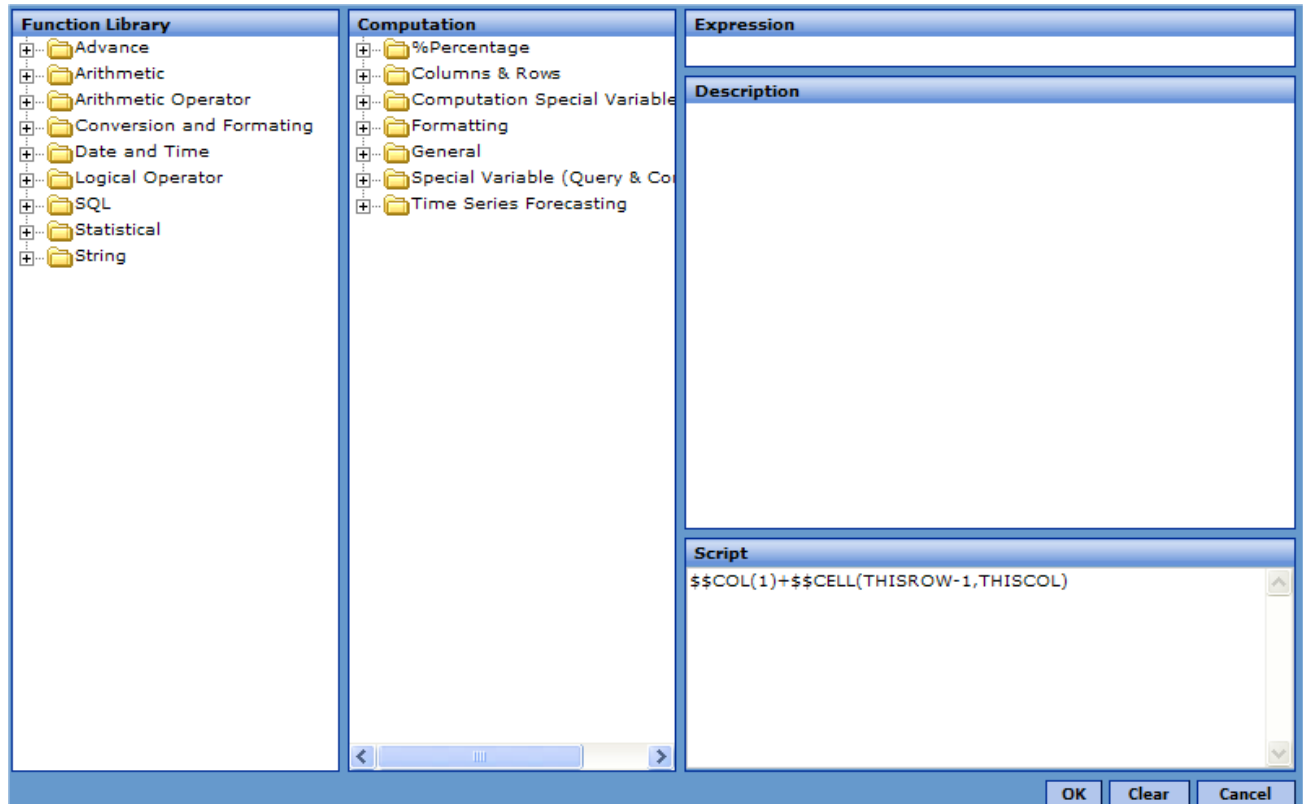
See the section “[Controlling the Processing Order](#),” later in this chapter.

- **Dec Point** — If the computation uses a numeric style, specify the number of decimal places it uses.

The **KPI** option gives you an easy way to refer to a single KPI. You can instead use a formula that refers to multiple KPIs. To do so, you use the **\$\$KPI** function; see the book *Expressions and Scripts in DeepSee*.

6.4.1 Specifying a Formula or Post-formula Expression

For the **Formula** or **Post-Formula** fields, if you do not know the syntax you need or are not familiar with all the options, click the **Edit** option next to the field. Then the system displays the **Script Editor** page:



The **Function Library** panel displays an expandable view of functions that you can use in the expression. This includes Caché ObjectScript functions, as well as macros that are specific to InterSystems DeepSee. The **Computation** panel displays an expandable view of macros, special variables, and template expressions that you can use in the formula expression.

To create a formula expression:

1. Expand the folders in **Function Library** and **Computation** until you see the item you need.
2. Double-click the item. Then:
 - The function, macro, variable, or expression is shown in the **Expression** field, with its full argument list (if applicable).
 - Detailed information is displayed in **Description** field.
 - The item is added to the **Script** field.
3. In the **Script** field, make edits as needed.

Important: You can type any valid Caché ObjectScript expressions, which can use any methods, routines, functions, or other elements, including your own. You are not restricted to use the elements provided within the user interface shown here. InterSystems suggests that you write your own functions wherever possible rather than use the elements that are specific to DeepSee.

6.5 Removing a Computation

To remove a computation, do one of the following:

- To remove a computation from the subject area, right-click it in the **Computation** panel and then click **Delete Computation**. Note that this change does not affect any pivot tables.

You can remove any computation from a subject area except for the predefined computations.

- To remove a computation from a pivot table, right-click it in the **Row**, **Column**, or **Metrics** panel and then click **Delete Node**. Then save the pivot table.

6.6 Controlling the Processing Order

The data cells (the white and off-white cells) in a pivot table are computed in a specific order by default: left to right, top to bottom. That is, the top left cell is computed first, followed by the cell to its right, and so on, until all the cells in the row are computed. Then the cells in the next row are computed, and so on.

You can use the **Processing Order** option for a computation to delay the processing of a particular cell until other cells have been evaluated. Specify null or an integer. For a given computation, if **Processing Order** equals n , this computation is processed after all the cells that have **Processing Order** equal to null or equal to values less than n .

Also, in certain cases when you link tables (as described in a later chapter), the **Processing Order** values 1–5 have specific meanings and should be used only in special cases. InterSystems suggests that you use the values 6 and up when you need to control processing order.

For example, if you need to ensure that a specific computation occurs after the rest of the pivot table has been evaluated, specify **Processing Order** for that computation as 6.

For another example, suppose that you need to delay the evaluation of two computations until the rest of the pivot table has been evaluated. Specify **Processing Order** as 6 for one of them and as 7 for the other. Or use 10 and 20.


For information on accessing this option, see “[Using the Compute Editor](#),” earlier in this chapter.

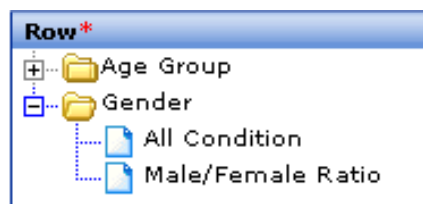
6.7 Nesting a Computation within a Dimension Row or Column

So far, this book has shown only examples where a computation is used as a single row or column. You can instead nest a computation within a dimension used for rows or columns. For example, you can do something like the following:

<i>Age Group</i>	<i>Gender</i>	<i>Patient Count</i>
0-29	Female	2,055
	Male	2,186
	Male/Female Ratio	1.06
30-59	Female	2,062
	Male	2,045
	Male/Female Ratio	0.99
60+	Female	944
	Male	708
	Male/Female Ratio	0.75

To place a computation within a row or column dimension:

1. Define the computation in the **Computation** panel.
2. Drag the computation from the **Computation** panel and drop it into the name of that dimension, within the **Row** panel or **Column** panel, as appropriate.
3. Optionally click the Expand button  next to the dimension to expand it. DeepSee adds the computation after the **All Condition** item, as follows:



4. To change the position of the computation, right-click the computation name and then click **Move Up**.

6.8 Examples

6.8.1 Mixed-type Summary Lines

When you use the basic summary line feature (see “[Adding Summary Lines](#)”), DeepSee treats all columns in the same way, which is not necessarily appropriate. For example, you might have a count in one column, and an average in another column. With the basic summary line feature, you can either display an grand total for both columns or a grand average for both. More typically, however, you would prefer to see this:

<i>Home City</i>	<i>Average Age</i>	<i>Patient Count</i>
Cedar Falls	36.39	1,093
Centerville	35.62	1,088
Cypress	36.23	1,126
Elm Heights	35.80	1,119
Juniper	36.83	1,127
Magnolia	36.53	1,092
Pine	35.35	1,154
Redwood	34.26	1,137
Spruce	36.26	1,064
Summary	35.92	10,000.00

In this case, `Summary` is a computation that is defined as follows:

```
$CASE(THISCOL,1:$COLSUM/(ROWS-1),:$COLSUM)
```

The `$CASE` function ensures that the first column is treated different from the second column. The `$COLSUM` function returns the total value in the current column and `ROWS` returns the number of rows.

6.8.2 Year-to-year Comparisons

Often it is useful to compare data from one year to an earlier year. The following example shows yearly rainfall data:

Sample Computations			
<i>Date Year</i>	<i>Inches of Rain</i>	<i>Delta Since 1900</i>	<i>Delta Over Past Year</i>
1900	192	0	
1901	175	-17	-17
1902	180	-12	5
1903	186	-6	6
1904	165	-27	-21
1905	168	-25	3
1906	171	-22	3
1907	169	-23	-2
1908	191	-1	22

The `Delta Since 1900` column displays change in rainfall since the year 1900. This computation is defined as follows:

```
$$CELL(THISROW,1) - $$CELL(1,1)
```

The `Delta Over Past Year` column displays the change in rainfall since the previous year. This computation is defined as follows:

```
$CASE(THISROW,1:" ",:$CELL(THISROW,1) - $$CELL(THISROW-1,1))
```

Notice that this expression sets the value to an empty string for the first row (the first year for which rainfall data is available). (For information on the city rainfall sample data, see the [DeepSee Developer Tutorial](#).)

6.8.3 Cumulative Count

In some cases, you may want to create a cumulative count like the following:

<i>Order Date Year</i>	<i>Order Date Month</i>	Count	Cumulative Count
2005	July	22	22
	August	25	47
	September	23	70
	October	26	96
	November	25	121
	December	31	152

The Cumulative Count computation has the following formula:

```
$$COL(1)+$$CELL(THISROW-1,THISCOL)
```

7

Adding Alerts (Conditional Formatting)

This chapter describes how to add alerts to pivot tables. It discusses the following topics:

- [An overview of alerts](#)
- [How to add alerts](#)
- [How to specify the cells to which an alert applies](#)
- [How to specify an alert range for an alert](#)
- [How to specify the alert display style for an alert](#)
- [How to add a user option to an alert](#)

7.1 Overview of Alerts

The following example shows a pivot table that includes alerts:

	Female	Male	Male/Female Ratio
<i>Age Bucket</i>	Patient Count	Patient Count	
0-9	695	719	1.03
10-19	691	702	1.02
20-29	686	670	0.98
30-39	759	789	1.04
40-49	794	742	0.93
50-59	583	559	0.96
60-69	344	351	1.02
70-79	349	243	0.70
80+	221	103	0.47

This pivot table includes the following three alerts, all applied to the third column:

- If the value in a cell is 0.5 (or less), display the cell in red.
- If the value in a cell is in the range 0.5 to 0.75, inclusive, display the cell in yellow.
- If the value in a cell is 1.0 or greater, display the cell in green.

The **Grid Data Alerts** dialog box lists all the alerts defined for the current pivot table.


An alert examines each data cell in the pivot table, checks whether the value in the cell falls into the alert range, and if so, applies the alert display style to that cell. The alert display style overrides any custom font or color properties of the measure, computation, dimension, or dimension member.

You can define the upper and lower values of the alert range as constants or as Caché ObjectScript expressions.

When a pivot table is displayed, the system uses each alert, one at a time, starting with the first alert. For a given cell, if multiple alerts apply to the cell, the last alert takes precedence.

7.2 Defining Alerts

To define alerts for a pivot table, do the following:

1. Open the pivot table.
2. Do either of the following:
 - In the Analyzer, click the Grid Setup button  and then click **Data Alerts**.
 - In the pivot table, right-click and select **Data Alert**.

The system then displays the **Grid Data Alerts** dialog box, which lists all the alerts defined for the current pivot table.

Row Number	Row Label	Column Label	Row From	Row To	Column From	Column To	Value From	Value To	Fonts	Image Substitution	Include Aggregate	Text Substitution
1					3	3		.5	Font Setting		<input type="checkbox"/>	
2					3	3	.5	.75	Font Setting		<input type="checkbox"/>	
3					3	3	1		Font Setting		<input type="checkbox"/>	

Add Line
Save to Pivot
OK
Cancel

Edit Area
Row No: None

Event :
Action :

Tooltip :

Description :

Label :
Update

Here you can do the following:

- Click **Add Line** to add a new, empty line into which you can enter the details for an alert.
- Right-click an existing alert and click **Add Line** to add a new, empty line.
- Edit an existing alert. If you edit the user options at the bottom of the screen, click **Update** to save those changes.

- Right-click an existing alert and click **Delete Line** to delete the alert.
- Click **Save** to save your changes and close this dialog box. Later you can save the pivot table or not, as wanted.
- Click **Save to Pivot** to save your changes to the pivot table and close this dialog box.
- Click **Close** to close this dialog box without saving changes.

Important: In this dialog box, **Row Number** displays the alert number for each alert, for this pivot table. This value appears to be editable but is not saved. If you use multiple alerts that might override each other, be sure to define them in the correct order, because you cannot change the order after creating them (although you can delete items and re-add them).

After you define alerts, be sure to save the pivot table.

7.3 Specifying the Cells to Which the Alert Applies

To specify the cells to which an alert applies, specify any subset of the following fields:

- **Row Label** — Specify the caption of the row to which the alert applies. If a row has multiple captions, note that the left-most caption is the only caption used. If you do not specify a value, all data rows are (potentially) examined.
- **Column Label** — Specify the caption of the column to which the alert applies. If a column has multiple captions, note that the top caption is the only caption used. If you do not specify a value, all data columns are (potentially) examined.
- **Row From** — Specify the row number of the first row that the alert should examine. The default is 1, the first data row.
- **Row To** — Specify the row number of the last row that the alert should examine. The default is the last data row.
- **Column From** — Specify the column number of the first column that the alert should examine. The default is 1, the first data column.
- **Column To** — Specify the column number of the last column that the alert should examine. The default is the last data column.
- **Include Aggregate** — Select this check box if the alert should examine the summary lines as well.

Important: In this dialog box, **Row Number** displays the alert number for each alert, for this pivot table. This value appears to be editable but is not saved. If you use multiple alerts that might override each other, be sure to define them in the correct order, because you cannot change the order after creating them (although you can delete items and re-add them).

7.4 Specify the Range of Values to Trigger an Alert

An alert checks whether the value in each data cell falls into the alert range that is defined in that alert. The alert range can be one-sided or two-sided.

To specify the range of values for an alert, specify one or both of the following fields:

- **Value From** — Specify the lower end of the range (inclusive).
- **Value To** — Specify the upper end of the range (inclusive).

You can define these values as constants or as Caché ObjectScript expressions.

You can also use query variables, which are variables passed in from your application when a dashboard is accessed; see [Using the DeepSee Dashboard Designer](#).

7.5 Specifying the Alert Display Style

Within an alert, you specify how to display a cell that contains a value within the alert range. You can specify any or all of the following fields:

- **Fonts** — Click this to display the **Font Selection** dialog box, where you can specify the font type, font size, font style, font effects, as well as the alignment and background and font colors. For information, see the chapter “[Specifying Fonts and Colors](#),” later in this book.
- **Image Substitution** — Click this to display the **Image List** dialog box, where you can select an image that has been loaded into the DeepSee library.

For information on loading image files, see the [DeepSee Site Configuration and Maintenance Guide](#).

- **Text Substitution** — Type a string to display instead of the cell data.

For information on **Include Aggregate**, see “[Specifying the Cells to Which the Alert Applies](#),” earlier in this chapter.

7.6 Specifying the User Options

For each alert, you can provide the user with a way to take appropriate action. Specifically, the user can click the cell or click a context menu item and then do one of the following:

- Open a DeepSee dashboard, which is a Web page that contains a pivot table, speedometer, or other elements.
- Run a script written in Caché ObjectScript.

To add a user option for a given alert, click the alert in the **Grid Data Alerts** dialog box and make changes in the bottom of the dialog box. When you are done with changes, click **Update**.

To add a user option, specify values for the following:

- **Event** — Select **On Click** to launch the option when the user clicks the cell. Or select **Context Menu** to add a menu item to the context menu.
- **Tooltip** — Specify an optional tooltip to display when the user hovers the pointer on the cell.
- **Description** — Specify an optional description for this user option.
- **Label** (if adding a context menu item) — Specify the name of the menu item to add.
- **Action** — Select **Open Dashboard** or **Run Script**.
Ignore **Open File**, which is not supported.
- **Dashboard Id** (if you chose **Open Dashboard**) — Specify a numeric dashboard ID, or click the Browse button to select a dashboard.
- **Filter By** (if you chose **Open Dashboard**) — Optionally specify a filter to apply to the dashboard when opening it. You can filter the dashboard to display only data for the current row, only data for the current column, or only data for the current cell.
- **Run Script** (if you chose **Run Script**) — Type a Caché ObjectScript statement.

Or click **Edit** to display the **Script Editor** dialog box.

When you are done with changes, be sure to click **Update**.

8

Defining Drill Options

This chapter describes how to add options to make the deployed pivot table truly interactive. It includes the following topics:

- [An overview of the drill options that you can provide to users within pivot tables](#)
- [How to specify which dimensions to include in the drill options list](#)
- [How to add drill-downs to the drill options list automatically](#)
- [How to add associated pivot tables to the context menu](#)

Also see the chapter “[Defining Alerts](#).”

To define drill options for use when a pivot table is displayed as a chart, you use the Architect. For information, see [Using the DeepSee Architect](#).


Important: If you have not yet used a DeepSee pivot table, it is suggested that you read the book [Overview of DeepSee](#), especially the first chapter.

8.1 Available Drill Options for the Users

When users work with pivot tables, they can use various drill options:

- When *drilling through*, the user drags and drops a dimension from the drill options list onto the row of interest in the pivot table.

Tip:

Remember that users can hide or display the drill options list by clicking the Drill Options button  in the pivot table banner.


- When *drilling down*, the user drags and drops a drill-down from the drill options list onto the row of interest in the pivot table. A drill-down consists of multiple dimensions.
- When *drilling down to an associated pivot table*, the user right-clicks a cell in the pivot table and selects a drill option that opens the associated pivot table.

When drilling through and drilling down, the users see only the measures shown in the table from which you started. In contrast, when drilling down to an associated pivot table, the users see the measures listed in that pivot table.

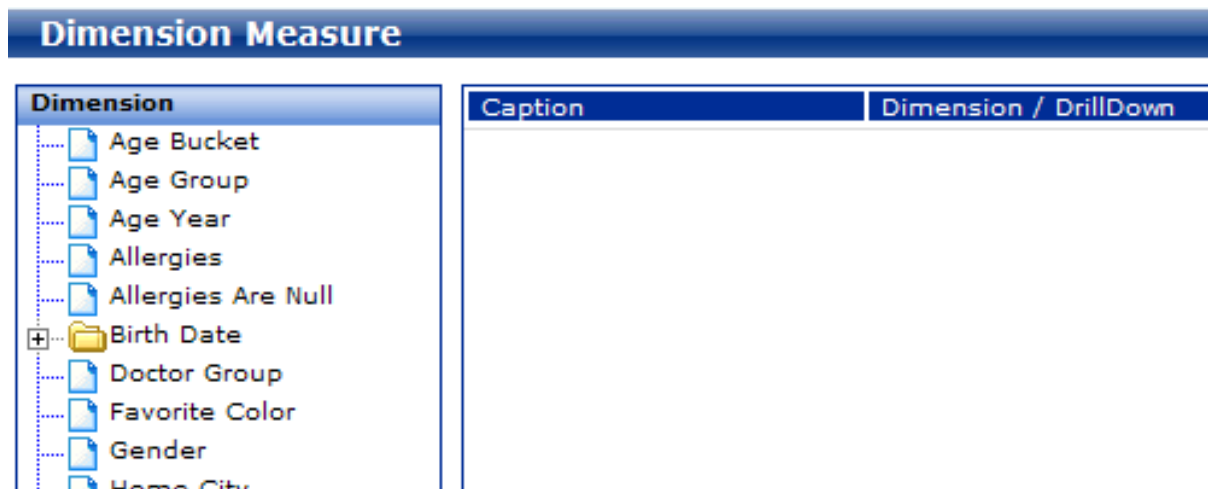
8.2 Specifying the Dimensions in the Drill Options List

Each pivot table can have its own drill options list. By default, this list includes all dimensions in the subject area. For any given pivot table, you can edit the list and you can specify the order in which the dimensions are listed.

To do so, do the following:

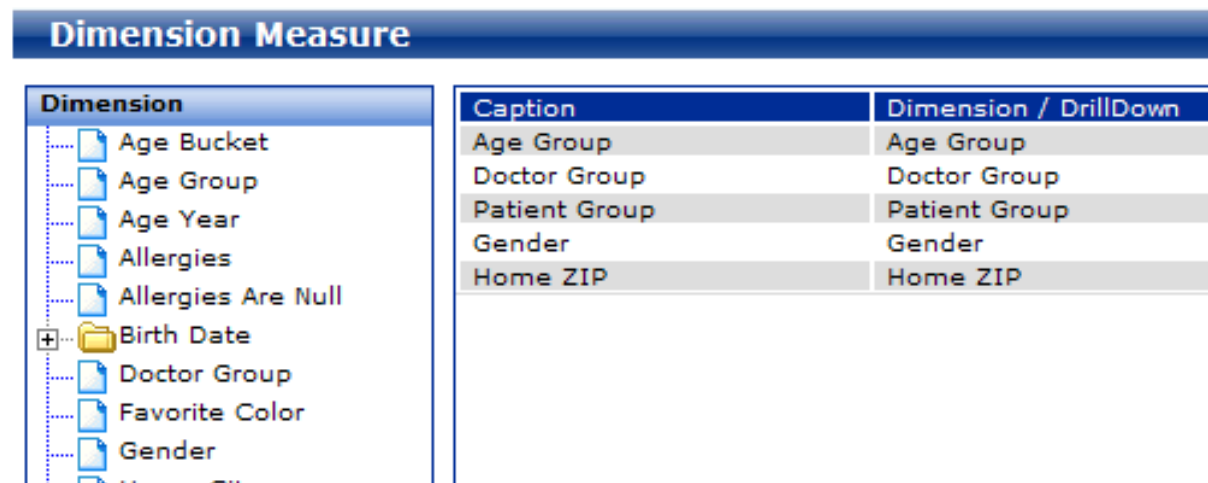
1. Open the pivot table so that you can make changes to it.
2. Click the Drill Options Setup button .

The Analyzer displays a dialog box that shows the default drill options.



The left area lists all the available dimensions. The upper right area lists the dimensions to include in the drill-down options, if you want to restrict the set. (If nothing is in this area, all dimensions are included).

3. For each dimension to include, drag the dimension and drop it into the upper right area.



4. Optionally rename the dimensions as needed. To do so, click the current dimension name (listed under **Caption**) to make the name editable. Then change the name as needed.
5. Save the pivot table.

Note: Ignore the section **Associate Reports**.

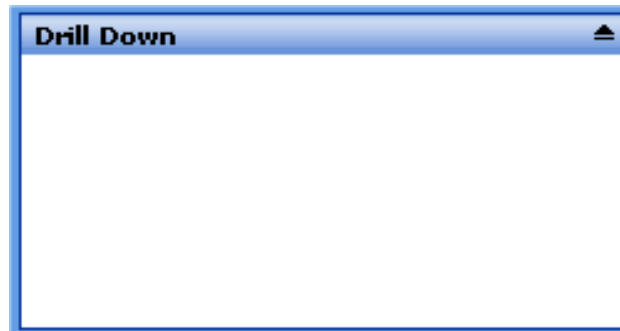
8.3 Defining Drill-downs

For any given pivot table, the drill options list includes all the drill-downs defined in the subject area, as well as any drill-downs defined within the pivot table.

8.3.1 Viewing the Available Drill-downs

The **Drill Down** panel on the left displays the drill-downs that will be available to the user who uses the current pivot table. At any time, this panel displays all the drill-downs defined in the subject area, as well as any defined for the currently viewed pivot table



By default, this is empty when you first start working with a subject area:

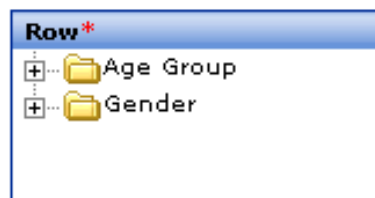


8.3.2 Defining a Drill-down

You define the drill-downs for the subject area and for any given pivot table. A drill-down consists of multiple dimensions, used in combination. You define a drill-down in the **Row** panel.

To define a drill-down, complete the following steps:

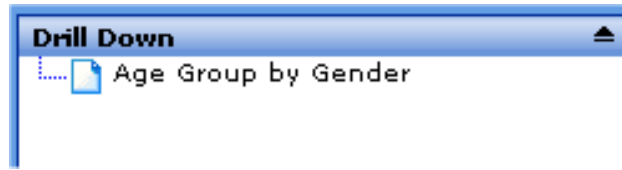
1. If you plan to define this drill-down within a given pivot table, open that pivot table.
2. Click the Clear button  in the upper right of the **Row** panel, to clear it.
3. If the **Dimension** panel is collapsed, expand it by clicking the Show button  in its upper right.
4. Drag and drop dimensions from **Dimension** to the **Row** panel. For example:



5. Right-click in the **Row** panel and then click **Save Drill Down**. The Analyzer displays a dialog box where you can specify the name for this drill-down.
6. In **Name**, specify a name that is helpful to the users. For example: Age Group by Gender
7. Click one of the following:
 - **Pivot Table** — Makes this drill-down available only in this pivot table. This is the default.
 - **Subject Area** — Makes this drill-down available to the entire subject area.

8. Click **Accept**.

The new drill-down is immediately listed in the **Drill Down** panel. For example:




9. Save the pivot table.

Tip: You can also define a drill-down by using the **Column** panel instead of the **Row** panel in the preceding steps.


8.3.3 Deleting a Drill-down

To delete a drill-down:

1. If the **Drill Down** panel is currently collapsed, click the Show button  in its upper right to expand it.
This panel displays all the drill-downs defined in the subject area, as well as any defined for the currently viewed pivot table.
2. Right-click the drill-down to delete and then click **Delete**.
The drill-down is immediately removed.

8.4 Enabling Drill-downs to Associated Tables

The context menu for a given pivot table can provide drill-down options that link to other pivot tables.

1. Create the pivot tables that you want to use as drill-downs, as described earlier in this book.
2. Open the pivot table to which you want to add these drill-downs.
3. Click the Link Reports button , which opens the **Link Report** dialog box, which was shown earlier in this chapter.
4. Click the **Drill Down** tab.
5. Right-click and then click **Add Line**.
The Analyzer displays a dialog box that lists all the pivot tables.
6. Click the name of a pivot table and then click **OK**.
7. Click **OK** to accept your changes and close the **Link Report** dialog box.
8. Save the pivot table.

Note: The other tabs of the **Link Report** dialog box enable you to link pivot tables visually; these are described in a later chapter.

9

Linking Pivot Tables for Complex Layouts


This chapter describes how you can link pivot tables together visually to display a more complex pivot table. This chapter discusses the following topics:

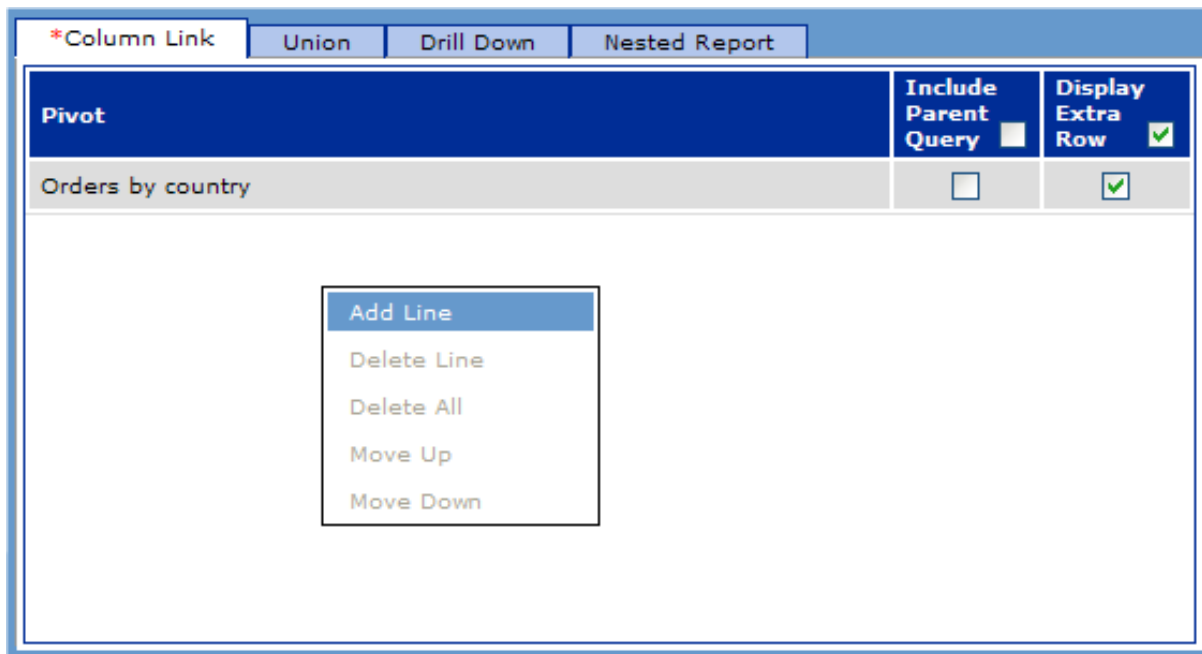
- [An overview of the dialog box that you use to link pivot tables](#)
- [How to link two pivot tables horizontally](#), displaying them side by side
- [How to link two pivot tables vertically](#), displaying one above another
- [How to nest one pivot table inside another](#)
- [Additional example](#)

Each section also provides information on how various pivot table options (such as alerts) are used in the combined tables.

9.1 Overview of Linking Pivot Tables

To link two pivot tables visually, use the following procedure:

1. Define all the tables.
2. Open the parent table, which you choose as follows:
 - If you are linking tables horizontally, the left table is the parent table.
 - If you are linking tables vertically, the top table is the parent table.
 - If you are nesting tables, the outer table is the parent table.
3. With the parent table open, click the Link Reports button , which opens the **Link Report** dialog box.



4. Click the tab corresponding to the kind of link you want.
 - If you are linking tables horizontally, click **Column Link**.
 - If you are linking tables vertically, click **Union**.
 - If you are nesting tables, click **Nested Report**.

Note: For information on the **Drill Down** tab, see “[Enabling Drill-downs to Associated Tables](#),” earlier in this book.

5. Right-click in the empty area of the tab and then click **Add Line**. The Analyzer then prompts you to select a pivot table.
6. Select the desired pivot table as follows:
 - If you are linking tables horizontally, select the table to display on the right.
 - If you are linking tables vertically, select the lower table.
 - If you are nesting tables, select the inner table.
7. Depending on the kind of linking you chose, you may have additional options to specify. These are discussed in the following sections.
8. Click **OK** to accept your changes and close the **Link Report** dialog box.
9. Save the pivot table (the parent table).

Only the parent table is redefined; the other tables are unchanged.

The linked pivot tables can belong to different subject areas, if you obey the following rules:

- Identify all the dimensions that are common across the subject areas. Typically, dimensions based on time and location are common, even for unrelated subject areas.

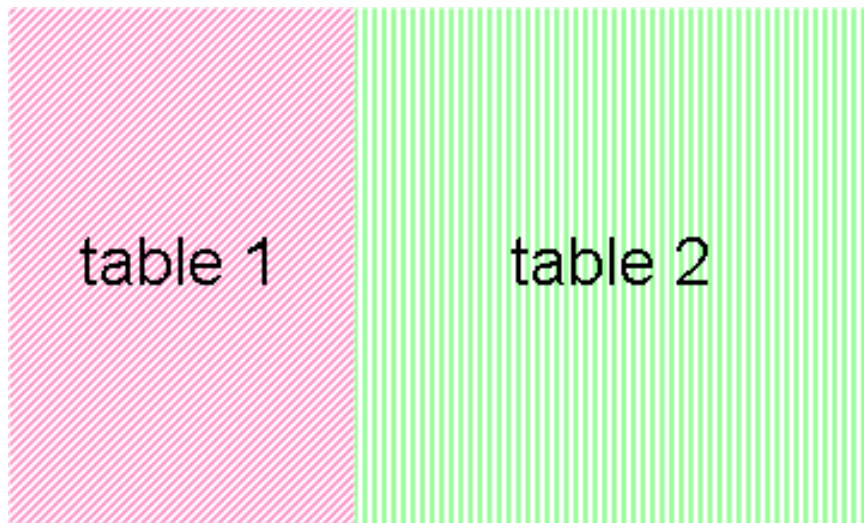
Other dimensions might or might not be common depending on whether the subject areas are related to each other in any meaningful sense. For example, suppose that one subject area represents transactions and another represents the customers who own the transactions. These two subject areas might have common dimensions such as customer, customer class, and so on.

- When you define those dimensions, ensure that the dimension names and sets of member names are the same in all relevant subject areas. (The underlying details of **Complex Code**, transformation options, and so on do not matter. All that matters is that the DeepSee indices work the same way, even if they are created differently.)

For an example of linking pivot tables from multiple subject areas, see the [DeepSee Developer Tutorial](#).

9.2 Linking Tables Horizontally

When you link tables horizontally, you place the tables side by side. This is most useful if the tables have all have most or all of the same rows. The following shows a general example.



For the basic procedure of linking pivot tables, see the section “[Overview](#).”

This section discusses the following topics:

- [Basic example](#)
- [The Include Extra Rows option](#), which has an effect only if the rows are different in the two tables
- [The Include Parent Query option](#), which has an effect only if the parent table is filtered
- [Information on how other pivot table options are used in the combined table](#)

9.2.1 Basic Example

Consider the following two tables:

Patient Count by Doctor Group	
<i>Doctor Group</i>	Patient Count
I	2,309
II	2,252
III	2,263
None	3,176

Average Allergy Count by Age Group and Doctor Group			
	0-29	30-59	60+
<i>Doctor Group</i>	Average Allergy Count	Average Allergy Count	Average Allergy Count
I	0.78	0.78	0.81
II	0.76	0.75	0.77
III	0.83	0.79	0.75
None	0.78	0.76	0.87

If you link these tables horizontally, the result is as follows:

Horizontal Link Example 1				
	Patient Count	0-29	30-59	60+
<i>Doctor Group</i>		Average Allergy Count	Average Allergy Count	Average Allergy Count
I	2,309	0.78	0.78	0.81
II	2,252	0.76	0.75	0.77
III	2,263	0.83	0.79	0.75
None	3,176	0.78	0.76	0.87

9.2.2 Include Extra Rows

If the rows are different in the two tables, you use the **Include Extra Rows** option to choose one of two possibilities:

- If **Include Extra Rows** is disabled, the result includes only rows that occur in the parent table. Any rows that are unique to the other table are simply ignored.

- If **Include Extra Rows** is enabled, the result includes all rows that occur in both tables. If a row occurs in one table but not in the other, pad it with null values as necessary.

9.2.3 Include Parent Query

When you link two tables horizontally, the following rules govern how data is filtered in the combined table:

- If the parent table has a filter, that filter is always applied to the columns contributed by the parent table.
- If the other table has a filter, that filter is always applied to the columns contributed by the other table.
- If the **Include Parent Query** option is enabled, the filter of the parent table is applied to the columns contributed by the other table (in addition to other filters on that data).

Consider the following filtered table, which shows only male patients:

MALE Patient Count by Doctor Group	
Doctor Group	Patient Count
I	1,133
II	1,065
III	1,109
None	1,571

Also consider the following table:

Average Allergy Count by Age Group and Doctor Group			
	0-29	30-59	60+
Doctor Group	Average Allergy Count	Average Allergy Count	Average Allergy Count
I	0.78	0.78	0.81
II	0.76	0.75	0.77
III	0.83	0.79	0.75
None	0.78	0.76	0.87

If we link these two tables horizontally, the result is as follows if the **Include Parent Query** option is disabled:

Parent Query Off				
	Patient Count	0-29	30-59	60+
Doctor Group		Average Allergy Count	Average Allergy Count	Average Allergy Count
I	1,133	0.78	0.78	0.81
II	1,065	0.76	0.75	0.77
III	1,109	0.83	0.79	0.75
None	1,571	0.78	0.76	0.87

If **Include Parent Query** is enabled, the result is as follows instead:

Parent Query On				
	Patient Count	0-29	30-59	60+
Doctor Group		Average Allergy Count	Average Allergy Count	Average Allergy Count
I	1,133	0.79	0.79	0.81
II	1,065	0.74	0.74	0.72
III	1,109	0.81	0.77	0.77
None	1,571	0.77	0.74	0.90

9.2.4 Interaction with Other Pivot Table Options

When you link two tables horizontally, the following rules govern the behavior and appearance of the combined table:

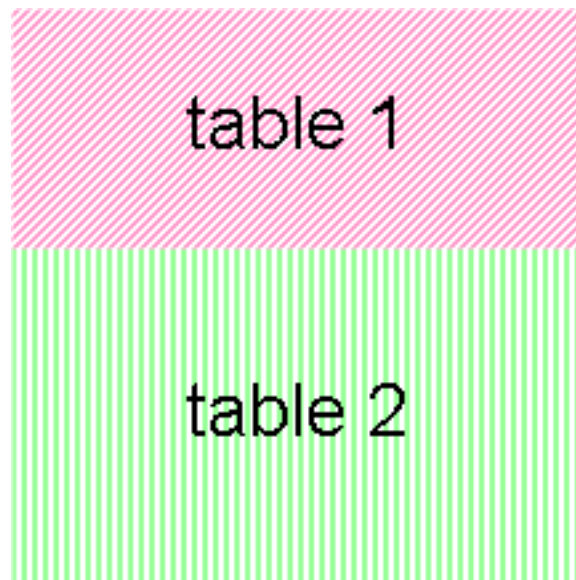
- Alerts in both tables are used. If the two tables define alerts that conflict with each other, precedence is given to the alert defined in the parent table.
- Summary lines defined in the parent table are used. Any summary lines in the other table are ignored.
- Rankings in both tables are used. When you rank items, you essentially reduce the number of rows; the remaining rows are aggregated into the remainder row, which you choose whether to display. When you link two tables horizontally, the rows of a ranked table are handled in the same way as any other rows.
- The combined table uses the grid setup options defined in the parent table and ignores any grid setup options defined in the other table. For information on grid setup options, see “[Specifying the Grid Setup Options](#),” earlier in this book.
- If the two tables have different default detail listings, both defaults are used. The default detail listing for the parent table applies to the columns that come from the parent table. Similarly, the default detail listing for the other table applies to the columns that come from the other table. See “[Specifying the Default Detail Listing](#),” later in this book.
- If the two tables have different grid themes, precedence is given to the grid theme used in the parent table. See “[Specifying Grid Themes](#),” later in this book.
- If you have customized the font or color of any rows or columns in the two tables, then:

- If the color or font of a row in the parent table is customized, that customization is applied to the entire row of the combined table.
- If the color or font of a row in the other table is customized, that customization is ignored.
- If the color or font of a column in either table is customized, that customization is applied to that column in the combined table.

See the chapter “[Specifying Fonts and Colors.](#)”

9.3 Linking Tables Vertically

When you link tables vertically, you stack the tables one above another. This is most useful if the tables have all have most or all of the same columns. The following shows a general example.



For the basic procedure of linking pivot tables, see the section “[Overview.](#)”

This section discusses the following topics:

- [Basic example](#)
- [The Match Columns option](#), which has an effect only if the columns are different in the two tables
- [The Include Parent Query option](#), which has an effect only if the parent table is filtered
- [Information on how other pivot table options are used in the combined table](#)

9.3.1 Example

Consider the following two tables:

<i>Gender</i>	Patient Count	Average Age
Female	5,122	37.18
Male	4,878	34.77

The second table uses the same columns but displays rows for each continent.

<i>Favorite Color</i>	Patient Count	Average Age
Blue	1,257	35.79
Green	1,254	34.89
No Data Available	2,390	35.94
Orange	1,276	35.60
Purple	1,254	36.78
Red	1,317	36.56
Yellow	1,252	36.50

If you link these two tables vertically, the result is as follows:

<i>Gender</i>	Patient Count	Average Age
Female	5,122	37.18
Male	4,878	34.77
Blue	1,257	35.79
Green	1,254	34.89
No Data Available	2,390	35.94
Orange	1,276	35.60
Purple	1,254	36.78
Red	1,317	36.56
Yellow	1,252	36.50

(The next step would be to remove the *Gender* dimension header; see “[Grid Layout Options](#),” earlier in this book. It is also possible to edit this label to something more generic; see “[Creating and Customizing Dimensions](#),” later in this book.)

9.3.2 The Match Columns Option

If the columns are different in the two tables, you can specify whether to align the columns that match either other (by using the **Match Columns** option).

For example, consider the following two tables:

<i>Gender</i>	Patient Count	Average Age
Female	5,122	37.18
Male	4,878	34.77

<i>Home City</i>	Average Age	Patient Count	Average Allergy Count
Cedar Falls	35.73	1,155	0.77
Centerville	35.49	1,071	0.79
Cypress	36.55	1,094	0.77
Elm Heights	35.39	1,086	0.78
Juniper	35.96	1,096	0.76
Magnolia	35.83	1,110	0.81
Pine	36.33	1,121	0.77
Redwood	36.45	1,133	0.80
Spruce	36.26	1,134	0.81

If you link these two tables vertically, and if you do not enable **Match Columns**, the result is as follows:

Union (column match disabled)			
<i>Gender</i>	Patient Count	Average Age	Average Allergy Count
Female	5,122	37.18	
Male	4,878	34.77	
Cedar Falls	35.73	1,155	0.77
Centerville	35.49	1,071	0.79
Cypress	36.55	1,094	0.77
Elm Heights	35.39	1,086	0.78
Juniper	35.96	1,096	0.76
Magnolia	35.83	1,110	0.81
Pine	36.33	1,121	0.77
Redwood	36.45	1,133	0.80
Spruce	36.26	1,134	0.81

However, if you do enable **Match Columns**, the result is as follows:

Union (column match enabled)			
<i>Gender</i>	Patient Count	Average Age	Average Allergy Count
Female	5,122	37.18	
Male	4,878	34.77	
Cedar Falls	1,155	35.73	0.77
Centerville	1,071	35.49	0.79
Cypress	1,094	36.55	0.77
Elm Heights	1,086	35.39	0.78
Juniper	1,096	35.96	0.76
Magnolia	1,110	35.83	0.81
Pine	1,121	36.33	0.77
Redwood	1,133	36.45	0.80
Spruce	1,134	36.26	0.81

(The next step would be to remove the Gender dimension header; see “[Grid Layout Options](#),” earlier in this book. It is also possible to edit this label to something more generic; see “[Creating and Customizing Dimensions](#),” later in this book.)

9.3.3 Options for Union

When you link two tables vertically, the following rules govern how data is filtered in the combined table:

- If the parent table has a filter, that filter is always applied to the rows contributed by the parent table.
- If the other table has a filter, that filter is always applied to the rows contributed by the other table.
- If the **Include Parent Query** option is enabled, the filter of the parent table is applied to the rows contributed by the other table (in addition to other filters on that data).

9.3.4 Interaction with Other Pivot Table Options

When you link two tables vertically, the following rules govern the behavior and appearance of the combined table:

- Alerts in both tables are used. The alerts defined in the parent table are applied to the rows that come from the parent table. Similarly, the alerts defined in the other table are applied to the rows that come from the other table.
- Summary lines defined in both tables are used. The summary lines defined in the parent table apply only to the rows that come from the parent table. Similarly, the summary lines defined in the other table apply only to the rows that come from the other table.

This means that all the summary lines contain the same numbers in the combined table that they had in the separate tables.

- Rankings in both tables are used. When you rank items, you essentially reduce the number of rows; the remaining rows are aggregated into the remainder row, which you choose whether to display. When you link two tables vertically, the rows of a ranked table are handled in the same way as any other rows.

- The combined table uses the grid setup options defined in the parent table and ignores any grid setup options defined in the other table. For information on grid setup options, see “[Specifying the Grid Setup Options](#),” earlier in this book.
- If the two tables have different default detail listings, both defaults are used. The default detail listing for the parent table applies to the rows that come from the parent table. Similarly, the default detail listing for the other table applies to the rows that come from the other table. See “[Specifying the Default Detail Listing](#),” later in this book.
- If the two tables have different grid themes, precedence is given to the grid theme used in the parent table. See “[Specifying Grid Themes](#),” later in this book.
- If you have customized the font or color of any rows or columns in the two tables, then:
 - If the color or font of a column in the parent table is customized, that customization is applied to the entire column of the combined table.
 - If the color or font of a column in the other table is customized, that customization is ignored.
 - If the color or font of a row in either table is customized, that customization is applied to that row in the combined table.

See the chapter “[Specifying Fonts and Colors](#).”

9.4 Nesting a Pivot Table within Another

You can nest a pivot table within another pivot table. The columns and measures in the outer table (the parent table) are ignored.

For the basic procedure of linking pivot tables, see the section “[Overview](#).”

This section discusses the following topics:

- [Basic example](#)
- [Information on how pivot table options are used in the combined table](#)

9.4.1 Example

For example, suppose that pivot table 1 is initially as follows:

<i>Age Group</i>	<i>Count</i>
0-29	4,255
30-59	4,185
60+	1,560

Suppose that pivot table 2 is as follows:

<i>Allergies</i>	Patient Count
No Information Available	4,432
ant bites	514
dust mites	497
peanuts	494
Others	6,101

If you nest pivot table 2 inside pivot table 1, the result is as follows:

Top Allergies by Age Group		
<i>Age Group</i>	<i>Allergies</i>	Patient Count
0-29	No Information Available	1,884
	ant bites	229
	dust mites	219
	additive/coloring agent	214
	Others	2,568
30-59	No Information Available	1,844
	nil known allergies	213
	eggs	211
	tree nuts	207
	Others	2,551
60+	No Information Available	704
	peanuts	91
	fish	85
	bee stings	81
	Others	937

9.4.2 Interaction with Other Pivot Table Options

When you nest two tables, the following rules govern the behavior and appearance of the combined table:

- The filters of both tables are used in combination.
- Alerts in the parent table are used. Alerts defined in the other table are ignored.
- Summary lines defined in the parent table are ignored. The summary lines defined in the other table are used.
- Rankings in both tables are used. When you rank items, you essentially reduce the number of rows; the remaining rows are aggregated into the remainder row, which you choose whether to display. When you link nest two tables, the rows of a ranked table are handled in the same way as any other rows.

- The combined table uses the grid setup options defined in the parent table and ignores any grid setup options defined in the other table. For information on grid setup options, see “[Specifying the Grid Setup Options](#),” earlier in this book.
- If the two tables have different default detail listings, precedence is given to the default specified in the parent table. See “[Specifying the Default Detail Listing](#),” later in this book.
- If the two tables have different grid themes, the grid theme of the parent table is ignored. See “[Specifying Grid Themes](#),” later in this book.
- If you have customized the font or color of any rows in the two tables, if both tables have rules for a given row, the combined table uses the rule defined in the inner table.

The combined table ignores the custom font and color for any column in the inner table.

See the chapter “[Specifying Fonts and Colors](#).”

9.5 Example: Placed Orders and Shipped Orders

As noted earlier, the meaning of a measure might depend on the pivot table in which it is used. For example, if `Placed Orders` is defined as `[Count]` and if we group the data by order date, we see the number of orders placed over time, as follows.

<i>Order Date</i> <i>Year</i>	<i>Order Date</i> <i>Quarter</i>	Placed Orders
2005	Q3	70
	Q4	82
2006	Q1	92
	Q2	93
	Q3	103
	Q4	120
2007	Q1	182
	Q2	88

In another pivot table, the measure `Shipped Orders` is defined the same way (`[Count]`), but we group the data by ship date so that we see the number of orders shipped over time, as follows:

<i>Shipped Date Year</i>	<i>Shipped Date Quarter</i>	Shipped Orders
2005	Q3	61
	Q4	82
2006	Q1	92
	Q2	92
	Q3	105
	Q4	109
2007	Q1	178
	Q2	90

To display orders and shipped orders side by side, we link these tables horizontally. The result is as follows:

		Placed Orders	Shipped Orders
2005	Q3	70	61
	Q4	82	82
2006	Q1	92	92
	Q2	93	92
	Q3	103	105
	Q4	120	109
2007	Q1	182	178
	Q2	88	90

Notice that in this pivot table, we have also hidden the dimension header; see “[Specifying the Grid Setup Options](#),” earlier in this book.

10

Creating and Customizing Dimensions

Within the Analyzer, you can create new dimensions and you can customize the definitions of the dimensions for a given pivot table. This is useful if you want to group data in different way than any of the existing dimensions permit. This chapter discusses the following topics:

- [How to create a default member for a dimension](#)
- [How to create a custom dimension to use in any pivot table](#)
- [An overview of the ways in which you can customize the existing dimensions in a pivot table](#)
- [How to rename a dimension in a pivot table](#)
- [How to add a custom member to a dimension](#)
- [How to edit any member of a dimension in a pivot table](#)
- [Details on the options you use to customize a member](#)
- [Notes on what happens when you rename a member](#)
- [How to specify the sort order for the members of a dimension in a pivot table](#)
- [How to prevent a dimension from being nested within other dimensions in a pivot table](#)
- [How to specify the members to display, when you have customized a dimension](#)

10.1 Creating a Default Member for a Dimension

It is often useful or even necessary to have a *default member* for a dimension. The purpose of this member is to group the records that are otherwise not represented in the dimension. For example, many patients may have a secondary doctor, but not all. If you display counts of patients grouped by their secondary doctors, you need a way to group those patients if you want to include their count.

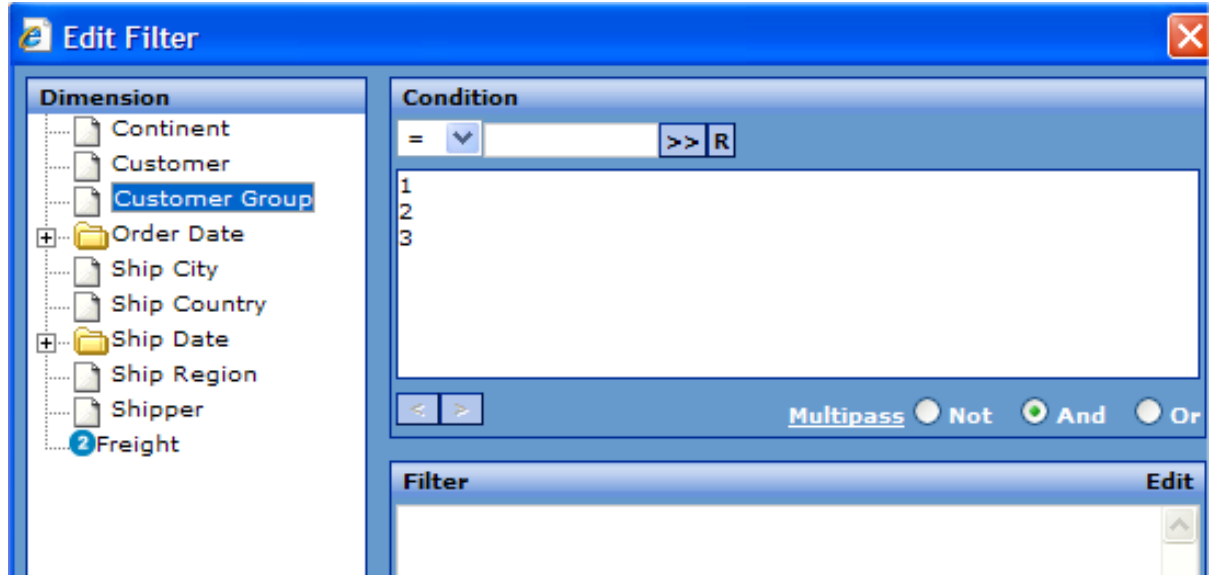
Similarly, when you add a custom dimension to a subject area, it is good practice to add a default member to the dimension, to own any data that is not assigned to other members. This practice ensures that any pivot table using the dimension does not exclude data added after the dimension was defined.

You may already have default members, which can be defined in the Architect. If you do not, you can create them just as easily within the Analyzer.

Because this procedure is useful even if you do not otherwise customize dimensions, it is described in full. For the example, we have a dimension called Customer Group.

1. Click the **Edit** option in the **Filter** panel on the left side of the Analyzer.
2. Specify a filter that excludes all the records that belong to members of this dimension. For the example, we need a filter that excludes all existing customer groups.
 - a. For **Dimension**, click the name of the dimension.


The upper right area then shows the existing members of this dimension:



- b. Click the **Not** option.
 - c. Double-click each member, in the list in the upper left area. As you do, the filter expression gets created and then expanded.

In our example, the final filter expression is as follows:

```
[NOT[Customer Group = 1]] AND
[NOT[Customer Group = 2]] AND
[NOT[Customer Group = 3]]
```

- d. Click **OK** to dismiss the dialog box.
3. Click the Save button  and then click **Save Query**.
4. For **Name**, specify a suitable name such as Unassigned, Other, or Default. For the region example, we could use the member name No Customer Group Assigned.
5. For **Dimension**, select the dimension, Customer Group in this case.
6. Click **Save**.

Note: If you create a member and then decide to delete it, you must use the Architect. When you use the technique described here to create members, these members are displayed on the **Compound Mem** tab of the Architect, where you can redefine or delete them. For information, see the book *Using the DeepSee Architect*.

10.2 Creating a Custom Dimension


To add a custom dimension to a subject area, you use the following procedure:

1. Define the first member of the dimension. When you do, you also define the dimension.
2. Add more members to the new dimension, optionally including a [default member](#), as described in the next section.

Note: If you create a dimension member and then decide to delete it, you must use the Architect. When you use the technique described here to create members, these members are displayed on the **Compound Mem** tab of the Architect, where you can redefine or delete them. For information, see the book [Using the DeepSee Architect](#).

10.2.1 Defining the Dimension and Its First Member

1. Click the **Edit** option in the **Filter** panel.
2. Specify a filter that selects the data that corresponds to a member of the dimension. For example:


```
[Favorite Color = Blue] OR [Favorite Color = Red] OR [Favorite Color = Yellow]
```
3. Click **OK** to dismiss the dialog box.
4. Click the Save button  and then click **Save Query**. The Analyzer then displays the following dialog box:



5. For **Name**, specify the name of this member. For example: `Primary Colors`
6. For **Dimension**, type the name of the new dimension to which this member belongs. For example: `Color Groups`
7. Click **Save**.

10.2.2 Defining Additional Members of the New Dimension

To add each additional member to the new dimension:

1. Click **Edit** in the **Filter** panel.
2. Specify a filter that selects the data that corresponds to the desired member.
3. Click the Save button  and then click **Save Query**.
4. For **Name**, specify the name of this member.
5. For **Dimension**, select the dimension.
6. Click **Save**.

10.3 Options for Customizing a Dimension

A dimension (such as Country) consists of members (such as Australia and Brazil). A dimension also has a default sort order that is used when you display the dimension as rows or columns in a pivot table:

- The members are sorted in ascending alphabetic order, unless the dimension is a date.
- If the dimension is a date or date element, the members are sorted chronologically.

Within a given pivot table, you can customize a dimension and change all the preceding details. You can:

- You can specify the font and color to use when displaying members of this dimension. See the chapter “[Specifying Fonts and Colors](#),” later in this book.
- Specify a new name for the dimension (which is shown in the dimension header, if that is included in the pivot table).
- Define new members of the dimension. For each custom member, you can specify all the following:
 - Name of the member.
 - Filter that defines this member.
 - Font and color to use when displaying this member (as opposed to all members of this dimension). See the chapter “[Specifying Fonts and Colors](#),” later in this book.
 - The display style (string, numeric, and so on) and the number of decimal points.
 - Whether to display null values or not.
- Redefine existing members of the dimension, using all the same options.
- Specify the sort order for the members.

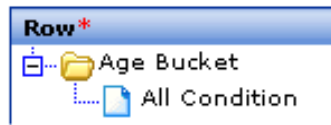
Although you start by customizing an existing dimension, the result may not bear any relationship to that dimension. Also, there is no requirement for the members of this dimension to be related to each other. The limit to what you can do is determined only by the filters you can define.

10.4 Renaming a Dimension

Within a pivot table, to rename a dimension, do the following:

1. Click the Expand button  next to the dimension name, within the **Row** or **Column** panel above the pivot table.

This expands the dimension as follows:



2. Right-click **All Condition** and then click **Edit Condition**. The Analyzer then displays a complex dialog box, most of which you can ignore for this procedure.
3. Type a new name for the dimension into the field **Caption Name**, at the top of the dialog box.
4. Click **OK** to close this dialog box. The dimension name is immediately changed in the **Row** or **Column** panel.
5. Optionally click **Find** to see the new name in the pivot table.

Note: If the dimension headers are not currently displayed, see the section “[Specifying the Grid Setup Options](#),” earlier in this book.

6. Save the pivot table.


The change applies only to this pivot table.

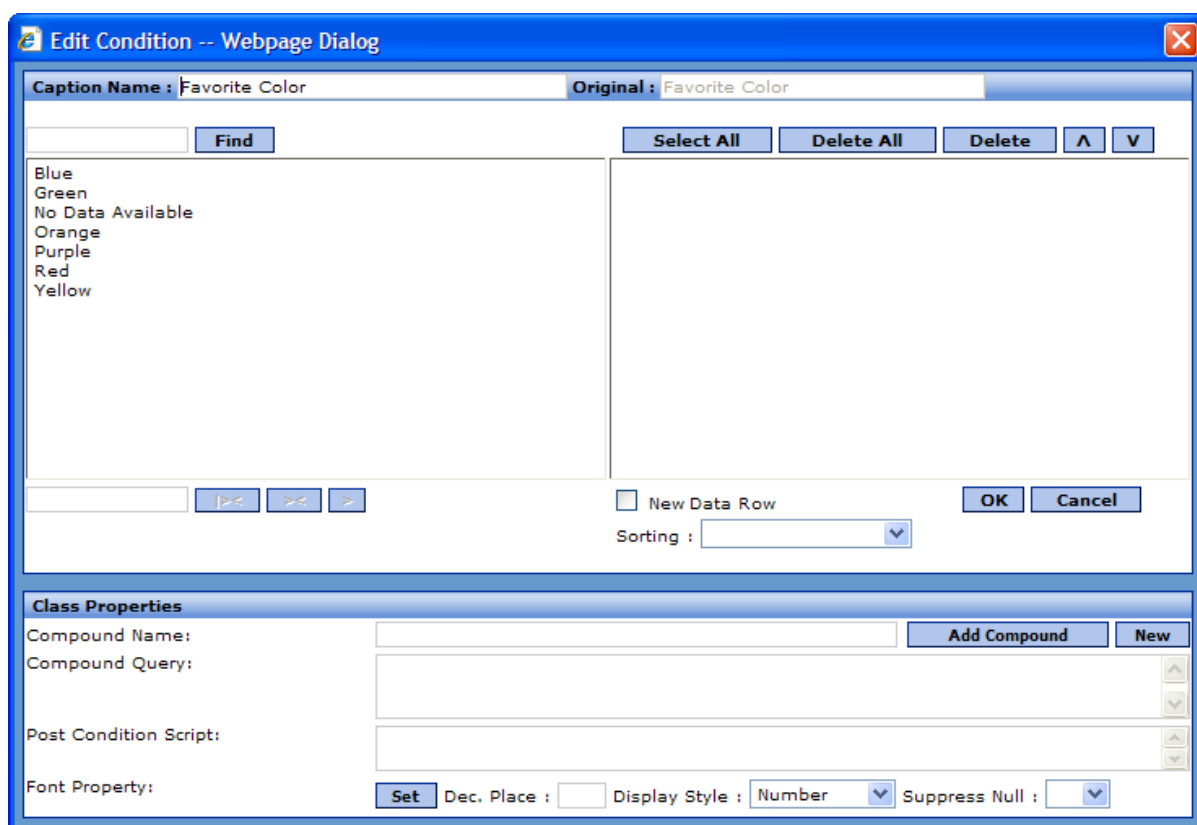
Renaming a dimension has no effect on any filters.

10.5 Adding a Custom Member

When you add a custom member to a dimension, the Analyzer assumes that you want to display that member. The dialog box thus controls both the member definitions *and* the selection of members shown in the pivot table.

Within a pivot table, to add a custom member to a dimension, do the following:

1. Click the Expand button  next to the dimension name, within the **Row** or **Column** panel above the pivot table.
2. Right-click **All Condition** and then click **Edit Condition**. The Analyzer then displays the following dialog box:



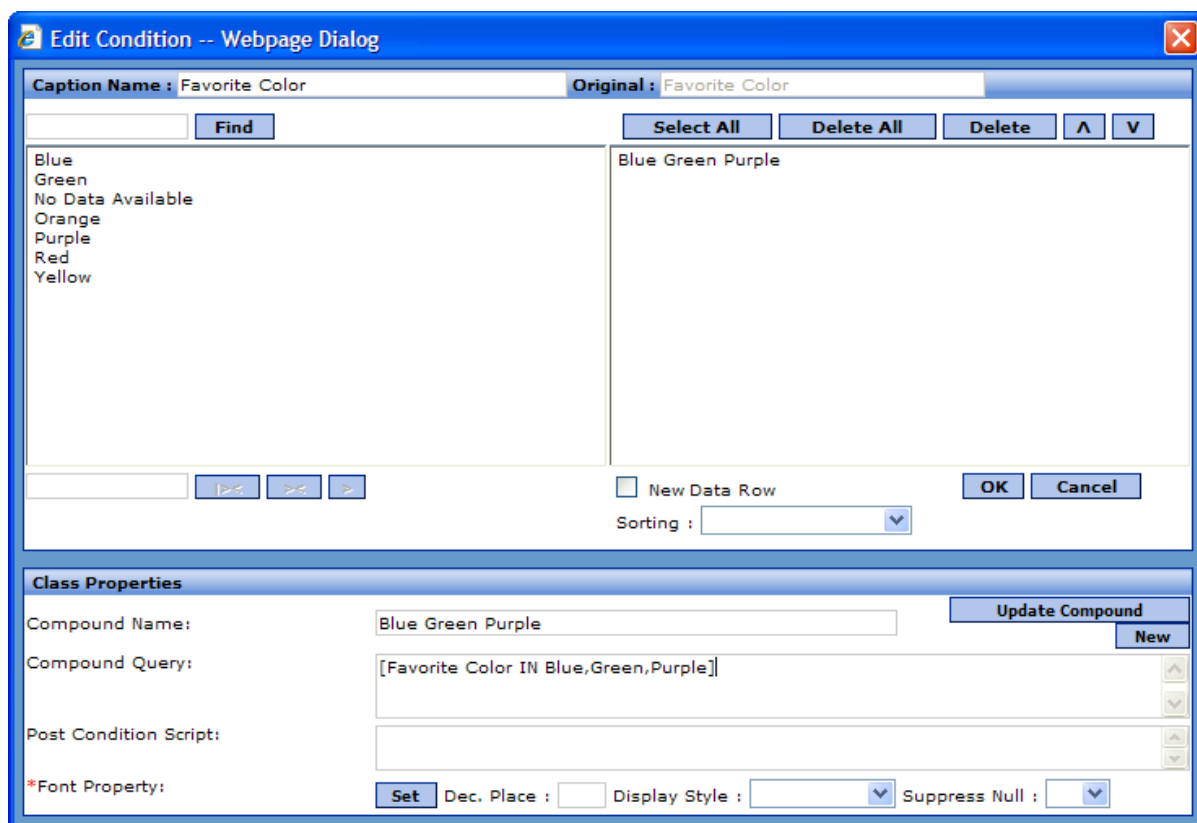
3. In the lower part of the screen, type the name of the new member into **Compound Name**. For example, Blue Green Purple.
4. In the field **Compound Query**, type a filter using the same syntax that is used for filters elsewhere. For example:

```
[Favorite Color IN Blue,Green,Purple]
```

See the chapter “[Filtering the Data](#)” and see the notes in “[Renaming a Member](#).”

5. Optionally specify the other options in the lower part of the screen, as described in “[Specifying Member Options](#),” later in this chapter.
6. Click **Add Compound**. The new member is immediately added to the upper right list.

For example:




7. Add members to the right hand list as needed, in the order you want to see them. When this list is empty, the pivot table shows all members. However, when this list shows any members, the pivot table shows only those members.
8. Click **OK** to close this dialog box.
9. Optionally click **Find** to see the new name in the pivot table.
10. Save the pivot table.

The change applies only to this pivot table.

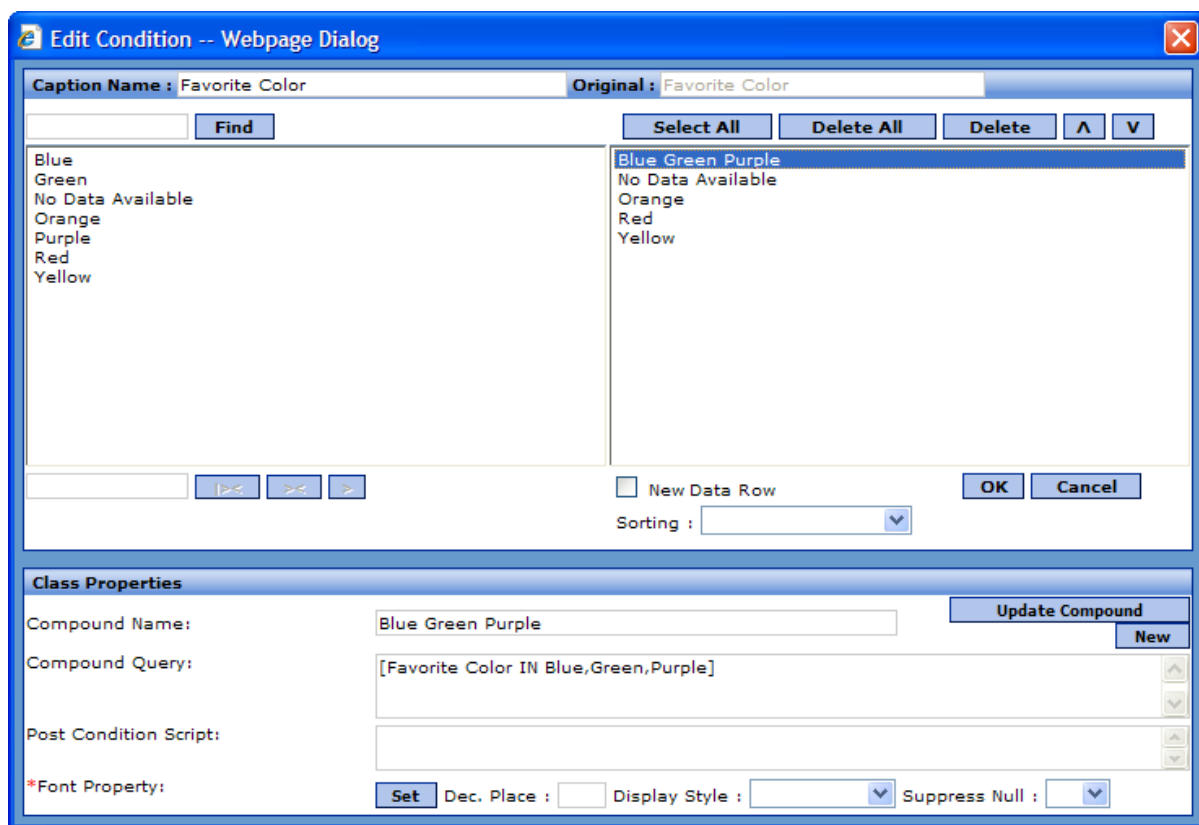
10.6 Editing a Member

You can edit any member of a dimension in a pivot table. To change the name, definition, or both of a member so:

1. Click the Expand button  next to the dimension name, within the **Row** or **Column** panel above the pivot table.
2. Right-click **All Condition** and then click **Edit Condition**.

The upper right area of the displayed dialog box lists the members that are currently displayed in this worksheet (including any predefined members).

3. Click a member name in the upper right area. The bottom area of the dialog box immediately displays details about that member. For example:



If the member is a predefined member, **Compound Query** is null, which means that the default filter for this member is used.

4. In the lower part of the screen, make any changes needed.

For information on the options, see “[Specifying Member Options](#),” later in this chapter.

5. Click **Update Compound**.
6. Make sure that every member you want to show in the pivot table is listed in the upper right list, in the order you want to see them. When this list is empty, the pivot table shows all members. However, when this list shows any members, the pivot table shows only those members.
7. Click **OK** to close this dialog box.
8. Optionally click **Find** to see the new name in the pivot table.
9. Save the pivot table.

The change applies only to this pivot table.

10.7 Specifying Member Options

When you create or edit a member of a dimension, you use the lower area of the **Edit Condition** dialog box. This area provides the following options:

- **Compound Name** — Specifies the name of this member. Also see the next section, “[Renaming a Member](#).”
- **Compound Query** — Specifies the filter that selects data for this member, using the same syntax that is used for filters elsewhere. For example:

[Favorite Color = Blue] OR [Favorite Color = Red] OR [Favorite Color = Yellow]

See the chapter “[Filtering the Data](#).”

- **Post Condition Script** — Specify optional Caché ObjectScript statements to override the values shown in the row or column that corresponds to this member.

You use post-formula scripts when you want to reprocess the original values, to change formatting, for example, or perhaps to simplify computation by breaking it into multiple steps. The script can refer to the variable *val*, which is the original value, and it must set the variable *val* as needed. See the book *Expressions and Scripts in DeepSee*.

- **Font Property** — Click **Set** to display a dialog box where you can set the font and colors to use when displaying this member. See the chapter “[Specifying Fonts and Colors](#),” later in this book.
- **Display Style** — Specifies the display style for this member. See the section “[Specifying a Display Style](#),” earlier in this book.
- **Dec Point** — If the member uses a numeric style, specify the number of decimal places it uses (0 by default).
- **Suppress Null** — Select **False** if you want to display placeholders to represent this member, if it has no data. Select **True** if you want to suppress such members. This setting overrides the **Suppress Null Column** and **Suppress Null Row** settings of the pivot table, which are documented in the section “[Specify the Grid Setup Options](#),” earlier in this book.

10.8 Renaming a Member

As noted in the previous section, to rename a member in a pivot table, you can edit the **Compound Name** field. However, it is important to understand how this may affect that pivot table:

- Filter expressions use the internal names of dimensions and members. By default, the external name of a dimension is the same as the internal name; similarly, the external name of a member is the same as the internal name.
- Each member of any given dimension is defined by a filter (**Compound Query**) that indicates which source records to use. The default filter for a given dimension member is [Dimension Name = Member Name].
- Thus if you rename a member, you also must edit **Compound Query**. For example, if you rename the home state AZ to Arizona, you would need to explicitly set **Compound Query** to [Home State = AZ]
- If you rename a member, any existing filters applied to the pivot table or subject area still work as they used to.

The only filter that would need to be changed is **Compound Query**, the filter that *defines* the member.


10.9 Specifying How to Sort the Members

A dimension has a default sort order that is used when you display the dimension as rows or columns in a pivot table:

- The members are sorted in ascending alphabetic order, unless the dimension is a date.
- If the dimension is a date or date element, the members are sorted chronologically.

10.9.1 Choosing a Different Sort Order


In this technique, you choose a different sorting style.

1. Click the Expand button  next to the dimension name, within the **Row** or **Column** panel above the pivot table.
2. Right-click **All Condition** and then click **Edit Condition**.
3. Select a value for **Sorting**.
4. Make sure that the upper right list is empty. If any members are listed here, DeepSee ignores the value of **Sorting**.
5. Click **OK** to close this dialog box.
6. Optionally click **Find** to see the result.
7. Save the pivot table.

The change applies only to this pivot table.

10.9.2 Sorting the Members Manually

In this technique, you manually place the members into the desired order.


1. Click the Expand button  next to the dimension name, within the **Row** or **Column** panel above the pivot table.
2. Right-click **All Condition** and then click **Edit Condition**.
3. For each member that you want to show in the pivot table, double-click that member in the left list so that DeepSee adds it to the upper right list.
4. Arrange the members in the upper right list into the desired order. To change the order in this list, click an item and then click **Up** or **Down**.
5. Click **OK** to close this dialog box.
6. Optionally click **Find** to see the result.
7. Save the pivot table.

The change applies only to this pivot table.

Ignore the **Sorting** option, which has no effect in this case.

10.10 Preventing a Dimension from Being Nested

By default, when you use multiple dimensions for rows or for columns, the dimensions are nested, in the order in which you list them. You can, however, prevent a given dimension from being nested within other dimensions. To do so:

1. Click the Expand button  next to the dimension name, within the **Row** or **Column** panel above the pivot table.
2. Right-click **All Condition** and then click **Edit Condition**.
3. Select the **New Data Row** check box.
4. Click **OK** to close this dialog box.
5. Optionally click **Find** to see the result.
6. Save the pivot table.

The change applies only to this pivot table.

For example, consider the following pivot table:

<i>Doctor Group</i>	<i>Gender</i>	<i>Count</i>
I	Female	1,179
	Male	1,149
II	Female	1,244
	Male	1,209
III	Female	1,092
	Male	968
None	Female	1,613
	Male	1,546

Here, members of the Gender dimension are nested within members of the Doctor Group dimension. Suppose that you instead want the following layout:


	<i>Count</i>
I	2,328
II	2,453
III	2,060
None	3,159
Female	5,128
Male	4,872

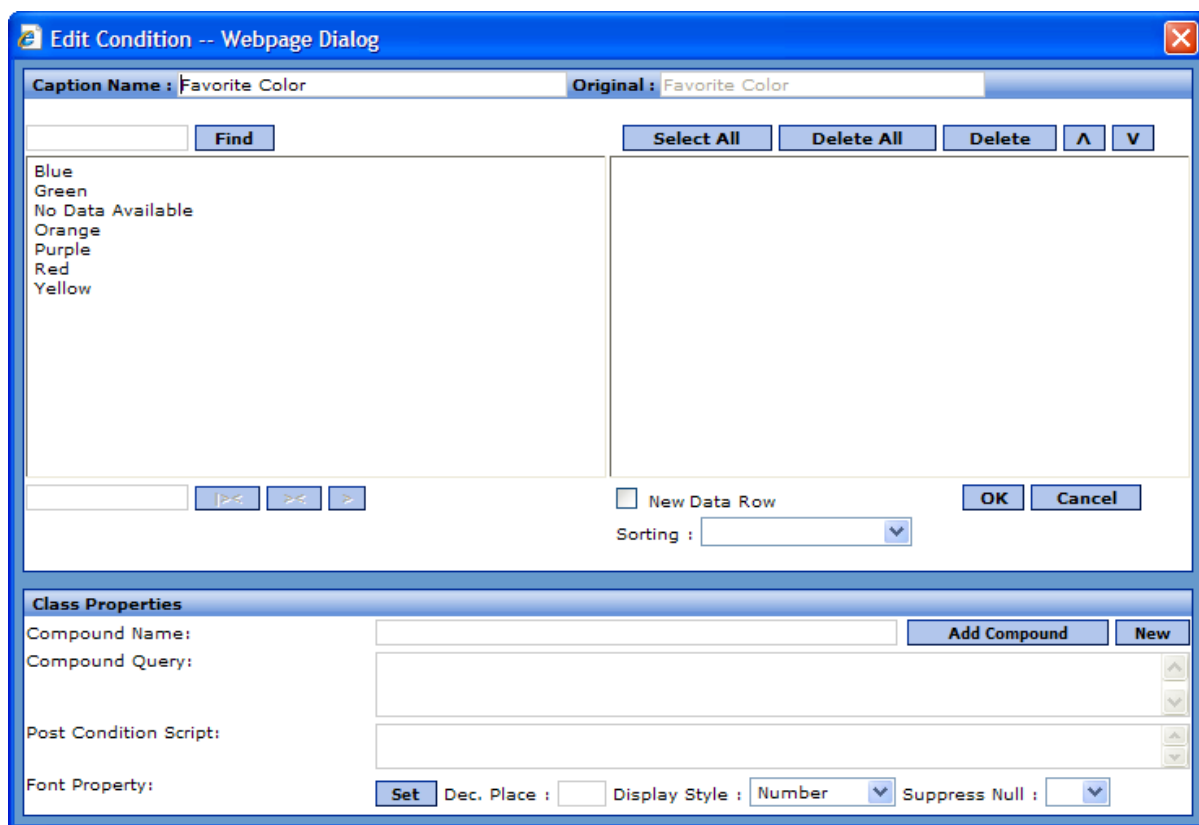
To get this result, we edit the Gender dimension, where we check the **New Data Row** option.

Also, we hid the dimension header, because it is no longer useful. See the section “[Specifying the Grid Setup Options](#),” earlier in this book.

10.11 Specifying the Members to Display

For a customized dimension, to specify the members to display, do the following:

1. Click the Expand button  next to the dimension name, within the **Row** or **Column** panel above the pivot table.
2. Right-click **All Condition** and then click **Edit Condition**. The Analyzer then displays the following dialog box:



The upper left area lists all the standard members of this dimension. The upper right lists all the members that are currently displayed (if this area is empty, all members are currently displayed). This list can include both standard members and your custom members, which you create at the bottom of the dialog box.

3. To add standard members, double-click members in the left list, in order to add them to the right list.
4. To add custom members, see the section “[Adding a Custom Member](#),” earlier in this chapter.

11

Specifying Fonts and Colors

You can customize the font and color of the data cells in a pivot table in various ways. This chapter includes information on the following:

- [An overview of all the ways to customize the font and color of the data cells in a pivot table](#)
- [An overview of the Font Selection dialog box, which you use to select font and color](#)
- [How to define and use grid themes](#)
- [How to customize the font and color for a measure, computation, or dimension](#)
- [How to specify the font and color for a given member of a dimension](#)

Also see the chapter “[Adding Alerts \(Conditional Formatting\)](#),” earlier in this book.

For information on colors used in charts, see the section “[Defining and Using Chart Themes](#),” later in this book.

11.1 Overview

There are multiple ways to customize the font and color of the data cells in any given pivot table:

- You can define an alert, which overrides all color and font choices, depending on a data value. See the chapter “[Adding Alerts \(Conditional Formatting\)](#),” earlier in this book.
- You can define and apply a *grid theme*, which specifies the default color and fonts used in the table. You can create multiple grid themes and apply them to any table.
- You can customize the font and color to use for the cells for each measure and computation.
- You can customize the font and color to use for the cells that show the dimension members. You can customize each dimension separately, and this applies to all members of the dimension.
- You can customize the font and color for a specific member of a dimension.

The following rules govern the font and color that is actually shown for a given cell:

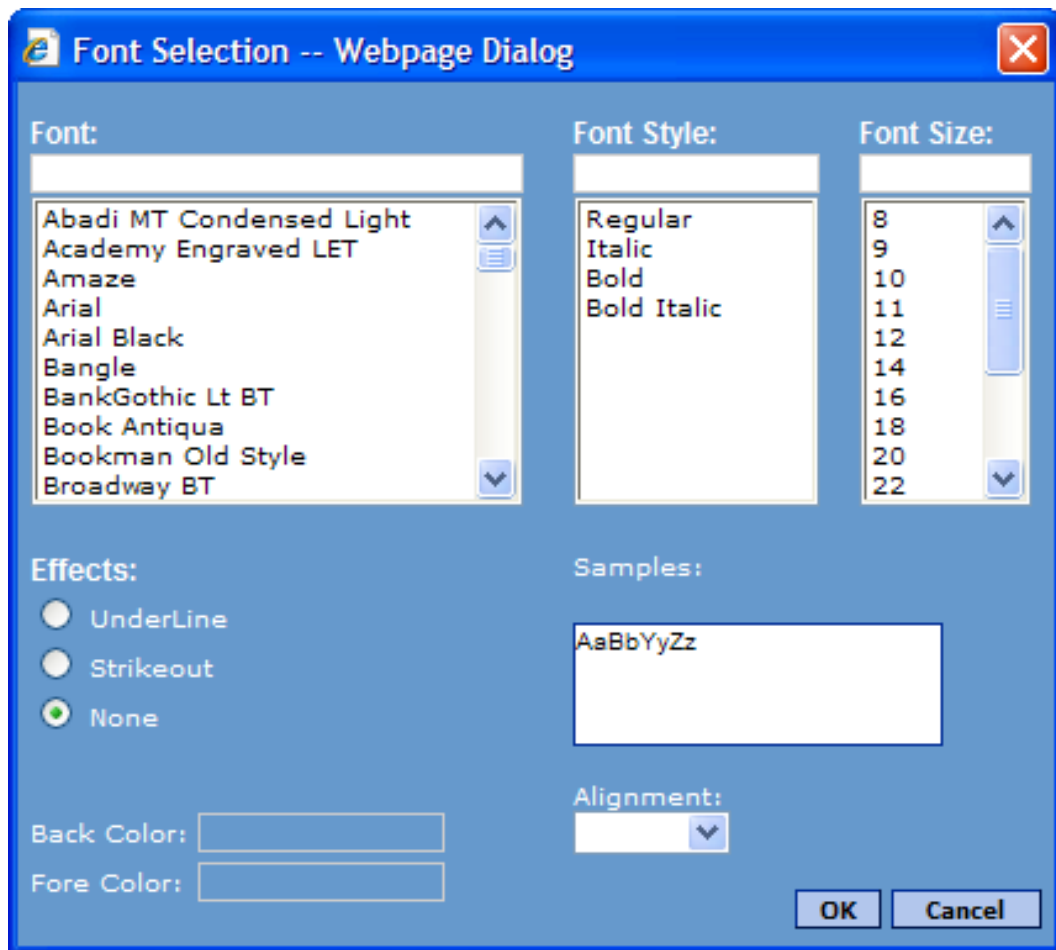
1. If an alert applies to a cell and the alert uses a custom font or color, that font or color is used. For information on alerts, see the chapter “[Adding Alerts \(Conditional Formatting\)](#),” earlier in this book.
2. Otherwise, if the cell displays a measure, computation, or dimension that uses custom font or color, that font or color is used.

If a given cell has conflicting customizations, the customization defined in the column takes precedence over the customization defined in the row.

- Otherwise, the cell uses the font and color defined in the currently used grid theme.

11.2 Using the Font Selection Dialog Box

In all cases when you choose fonts and colors, you use the following dialog box:



To use this dialog box, specify values as follows:

- For **Font**, optionally select a font type from the list. Or skip this field to keep the default.
- For **Font Style**, optionally select a font style from the list. Or skip this field to keep the default.
- For **Font Size**, optionally type or select a font size from the list. Or skip this field to keep the default.
- For **Effects**, optionally click **Underline** or **Strikeout** to display the font with the desired effect.

When you modify any of the preceding options, the **Samples** box is updated to show a sample with your choice.

- For **Back Color**, optionally click this and specify a color to use for the background for all cells that display this item. When you click this, the system displays a dialog box where you can select a color or type in a color value (in RGB numbers or in hex).


- For **Fore Color**, optionally click this and specify a color to use for the font for all cells that display this item. When you click this, the system displays a dialog box where you can select a color or type in a color value (in RGB numbers or in hex).
- For **Alignment**, optionally select one of the following options to control how text is aligned for this item: **Align Left**, **Align Right**, **Center**.

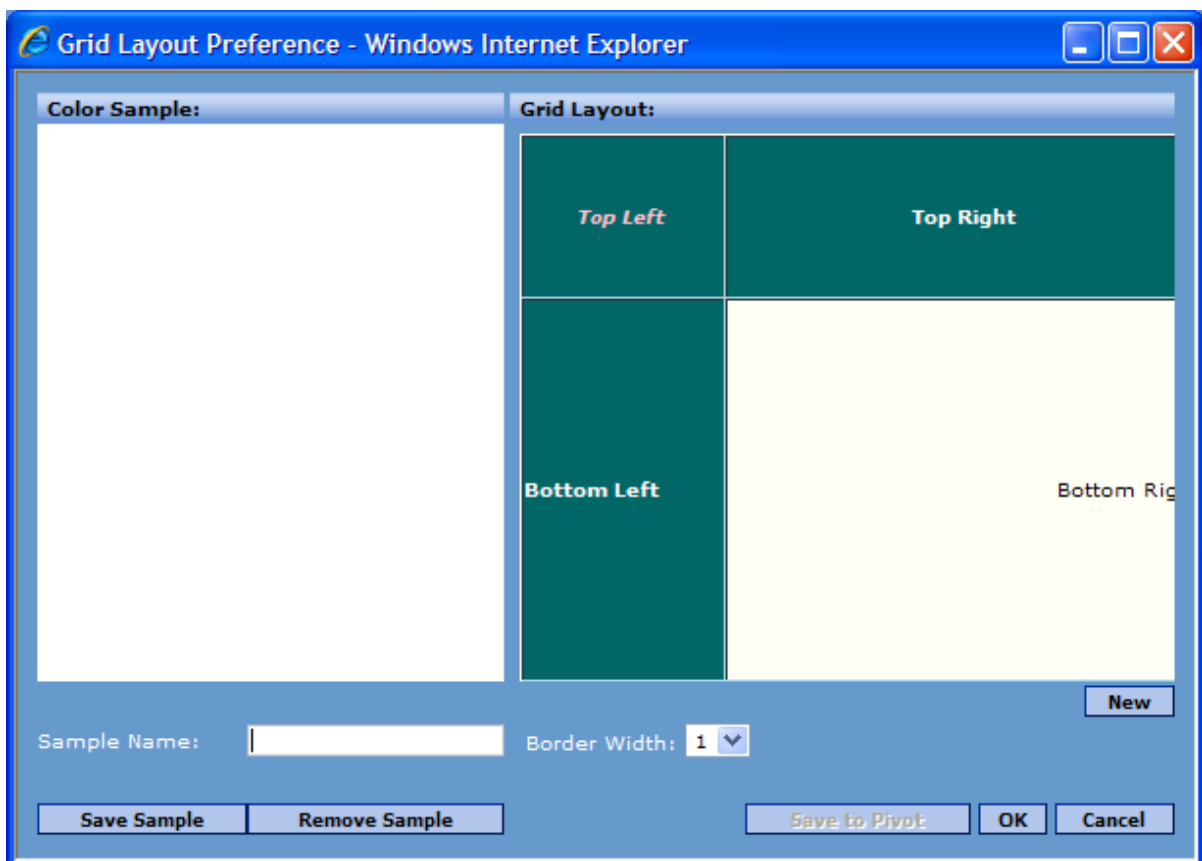
11.3 Defining and Using Grid Themes

Grid themes define the default color and fonts used in pivot tables, when displayed in tabular format. Any pivot table uses a grid theme — either the default or another one that you have created. You can redefine the default theme, define new themes, and you can specify which theme a given pivot table uses.

11.3.1 Defining or Redefining a Grid Theme

To define a grid theme, do the following:

1. Open any pivot. (To define a grid theme, you must have some pivot table open.)
2. Click **Find** to display it.
3. If the pivot is not currently displayed as a table, click the Switch to Grid button .
4. Right-click in the data area and then click **Layout Preference**. The system displays the following dialog box:



The **Color Sample** area lists available grid themes (except for the default theme). This is initially empty.

The **Grid Layout** area on right displays a preview of the currently selected grid theme. If no theme is selected, this area displays a preview of the default theme.

5. In **Sample Name**, optionally type the name of grid theme you want to create or click an existing grid theme. (If you do not select a grid theme or specify a new name, you will be editing the default grid theme.)

Optionally save it by clicking **Save Sample**. If you do so, notice that the grid theme is no longer selected. Be sure to click the grid theme name again in the **Color Sample** list so that it is selected for further changes.

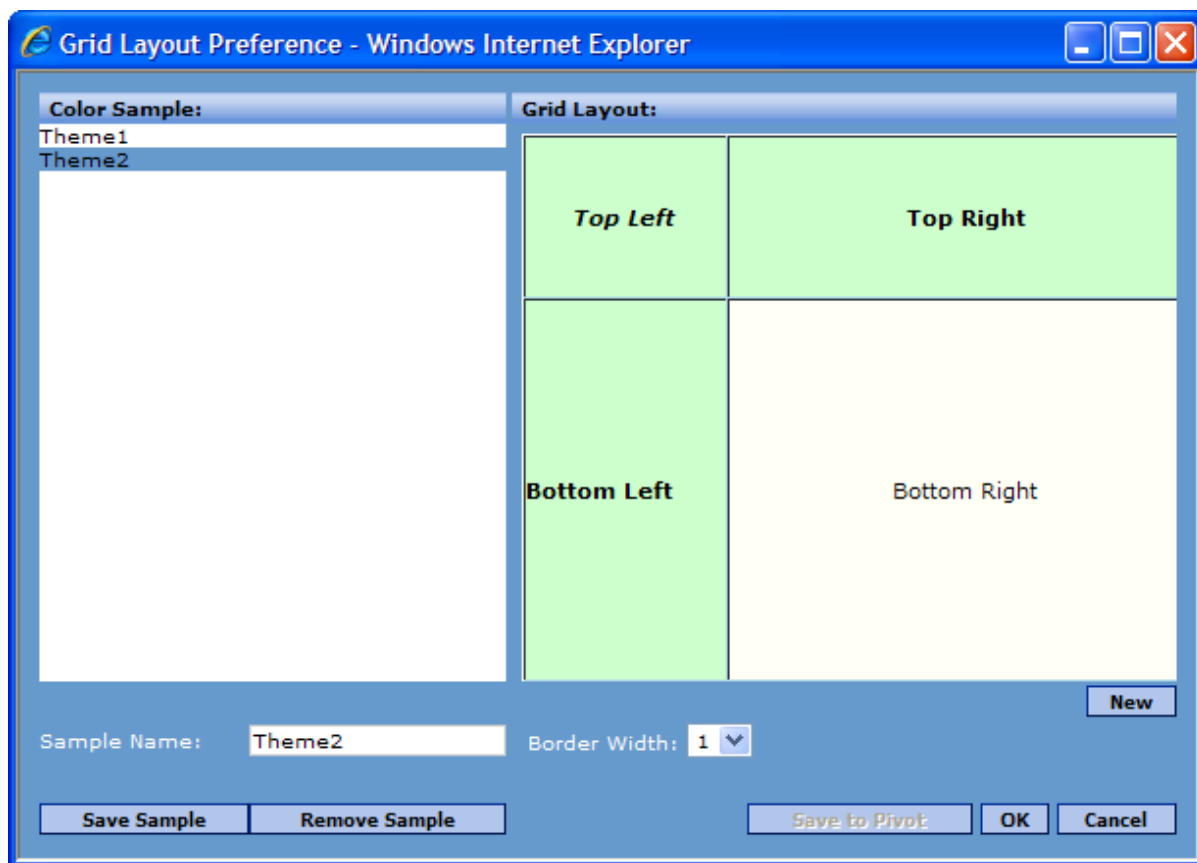
If you specify a new grid theme name, note that its definition theme is initially the same as the default theme.

6. In the **Grid Layout** area, click any of the four boxes: **Top Left**, **Top Right**, **Bottom Left**, or **Bottom Right**. When you do, the system displays another dialog box where you can specify the font and colors used in this area of the grid. See [“Using the Font Selection Dialog Box”](#) for details.

Note: The data rows are displayed in two colors, in alternating rows. The color that you specify for **Bottom Right** is used for the first row (and every other row after that). The alternating rows are off-white.

7. Click **OK** to close the **Font Selection** dialog box.
8. Repeat the previous steps for each area of the grid, as needed.

The result might be as follows:



9. Optionally change the value for the **Border Width** option, which controls the width of the borders in this grid theme.
10. Click **Save Sample** to save the grid theme.


The grid theme is now available for use with any pivot table in this subject area.

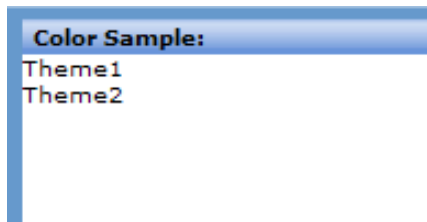
11. Optionally, to apply the new grid theme to the current pivot table:

- a. Click the name of the desired grid theme in the **Color Sample** list.
- b. Click **Save to Pivot**.

11.3.2 Applying a Grid Theme

To apply a grid theme to a pivot table, do the following:

1. Open the pivot.
2. Click **Find** to display it.
3. If the pivot is not currently displayed as a table, click the Switch to Grid button .
4. Right-click in the data area and then click **Layout Preference**. The system displays a dialog box that lists the available grid themes. For example:



\

If the pivot table is currently using the default theme, no theme is highlighted in this list. Otherwise, this list highlights the theme that the pivot table is currently using.

5. Click the name of the desired grid theme. The right side of the dialog box then displays a preview of this theme.
6. Click **Save to Pivot** to apply this grid theme to the current pivot table.

11.4 Specifying the Font and Color for a Measure, Computation, or Dimension

To specify the font and color to use for a given measure, computation, or all members of a dimension in a given pivot table, do the following:


1. Right-click as follows:
 - Right-click the measure in the **Metrics** panel and select **Edit Font Properties**.
 - Right-click the computation in the **Row**, **Column**, or **Metrics** panel and select **Edit Font Properties**.
 - Right-click the dimension in the **Row** or **Column** panel and select **Edit Font Properties**.

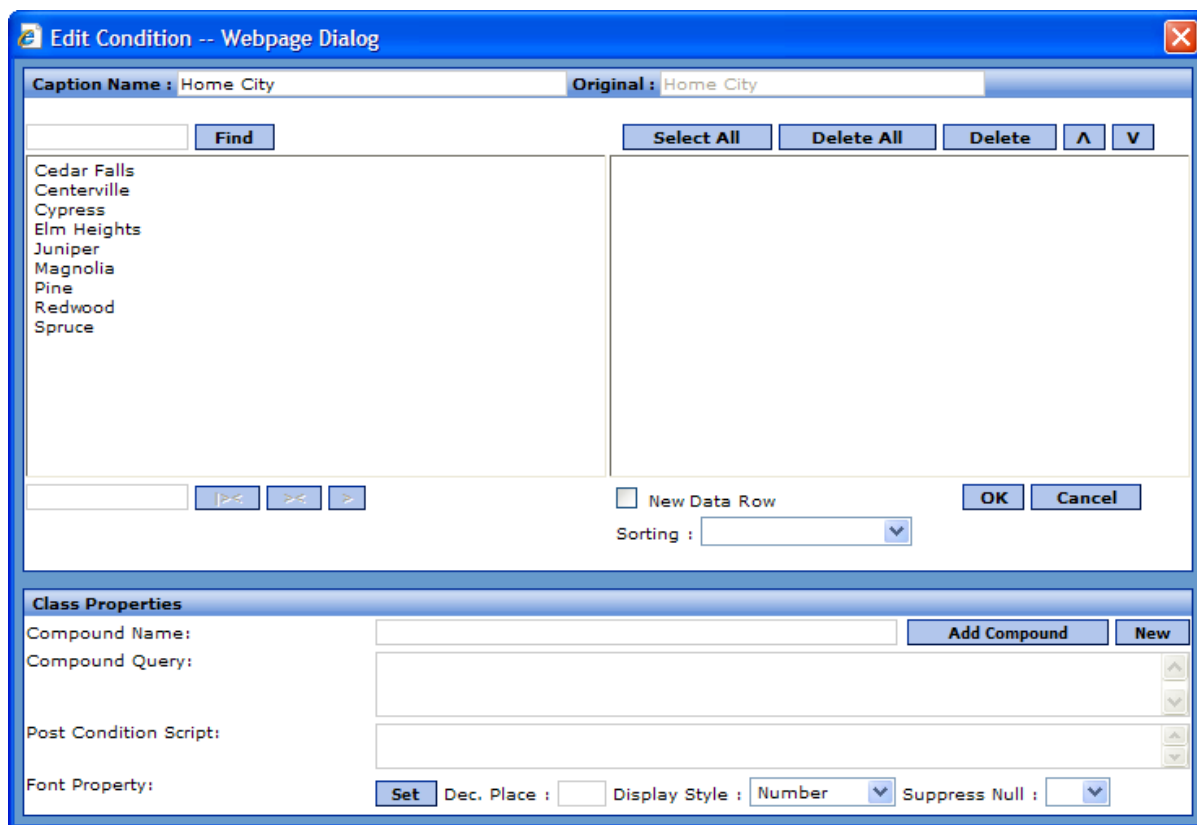
The Analyzer displays a dialog box where you can set the font and colors to use when displaying this item. See [“Using the Font Selection Dialog Box”](#) for details.

2. Click **OK** to close the **Font Selection** dialog box.
3. Save the pivot table.

11.5 Specifying the Font and Color for a Specific Member

To specify the font and color to use for a specific member of a dimension, do the following:

1. Click the Expand button  next to the dimension name, within the **Row** or **Column** panel above the pivot table.
2. Right-click **All Condition** and then click **Edit Condition**. The Analyzer then displays the following dialog box:



The upper right area of this dialog box lists the members that are currently displayed in this worksheet (including any predefined members).

3. Click a member name in the upper right area. The bottom area of the dialog box immediately displays details about that member. (If the member is a predefined member, the query is not displayed.)
4. In the lower part of the screen, click **Set** (next to **Font Property**).

The screenshot shows a 'Class Properties' dialog box. At the top, there are navigation buttons: '<>', '<<', and '>'. Below these is a 'Sort' button. The main section is titled 'Class Properties' and contains several fields: 'Compound Name' with the value 'Centerville', 'Compound Query' (empty), 'Post Condition Script' (empty), and 'Font Property'. The 'Font Property' section is circled in red and includes a 'Set' button, a 'Dec. Place' input field, and a 'Disp' button.

The Analyzer displays a dialog box where you can set the font and colors to use when displaying this item. See “[Using the Font Selection Dialog Box](#)” for details.

5. Click **OK** to close the **Font Selection** dialog box.
6. Click **Update Compound**.
7. Click **OK** to close this dialog box.
8. Optionally click **Find** to see the change to the pivot table.

<i>Home City</i>	<i>Patient Count</i>
Cedar Falls	1,096
Centerville	1,129
Cypress	1,157
Elm Heights	1,134
Juniper	1,112
Magnolia	1,077
Pine	1,072
Redwood	1,084
Spruce	1,139

9. Save the pivot table.

12

Defining KPIs

This chapter describes how to define key performance indicators (KPIs) in DeepSee. It discusses the following topics:

- [An overview of KPIs in DeepSee](#)
- [How to define or modify a KPI](#)
- [How to define a set of ranges and display rules for a KPI](#)
- [How to add images to the display rules for a KPI](#)
- [How to delete a KPI](#)




12.1 Overview of KPIs

A KPI is a value (typically numeric) that summarizes critical information for your enterprise. KPIs have different meanings in different industries, but include quantities such as return on investment (ROI), revenue, average customer waiting time, and so on.

In DeepSee, a KPI is essentially a measure that has been given official recognition for stand-alone use. If the measure is redefined, the KPI is updated accordingly. More generally, you can define a KPI as a Caché ObjectScript expression, which can refer to other KPIs or any other value that is needed.

By default, a KPI is based on an entire subject area. You can apply a filter, so that only a subset of the records are included. You can include a filter in the definition of the KPI or later when you use the KPI.

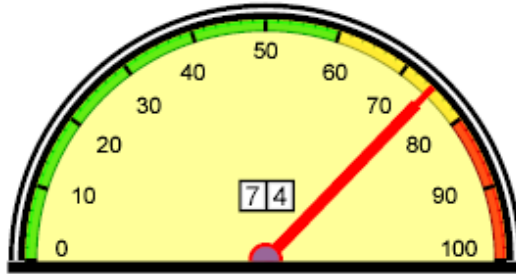
In DeepSee, a KPI can include a set of display rules, which take effect in specific scenarios. You define a set of value ranges and specify the display rules for each range. The display rules can affect the colors, font, display of images, and so on. The following shows an example:

From Value	To Value	Foreground Color	Background Color	Font Name
	60		 #00FF00	Arial
60	80		 #FFFF33	Arial
80			 #FF0000	Arial

You can use DeepSee KPIs in the following places:

- In the definition of another KPI, as discussed later in this chapter.

- In the definition of a computation, as discussed in the chapter “[Defining Computations.](#)”
- In a scorecard row. See the section “[Creating Scorecards.](#)”
- In a speedometer on a dashboard. If the KPI has any display rules, those affect the speedometer. For example:



See [Using the DeepSee Dashboard Designer.](#)

- In other objects in a dashboard, to specify display rules that affect the objects.


Also, DeepSee provides a function (**\$\$KPI**) that you can use to get the value of any KPI; you can use this in various contexts that support Caché ObjectScript expressions. See the book [Expressions and Scripts in DeepSee.](#)

12.2 Defining and Modifying KPIs

To define or redefine a KPI:

1. At the top of the Analyzer page, click **Main > KPI Setup.**

The system then displays a page like the following:

2. Do one of the following:
 - Type a new KPI name into **Name**. Then click the Browse button  next to **Folder** and select the folder in which to store this KPI.
 - Expand the appropriate folder on the left and double-click a KPI name within it.
 - Type the ID of a KPI into **KPI Search** and then click **Search**.
3. Optionally specify minimum and maximum values for this KPI, to use when this KPI is included in a speedometer. To do so, enter values into **Minimum** and **Maximum**.

This range specifies the lowest and highest numbers on the scale of the speedometer, and has no effect on the KPI value. If the KPI value is lower than **Minimum**, DeepSee adjusts the bottom number on the scale as needed. Similarly, if the KPI value is higher than **Maximum**, DeepSee adjusts the upper number on the scale as needed.

4. For **Schema**, select a subject area.
5. Optionally specify how to compute this KPI. Do one of the following:

- For **Measure**, select a measure.

Notice that the tool lists only the measures that can be aggregated. That is, it does not list any date measures that have no aggregation functions.

- Click the **Formula** tab and enter a Caché ObjectScript expression.

This expression can use the **\$\$KPI** function to refer to the value of another KPI; see the book *Expressions and Scripts in DeepSee*.

If you specify both, the formula takes precedence.

If you specify neither, the KPI counts the records.

6. Optionally apply a filter to the data used by this KPI. To do so, type a filter expression into the large, unlabeled box beneath **Schema** and **Measure**.

For example, suppose that you create a KPI based on the `Average Test Score` measure. By default, the KPI calculates the average test score for all patients. If you apply the following filter, the KPI instead considers only the patients who have a non-null test score:

```
[Tested? = Yes]
```

(As a reminder, the `Tested?` dimension has two members, `Yes` and `No`, which refer to the patients who have a test score and those who do not, respectively. See the *DeepSee Developer Tutorial*.)

7. Optionally define ranges and display rules. See the [following section](#).
8. Optionally add images to the display rules, for use in dashboards. See “[Adding Images to the Display Rules](#).”
9. Click **Add** or **Update** in the lower right.

Important: If you base a KPI on a filtered measure, that filter is ignored. If you want the KPI to be filtered in the same way as the measure, include that filter within the KPI definition as well.

12.3 Defining Ranges and Display Rules for a KPI

A KPI can include a set of display rules that you can apply in other areas of DeepSee (such as in the Dashboard Designer). Each rule is associated with a specific range of values; if the KPI value falls in that range, the corresponding display rule is used. To define these rules:

1. Click the **Value Range** tab.

In this tab, you define a set of ranges, each with a name or caption.

2. To add a row to the table, right-click in the empty area and select **Add Line**. The system then adds a blank line.
3. Specify the following details for this range:

- **From Value** — Specify the (optional) lower end of this range. Click once in this cell and begin typing. This value is a constant, not an expression.

- **To Value** — Specify the (optional) upper end of this range. Click once in this cell and begin typing. This value is a constant, not an expression.
- **Foreground Color** — Optionally specify the font color to use when the KPI value is in this range. Double-click in this cell, which displays a dialog box, and then click a color.
- **Background Color** — Optionally specify the background color to use when the KPI value is in this range. Double-click in this cell, which displays a dialog box, and then click a color.
- **Font Name** — Optionally specify the font type face, font size, and font style to use when the KPI value is in this range. Double-click in this cell, which displays a dialog box, and then select the details.
- **Alignment** — Optionally specify the alignment to use for strings when the KPI value is in this range. Double-click in this cell, which displays a drop-down list, and then select **Right**, **Left**, or **Center**.


Tip: To move from one field to another, you can also press **Tab**.

4. Repeat as necessary.

You can also add an image to each range; see the [next section](#).

12.4 Adding Images to the Display Rules

Each display rule for a KPI can also have an associated image. This feature is used in dashboards; depending on the value of the KPI, a different image is displayed on the dashboard. If you have already defined the ranges as described in the previous section, do the following to add an image to each display rule:

1. Load the image files into the DeepSee library. For information, see the [DeepSee Site Configuration and Maintenance Guide](#).
2. Click the **Value Range** tab.
3. Click a row in the table.
4. At the bottom of the page, click the Browse button  next to **Image List** and then select an image. The page displays a preview of the image.

To clear the previous image, if any, click **Clr**.

5. Repeat as necessary.
6. When you are done, click **Update** in the lower right.

12.5 Deleting a KPI

To delete a KPI:

1. At the top of the Analyzer page, click **Main > KPI Setup**.
2. On the left, click the name of the folder that contains the KPI and then click the KPI name.
3. Click **Delete** in the lower right. DeepSee prompts for confirmation.

13

Other Pivot Table Options

This chapter discusses other options that affect pivot tables. It includes information on the following topics:

- [How to create scorecards](#)
- [How to define chart themes for use in pivot tables when in chart format](#)
- [How to specify the default detail listing for a pivot table](#)
- [How to add label rows or label columns to a pivot table](#)
- [How to create pivot tables that use SQL queries](#)
- [How to add a time series to a pivot table](#)

13.1 Creating Scorecards

A scorecard is a specialized kind of pivot table. This section discusses the following topics:

- [An overview of DeepSee scorecards](#)
- [How to define the scorecard columns](#)
- [How to define the scorecard rows](#)

13.1.1 Overview of Scorecards

A scorecard is a specialized kind of pivot table that provides reference information as well as data. The following shows an example:

scorecard example			
<i>Test</i>	<i>Reference Range</i>	<i>Units</i>	<i>Value</i>
lab test 1	135-145	mmol/L	141
lab test 2	95-100	mmol/L	102
lab test 3	25-100	U/L	87

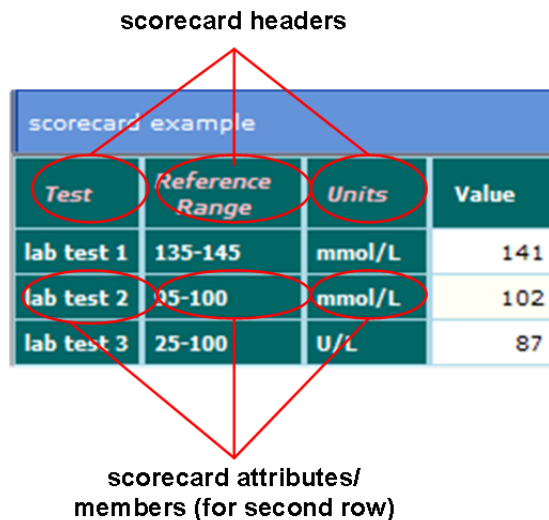
This scorecard has three fixed columns and one data column. The fixed columns are *Test* (the name of a lab test), *Reference Range* (the reference range suitable for this test), and *Units* (which indicates the units for the reference range and for the test value).

A scorecard can have multiple data columns, as shown in the following example:

			Episode 1	Episode 2
<i>Test</i>	<i>Reference Range</i>	<i>Units</i>	Value	Value
lab test 1	135-145	mmol/L	141	147
lab test 2	95-100	mmol/L	102	105
lab test 3	25-100	U/L	87	99

13.1.1.1 A Look at the Fixed Columns of a Scorecard

Before we look at how to define scorecards, it is useful to define the parts of the fixed columns:



Each fixed column has a *scorecard header* (for example, *Reference Range*). The items below that are called *scorecard attributes* or *scorecard members*. All these items are strings.

13.1.1.2 A Look at the Scorecard Rows


You define each scorecard row separately. The definition of a scorecard row includes the following information:

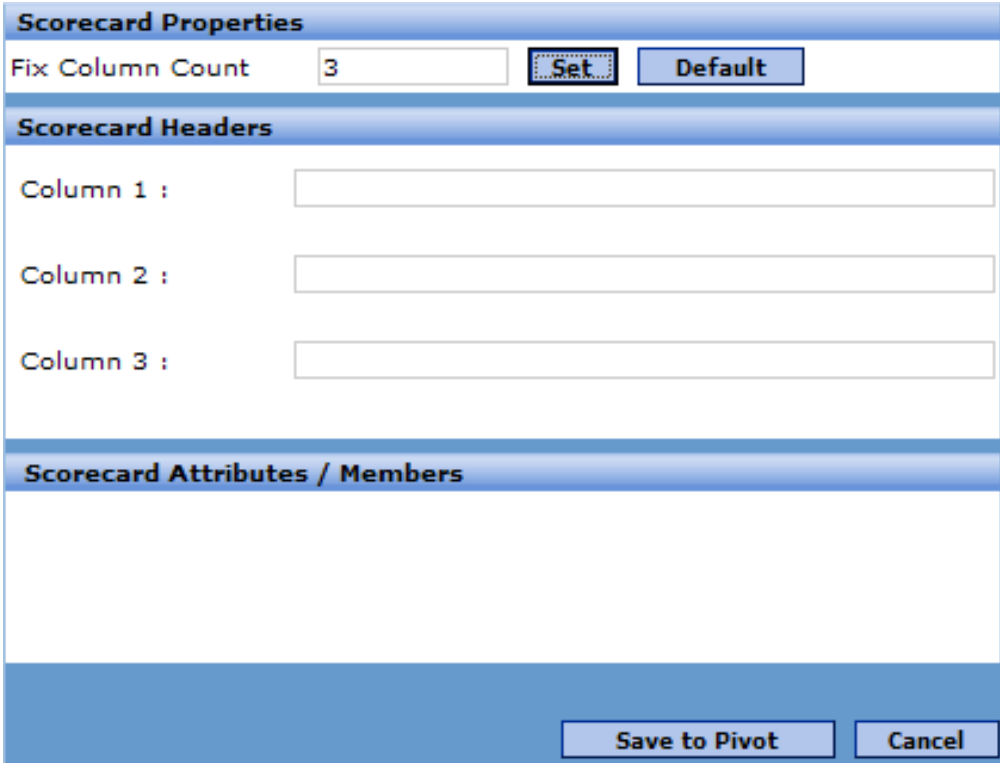
- A KPI (key performance indicator) or a formula — to display in the data column.
- Strings to display in the fixed columns, as appropriate for the scorecard headers. For example, if the scorecard headers are *Test*, *Reference Range*, and *Units*, the scorecard row would specify a test name, the reference range for that test, and the units used for the test values.

13.1.2 Specifying the Columns of the Scorecard

To specify the columns of a scorecard, do the following:

1. Create a new pivot table and save it.

2. With the pivot table open, click the Grid Setup button  and then click **Scorecard Setup**. The system displays a dialog box where you specify the scorecard headers (thus controlling the fixed columns).
3. Define the scorecard headers (also known as scorecard attributes/members) as follows:
 - To define your own scorecard headers, type the desired number of headers into **Fix Column Count** and then click **Set**. The dialog box then displays one entry for each scorecard header as follows:



The dialog box is titled "Scorecard Properties". It has a "Fix Column Count" field with the value "3" and two buttons: "Set" and "Default". Below this is a section titled "Scorecard Headers" with three input fields labeled "Column 1 :", "Column 2 :", and "Column 3 :". At the bottom is a section titled "Scorecard Attributes / Members" which is currently empty. At the very bottom are two buttons: "Save to Pivot" and "Cancel".

- If you want to use the default scorecard headers, click **Default**. The dialog box then displays the following:



The dialog box is titled "Scorecard Properties". It has a "Fix Column Count" field with the value "5" and two buttons: "Set" and "Default". Below this is a section titled "Scorecard Headers" with five input fields labeled "Column 1 :", "Column 2 :", "Column 3 :", "Column 4 :", and "Column 5 :". The fields contain the following text: "Scorecard Category", "Strategic Objectives", "Driver & Outcome", "Targets", and "Acceptable Variance". At the bottom is a section titled "Scorecard Attributes / Members" which is currently empty. At the very bottom are two buttons: "Save to Pivot" and "Cancel".

4. In the **Scorecard Headers** area, type titles for the headers of the fixed columns or edit the existing titles.
5. Click **Save to Pivot** at the bottom of the dialog box.

The next step is to define the data column or columns; this is optional because one data column is shown by default.

6. Optionally drag dimensions from **Dimension** to the **Column** panel.

(In the second example in the overview, we dragged the `Episode` dimension to the **Column** panel. This means that the scorecard displays one column for each member of that dimension, as usual.)

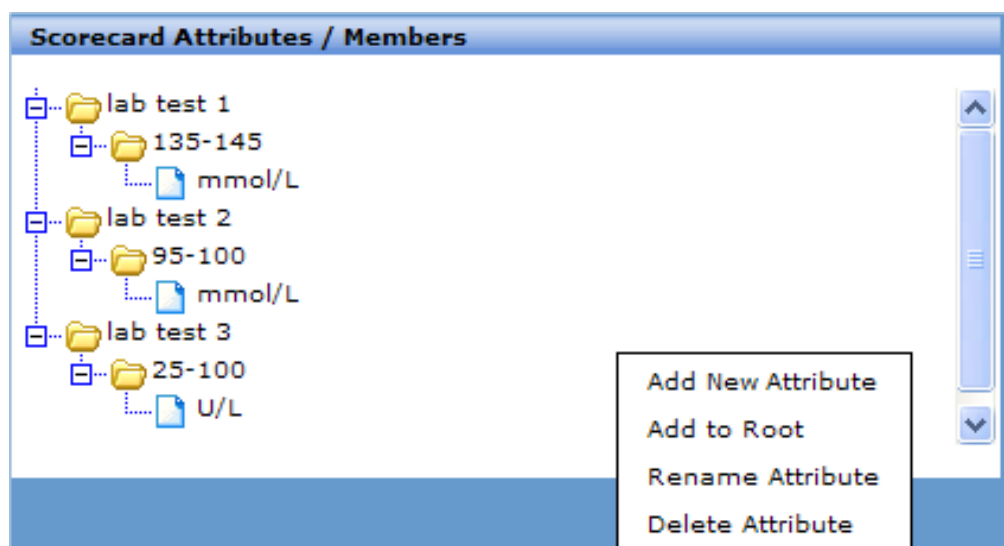
7. To specify the title for the data column(s), [add a temporary metric](#) to the pivot table. Specify its name as desired. (In the example in the overview, we used the title `Value`.)

Do not specify a measure formula; none is needed in this case. (If you do specify a measure formula, it is ignored.)

8. Save the pivot table and then add rows as described in the [next section](#).


13.1.2.1 Defining Scorecard Attributes

As noted earlier, each scorecard row includes a set of fixed columns, which are the attributes (or members) of that row. You can define these when you add the scorecard row (as described in the next section), or you can define them in the **Scorecard Members / Attributes** area in the scorecard setup. The following shows an example:



In this area, each root node and its children corresponds to a set of attributes that can be used together in the fixed columns for a scorecard row. For example, one scorecard row might include the attributes `lab test 1`, `135-145`, and `mmol/L` in its fixed columns.

To define the scorecard attributes within the scorecard setup, do the following:

1. With the pivot table open, click the Grid Setup button  and then click **Scorecard Setup**.
2. In the **Scorecard Headers** area, type titles for the headers of the fixed columns or edit the existing titles.
3. In the **Scorecard Members / Attributes** area, right-click and select **Add to Root**. Type an attribute to use in the first fixed column; for example, `lab test 1`.
4. Right-click the item you just added and then click **Add New Attribute**. Type an attribute to use in the second fixed column; for example, `135-145`.
5. Repeat as needed until you have created all the needed sets of attributes.
6. Click **Save to Pivot** at the bottom of the dialog box.
7. Save the pivot table and then add rows as described in the next section.

13.1.3 Adding Scorecard Rows

To add rows to a scorecard pivot table, do the following:

1. Open the pivot table, if it is not already open.
2. Then do one of the following:
 - Right click in the **Row** panel and click **Add Scorecard**.
 - Drag and drop **Scorecard** from the **Other** panel to the **Row** panel. Then right-click it and click **Edit Scorecard**.
 - Double-click **Scorecard** in the **Other** panel. Then right-click it and click **Edit Scorecard**.

Note: Despite the label in the user interface, you are adding or editing a scorecard *row*, not a scorecard.

The system then displays the following dialog box:

Note: The **Scorecard Attributes / Members** section lists the scorecard headers that you defined when you set up the scorecard columns; see the [previous section](#).

3. For **Scorecard Name**, specify the name of this scorecard row (for display within the **Row** panel). This name is not visible to users.
4. Optionally specify the following properties:
 - **Display Style** — Choose a display style for this scorecard row. For details and examples, see the section “[Specifying a Display Style](#),” earlier in this book.
 - **Dec Point** — If the scorecard row uses a numeric style, specify the number of decimal places it uses (0 by default).
 - **Processing Order** — Usually, you leave this option blank, which means this computation is performed within the default sequence. By default, the cells are processed one at a time, from left to right, top to bottom. See the section “[Controlling the Processing Order](#),” earlier in this book.

- **Post-Formula** — Specify optional Caché ObjectScript statements to override the initial values calculated for this row.

You use post-formula scripts when you want to reprocess the original values, to change formatting, for example, or perhaps to simplify computation by breaking it into multiple steps. The script can refer to the *val*, which is the original value, and it must set the variable *val* as needed. See the book [Expressions and Scripts in DeepSee](#).

5. The **Scorecard Attributes / Members** section lists the scorecard headers that you defined when you set up the scorecard columns (for example *Test*, *Reference Range*, and *Units*). Here you specify the strings to display beneath these headers, for the row that you are defining.

For each header, type a string. For example:

The screenshot shows a dialog box titled "Scorecard Attributes / Members :". It contains three rows of input fields. The first row is labeled "Test :" and contains the text "lab test 3". The second row is labeled "Reference Range :" and contains the text "25-100". The third row is labeled "Units :" and contains the text "U/L". To the right of each text field are two small up/down arrow buttons and a blue drop-down menu button.

Or select an attribute from the drop-down list; this is available only if you have defined the scorecard attributes as described [earlier in this chapter](#).

6. Click **OK**.

13.2 Defining and Using Chart Themes

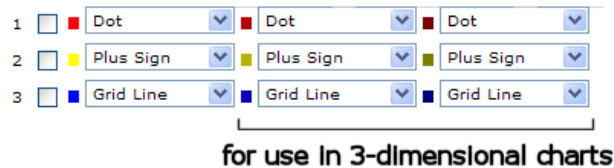
Any pivot table, when in chart format, uses a chart theme. The Analyzer provides two modifiable predefined chart themes, and you can add your own. This section discusses the following:

- [An overview of chart themes](#)
- [Information about the predefined chart themes](#)
- [How to define or redefine chart themes](#)
- [How to apply a chart theme to a given chart](#)
- [How to delete chart themes](#)

13.2.1 Overview of Chart Themes

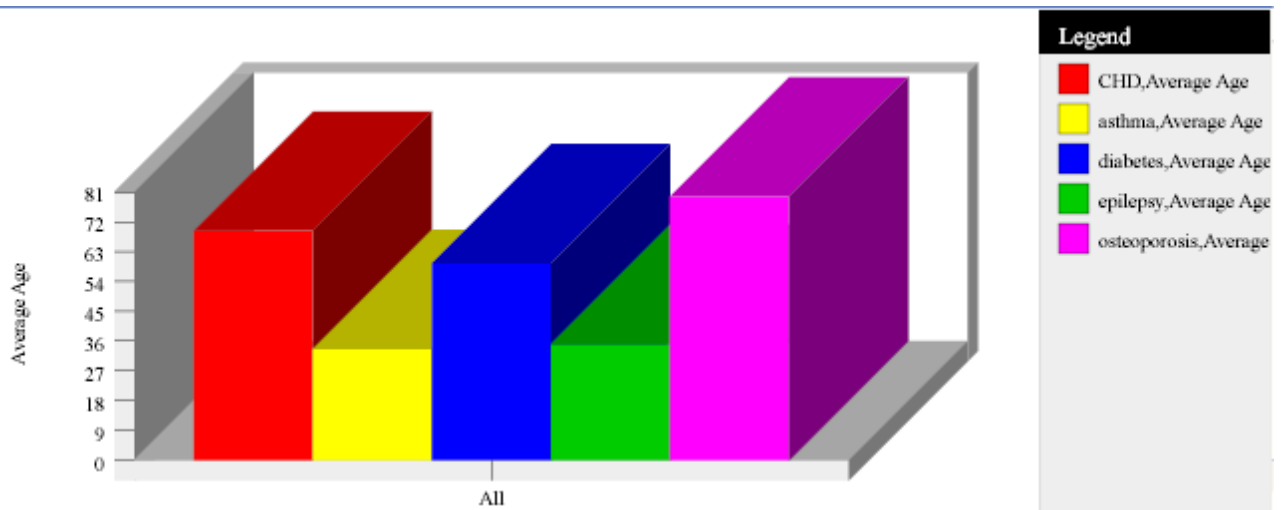
A chart theme consists of the following selections:

- The colors to use for the background, font, and border.
- A table of color-pattern combinations, as in the following example:



When a chart is displayed, each separately displayed element receives a color and pattern. The first element receives the first color and pattern from this table, the second receives the second, and so on. If the number of elements to display is greater than the number of color-pattern combinations, DeepSee displays the remaining elements with the default color and pattern, discussed below.

In the table of color-pattern combinations, each row consists of three pairs. The first color-pattern pair is for use in the legend and in two-dimensional charts; the second and third pairs are used only when the chart is shown with a three-dimensional effect as follows:



13.2.2 Default Colors and Patterns

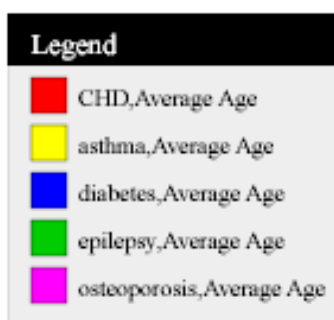
For a chart shown in normal format, the default color is black and the default fill pattern is solid.

For a chart shown with a three-dimension effect:

- For the first color-pattern pair, the default is solid black.
- For the second and third color-pattern pairs, the default is to use the same color and fill pattern that were used in the first pair.

13.2.3 Predefined Chart Themes

The Analyzer provides two predefined chart themes. The default theme uses multiple colors but only the solid fill pattern. For example:




The other predefined chart theme uses only black and white, but uses multiple fill patterns. For example:

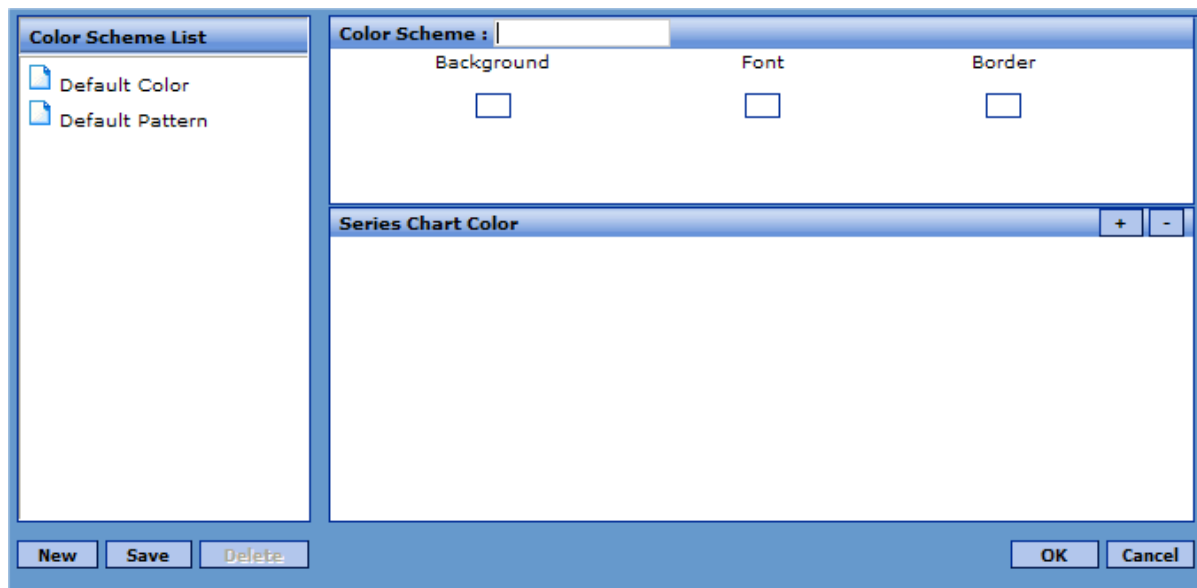


13.2.4 Defining or Redefining a Chart Theme

To define or redefine a chart theme:

1. Click the Chart Themes button  in the tool bar.

The Analyzer displays the following dialog box:




The left area lists the available chart themes, and the right area shows the definition of the currently selected theme — that is, the one that you are editing, if any.

2. Next, do one of the following:

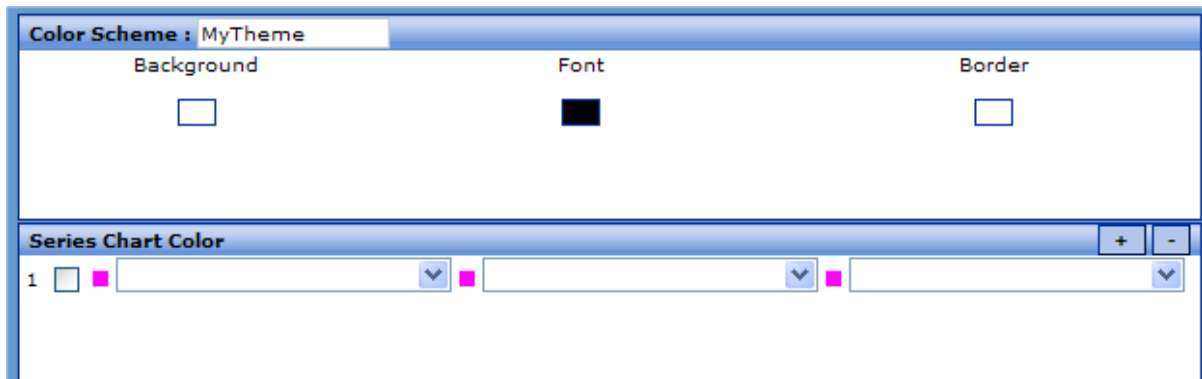
- To create a new chart theme, if **Color Scheme** is not empty, click **New**. This clears all information on the right side of the screen.
 - To redefine an existing chart theme, select it from the list on the left.
3. In **Color Scheme**, type or change the name of the chart theme.
 4. Specify the basic colors as follows:
 - To set the background color, click the box labeled **Background**.
 - To set the font color, click the box labeled **Font**.
 - To set the color of the border, click the box labeled **Border**.
- In each case, the Analyzer then displays a dialog box where you can choose a color. Choose a color and click **OK**.
5. In the lower right, define or redefine the rows. See the following subsections.
 6. Click **Save** to save the new chart theme.

13.2.4.1 Adding a Row

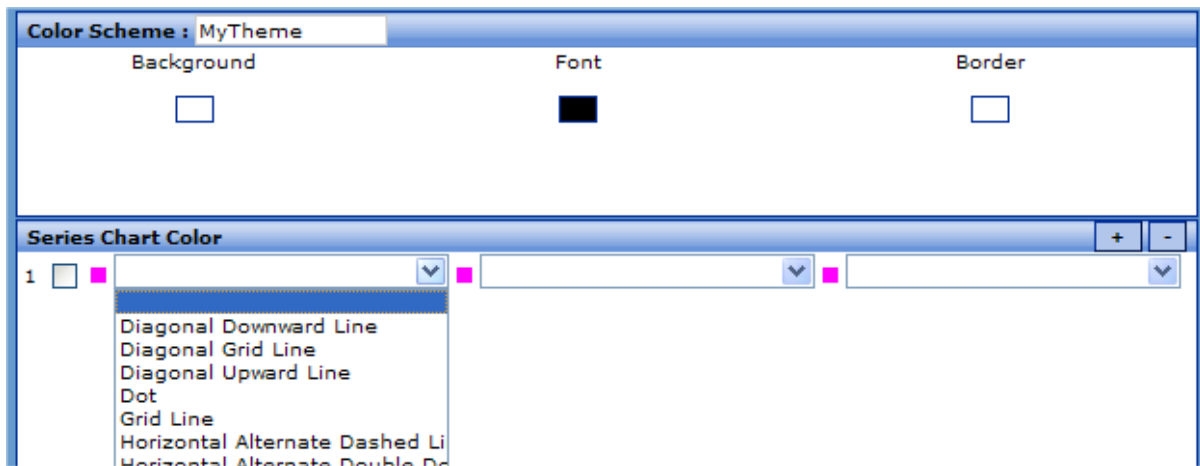
To add a row that defines a set of color-pattern combinations:

1. In the lower right, click the Add Color Scheme Item button . This displays a dialog box where you can choose a color.
2. Choose a color and click **OK**.

The Analyzer then displays a new row in the **Series Chart Color** section, as follows:



3. To specify a fill pattern, click the selection from the first drop-down menu in this row. For example:



The default is the solid fill pattern.

- Optionally specify the other two color-pattern pairs in this row, in a similar manner. These pairs are used only when the chart is shown with a three-dimensional effect. For an example, see “[Overview of Chart Themes](#),” earlier in this chapter.

13.2.4.2 Modifying a Row

To modify a row that defines a color-fill-pattern combination:

- To change the color, click the colored box at the left of the row. This displays a dialog box where you can choose a color.
- Choose a color and click **OK**.
- To specify a fill pattern, click the selection from the first drop-down menu in this row. The default is the solid fill pattern.



13.2.4.3 Deleting a Row

To delete a row that defines a color-fill-pattern combination:

- Click the check box to the right of the number.
- Click the minus sign (–) in the lower right. The row is immediately deleted.


13.2.5 Applying a Chart Theme

To apply a chart theme to a given chart:

- Open the pivot table and display it in chart format by clicking the Chart button  in the pivot table banner.
- Right-click within the chart and then click **Chart Properties**.
- Click the Browse button  next to the **Color Scheme** field. This displays another dialog box.
- Double-click the name of the chart theme you want to apply. This selects the theme and closes the dialog box.
- Click **Apply** to apply the theme to the chart.
- Save the pivot table.

13.2.6 Deleting a Chart Theme


To delete a chart theme:

1. Click the Chart Themes button  in the tool bar.
2. On the left side of the dialog box, click the name of the chart theme you want to delete.
3. Click **Delete**. The Analyzer prompts you for confirmation.
4. Click **OK**.

13.3 Specifying the Default Detail Listing

A subject area can contain multiple detail listings, and it can have a default detail listing (specified in the Architect). In addition, each pivot table has a default detail listing.

When you define a pivot table, you specify which detail listing is the default. To do so:

1. Open the pivot table so that you can make changes to it.
2. Click the Select Detail Listing button  in the toolbar.
The system displays a dialog box that lists the available detail listings.
3. Click the name of a detail listing and then click **OK**.
4. Save the pivot table.


13.4 Adding Label Rows and Label Columns

You can add labels to a pivot table. Specifically, you can add a row or column that is empty but that has a caption; this row or column acts as the label. This can be useful if you hide the banner for the pivot table, thus hiding the name of the pivot table.

When you have multiple dimensions for rows (or for columns) and you include a label, you can place the label between the dimensions. See the example in this section.

13.4.1 Adding a Label to a Pivot Table

To add a label to a pivot table, use one of the following procedures:

1. First, do one of the following:
 - Right-click in **Row** or in **Column**, depending on where you want to place the label. Then click **Add Label**. Specify a label name and click **OK**.
 - If the **Others** panel is collapsed, expand it by clicking the Show button  in its upper right. Then right-click **Label** and click **Add to Row** or **Add to Column**, depending on where you want to place it.
2. Right-click the label, click **Rename Label**, specify a new value, and click **OK**.

3. Save the pivot table.

13.4.2 Renaming a Label

To rename a label:

1. Right-click it in the **Row** or **Column** panel and then click **Rename Label**.
2. Type a new label name.
3. Click **OK**.
4. Save the pivot table.

13.4.3 Removing a Label

To remove a label from a pivot table:

1. Right-click it in the **Row** or **Column** panel and then click **Delete Node**.
2. Save the pivot table.

13.4.4 Example 1

Consider the following row definition:



The pivot table looks as follows:

	<i>Age Group</i>	Count
My Label		
0-29	Female	2,130
	Male	2,163
30-59	Female	2,056
	Male	2,038
60+	Female	942
	Male	671

13.4.5 Example 2

When you have multiple dimensions for rows (or for columns) and you include a label, you can place the label between the dimensions, as follows:



The result is as follows:


Age Group	Count
0-29	4,293
30-59	4,094
60+	1,613
My Label	
Female	5,128
Male	4,872

13.5 Creating Pivot Tables That Use SQL Queries

You can use an SQL query to create the basic definition of a pivot table; this is useful in rare circumstances.

13.5.1 Creating a Pivot Table That Uses an SQL Query

To create a pivot table that uses an SQL query:

1. Click the New Pivot Table button  on the toolbar.
2. Click the **SQL** button on the toolbar.

The Analyzer then displays a dialog box where you can type an SQL query.

Query :

SQL Wizard

Column Grouping Count : 1 Row Grouping Count :

Column Grouping List :

Row Grouping List :

OK Cancel

3. For **Query**, type an SQL SELECT query.
4. Optionally use other options to specify how the returned records are displayed:
 - **Column Grouping Count** — Specify the number of columns to display as fixed columns, starting from the left. Specify an integer greater than or equal to 1.
 - **Row Grouping Count** — Specify the number of rows that to display as fixed rows, starting from the top, in addition to the existing column headers. Specify an integer greater than or equal to 0.
5. Click **OK** to close the dialog box.
6. Click **Find** to see the results.

Tip: If the Analyzer apparently finds no rows, the cause might be a malformed query. Try executing the same query in the Management Portal, which provides more feedback about syntax errors.

7. Save the pivot table.

13.5.2 Filtering the Pivot Table

When you create a pivot table as described in the previous section, you can filter the data that it displays. You have one or two options, depending on the location of the data:

- You can always specify an SQL WHERE clause within the query, in the usual way.
- If the query refers to tables in the current Caché namespace, you can apply a filter by using the Analyzer filter editor as described in the chapter “[Filtering the Data](#).”

13.5.3 Example

Consider the following pivot table:

<i>Home City</i>	Patient Count
CEDAR FALLS	291
CENTERVILLE	247
CYPRESS	238
ELM HEIGHTS	249
JUNIPER	259
MAGNOLIA	255
PINE	258
REDWOOD	261
SPRUCE	258

This pivot table uses the following SQL query:

```
SELECT HomeCity->Name AS "Home City", Count(*) AS "Patient Count"
FROM DeepSee_Study.Patient GROUP BY HomeCity->Name
```

It also uses the following filter:

```
[Doctor Group = III]
```

13.6 Adding a Time Series

You can add a time series to a pivot table. A time series is an ordered set of time buckets with a specific start and end. When you add a time series as a row (or column), the pivot table has a row (or column) for every bucket in that span of time. The two most useful time series are year-type and period-type series.

To add a time series to a pivot table:

1. First make sure that you are displaying null rows or null columns, as appropriate. See “[Grid Layout Options](#),” earlier in this book.
2. Next do one of the following:
 - Right-click in the **Row** panel or the **Column** panel and then click **Add Series Object**.
 - Expand the **Others** panel, and drag and drop **Time Series** from this panel to the **Row** panel or the **Column** panel. Then right-click the new **Time Series** item and click **Edit Time Series**.

The Analyzer then displays the following dialog box:

3. For **Type**, select a type, one of the following:
 - **Date** — results in a continuous set of dates, day by day.
 - **Period** — results in a continuous set of periods.
 - **Day** — results in a continuous set of days of the week.
 - **Months** — results in a continuous set of months of the year.
 - **Quarters** — results in a continuous set of quarters of the year.
 - **Years** — results in a continuous set of years.
 - **Number** — results in a continuous set of integers.
 - **Custom** — creates your custom buckets as specified in **Filter Query**.

The type you choose controls what you see on the screen and what you use for a series name.

4. For **Series Name**, enter a name as follows:

- If you selected **Date**, **Period**, **Quarter**, or **Year**, specify a series name that is identical to the name of a time dimension that is aggregated in the same way as the series you are creating.
 - If you selected **Day** or **Number**, use any name.
- For **Start Value** and **End Value**, enter the start and end dates of the range, as follows. Note that these dates are inclusive.
 - If you selected **Date**, the dialog box displays date choosers. Use these to select dates.
 - If you selected **Day**, use integers. For example, 1 represents the first day of the month.
 - If you selected **Month**, use integers. For example, 1 represents January.
 - If you selected **Period**, use the format *YYYY* or *YYYY-MM*, where *YYYY* is a four-digit year and *MM* is a two-digit month. For example, specify 2005 or 2005-06.
 - If you selected **Quarter**, use integers. For example, 1 represents the first quarter.
 - If you selected **Year**, use the format *YYYY*, for example, 2005.
 - If you selected **Number**, use integers.

Or skip these fields and specify a value for **Filter Query** instead.

Note: If you selected **Custom**, these fields are grayed out.

- For **Increment**, specify an integer that indicates the number of units in a bucket. Use 1 for continuous buckets; see the example that shows how this setting works.

Note: If you selected **Custom**, these fields are grayed out.

- If you selected **Custom**, specify a Caché ObjectScript statement for **Filter Query** that specifies values for the *VAL* array, as in the following example:

```
For i=5:1:10 set VAL(i)=i
```

- Click **OK** to close this dialog box.
- Click **Find** to see the results.

The following shows a year-type time series:

time series -- Ship Date Year	
	Count
2004	
2005	143
2006	398
2007	268
2008	
2009	

This was created with the following settings:

Setting	Value
Series Name	Ship Date Year
Type	Year
Start Value	2003
Increment	1
End Value	2009

In contrast, consider the following variation:

Ship Date Year with increment 2	
	Count
2004	
2006	398
2008	

This time series was defined with all the same settings, except that **Increment** is 2 in this case.

A

Accessing Pivot Tables and KPIs Programmatically

The %BI.Utils class enables you to access pivot tables and KPIs programmatically. This chapter describes how to use this class.

A.1 Available Methods and Helper Class

The %BI.Utils class enables you to access pivot tables and KPIs programmatically. This class provides the following class methods:

KPI()

```
classmethod KPI(KPIID As %String, Filter As %String, Variables As %String) as %String
```

Returns the value of the given KPI. Use the following string arguments:

- *KPIID* — The ID of the KPI. For example: "10001"
- *Filter* — A DeepSee filter expression. For example: "[Allergies = wheat]"
There is no default value for this argument. If you do not want to specify a filter, use ""
The filter can include a query variable. For example: "[Diagnoses = {MyVar}]"
- *Variables* — The value for the query variable. For example, "CHD"
There is no default value for this argument. If you do not want to specify a value, use ""
For information on query variables, see [Using the DeepSee Dashboard Designer](#).

Pivot()

```
classmethod Pivot(PivotId As %String, ColumnDelimiter As %String) as %BI.PivotData
```

Returns an instance of %BI.PivotData that contains the data for the given pivot table. Use the following arguments:

- *PivotId* — The ID of the pivot table, for example, "10001"
The Analyzer does not display the ID of a pivot table. To see these IDs, go to **Administrator > Folder Management**. Then, for **File Type**, click **Pivot**.

- *ColumnDelimiter* — The character to use as the column delimiter within each row of the returned %BI.PivotData instance. The default character is the caret (^).

The class %BI.PivotData has two properties:

- Header, which is a list of strings. This property will contain the header or header rows for returned dataset. Each string in this list corresponds to a header row. In the string, the columns are delimited by a caret (^).
- Row, which is a list of strings. This property will contain the data row for returned dataset. Each string in this list corresponds to a data row. In the string, the columns are delimited by the column delimiter you specified as an argument.

A.2 Examples of Accessing KPI Values

The following example Terminal session displays the value of KPI 10002 (which is the Average Age measure in this example):

```
SAMPLES>w ##class(%BI.Utills).KPI(10002,"","")
35.78
SAMPLES>w ##class(%BI.Utills).KPI(10002,"[Diagnoses = CHD]","")
69.23
```

For another example, the following session sets and then uses a query variable:

```
SAMPLES>set myvar="wheat"

SAMPLES>w ##class(%BI.Utills).KPI(10002,"[Allergies = {myvar}]",myvar)
35.28

SAMPLES>set myvar="eggs"

SAMPLES>w ##class(%BI.Utills).KPI(10002,"[Allergies = {myvar}]",myvar)
36.06
```

A.3 Examples of Accessing Pivot Table Values

The following sample method gets the values in a pivot table, writes information about the pivot table, and then writes the pivot table out:

```
ClassMethod ShowPivotData(id As %String = "10012") As %Status
{
    Set table=##class(%BI.Utills).Pivot(id)
    Write !, "Basic information for pivot table: ", id
    Write !, "Number of header rows: ", table.Header.Count()
    Write !, "Number of data rows: ", table.Row.Count()

    Write !, "Full results are as follows *****"
    For hid=1:1:table.Header.Count(){
        Write !, table.Header.GetAt(hid)
    }
    For rid=1:1:table.Row.Count(){
        Write !, table.Row.GetAt(rid)
    }

    Quit $$$OK
}
```

If we use this method in the Terminal, we might see results like the following:


```
SAMPLES>w ##class(Test.Test).ShowPivotData(10012)

Basic information for pivot table: 10012
Number of header rows: 2
Number of data rows: 3
Full results are as follows *****
^Female^Male
Age Group^Patient Count^Patient Count
0-29^2,116^2,102
30-59^2,111^2,051
60+^927^6871
```


Glossary

alert

A rule that examines each data cell in a pivot table, checks whether the value in the cell falls into the alert range, and if so, applies the alert display style to that cell. The alert display style overrides any custom font or color properties of that cell.

BI-enabled classes

Caché ObjectScript classes that extend %BI.Adaptor. The properties of these classes (and the properties of their object-valued properties) can all be used as dimensions within DeepSee.

chart theme

A set of color-pattern combinations for use in charts.

compound dimension

A dimension that is based on another dimension (and is more aggregated than it).

computation

A kind of data displayed in the main body of a pivot table (the white and off-white cells). Computations are defined in terms of other data in the pivot table (or by using KPIs). The formula for a computation uses Caché ObjectScript.

dashboard

A CSP page that is used to package a pivot table so that it can be included in your application. In addition to pivot tables, dashboards can include controls, graphics, text, links, and so on.

detail listing

A dialog box that displays selected data fields for the source data that underlies a given number shown in a pivot table.

detail listing field

A data field within a detail listing.

dimension

A construct that groups the source data into a specific set of members. When a pivot table uses a given dimension, it groups the records separately for each member of that dimension. For example, if a pivot table uses a dimension called Country, it shows separate rows (or columns, depending on layout) for each country that is represented in the data.

Dimensions are indexed, by default.

drill-down, drill down

As a noun, *drill-down* refers to a combination of dimensions.

As a verb, *drill down* means to drag and drop a drill-down onto a pivot table, in order to see details for the dimensions of that drill-down. Via the context menu, you can also drill down to an associated pivot table.

drill through

To drag and drop a dimension onto a pivot table, in order to see details for that dimension.

dynamic dimension

A dimension that is not indexed.

filter

A boolean expression that specifies which source records to select. In DeepSee, a filter refers to a dimension and selects specific members of that dimension. For example:

```
[Home City = Elm Heights]
```

More advanced filters use logical operators, other comparison operators, and even embedded Caché ObjectScript expressions.

grid theme

Defines the default color and fonts used in the four areas of a pivot table: top left, top right, bottom left, and bottom right.

measure

A kind of data displayed in the main body of a pivot table (the white and off-white cells). The formula for a measure specifies which source data to use and how to aggregate it. Roughly speaking, when InterSystems DeepSee computes the value for a measure in a given table cell, it performs two actions:

1. It identifies all the source records associated with that data cell. This depends on the dimensions used in the pivot table, how the dimensions are used, any filtering that has been applied to the pivot table, and any filtering that has been applied to the subject area.
2. It summarizes those records with a single value, using the information in the measure formula.

member

An element of a dimension. A member corresponds to a specific set of records in the source data. When a pivot table uses a dimension, it groups the records separately for each member of that dimension. For example, if a pivot table uses a dimension called home city, it shows separate rows (or columns, depending on layout) for each home city that is represented in the data.

metric

Generic term that refers to either a measure or a computation.

pivot table

An interactive, drillable display of data. A pivot table displays at least one measure or computation and can use zero or more dimensions. A pivot table can be displayed in table format, in chart format, or in a combination format.

role

A set of one or more privileges, which control access to options in DeepSee. Roles also control access to subject areas and detail listings. Each role includes a set of users.

scorecard

A specialized kind of pivot table that provides reference information (in fixed columns) as well as your data.

subject area

A sub-cube that has been created for use in the Analyzer. A subject area includes the following details:

- A subset (or all) of the dimensions defined for these BI-enabled classes.
- An optional filter.
- A set of user roles that have access to this subject area.

summary line

A row in a pivot table that summarizes the preceding rows, for example, a total or subtotal.

time series

An ordered set of time buckets with a specific start and end, displayed as rows or columns in a pivot table.

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