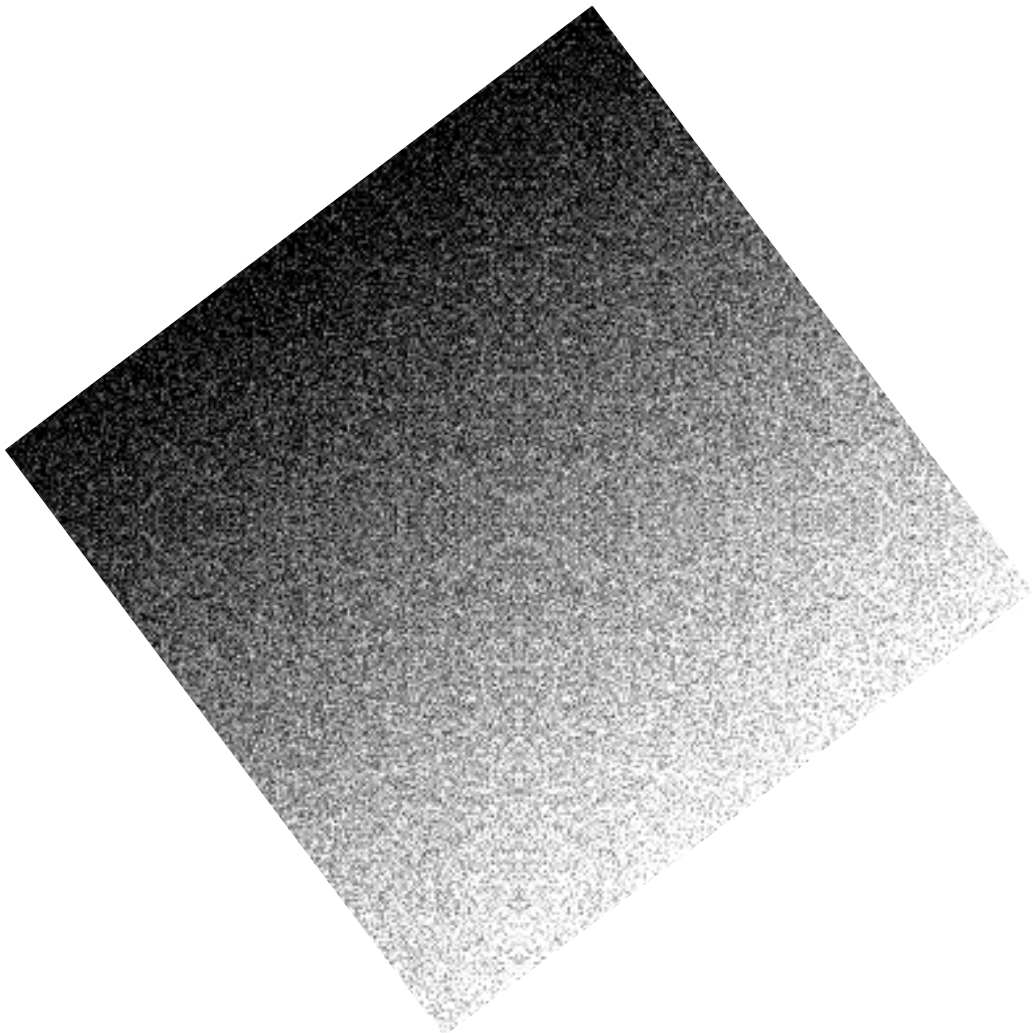
Intelligent Decision Server

IBM

Layout User's Guide

Version 1



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Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page vii.

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This edition applies to Version 1 of Intelligent Decision Server, 5639–IDS, and to any subsequent releases until otherwise indicated in new editions or technical newsletters. Make sure you are using the correct edition for the level of the product.

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About This Book

This book describes how to use the Layout tool to analyze data, and format and print a report.

Who Should Read This Book

This book is intended for use by anyone who uses the Layout tool to create a report using data from a source icon, such as the Query tool. This book describes the tasks necessary to format data in a report for electronic or print distribution.

This book is written with the assumption that you have a working knowledge of IDS, especially the Query tool.

Recommended Reading

This guide is designed to be used with the following IDS publications:

Capsule User's Guide

Query User's Guide

Spreadsheet User's Guide

SQL Entry User's Guide

Transformers Guide

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Chapter 1. What Is Layout?

The Layout tool allows you to create reports using *tabular data* (data arranged in columns and rows) from many IDS tools, including Query, Spreadsheet, and SQL Entry.

Once you have transferred data from another tool into the Layout tool, you can format the data, add sort levels and calculations, and arrange the report layout. You can also modify the data that is displayed by adding computed columns, changing column headings, and hiding columns.

You can use the Layout tool to:

- Create a simple report
- Design columnar reports
- Analyze data by a specific sort order
- Create calculations using columns of data
- Create a summary report

You can also use the Layout tool with other tools in a Capsule application to produce a report automatically.

This chapter describes a typical report created with the Layout tool and the steps used to create a report.

A Layout Report

Reports typically consist of three major components:

- Headings
- Details
- Summaries

The Layout tool is particularly useful for creating reports needing calculations for different *sort levels*. As an aid to understanding the concept of sort levels, consider the following tabular data:

Vendor	Style	Color	City
Spirit	Half-Moon	Red	New York
Sun Spot	V Flap	Bronze	White Plains
Spirit	V Flap	Bronze	White Plains
Sun Spot	Half-Moon	Red	New York

You could sort the data shown above by vendor, and within vendor by style. You would then have two sort levels within the report:

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Vendor	Style	Color	City
Spirit	Half-Moon	Red	New York
Spirit	V Flap	Bronze	White Plains
Sun Spot	Half-Moon	Red	New York
Sun Spot	V Flap	Bronze	White Plains

You can create calculations on the sort levels, such as subtotals, averages, and min/max.

In addition, the Layout tool lets you control the format of your reports, allowing you to specify such components as:

- Fonts and font sizes
- Placement of fields
- Field borders, such as a box
- Sections for titles and summaries

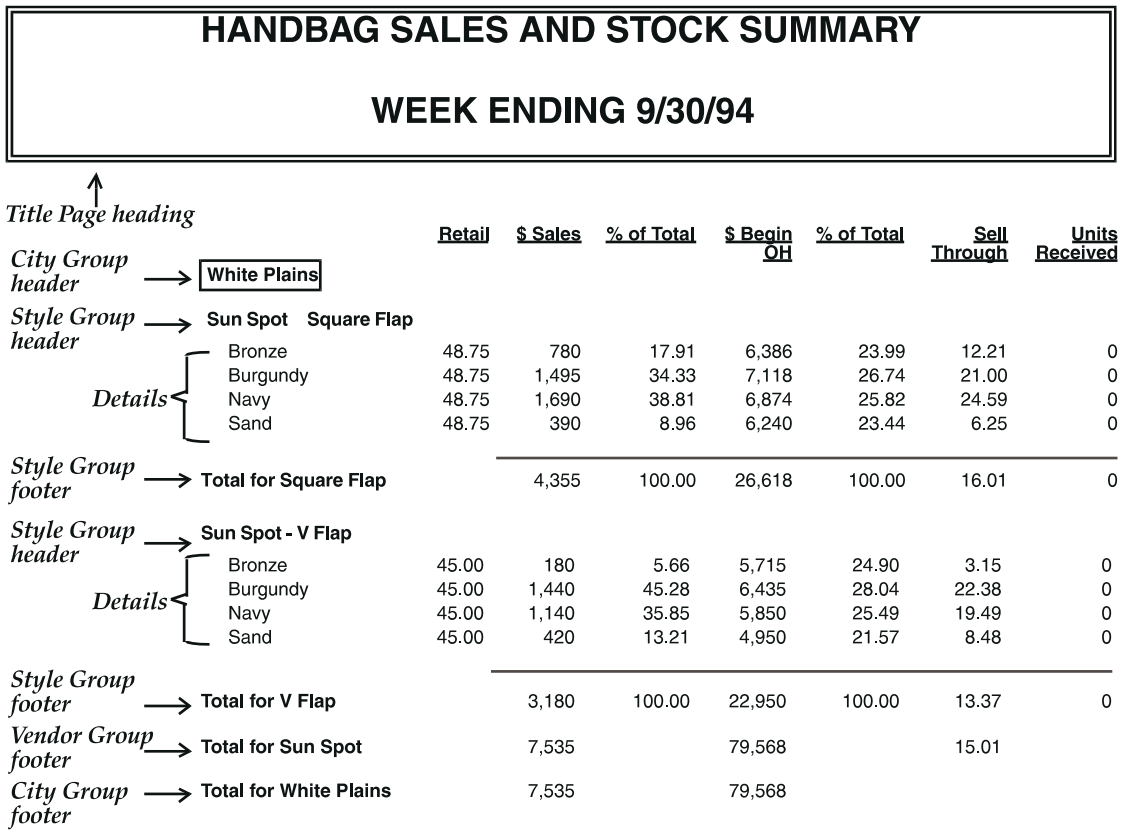
An annotated example of a typical report is shown in the following illustration.

HANDBAG SALES AND STOCK SUMMARY

WEEK ENDING 9/30/94

Title Page heading

		Retail	$ Sales	% of Total	$ Begin OH	% of Total	Sell Through	Units Received
City Group header →	**White Plains**							
Style Group header →	**Sun Spot Square Flap**							
Details	Bronze	48.75	780	17.91	6,386	23.99	12.21	0
	Burgundy	48.75	1,495	34.33	7,118	26.74	21.00	0
	Navy	48.75	1,690	38.81	6,874	25.82	24.59	0
	Sand	48.75	390	8.96	6,240	23.44	6.25	0
Style Group footer →	**Total for Square Flap**		4,355	100.00	26,618	100.00	16.01	0
Style Group header →	**Sun Spot - V Flap**							
Details	Bronze	45.00	180	5.66	5,715	24.90	3.15	0
	Burgundy	45.00	1,440	45.28	6,435	28.04	22.38	0
	Navy	45.00	1,140	35.85	5,850	25.49	19.49	0
	Sand	45.00	420	13.21	4,950	21.57	8.48	0
Style Group footer →	**Total for V Flap**		3,180	100.00	22,950	100.00	13.37	0
Vendor Group footer →	**Total for Sun Spot**		7,535		79,568		15.01	
City Group footer →	**Total for White Plains**		7,535		79,568			



You can use the same data to create very different reports by specifying a different sort order. For example, the report in the previous illustration is sorted first by city, then by vendor, then style, and finally by color in alphabetic order. The same data could be used to produce, for example, a report sorted by the highest individual sales per city (to emphasize the vendors who consistently sell the most merchandise).

Lines of detail data, contained in the *details area*, can also be hidden in detail-level reports when a summary report is needed. The same report shown in the previous illustration could be slightly modified to show only summary data in a different Layout icon.

HANDBAG SALES AND STOCK SUMMARY

WEEK ENDING 9/30/94

New York	$ Sales	$ Begin OH	Sell Through
Sun Spot Round Flap	1,610	24,833	6.34
Sun Spot Square Flap	1,560	24,863	6.03
Sun Spot V Flap	1,500	21,330	6.58
Sun Sport	4,670	71,025	6.58
Spirit Half-Moon	1,044	10,940	9.78
Spirit Oval Pouch	1,470	18,926	7.73
Spirit School Bag	2,277	25,875	8.81
Spirit	4,670	71,025	8.60
Total for New York	9.461	126,767	

Los Angeles	$ Sales	$ Begin OH	Sell Through
Sun Spot Round Flap	1,400	26,933	5.18
Sun Spot Square Flap	1,690	23,985	7.10
Sun Spot V Flap	1,740	22,590	7.79
Sun Sport	4,830	73,508	6.578
Spirit Half-Moon	1,044	10,505	9.96
Spirit Oval Pouch	1,470	18,155	8.15
Spirit School Bag	1,863	27,221	6.84
Spirit	4,377	55,880	7.83
Total for Los Angeles	9,207	129,388	

Page 1

In this report, the rows of detail data are suppressed, and only the aggregate calculation results are displayed.

Creating a Layout Report

Creating a report generally consists of the following tasks:

1. Preparing your source data.
2. Setting up the size, orientation, and margins of your report, if the defaults are not appropriate.
3. Copying data into the Layout tool from a Query, Spreadsheet, SQL Entry, or Transformer icon.

4. Setting global formats for fonts, numbers, and dates.
5. Defining the sort order and type of sort for the data columns, using either the Quick Report window or the Sort/Calculation window.
6. Creating any calculations necessary for your report. You can create subtotals and grand totals in the Quick Report window. To create complex calculations, use the Sort/Calculation window.
7. Specifying which data columns to place in the details area, using either the Quick Report window or the Report Layout window.
8. Adjusting number, text, and date formatting to meet your audience's needs.
9. Associating data conditions, that is, data values that meet specific requirements, with certain formats. For example, you can automatically show sales of over 500,000 dollars in bold or italics to highlight markets that are doing well. Or, in a column where you have calculated market growth over the past year, you could replace improvement figures of less than 1% with the word None.
10. Fine-tuning the formatting by adjusting work area width or height, field placement, and adding page breaks, text, or space.
11. Updating the report periodically to display changes.
12. Printing the report and/or distributing it electronically.
13. Interacting with PC applications (RTF format).

These tasks are discussed in more detail in the remainder of this book.

Chapter 2. Getting Started

This chapter describes acceptable types of data for the Layout tool and also describes how to:

- Copy data into the Layout window
- Specify the size and orientation of your report
- Set the report margins
- Set global formats for the report
- Use specified formats for the report

The Layout tool does not perform data access, but receives data from a source icon. To build a report, you must first transfer data into the Layout tool. Then you can set up your report layout and format your data.

Acceptable Types of Data

The Layout tool accepts tabular data from certain IDS tools. The IDS tools that can be used as source icons are:

- Query
- Spreadsheet
- SQL Entry
- Transformers

The Layout tool can also accept tabular data from a PC application such as Lotus** 1-2-3 or Microsoft** Excel, but you must first transfer the data into a IDS Spreadsheet tool and then into the Layout tool. The particular PC application must be able to transfer data to one of the file types supported by the PC Application tool. See *Interacting With PC Applications* for more information.

The following guidelines apply to data that is accepted by the Layout tool:

- Each column of data must have a unique heading. The columns heading must contain at least a character, even if it is a space.
- Each column must contain only one type of data. For example, you cannot use a column that contains both numbers and text.
- Error and N/A values are allowed in the data.

The first row of data transferred into the Layout tool is considered by default to be a heading row. In other words, the default value for the field **Number of Heading Rows** is 1. If the source icon has more than one row of headings, you must specify the number of heading rows in the Layout Options window, shown in Figure 1 on page 7.

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To open the Layout Options window, click on the **Select All** button in the upper-left corner of the Layout window, and open the Layout Options window by pressing the Options function key.

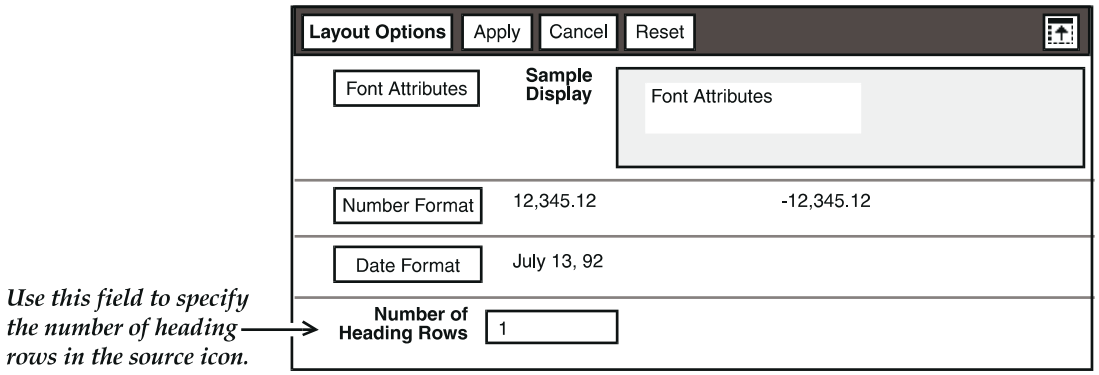


Figure 1. Layout Options window

Copying Data into the Layout Window

Copy the data you wish to show in a report from a source icon into the Layout window. The data is transferred to the Layout tool as columns of information.

To copy data into the Layout window:

1. Open the source icon.
2. Open the Layout icon. (Data cannot be transferred to a closed Layout icon, except within a Capsule application. For information about transferring data to Layout in a Capsule application, see "Using Layout in a Capsule Application" on page 92.)

   The Layout window appears.
3. Click on the **Select All** button in the source icon, or select specific portions of the source icon, including the headings.
4. Copy the data into the display area of the Layout window.

After you copy data into the Layout window, the following occurs:

The area outside the display area border highlights to indicate that the Layout tool received the data.

The message bar of your desktop displays information about how many rows and columns the Layout tool received from the source icon.

The **Quick Report** button appears in the window header.

When you click on the **Clear Data** button in a Layout tool, just the data is cleared. The tool retains internally the column names and column *data types* (for example, number, date, or text data). If you copy data into a Layout tool from which you have cleared the

data or that already contains data, the column names and data types in the new data must be the same as the original column names and data types copied into the tool, or the Layout tool displays an error message and does not accept the data. In the case of a Layout tool that already contains data, if the new data is acceptable, it overwrites any data already in the tool.

Data is not displayed in the Layout window until you specify a layout for the data columns. You can specify the layout in either the Quick Report window described in “Defining the Basic Layout of the Report” on page 23, or in the Report Layout window described in “Adding Columns to a Report” on page 64.

Specifying the Size and Orientation of Your Report

In most IDS tools, the fields that determine the page size and orientation are located in the Printing page of the Icon Options window. In the Layout tool, these fields are located in the Printing Controls window.

To open the Printing Controls window, select the **Printing Controls** choice from the Special menu. The Printing Controls window appears, as shown in Figure 2.

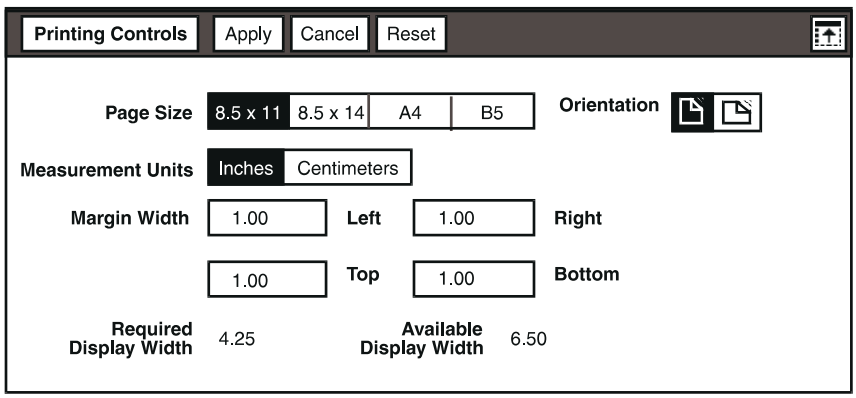


Figure 2. Printing Controls window

To change the settings in the Printing Controls window:

1. Select the choices that reflect the changes you want to make, or enter values in the appropriate fields.
2. Click on the **Apply** button or close the Printing Controls window.

The following table describes how to use the fields in the Printing Controls window to modify the page setup of your report.

Use this field	To do this
Page Size	Select the paper size that your printer uses.
Orientation	Specify how the report is to be displayed and printed on the page: vertically or horizontally.
Measurement Units	Specify the measurement unit to be used when setting the report margins.

The **Margin Width** fields are described in "Setting the Report Margins."

Setting the Report Margins

A margin is the amount of space between the body of the report and the edge of the window or printed page. By default, margins are 1 inch or 2.54 centimeters, depending on the unit of measurement.

You can change the report margin settings by replacing the existing value in the **Margin Width** fields, located in the Printing Controls window. Each field represents the corresponding margin.

When you change the margins of your report, the values in the **Required Display Width** and **Available Display Width** fields automatically change to reflect the new margin settings. The value in the **Required Display Width** field represents the amount of space needed to display the report horizontally. By default, this value is initially set to half of the width of the page size (see "Specifying the Size and Orientation of Your Report" on page 8). After you have begun building your report, this value changes to reflect the requirements of the fields that you have added to the report. The value in the **Available Display Width** field represents the total width available on a page.

Setting Global Formats

When you copy a Layout icon from the Blank Icons file drawer to your desktop, the icon automatically inherits your desktop preferences for font, typeface, numbers, and dates, and uses these default formats in the report.

The fields in the Layout Options window allow you to set several format characteristics in the report:

Font attributes

Number formats

Date formats

You can use the Layout Options window to change not only the default formats but also to set global formats for the entire report. The global formats apply to all columns and fields in the report, unless their formats are changed in individual options windows, as described in "Overriding Global Formats in the Report" on page 82.

To specify formats for the entire contents of the report:

1. Click on the **Select All** button in the upper-left corner of the Layout window, and open the Layout Options window either by pressing the Options function key or using the pop-up function pad.
2. Click on the toggle button to open the panel that contains the formatting options you want.
3. Set the desired format from the displayed options.
4. Click on **Apply** or close the Layout Options window to change the default formats for the report.

The following sections describe each panel of the Layout Options window.

Formatting Text

You can change the font, font size, and the appearance of your report's text using the Font Attributes panel of the Layout Options window, shown in Figure 3.

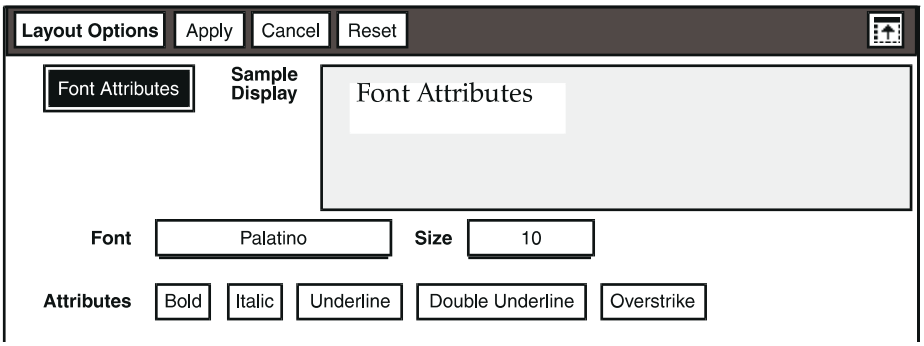


Figure 3. Font Attributes panel of the Layout Options window

To open the Font Attributes panel, click on the **Font Attributes** button.

Choosing the Global Typeface

By default, the initial typeface in a Layout icon is specified in the desktop's Set Preferences window.

You can change default text formats of individual reports by changing the settings in the **Font** and **Size** fields in the Layout Options window before you enter any data. Changing fonts globally only affects new data. It does not affect fonts changed in individual fields.

Changing the typeface in the desktop's Set Preferences window does not change the typeface in existing reports. The typeface will change to the new setting if new data is copied into the Layout tool.

To change the typeface used in the report:

1. In the **Font** field, select the font you want to use.

2. In the **Size** field, select the font size you want to use. Only the sizes available for the selected font appear in this field.

   An example of your selected font and size is displayed in the **Sample Display** field.

3. Click on the **Apply** button or close the Layout Options window.

Changing the Global Appearance of Text

You can change the global appearance of text in a report, for example, by italicizing it. Use the **Attributes** field in the Layout Options window to make these modifications.

The **Attributes** field contains the following choices: bold, italic, underline, double underline, and overstrike. You can apply more than one attribute to text. For example, you can make the text both bold and italic.

To change the appearance of all text in the report:

1. In the **Attributes** field, click on the appropriate buttons representing the font attributes you want.
2. Click on the **Apply** button or close the Layout Options window.

Formatting Numbers

You can change the way all numbers are displayed in your report by specifying settings in the Number Format panel.

When you format numbers in a report, you can change:

Decimal precision

Rounding

Sign representation

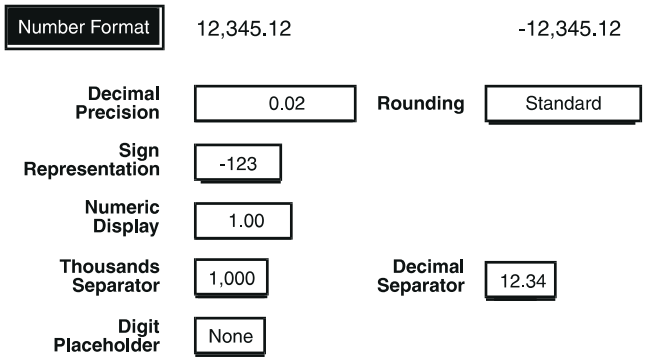
How the number is displayed

The separator used for thousands and decimals

The digit placeholder

To open the Number Formats panel, click on the **Number Formats** button.

The read-only field shows an example of the number format that is currently selected for positive and negative numbers.



The following table contains information about each field in the Number Formats panel.

Use this field	To do this
Decimal Precision	Specify how many digits appear to the right of a decimal point.
Rounding	Choose whether to round or truncate a number at the specified number of decimal places.
Sign Representation	Specify a negative sign, parentheses, square brackets, angle brackets, or other symbol to indicate positive and negative values.
Numeric Display	Choose the format for displaying numbers. The choices are Standard, General, and Scientific.
Thousands Separator	Specify the format used for a number in the thousands. The choices are no separator (1000), space (1 000), comma (1,000), period (1.000), or apostrophe (1'000).
Decimal Separator	Choose either a period or a comma as the character used as a decimal separator.
Digit Placeholder	Specify the number or symbol used to lengthen the integer part of a number or maintain leading zeroes. The choices are no placeholder, zero, space, or asterisk.

The following sections describe each field in detail.

Decimal Precision

You can use the **Decimal Precision** field to change the number of decimal places that you want to display in a report.

To change the number of decimal places displayed:

1. In the **Decimal Precision** field, select the number of places you want the number to display to the right of the decimal point.
2. Click on the **Apply** button or close the Layout Options window.

The value of a number as it was copied into the report (with its full precision) is retained by the report, and used in calculations. The **Decimal Precision** setting only affects the

decimal places displayed in the report. You can always see the full precision value of a number by browsing the field in the Sort/Calculation window, described in detail in Chapter 5, “Adding Computed Columns” on page 39.

Rounding and Truncating

You can use the **Rounding** field to round off or truncate your displayed number.

When you round a number, the displayed number stays the same if the last digit is less than 5 and rounds up if the last digit is 5 or greater (the opposite is true for negative numbers). When you truncate a number, the number is cut off at the appropriate number of decimal places.

For numbers with more than 12 decimal places, the report automatically rounds off or truncates the number to the twelfth place, but internally maintains and uses a value up to 15 digits.

The following table shows how the same number displays at the first five precision levels when the **Rounding** field is set to Standard and when it is set to Truncate.

This value	at this precision	appears when rounded as	appears when truncated as
7.792578	0	8	7
	0.1	7.8	7.7
	0.02	7.79	7.79
	0.003	7.793	7.792
	0.0004	7.7926	7.7925
	0.00005	7.79258	7.79257

Sign Representation

You can show positive and negative numbers with the representation that you specify in the **Sign Representation** field. The choices in the **Sign Representation** field are a negative sign (either before or after the number), parentheses, square brackets, angle brackets, or another symbol that you specify.

To specify sign representation in a report:

1. In the **Sign Representation** field, select a sign to display in the report.
2. Select **Other**. The **Positive**, **Zero**, **Negative**, and **Placement** fields appear.

3. Enter the sign that you want to represent positive, zero, or negative values.
4. Specify the placement of the sign either before or after the number by selecting a choice in the **Placement** field.
5. Click on the **Apply** button or close the Layout Options window.

Displaying Numbers

You can use the **Numeric Display** field to display numbers in the report in a standard, general, or scientific format. For example, some statistical reports may require scientific notation to display very large numbers. The following table contains information about each number format.

Format	Description	Examples
Standard	Displays numbers as entered.	1.00
		46
		0.754
		376.9982
Scientific	Uses scientific notation. Allows only one digit in the integer portion of the number.	1.00E00
		2.35E
		4.76E
General	Displays numbers as entered. If the number is too long to fit in the current column, it is translated into scientific notation.	456.9452
		0.41
		1.955E

Thousands Separator and Decimal Separator

Use the **Thousands Separator** and **Decimal Separator** fields to specify the separator displayed in the report.

You cannot use the same separator for both decimals and thousands. For example, if you select a comma as the thousands separator, you cannot use a comma as the decimal separator.

Displaying a Placeholder with Numbers

You can use the **Digit Placeholder** field to *pad* the length of the integer parts of a column of numbers to a specified length, expressed as the number of characters to display.

For example, consider the following column of numbers that range in length from three to six digits:

123
4567
12345
6789 1

To display all the numbers as 6-digit numbers, padding those numbers with less than six digits by adding zeros to the left of the number, you would specify in the **Digit Placeholder** field and enter 6 in the **Length** field.

This setting would result in the previous column appearing as follows:

123
4567
12345
6789 1

To display a placeholder with numbers:

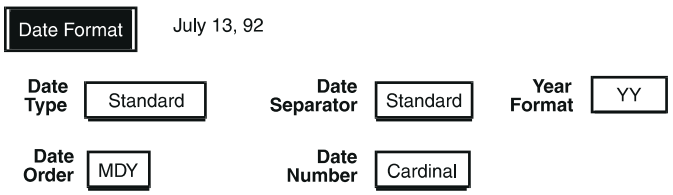
1. In the **Digit Placeholder** field, select zero, space, or asterisk to be displayed in the number.
2. In the **Length** field that appears, specify how many digits you want to display before the decimal point.
3. Click on the **Apply** button or close the Layout Options window.

Formatting Dates

You can change the way dates are displayed in your report using the Date Format panel field settings. These settings allow you to set the style of the date, such as using the written name of the month or the month number, or changing the order of the month, day, and year. You can also specify the character used to separate the parts of a date.

To change the date format:

1. Click on the **Date Format** button.



   The read-only field shows an example of the date format that is currently selected.

2. Select the settings you want from the choice menus. Consult the table that follows this procedure for information about each field.

   Date fields are interdependent. For example, if you specify a Date Type of Numeric, the date can be expressed a variety of ways (such as 02/18/94, 02-18-1994, 18.02.94), depending on the settings in other fields (such as Year Format, Date Order, and Date Separator).

3. To put your changes into effect, click on the **Apply** button or close the Layout Options window.

Use this field	To do this
Date Type	Specify how the date is displayed. **Standard** displays dates with the month fully spelled out and the year represented by two or four digits (depending on the choice in the **Year Format** field), as in August 18, 1994. **Long** displays the day of the week and month fully spelled out and the year as two or four digits (depending on the choice in the **Year Format** field), as in Friday February 18, 1994. **Abbreviated** displays the month as an abbreviated word and the year as two or four digits (depending on the choice in the **Year Format** field), as in Feb 18, 1994. **Numeric** displays dates as numbers, as in 02/l8/94.
Date Separator	Specify the character to separate the month, day, and year. The choices are Standard, slash (/), hyphen (-), period (.), or space. (The Standard setting is derived from the system default setting. In the United States, it consists of a space to separate the month and day, and a comma and space to separate the day from the year, for example, 2 18, 94 or February 18, 1994.)
Year Format	Specify the format of a year in a date entry. The choices are YY (two digits, as in 94) or YYYY (four digits, as in 1994).
Date Order	Specify the arrangement of the month (M), day (D), and year (Y). The choices are MDY, DMY, YMD, MY, DM, MD, and DY.
Date Number	Specify whether the day is to be expressed as a *cardinal* or *ordinal* number (for example, Feb 18 or Feb 18th).

Chapter 3. Creating a Quick Report

The Quick Report window lets you create a report quickly and easily. Using the Quick Report window, you can:

- Create a title, page header, and page footer
- Specify the sort order for the report
- Place columns in the details area, either side-by-side or stacked
- Add subtotals and grand totals to the report

You can also use the Quick Report window to start a report, and then enhance your report with the Sort/Calculation and Report Layout windows.

This chapter describes how to use the Quick Report window to create and generate a report.

Using the Quick Report Window

After you transfer data into the Layout tool, the **Quick Report** button appears in the window header. The Quick Report window allows you to build a basic report and generate subtotals and grand totals.

The Quick Report window has four pages that are used to set up a report:

Use this page	To do this
Report Controls	Title the report and set up the page header and page footer areas. You can also add a page number and display the date and time the report was generated.
Sort Controls	Specify the sort order in the report by moving column names from one list box to another. You can also specify the type of sort for each column.
Details Area	Select which columns to place in the details area and choose how the columns are displayed in the report.
Total/Subtotal	Define grand totals and subtotals on columns of numeric data in your report by selecting columns in the list boxes.

To open the Quick Report window, click on the **Quick Report** button in the Layout window header.

The Quick Report window opens and all buttons disappear from the main Layout window.

Do not close the Quick Report window until you are finished setting up your report. Once you make a change and close the Quick Report window, the **Quick Report** button disappears from the window header. You must then modify your report using the Sort/Calculation and Report Layout windows.

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Creating a Title

You can add a title to your report using the Report Controls page. When the report is generated, the title appears centered at the top of the report.

To add a title to your report, select **Report Controls**, and type a title in the **Report Title** field.

For example, to title the report shown in this chapter, type HANDBAG SALES AND STOCK SUMMARY in the **Report Title** field.

You can change the typeface and alignment of the title in the Report Layout window. See Chapter 7, “Formatting a Report” on page 68 for more information.

Setting Up a Page Header and Page Footer

The **Page Header** and **Page Footer** fields allow you to type text that is centered and repeats at the top and bottom of each page of the report. You can include a page number or the system-defined date and time in either the header or footer.

If you create a title for your report, the header does not appear on the first page of the report.

To add a header and footer to a report, enter the desired text in the **Page Header** and **Page Footer** fields.

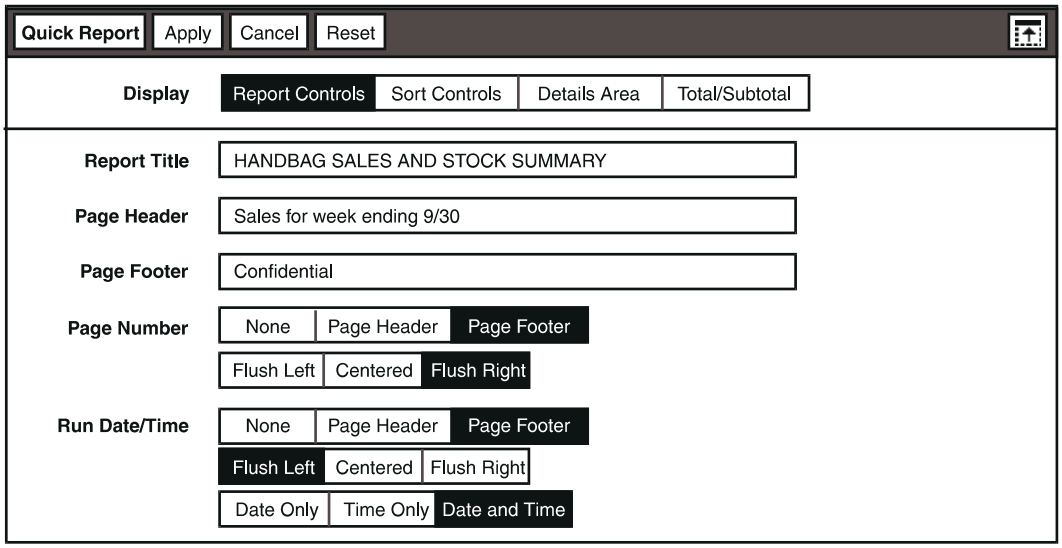
To create a header and footer for the sample report in this chapter:

1. Type Sales for week ending 9/3 /94 in the **Page Header** field.
2. Type Confidential in the **Page Footer** field.
3. In the **Page Number** field, choose the location and the placement for the page number.

   For example, select **Page Footer** and **Flush Right** to place a page number at the bottom right of every page.
4. In the **Run Date/Time** field, choose the location and placement for the date and time, and then choose whether to show the date, time, or both.

   For example, select **Page Footer**, **Flush Left**, and **Date and Time** to place a date and time at the bottom left of every page.

The Quick Report window looks similar to the following illustration.



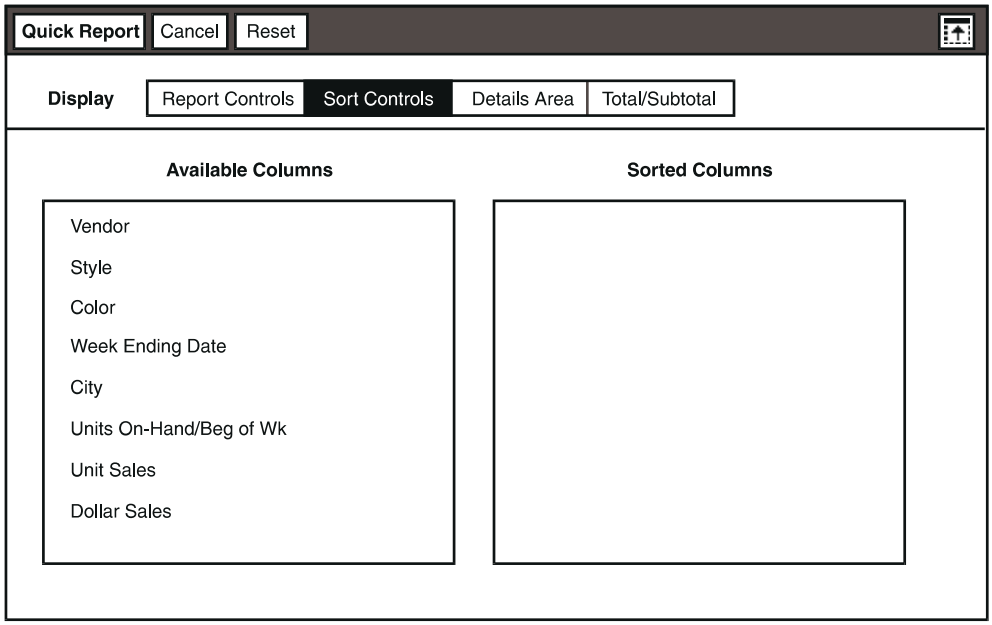
You can change the typeface and alignment of the title in the Report Layout window. See Chapter 7, “Formatting a Report” on page 68 for more information.

Specifying the Sort Order and Type

The next step in creating a quick report is to specify the sort order. You specify which columns to sort, the sort order, and the type of sort for each column in the Sort Controls page.

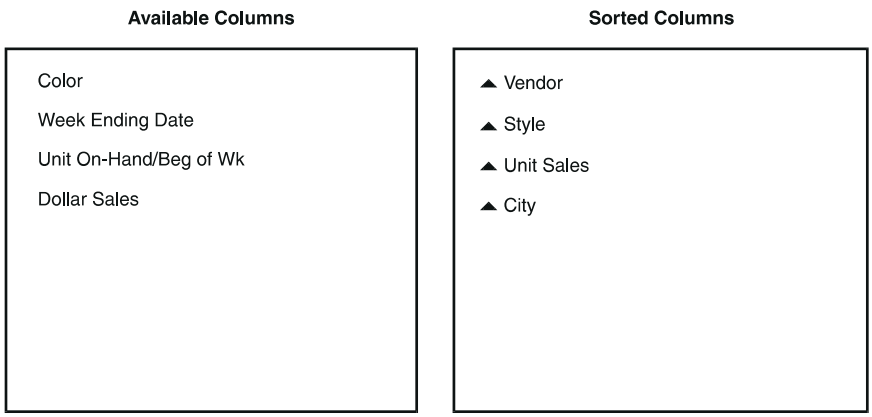
To sort the data in your report, select **Sort Controls** in the **Display** field.

The Quick Report window displays the Sort Controls page. The left list box, **Available Columns**, contains the name of each column of data that was copied into the Layout tool.



To specify which columns to sort, select one or more columns and move the columns into the **Sorted Columns** list box. The order in which you select or move (not copy) the columns into the **Sorted Columns** list box determines the sort order of the data.

Do not select all the columns. At least one column in the report must not be sorted.



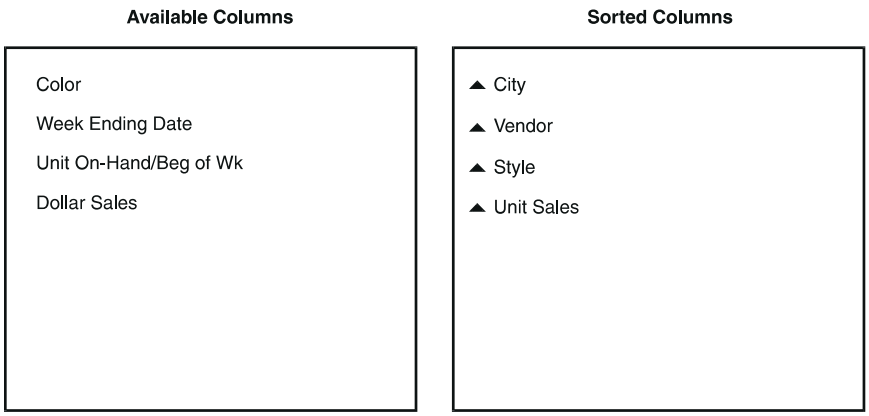
The Layout tool sorts the data by the top column first, then sorts the data by the next column in the list, until the data is sorted by the last column.

You can change the sort order by moving the columns within the **Sorted Columns** list box. For example, suppose you want to move the City column above the Vendor column so that the data is sorted by city first.

To change the sort order:

1. Select the column you want to place in a different sort order. In this example, you would select City.
2. Use the Move function key or pop-up function pad to move the column, and select the column you want to place it above (Vendor).

   The City column is placed above the Vendor column in the list box, and the sort order changes.



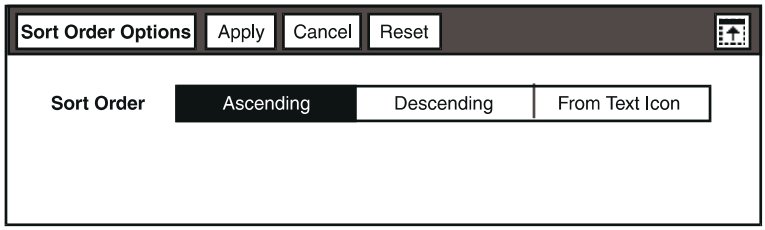
The arrowhead next to each column is called the *sort indicator*. Data in the report is automatically sorted in ascending order: values are sorted from smallest to largest; text from A to Z; and dates from past to present.

You can change the type of sort for a column in the Sort Order Options window. For example, suppose you want to sort the data so that the largest number of units sold appears at the top of the report.

To change the type of sort for the Unit Sales column to descending:

1. Select the Unit Sales column, and open the Sort Order Options window either by pressing the Options function key or using the pop-up function pad.

   Three choices appear in the **Sort Order** field.



2. Select **Descending**.
3. Click on the **Apply** button or close the Sort Order Options window.

   The sort indicator changes to a descending arrowhead, and the data is sorted by unit sales in descending order from largest to smallest.

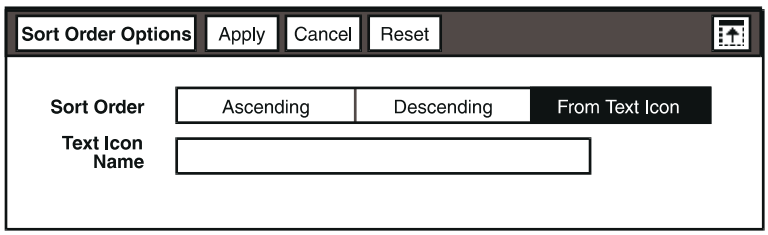
When you want to sort the data in your report in an order other than ascending or descending, you can specify the sort order in a text document and have the Layout tool access that document to obtain the sort order.

For example, suppose you want to sort the data by city in the following order: New York, White Plains, Los Angeles, Glendale, and Toronto. If you specify the sort order as ascending or descending, the cities sort alphabetically. But you can specify the exact sort order in a text document, as described in “Specifying the Sort Order in a Text Document” on page 35.

To change the type of sort for the City column to be specified in a text icon:

1. Select the City column, and open the Sort Options window.
2. Select **From Text Icon**.

   The **Text Icon Name** field appears.



3. Enter the name or path name of the text document that contains the specified sort order for that column of data.

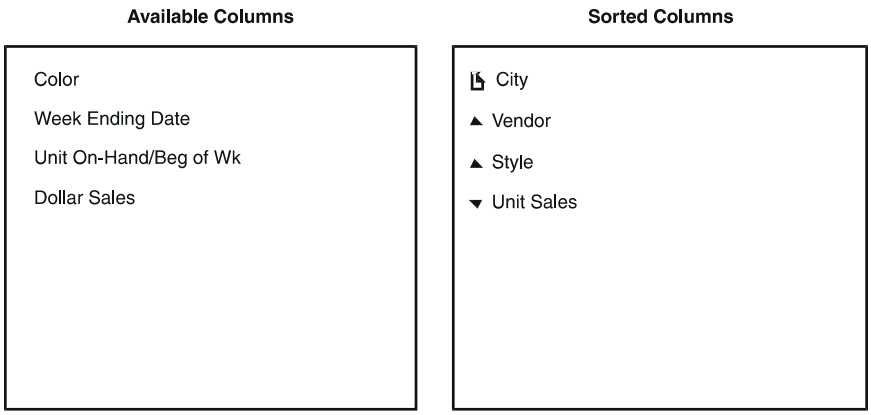
   For example, type City Sort to specify a text document for sorting the data by city in a specific order.

   The name entered must match the text document name or path name exactly, including spaces and uppercase and lowercase characters.

4. Click on the **Apply** button or close the Layout Options window.

The sort indicator changes to a text icon graphic. When you generate the report, the Layout tool sorts the data using the order defined in the text document.

The Sort Controls page looks similar to the following illustration.



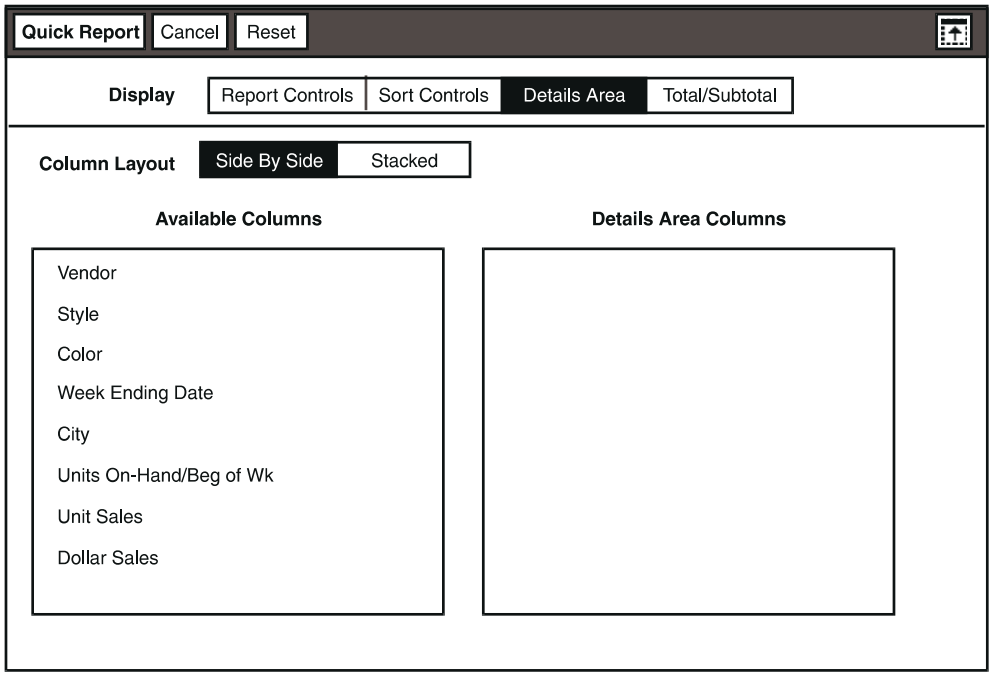
Defining the Basic Layout of the Report

The Details Area page allows you to specify which columns to include in the body of the report, called the details area, and define a basic layout for the report. The columns in the details area can be arranged horizontally or stacked vertically in the report.

To set up the data in the details area:

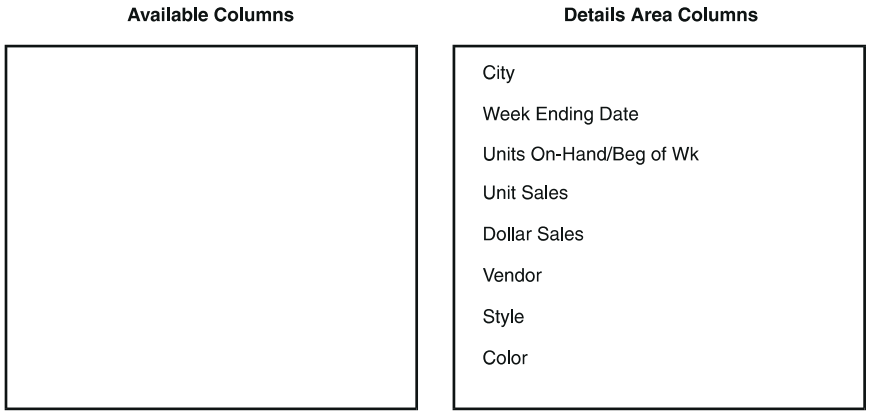
1. In the **Display** field, select **Details Area**.

   The Details Area page appears. The left list box, **Available Columns**, contains the name of each column of data that was copied into the Layout tool.



2. Select one or more columns that you want to place in the details area of your report and move the columns into the **Details Area Columns** list box.

   The order in which you move the columns into the **Details Area Columns** list box determines how the columns are displayed in the details area. You can change the display order by moving the columns within the **Details Area Columns** list box.



3. Select a choice in the **Column Layout** field to set column alignment.

With the default setting, **Side By Side**, columns appear horizontally in the report. The default width for each column is 1.25. Each line of heading or data wraps around to the next line, as shown below:

Handbag Sales

City		Week Ending Date	Units On-Hand/Beg of Wk	
Unit Sales		Dollar Sales	Vendor	
Style		Color		
New York		09/30/94		119.00
	12.00		348.00 Spirit	
Half-Moon		Royal		
New York		09/30/94		117.00
	12.00		348.00 Spirit	
Half-Moon		Silver		

In this example, the column headers proceed from City to Units On-Hand/Beg of Wk and then wrap to the next line, which in turn wraps after Vendor. The column headers end at the word Color; the next line, beginning with New York, is the data associated with the previous column headings.

If you select **Stacked** in the **Column Layout** field, the columns appear stacked vertically in the report.

Handbag Sales

City	
Week Ending Date	
Units On-Hand/Beg of Wk	
Unit Sales	
Dollar Sales	
Vendor	
Style	
Color	
New York	
09/30/94	
	119.00
	12.00
	348.00
Spirit	
Half-Moon	
Silver	
New York	
09/30/94	
	117.00
	12.00
	348.00
Spirit	
Half-Moon	
Royal	

The Quick Report window is the only window that allows you to automatically stack the columns in the report. If you want to change your column layout to be stacked after you close the Quick Report window, you must move fields manually in the Report Layout window.

Adding Grand Totals and Subtotals

You can add grand totals and/or subtotals to your report by selecting one of the choices in the **Totals** field on the Total/Subtotal page.

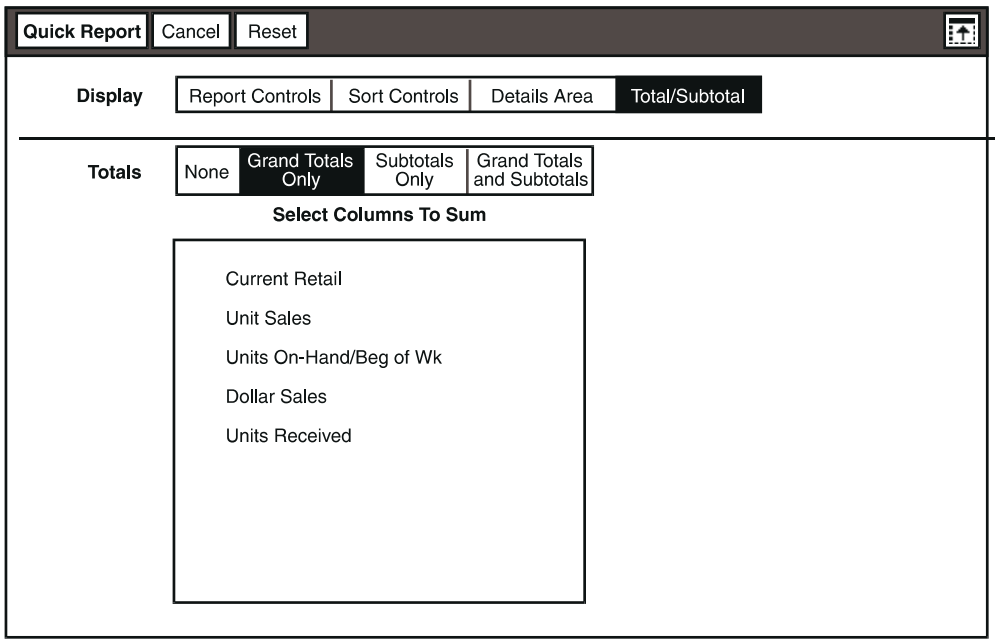
After you generate the report, grand totals appear in the report summary, described in “Adding a Report Summary” on page 62. Subtotals appear in the group footer of the specified sort column. See “Modifying a Break Group” on page 59 for more information about group headers and footers.

Data in the report can only be subtotaled by sort columns. If you have not selected any columns to sort by in the Sort Controls page, you can only add grand totals to your report.

To add grand totals to your report:

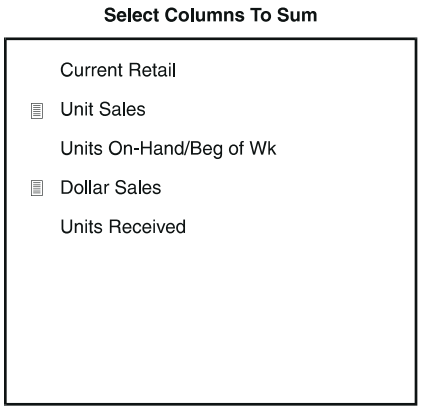
1. Select **Grand Totals Only** in the **Totals** field.

   A list box appears, displaying the columns containing numeric data.



2. Select one or more columns that you want to total.

   A check mark appears to the left of each column you select, indicating that the report summary contains a total for the column when the report is generated.

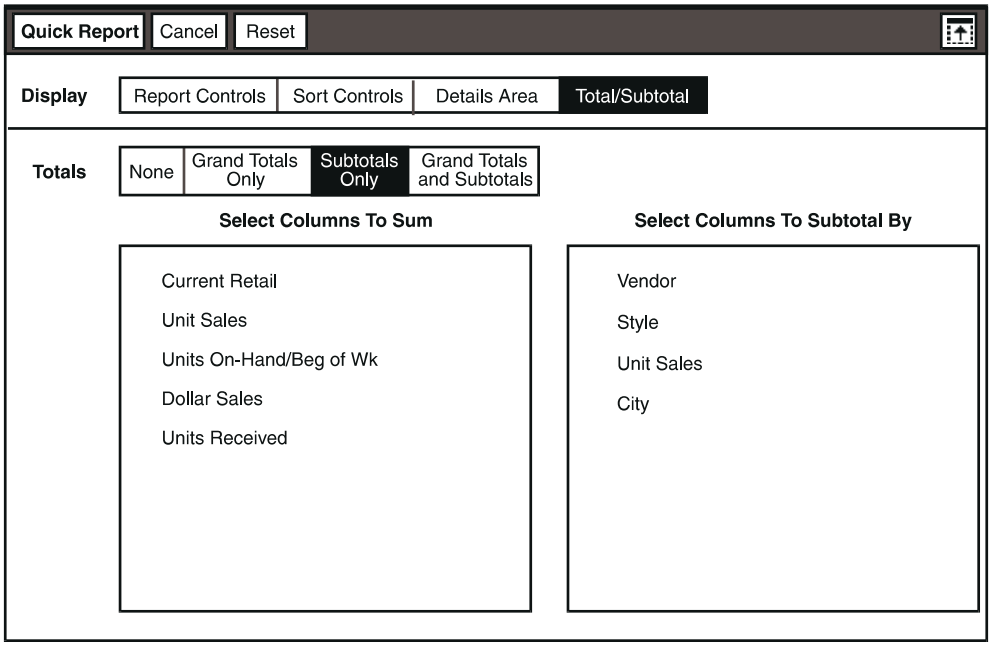


To add subtotals to your report:

1. Select **Subtotals Only** in the **Totals** field.

   Two list boxes appear: the left list box displays the columns containing numeric data; the right list box displays the names of the sort columns.

   The order of the columns in the right list box is not significant.



2. Select one or more columns in the left list box that you want to sum.

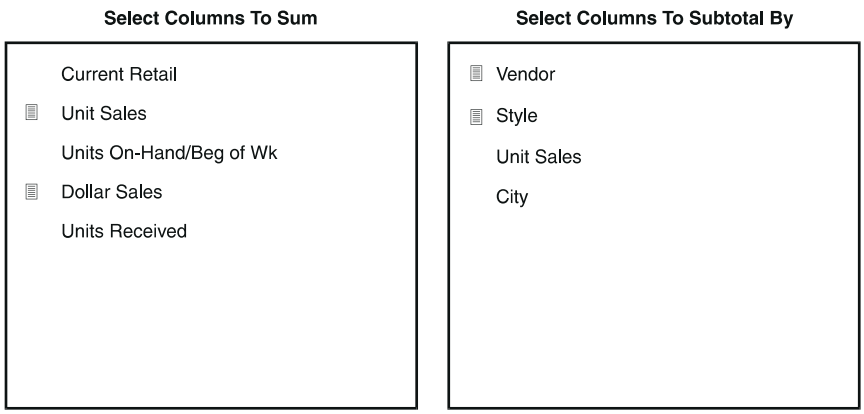
3. Select one or more columns in the right list box to indicate which column you want to subtotal by.

   A check mark appears to the left of each column you select. In this example, the unit sales and dollar sales are summed for each vendor and handbag style when the report is generated, producing four subtotals:

   Unit sales
   - By vendor
   - By style

   Dollar sales
   - By vendor
   - By style

4.



To add both grand totals and subtotals to your report:

1. Select **Grand Totals and Subtotals** in the **Totals** field.

   Two list boxes appear: the left list box displays the columns containing numeric data; the right list box displays the names of sort columns.

2. Select one or more columns that you want to total and subtotal.

   A check mark appears to the left of each column you select. In this example, a total for the unit sales and dollar sales is generated for the entire report. The unit sales and dollar sales are summed for each city, vendor, and handbag style when the report is generated. In this case, six subtotals are generated as well as two grand totals, for unit sales and dollar sales.

Generating a Quick Report

After you customize the title, headers, and footers of your report, define the sort order and type for the columns, specify the data to be included in your report, and add grand totals and subtotals, the report is ready to be generated.

To generate your report:

1. Close the Quick Report window.

   The **Quick Report** button disappears from the window header. You cannot modify your report using the Quick Report window.

2. Click on the **Update Report** button in the Layout window header.

   The Report Layout and Sort/Calculation window are set up according to the choices specified in the Quick Report window, and the report is generated. The report appears in the Layout window.

Once you create a quick report, you can review the report set-up and modify your report in the Sort/Calculation and Report Layout windows. For information about the Sort/Calculation window, see Chapter 4, “Sorting Information in the Report” on page 30 and Chapter 5, “Adding Computed Columns” on page 39. For information about the Report Layout window, see Chapter 6, “Defining the Layout of a Report” on page 50.

Chapter 4. Sorting Information in the Report

Data within a report is typically sorted in one or more ways, providing a sequence in which to display the data. You can sort data in a report using any column contained in the Layout tool. When you sort the data, items with identical values in the sort column are grouped together. For example, you might sort names in a report alphabetically, from A to Z, or you might sort sales dollars from high to low values. You can also sort items within a group in an arbitrary order.

For multiple columns of data, the information in a report can be sorted by the values in one column, and within that sort order sorted again by the values in one or more other columns. For example, books could be sorted by author, and then by title within author.

Each column used to sort the data is referred to as a sort level, as discussed in “A Layout Report” on page 1; most reports contain multiple sort levels. You can also sort information using columns that are not displayed in your report and, conversely, can display columns that are not sorted.

Calculations can be performed on groups of items and the results displayed in a *break group* (rows of related data grouped together by sorting).

As an example, consider the data in Table 1. The table is sorted by vendor, size, and color, in that order. Each vendor break group contains rows for a single vendor. There are two vendor break groups in the data shown below; the first consists of the first four rows, the Smith data rows, and the second consists of the Jones data rows.

Within the Smith vendor break group, each style break group contains data for one size. There are four size break groups: Smith-Large; Smith-Small; Jones-Large, and Jones-Small.

Finally, the color break group for one size has only one row in this set of data. The first color break group is the Smith-Large-Blue row; the last color break group is the Jones-Small-Red row.

Table 1. Break groups

Vendor	Size	Color	$ Sales	Unit Sales
Smith	Large	Blue	55	4
Smith	Large	Red	34	2
Smith	Small	Blue	66	8
Smith	Small	Red	36	4
Jones	Large	Blue	84	4
Jones	Large	Red	24	1
Jones	Small	Red	11	1

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Break groups are sometimes referred to as sort levels. The sort level is the name of the field used to determine the break group, meaning that Vendor in the data above is a sort level as well as the field that defines the vendor break group. The $ Sales and Unit Sales columns, however, are not being sorted, and therefore do not have any break groups or sort levels associated with them.

The Layout tool uses break groups and sort levels to determine where to put break group subtotals, calculations, and page breaks.

This chapter describes how to specify the sort order and change the type of sort for a column. This chapter also describes how the sort order affects your report.

This chapter uses examples that illustrate a report created without the Quick Report window. That is, the examples in this chapter are unrelated to the sample report shown in Chapter 3, “Creating a Quick Report” on page 17.

Specifying the Sort Order

You determine the sort order of the data in the Sort/Calculation window.

To open the Sort/Calculation window, click on the **Sort/Calculation** button in the Layout window header. The Sort/Calculation window appears, shown in Figure 4. The data columns are depicted in a single horizontal row.

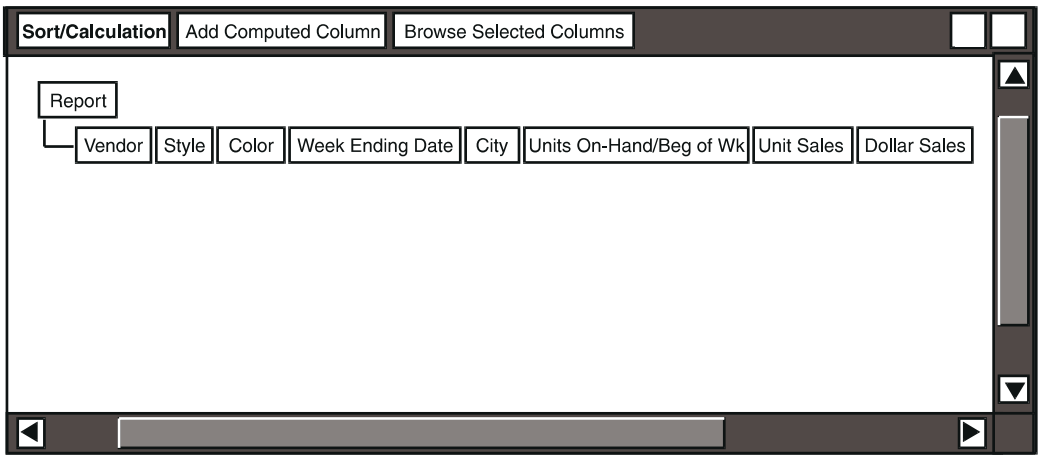


Figure 4. Sort/Calculation window

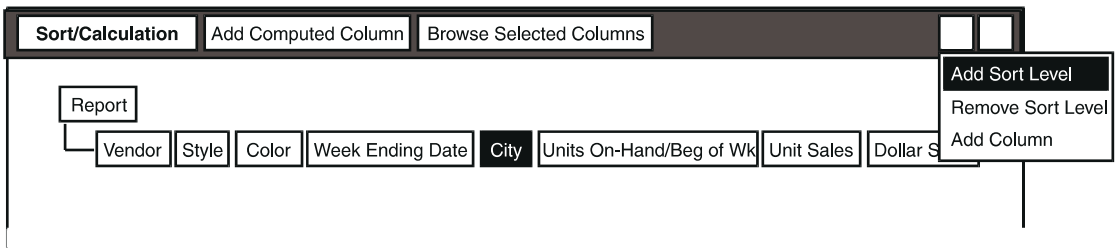
Adding a Sort Level

When you make a column into a sort level, the data at and below that level in the report is sorted by that column. You can sort the data using any of the columns contained in the report. The Layout tool does not allow you to sort all of the columns. There must always be at least one column in the unsorted row of columns.

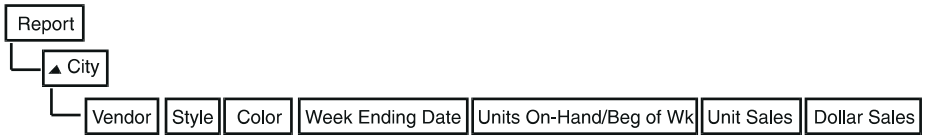
To add a sort level to a column:

1. Select the column you want to sort by. For example, select the City column.
2. Move the column underneath the Report level in the data tree or select **Add Sort Level** from the Special menu.

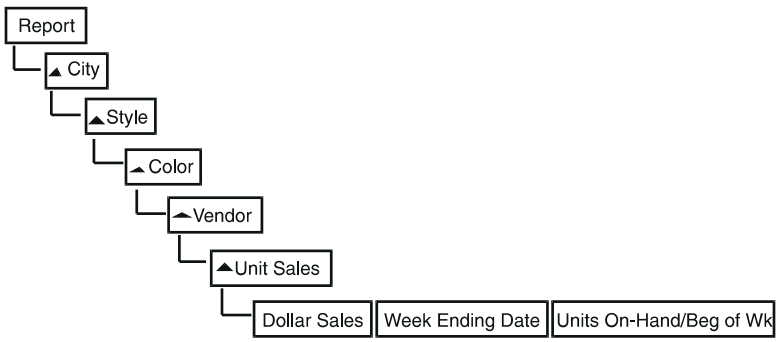
   You can use the mouse to move columns from one position to another by selecting the column, holding down the left mouse button, and dragging the column to its new position.



As mentioned in “Specifying the Sort Order and Type” on page 19, a sort indicator is added next to the column name. The other data moves below the City column to show that the data is sorted first by city.



You can also select multiple columns in the Sort/Calculation window before selecting **Add Sort Level**. The data is sorted in the order the columns were selected.

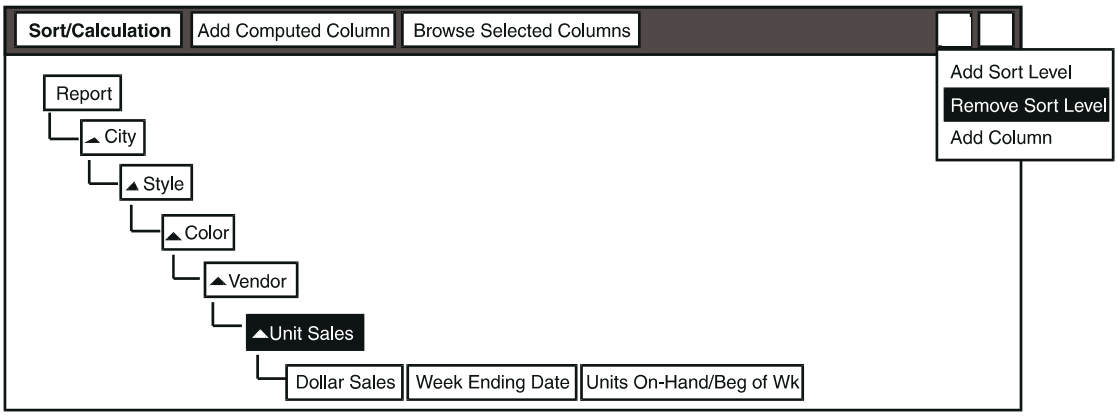


Removing a Sort Level

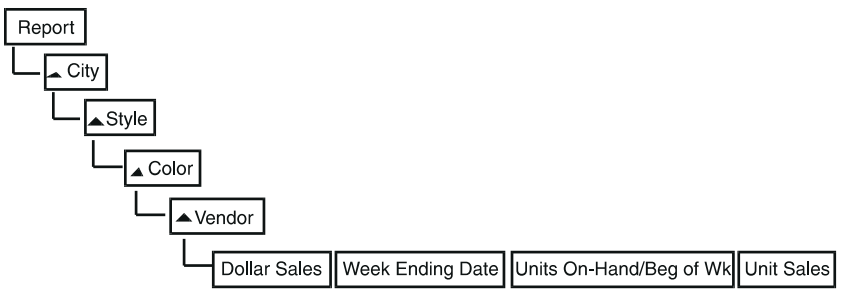
You can remove a sort level so that the data in the report is no longer sorted by that column. For example, suppose you decide that you do not want to sort the data in the report by unit sales.

To remove a sort level:

1. Select the sort column from which you want to remove the sort. In this example, select the Unit Sales column.
2. Move the column to its original place in the data tree or below the sorted columns or select **Remove Sort Level** from the Special menu.



The column is then returned to the last position in the unsorted row of columns.



You cannot remove the sort level from a column with calculated columns that use the sorted column.

Rearranging the Sort Order

You can change the sort order of data in the report by selecting a column and moving it to a new position.

For example, suppose you want to sort the data by vendor after it is sorted by city. You would select the Vendor column and move it to the position below the City column.

To rearrange the sort order of the columns:

1. Select the sort column you want to move in the Sort/Calculation window.
2. Move the column to a new sort position.

Changing the Type of Sort

By default, data is sorted in ascending order: values are sorted from smallest to largest; text from A to Z; and dates from past to present. You can change the type of sort to descending or to an order specified in a text document.

Sorting the Data in Descending Order

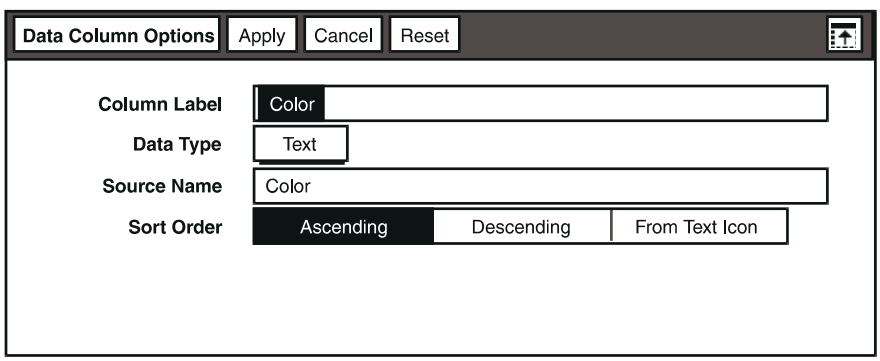
When you sort data in descending order, values are sorted from largest to smallest; text from Z to A; and dates from present to past.

For example, suppose the data in your report is sorted by color, and you want to show the colors listed in reverse alphabetical order.

To sort the colors in descending order:

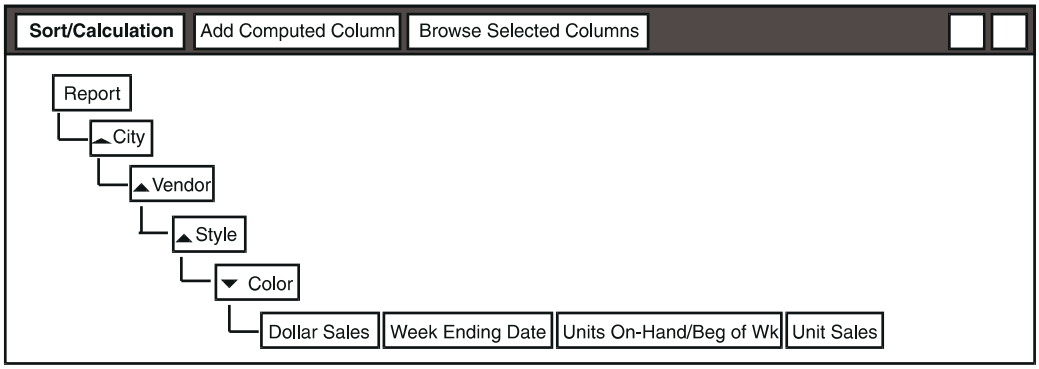
1. Select the Color column, and open the Data Column Options window.

   Three choices appear in the **Sort Order** field.



2. Select **Descending**.
3. Click on the **Apply** button or close the Data Column Options window.

   The sort indicator changes to a descending arrowhead.



Specifying the Sort Order in a Text Document

When you want to sort the data in your report in a specific order that is neither ascending nor descending, you specify the sort order in a text document.

For example, suppose you want to sort the data by city in the following order: New York, White Plains, Los Angeles, Glendale, and Toronto. If you specify the sort order as ascending or descending, the cities sort alphabetically. You can specify the exact sort order in a text document.

If you list fewer entries in the text document than there are values in your data, the values that are not listed are sorted in your report after the others, according to the order they occur in the original data.

To specify the sort order of a column in a text document:

1. Copy a blank Text icon to your desktop or to the container (such as a Capsule application, folder, or file drawer) in which you plan to use the Layout tool.
2. Open the Text icon, and enter the data in the order you want it sorted, using the following guidelines:

   Enter each value on an individual line.

   Enter the data character-for-character exactly as it appears in the column, including spaces and uppercase and lowercase characters. (Make sure you have not included any extra spaces, particularly at the end of the data, where they are difficult to notice.)

   Do not use commas, tab spaces, or any other symbols or characters as separators.
3. Close and rename the text document.

   If the text document name is not unique, the system finds the first occurrence of the icon with the duplicate name, which may not be the correct text document.

Use the **Text Icon Name** field in the Data Column Options window to specify the name or path name of the text document.

To specify the name or path name of the text document:

1. Select the City column, and open the Data Column Options window.
2. Select **From Text Icon**.

   The **Text Icon Name** field appears.
3. Enter the name or path name of the text document that contains the specified sort order for that column of data.

   The name entered must match the text document name or path name exactly, including spaces and upper- and lowercase characters.

   When you specify the text document with a path name:

   You must use a vertical bar as the delimiter.

   The path name can specify a file drawer in the File Drawers container, but the specified file drawer must be on the System disk.

   The path name must specify the containers that lead to the text document.

   For example, if your text document, named Region Sort, is in the Data folder in the same container as the Layout tool, you specify the path name as:

   Data|Region Sort

   However, if your text document is in the Data file drawer, which is in the Layout Icons folder, you specify the path name as:

   Layout Icons|Data|Region Sort

   If the path name you specify does not begin with a vertical bar, the Layout tool looks for the text document at the same level as the tool. That is, a Layout tool in a container looks for the text document in that same container. If you had specified the path Layout Icons|Data|Region Sort, and the Layout tool were in a folder named Reports, it would look for:

   Reports|Layout Icons|Data|Region Sort

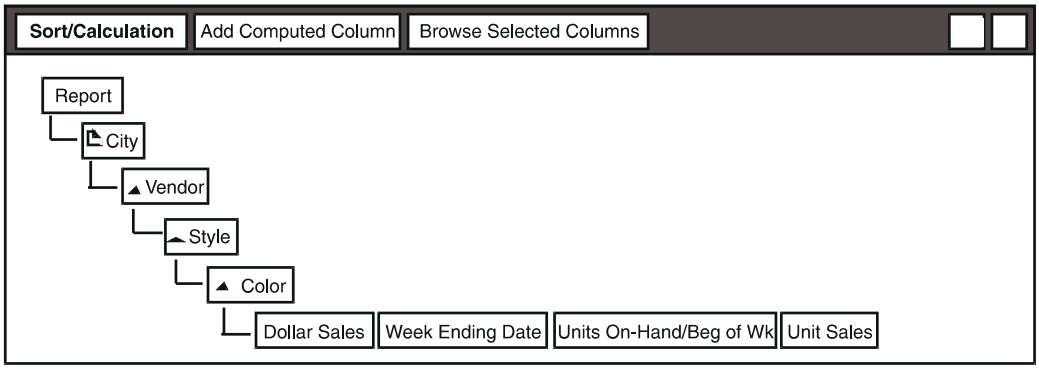
   Similarly, a Layout tool on the desktop or in a Capsule application would first look at the desktop or in the Capsule application, respectively.

   If a match is not found beginning at the same level, the Layout tool next looks for the path beginning at |System|File Drawers. Using our previous example, it would begin looking for:

   |System|File Drawers|Layout Icons|Data|Region Sort

   If a match is not found after checking both places for the text document, the Layout tool returns an error message.
4. Click on the **Apply** button or close the Data Column Options window.

   The sort indicator changes to a text icon graphic.



Understanding How the Sort Order Affects Your Report

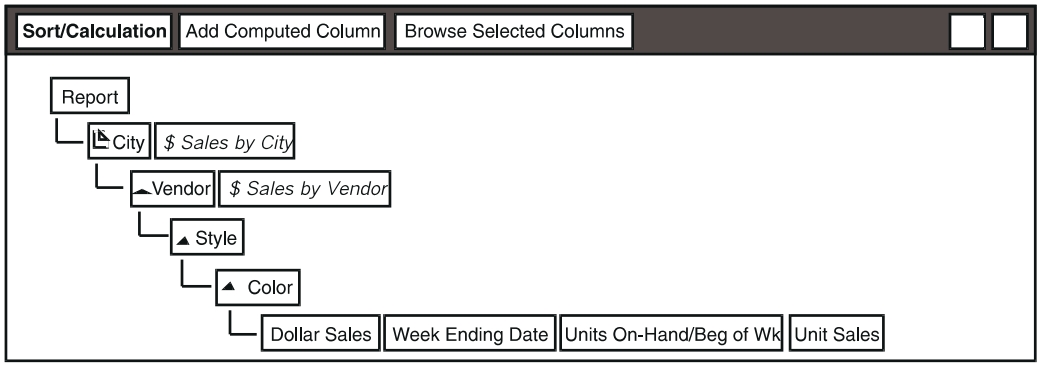
The arrangement of the data columns in the Sort/Calculation window has no effect on the appearance and layout of the data in your report. However, the columns you use to sort the data result in break groups in the report and affect the calculations in computed columns, as explained in the following sections.

Break Groups

As discussed in Chapter 4, “Sorting Information in the Report” on page 30, break groups are related rows of data grouped together by sorting. A break group is created in the report for each sort column. In the Report Layout window, computed columns, headings, and text can be added to break group work areas. For more information about break groups, see “Modifying a Break Group” on page 59.

Computed Column Placement

Computed columns are placed next to a sort column in the Sort/Calculation window and labeled in italics. The computed column uses the sort column in aggregations, sub-totals, and other calculations. For example, if the data in the report is sorted by city, a subtotal for the dollar sales in each city can be generated in a computed column by using the formula, sum([Dollar Sales]), and placing the computed column next to the City column. To generate a subtotal for dollar sales sorted by vendor, the same formula can be used in a computed column, but the column would be placed next to the Vendor column.



For more information about computed columns, see Chapter 5, “Adding Computed Columns” on page 39.

Double-Pass Calculations

The Layout tool enables you to build formulas that use other computed columns in their calculations. Formulas using other computed columns are called double-pass calculations. When the report is updated, the first computed column is calculated, and its results are used to arrive at the results of the second computed column.

For more information about double-pass calculations, see “Double-Pass Calculations” on page 46.

Chapter 5. Adding Computed Columns

In addition to the columns that constitute your data, you can create computed columns that contain calculations. Computed columns can appear as columnar data, or as a field in a break group or report summary. Typical uses for calculations include:

Subtotaling data

Generating running totals

Averaging

Concatenating strings to create labels

Creating share calculations

This chapter describes how to:

Add a computed column

Enter formulas

Rename a computed column

Edit formulas

Set up advanced calculations

Adding a Computed Column

The Sort/Calculation window allows you to add computed columns to the report. The placement of the computed column is discussed in “Computed Column Placement” on page 37. In addition, when you place a computed column at the Report level in the Sort/Calculation window, it generates results for the entire report.

To add a computed column to a report:

1. Open the Sort/Calculation window.
2. Click on the **Add Computed Column** button.

   The pointer changes into a bucket.
3. Click in the window on the sort level where you want to place the computed column. For example, click on the City column.

   The computed column appears in the window, labeled Comp1, indicating it is the first computed column added to the report.

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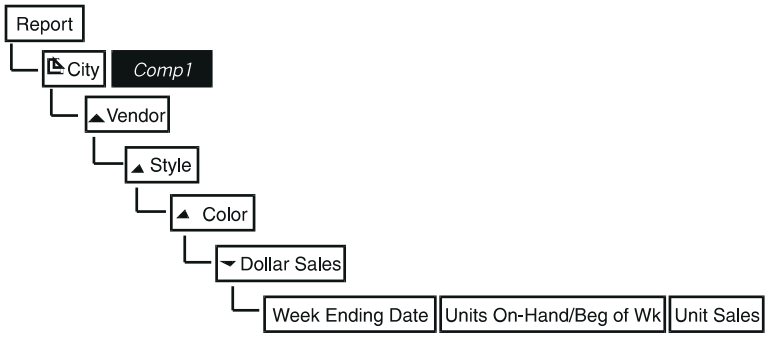


Entering a Formula

When you create a computed column, the Computed Column Options window automatically opens, as shown in Figure 5.

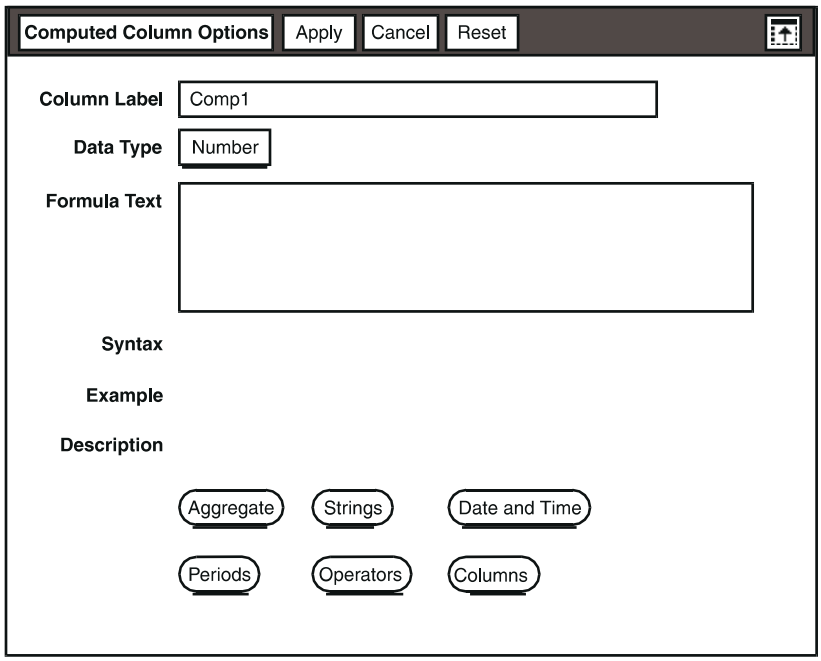


Figure 5. Computed Column Options window

You build a formula by entering functions and column names into the **Formula Text** field, either by typing them in or selecting them from the menus.

To enter a function or column name into the **Formula Text** field:

1. Type in the function or column name.

2. Point to a function-category or the **Columns** button at the bottom of the window, then hold down the left mouse button and drag the pointer through the menu.
3. When you reach the item you want to use, release the left mouse button.

   The item is automatically entered into the **Formula Text** field.
4. Continue building the formula using the syntax help provided in the Computed Column Options window, as described in more detail in the following section.

Getting Syntax Help

The Computed Column Options window has three fields that provide helpful information about the functions. They are located beneath the **Formula Text** field in the top part of the window. Descriptive text appears in the **Syntax**, **Example**, and **Description** fields.

You can scan the function menus without entering a function into the **Formula Text** field. Scanning is useful when you are not sure which function is appropriate for the result you are trying to obtain.

To scan the function menus:

1. Point to a function-category button, then hold down the left mouse button and drag the pointer through the menu.

   As you move through the menu, the help information in the **Syntax**, **Example**, and **Description** fields changes for each function.
2. To freeze the help information for a particular function, drag the pointer out of the menu to a blank area in the window, then release the mouse button.

   The information in the read-only fields remains displayed, allowing you to study the syntax, examples, and description of the function.

Using Functions, Operators, Periods, and Columns

A function usually consists of two parts: the function name (such as sum); and the function's *arguments* (the values to be operated on). Use the following guidelines to format and arrange these parts in a specific way.

Use lowercase letters for function names.

Place parentheses around the arguments. Use commas to separate multiple arguments. For example, rank([Dollar sales], [City], descend).

Enclose column names in brackets.

Enclose text in quotation marks. For example:

"Glendale Sales"

To avoid errors, use the Computed Column Options window to enter functions. This entry method enables you to select function names from menus and use the syntax help displayed in the window for guidance.

The Layout tool provides menus for the following types of functions:

Aggregate

Aggregate functions summarize data for entire columns by calculating a single value from the values contained in a column of data. Aggregate functions can be applied to columns that are organized into break groups. Results of aggregate functions in reports are displayed in the appropriate break group header or footer, except for the rank and runtotal functions which each create a new column of data.

Strings

String functions manipulate text data types. The output of a string function can be a string, date, or number.

Date and Time

Date and time functions return information about date and time values or calculate a date and time result. A date and time parameter can either be a string or a numeric date type which forms a valid date and time value.

The Layout tool also provides other menus that you can use in conjunction with the **Aggregate**, **Strings**, and **Date and Time** menus to build calculations. Using these menus allow you to avoid mistakes caused by misspellings in your formulas. These menus include:

Periods

You can use this menu to insert any of the time periods required by your formula, such as day, week, qweek, etc.

Operators

This menu gives you access to a variety of arithmetic, relational, and logical operators, such as **+**, **>**, and, true, not =, etc., as well as key words used in the functions, such as ascending or na.

Columns

This menu allows you to insert the names of any column in the report into your formulas. The column names displayed include any computed columns you have created.

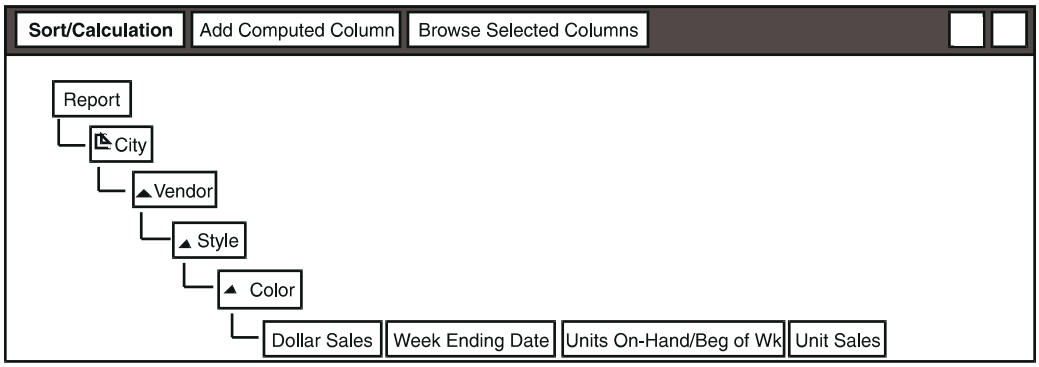
See Appendix B, “Building Blocks for Calculations” on page 96 for specific descriptions, syntax, and examples.

Using Data Columns

As discussed previously, the data columns displayed in the Sort/Calculation window and in the **Columns** menu of the Computed Column Options window are either the original columns you copied into the Layout tool or computed columns you have created.

There is a critical difference between these two column types. Original data columns contain a value for every row of input data. Computed data columns, on the other hand, typically contain a single value for groups of rows. This relationship of value to row is sometimes expressed as one-to-one and one-to-many, or multi-valued.

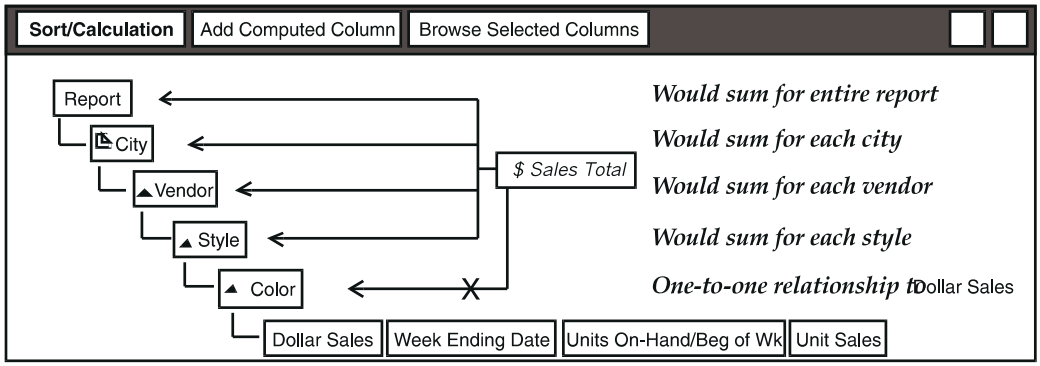
This relationship is particularly important when you are building a formula. For example, consider the following Sort/Calculation window.



There are three multi-valued relationships in this window: one city to many vendors; one vendor to many styles; one style to many colors. You could not, for example, use Color in a calculation at the Style sort level, nor could you use Style in a calculation at the Vendor level. You would receive an error message that a column belonging to a lower sort level cannot be used in the formula.

The error is caused by the fact that the Color sort level contains many rows of data for each style. By attempting to place Color in a calculation at a higher level, you are attempting to display many values in a single field. Only one value is allowed at a time in any one field.

Number columns, which can be aggregated, can be used in calculations at a higher level, however, to create a sum (subtotal) or average, for example. In the window above, you could create an aggregate $ Sales Total that sums the dollar sales. You could place $ Sales Total at the Vendor sort level to sum the sales for each vendor, at the City level to sum the sales for each city, or even at the Report level. This aggregate could also be placed in either the header or the footer. It would not make sense, however, to place $ Sales Total at the Color level, because the relationship of color to dollar sales is one-to-one; no aggregation is possible.



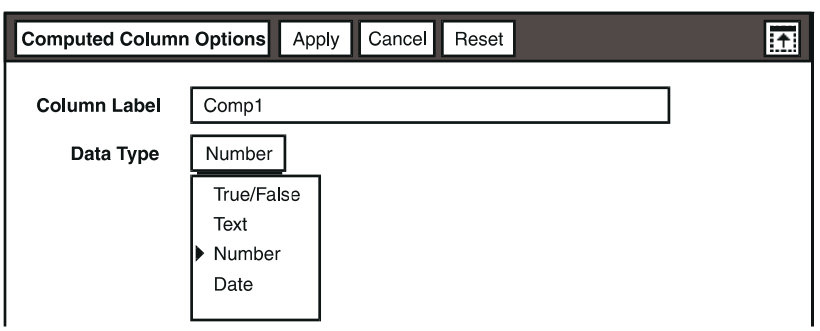
Only number columns can be aggregated; text, true/false, and date columns cannot.

Specifying the Data Type

In most cases, the Layout tool is able to determine automatically the data type for a computed column and display that data type in the **Data Type** field in the Computed Column Options window. However, for a computed column that contains an *@-variable* (a variable whose value is passed to the tool from within a capsule application), you need to specify the type of data contained by the variable. The four data types and their results are explained in the following table.

Data type	Results returned	Example
Text	Text string	Glendale Sales
Number	Numeric data	1345.99
Date	Date	June 16, 1994
True/False	Boolean value	True
		False

To specify the data type for a computed column with an @-variable, select the data type in the **Data Type** field.



You cannot use an @-variable in the label of a computed column.

Renaming a Computed Column

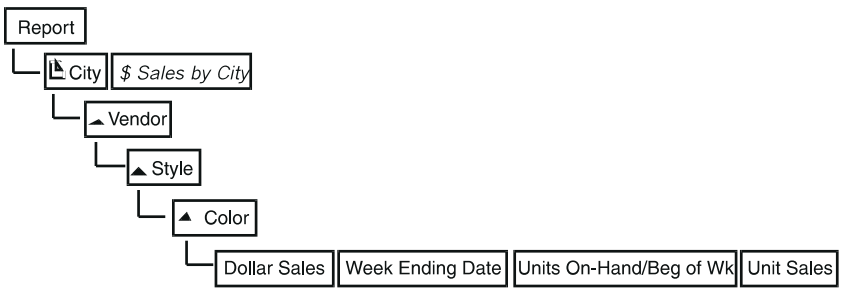
When you create a computed column, it has a default name, based on the order in which the columns are created. This name is shown in the **Column Label** field.

You can rename the computed column with a meaningful name that identifies the type of calculation, the data being used in the calculation, or the sort level or break group of the calculation.

To rename the computed column:

1. Enter the new name in the **Column Label** field.
2. Click on the **Apply** button or close the Computed Column Options window.

   The name of the computed column changes in the Sort/Calculation window.



When you add a computed column in the Sort/Calculation window, its name automatically appears in both the **Add Column** menu of the Report Layout window and the **Columns** menu of the Computed Column Options window.

Editing Formulas

You may want to make modifications to formulas that you have already created. To edit an existing formula:

1. Select the computed column that contains the formula you want to edit.
2. Open the Computed Column Options window.
3. In the **Formula Text** field, edit the formula.
4. Click on the **Apply** button or close the Computed Column Options window.

Setting Up Advanced Calculations

The Layout tool allows you to perform the following advanced calculations:

Double-pass calculations

Share calculations

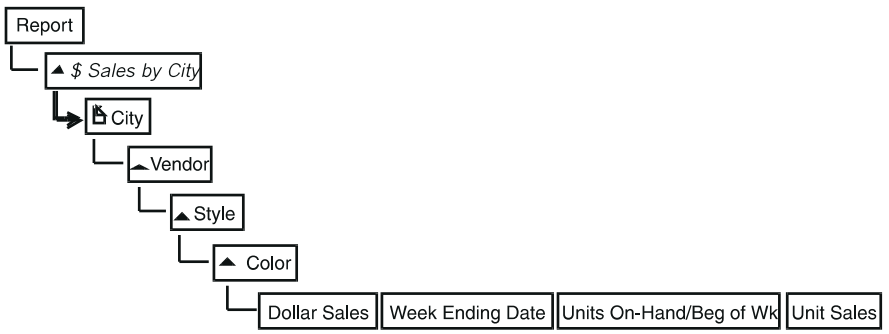
Calculations using @-variables

Double-Pass Calculations

A *double-pass calculation* is a calculation that must be completed so that the results can be used as a factor in another operation. Double-pass calculations can be used to sort or rank data by a computed column that was previously calculated. The first pass calculates the values for the column; the second pass is then required to sort or rank the data. Some typical uses with computed columns include runtotals, max or min functions, or aggregate functions.

For example, suppose you have a report that is sorted by city and also contains a computed column for totaling the sales in each city.

You decide that you want to change your report by sorting the city with the highest dollar sales at the top of your report. You would move the computed column containing the formula for totaling sales by city ($ Sales by City) above the City column.



A double-pass calculation is created. An ascending sort indicator is automatically added to the computed column, and a double-pass arrow appears in the Sort/Calculation window.

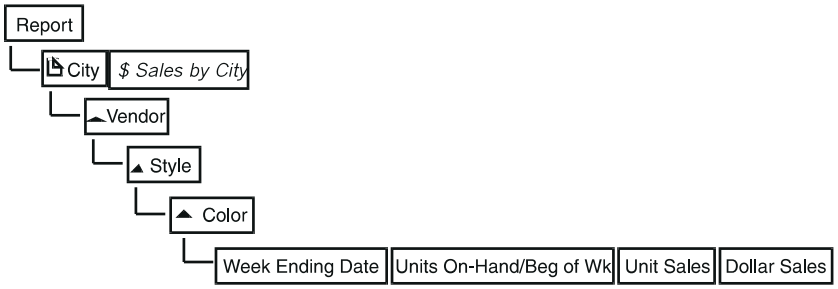
Share Calculations

Suppose you want to show in your report what percentage of sales were generated by a specific product or market (a detail item). This figure, typically called a *share calculation*, requires two distinct calculations:

1. Sum the detail sales.
2. Divide the detail figure by the aggregated total and multiply by 100.00 to get the percentage.

A third step, summing the percentages, is often performed.

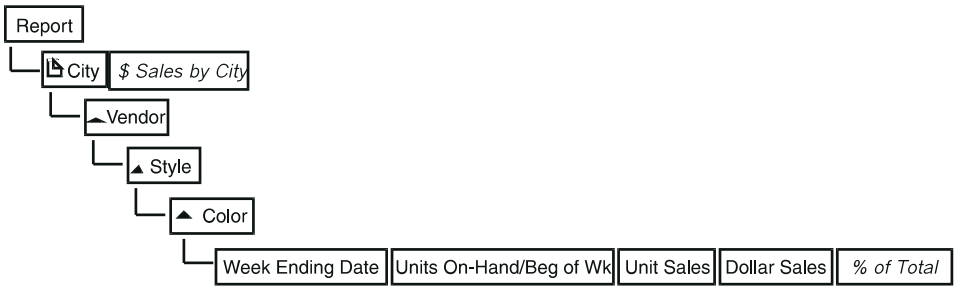
For example, suppose you want to compute the dollar sales for each city. You would create a computed column $ Sales by City containing the formula sum([Dollar Sales]) and place it at the City sort level in the Sort/Calculation window.



To calculate the share, you would then create another computed column, % of Total, using the following formula:

[Dollar Sales]/[$ Sales by City] 1 .

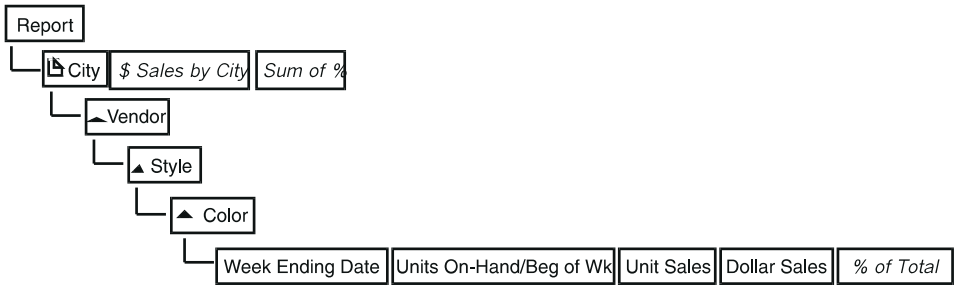
Because you are deriving a value for each of the detail sales, you would place this column at the same level as Dollar Sales.



Finally, you could create another computed column, Sum of %, to aggregate the percentages, using the following formula:

sum([% of Total])

Because this aggregate is for the sales for each city, you would place this computed column at the same level as City.



The following report excerpt illustrates the use of a share calculation.

Share Calculations

	Retail	$ Sales	% of Total	$ Begin OH	% of Total	Sell Through	Units Received
White Plains							
Sun Spot Square Flap							
Bronze	48.75	780	17.91	6,386	23.99	12.21	0
Burgundy	48.75	1,495	34.33	7,118	26.74	21.00	0
Navy	48.75	1,690	38.81	6,874	25.82	24.59	0
Sand	48.75	390	8.96	6,240	23.44	6.25	0
Total for Square Flap		4,355	100.00	26,618	100.00	16.01	0
Sun Spot - V Flap							
Bronze	45.00	180	5.66	5,715	24.90	3.15	0
Burgundy	45.00	1,440	45.28	6,435	28.04	22.38	0
Navy	45.00	1,140	35.85	5,850	25.49	19.49	0
Sand	45.00	420	13.21	4,950	21.57	8.48	0
Total for V Flap		3,180	100.00	22,950	100.00	13.37	0
Total for Sun Spot		11,525		76,763		15.01	
Total for White Plains		1,044		138,677			

Aggregates of Share Calculations

Calculations Using @-Variables

When you construct a calculation within the Layout tool, you can use constants within the formula. For example, you could calculate the sales tax of an item by multiplying its price by the tax rate; given a sales tax of 0.075, your formula would resemble the following:

[UnitPrice] . 75

You also have the option when building a report for use with a capsule application of replacing constants with @-variables. If you were to specify the tax rate as the @-variable @T, for example, you could accommodate any changes in that rate with a

single change to the Capsule icon controls, rather than having to find and replace each instance of the constant itself. In this case, your formula would resemble the following:

[Unit Price] @T

Another typical use is to concatenate fields and @-variables containing strings to create labels. For example:

concat([Vendor]," – ",@A)

String @-variables do not require quotation marks around them in **Formula Text** fields.

If @A is set to "Sales Dollar Totals" or "Sales Units Totals", the label for the vendor Spirit would appear as one of the following:

Spirit – Sales Dollar Totals

Spirit – Sales Units Totals

You can specify only constants as @-variables. You cannot specify a complete formula itself as the value for an @-variable.

Chapter 6. Defining the Layout of a Report

Before you can view data in the Layout window, you must decide which columns to include in the report and define a basic layout in the Report Layout window. You can add columns, fields that create text, page breaks, a page number, and a timestamp to the report.

This chapter describes the Report Layout window and the work areas used to design the report.

This chapter also includes information on how to:

- Add fields to a report
- Format fields in a report
- Hide field borders
- Add columns to a report
- Manipulate fields and columns in a work area
- Specify page breaks

Understanding the Report Layout Window

The Report Layout window allows you to define the report layout and formats. To open the Report Layout window, click on the **Report Layout** button.

The Report Layout window opens, similar to the one shown in Figure 6 on page 51.

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Figure 6. Report Layout window

The Report Layout window for your report may look different because break groups are determined by sort columns.

Using Work Areas to Design the Report

The Layout tool allows you to create reports that present data in various layouts. While the layout of each report might look different, every report is composed of individual sections called *work areas*. These areas divide the report into functional sections such

as a title, details, and report summary areas. Each report is composed of one or more of the following work areas:

Title page or first page header

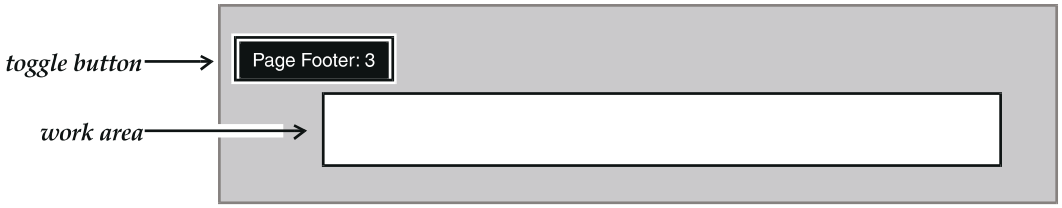
Page header and footer

Group header and footer

Details, which include column headings and data

Report summary

Each work area is represented in the Report Layout window by a toggle button shows the name of the work area and a number that reflects how many lines a work area contains. The work area itself appears when you select the toggle button.



Opening and Resizing a Work Area

Work areas open to a default size. You can expand or shrink the work area to rearrange, insert, and delete fields, and affect the spacing in your report.

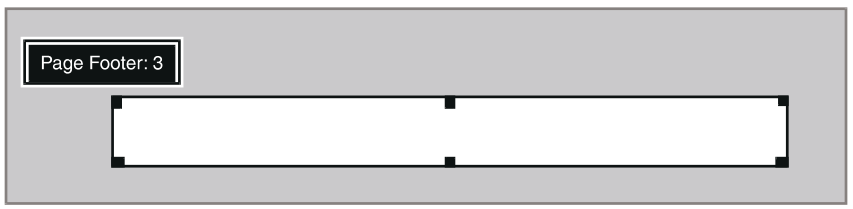
To open and resize a work area:

1. Click on the work area's toggle button.

   The work area appears below the toggle button.

2. Select the work area.

   Handles appear on the sides and corners of the work area.



3. Select and drag the handle in the direction you want to resize the work area.

   The number on the toggle button automatically reflects the change in the work area size.

Work areas can only be sized vertically.

Adding Fields to a Work Area

There are four types of fields you can add to the work areas in a report:

Text

Page break

Page number

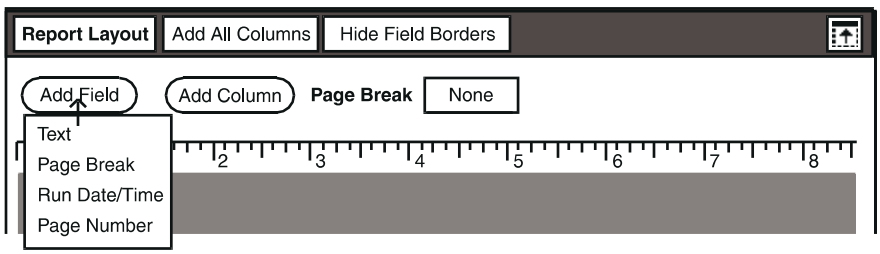
Run date/time

Place the fields in the work area the same way you want the fields to appear in the finished report. Fields can be added only to specific work areas in the report.

For example, you would place the page number field in the right corner of the Page Footer work area if you want the page number to appear on the lower-right corner of every page.

To add a field to a work area:

1. Click on the **Add Field** button and hold down the mouse key.

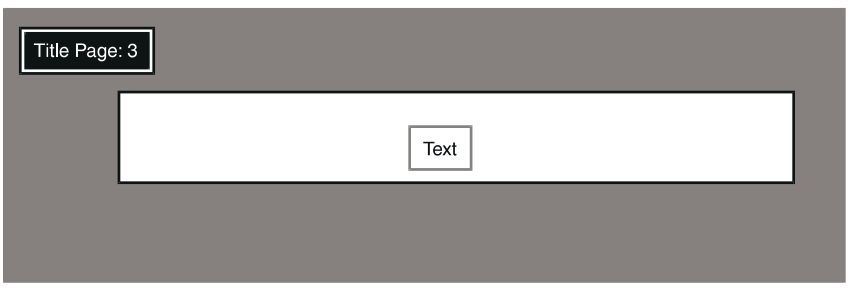


2. Select a choice from the menu, and lift your finger off the mouse key.

   The pointer changes into a bucket.

3. Click at the desired location in the work area in which you want to place the field.

   The field appears in the work area.



The following sections describe each field.

Text

A text field can be added to any work area in the report. Using a text field you can:

Create a label to identify the results of a calculation

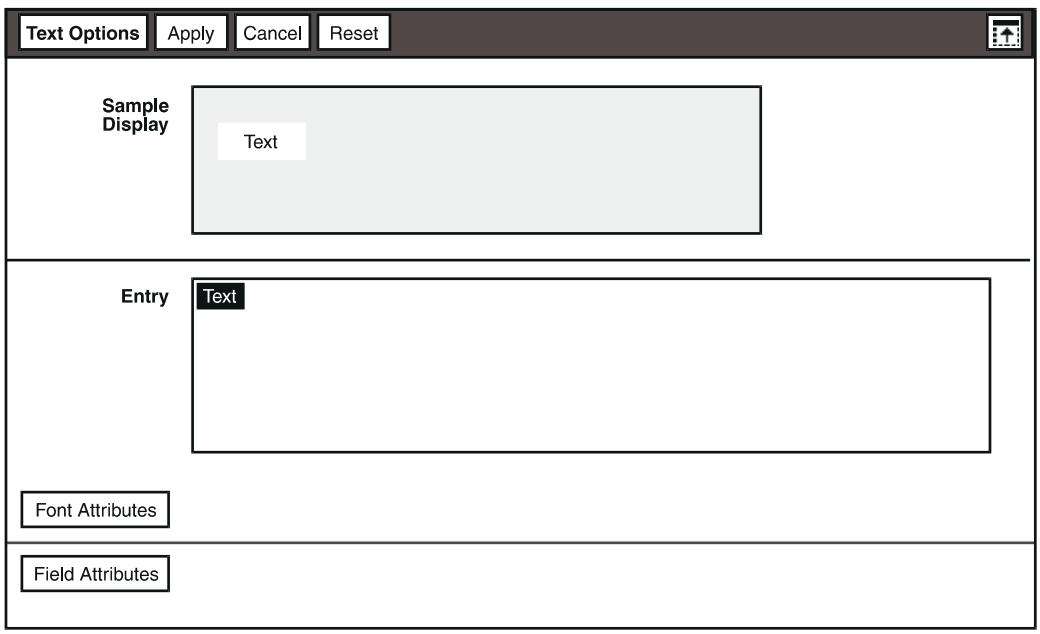
Annotate your report

Create a line separator anywhere in the report by entering a series of repeating characters, such as ***

You edit and format the text field in the Text Options window.

To enter text in a report:

1. Select the **Text** choice from the **Add Field** menu.
2. Place the text field in the appropriate work area.
3. Open the Text Options window.



4. Type text in the **Entry** field.

   The **Sample Display** field is a read-only field. Use the **Entry** field to enter and edit text.

5. Change the font typeface and size of the text or the borders around the text field, if appropriate.

   Changes made to the text field appear in the **Sample Display** field.

For information about customizing the text typeface and size, see “Formatting Text” on page 10. For information about formatting the text field, see “Formatting Fields” on page 63.

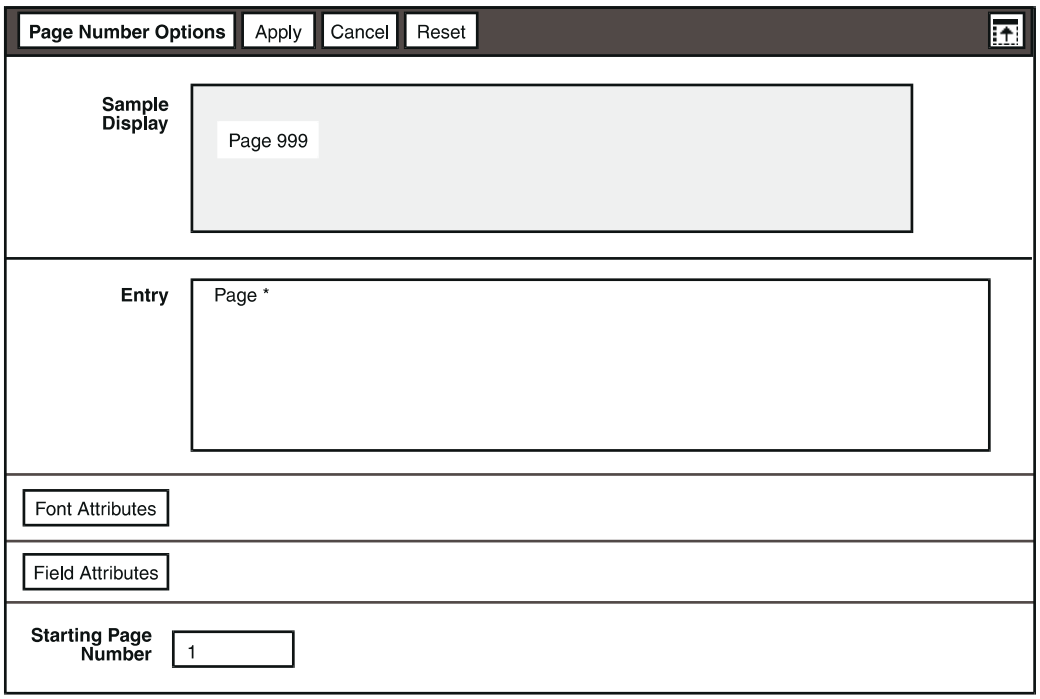
Page Break

A page break field can be inserted into the Title Page work area to create a separate title page, or placed in the Report Summary work area if you need to insert a page break in a lengthy report summary.

You can also use the **Page Break** field described in “Specifying Page Breaks” on page 67 to add page breaks to your report whenever the value of a break group changes.

Page Number

The page number field indicates the current page number of a report. You can only place a single page number in the report, either in the Page Header or Page Footer work area. You can customize the page number format by opening the Page Number Options window, and using the fields in the Font Attributes and Field Attributes panels. The asterisk in the **Entry** field is a variable that is replaced by the actual page number in the report.



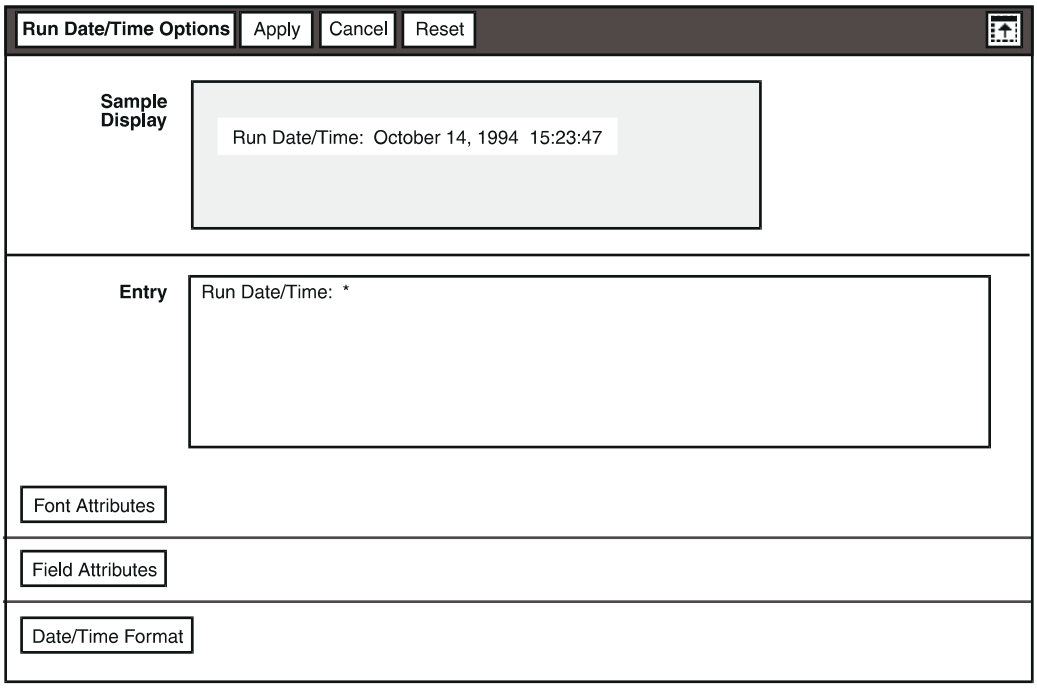
If the Layout report is a part of a longer report, you can specify that the page numbering begin on a page other than one by changing the default value in the **Starting Page Number** field.

Changes made to the page number field, font, or format appear in the **Sample Display** field. For information about customizing the page number typeface and size, see “Formatting Text” on page 10. For information about formatting the page number field, see “Formatting Fields” on page 63.

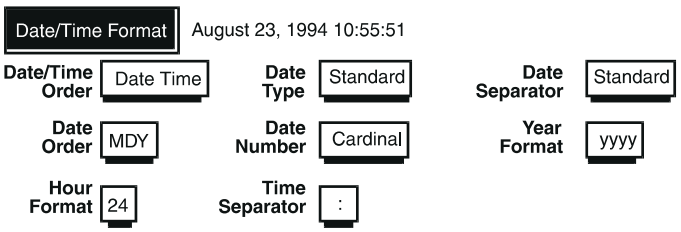
Run Date/Time

The **Run Date/Time** field is updated each time the report is generated, when you copy the Layout tool to the printer, or whenever you open the Layout tool. You can use @-variables to maintain the original date and time that the Capsule tool ran. A **Run Date/Time** field can be placed in the Report Title, Page Header, Page Footer, and Report Summary work areas. After you place the **Run Date/Time** field in the report, you can customize its format by opening the Run Date/Time Options window. Changes made to the **Run Date/Time** field appear in the **Sample Display** field. As is the case for the page number, the asterisk in the **Entry** field is a variable that is replaced by the actual run date and time in the report.

The size of the Sample Display region is the same as that of the field in the work area. If the **Run Date/Time** field does not display in its entirety, you should resize the field within the work area.



The fields in the Date/Time Format panel allow you to choose whether to show the date, time, or both, as well as specify the style of the date and the character used to separate the parts of a date as described in “Formatting Dates” on page 15.



The Date/Time Format panel contains three unique fields described in the following table.

Table 2. Date/Time Format panel field descriptions

Use this field	To do this
Date/Time Order	Specify the arrangement of the date and time, and whether both the date and time are shown. the choices are Date Time, Time Date, Date Only, and Time Only
Hour Format	Specify whether a 12-hour or 24-hour clock is to be used in the run date/time field. If you specify the 12-hour clock, time entries are followed by a.m. or p.m.
Time Separator	Specify the character used to separate the hours, minutes, and seconds in the run date/time field. The choices are colon (**:**), period (**.**), and hms.

To change the font typeface and size of the run date/time, or the borders around the **Run Date/Time** field, use the fields in the Font Attributes and Field Attributes panels as described in “Formatting Text” on page 10 and “Formatting Fields” on page 63.

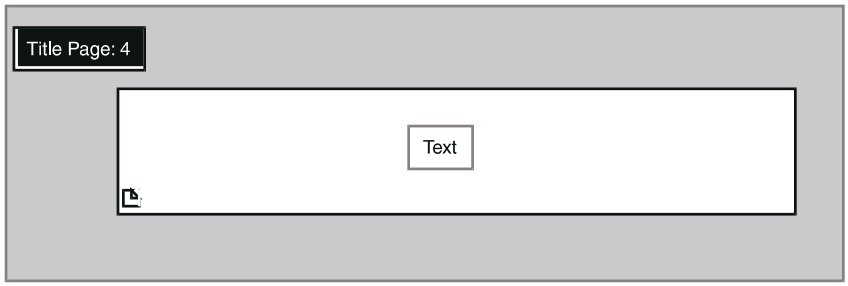
Creating a Title Page or First Page Header

The title of the report is text that you specify, and can print as a separate cover page or at the top of the first page of the report. Title page text can span several pages.

To create a title that appears at the top of the first page of the report:

1. Open the Title Page work area.
2. Add a text field.
3. Open the Text Options window and enter text into the **Entry** field, as described in “Text” on page 54.

To create a separate title page or pages, add a page break field after the text field.



You can also use @-variables to automatically generate your title when you use the Layout tool in a capsule application. See “Calculations Using @-Variables” on page 48 and “Using @-Variables in a Report Title” on page 93 for more information.

Creating a Page Header and Page Footer

The page header displays information at the top of each page of a report, and the page footer displays information at the bottom of each page of a report.

Report headers and footers are not displayed on the Report Summary page.

Page headers can include:

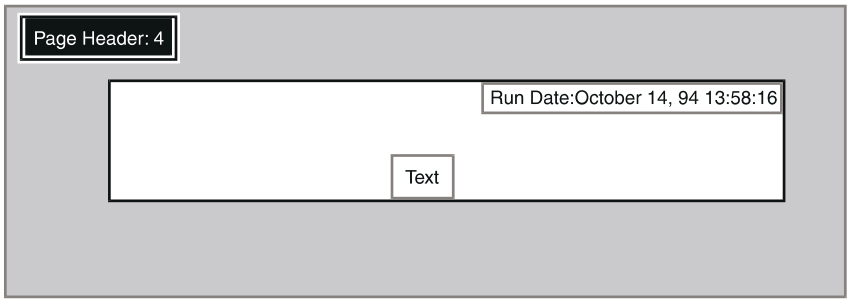
- The report title or other descriptive text
- The date and time the report was generated
- The page number
- Column headings to identify data that spans several pages

Page footers can include:

- Descriptive text
- The date and time the report was generated
- The page number

You cannot add column fields to the Page Header, Page Footer, or Heading area in Details.

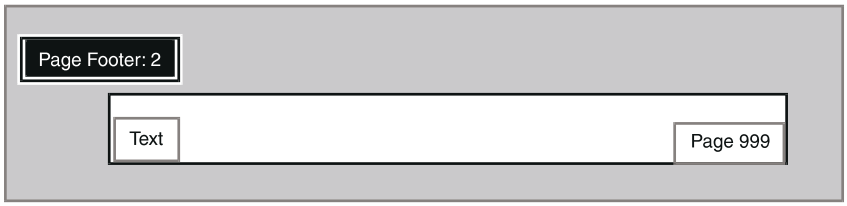
Suppose you want to print the date and time the report was generated and a shortened version of the title at the top of each page. You would add a run date/time field and a text field to the Page Header work area.



To create a page header:

1. Open the Page Header work area.
2. Add the information you want to appear at the top of each page by adding the appropriate field to the work area.

Suppose you also want to include the word "Confidential" and a page number at the bottom of each page. You would add a text field and the page number field to the Page Footer work area.



To create a page footer:

1. Open the Page Footer work area.
2. Add the information you want to appear at the bottom of each page.

Modifying a Break Group

Layout automatically adds break groups for each sort column in a report. Break groups are used to define sections and subsections of a report and create space whenever a value changes at a defined sort level.

Each break group has two work areas:

A group header, which appears before the group of data values, and can display:

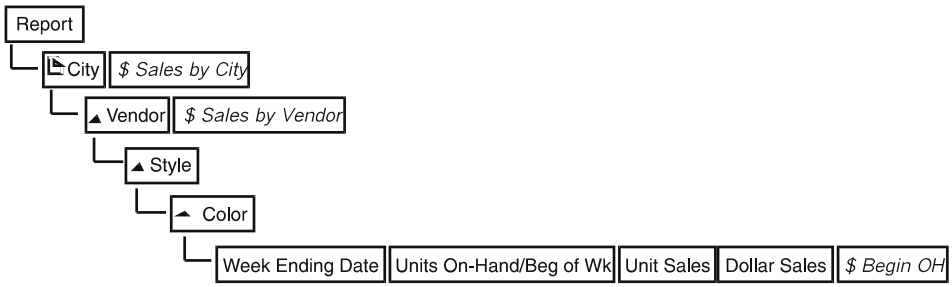
- Column headings
- The results of calculations
- Text

A group footer, which appears after the group of data values, and can display:

– The results of calculations
– Text

When you place a column in a group header or group footer, the column must be at the same or a higher sort level than the column creating the break group.

For example, suppose you have the following data tree in the Sort/Calculation window, and you want to add the City and Unit Sales columns to the Vendor Group Header work area.



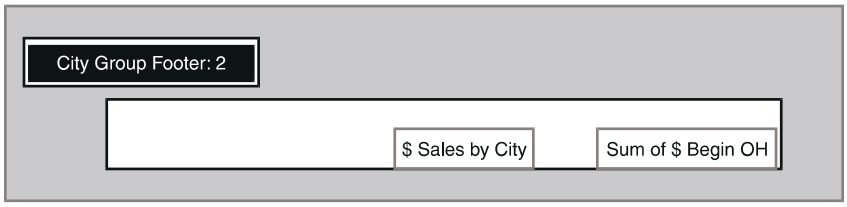
You can add the City column to the Vendor Group Header work area because the City column is at a higher sort level, or sorted before, the Vendor column. You cannot add the Unit Sales column to the Vendor Group Header work area because the Unit Sales column is at a lower sort level, or sorted after, the Vendor column.

However, as discussed in “Using Data Columns” on page 42, you can place the calculated columns $ Sales by City and $ Sales by Vendor in the Vendor header or footer work areas, because they are aggregates of Dollar Sales to the Vendor and City sort levels.

To modify a group header:

1. Open the group header work areas that you want to display in the report.
2. Add the information that you want to appear before the break group by adding the appropriate field or column to the data work area.

As another example, in a report that sorts the data by city, you may want to include a group footer after each city to summarize the dollar sales and the dollar amount of the current inventory in each city. You would place the computed columns in the City Group Footer work area.



To modify a group footer:

1. Open the group footer work areas that you want to display in the report.
2. Add the information that you want to appear after the break group.

If you want to change or remove any break groups, use the Sort/Calculation window to modify the sort columns. See “Specifying the Sort Order” on page 31 for more information.

Adding Columns to the Details Area

The Details work area contains the detail data for the report, and is comprised of two work areas:

The Headings work area displays the headings for the columns in the report

The Data work area displays the rows of data contained in the columns

Suppose you want to create a sales and stock summary of handbags by city, including the retail price, dollar sales, and dollar amount of the stock on hand for each vendor, style, and color.

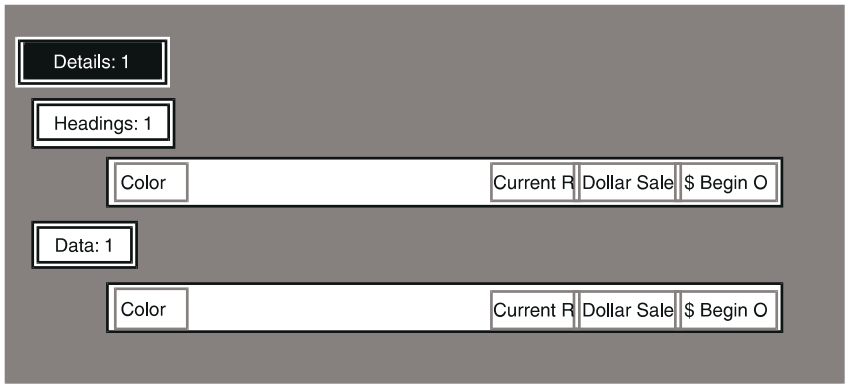
To add columns to the Details area:

1. Click on the **Details** toggle button.

   The Headings and Data work areas appear.
2. Resize the work areas, if necessary.
3. Add the columns that you want to display as the detail data in your report to the Data work area, as described in “Using the Add Column Button” on page 65.

   The column headings automatically appear in the Headings work area.

In this example, you would add the Color, Dollar Sales, and $Begin OH columns to the Data work area, placing the fields in the work area as you wish.



In the above example, the report would display a line similar to the following.

Color	Current Retail	Dollar Sales	$ Begin OH
Bronze	48.75	780	6,386

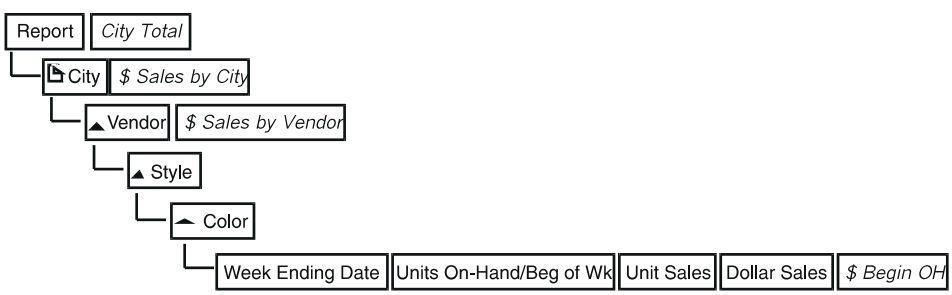
See “Formatting Headings” on page 71 for information on how to format column headings and data.

Adding a Report Summary

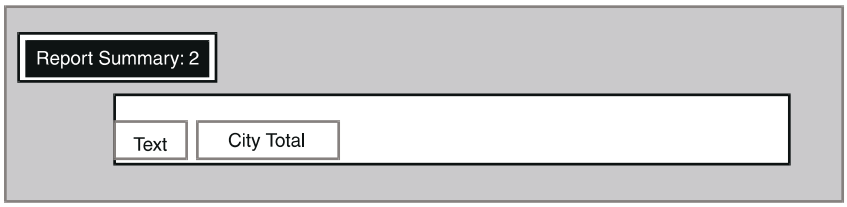
The report summary appears at the end of the report. It typically includes grand totals and descriptive conclusive information about the data contained in the report.

Suppose you want to total the dollar sales for all of the cities contained in your report. You would add a report-level calculation (for City Total in the following example) in the Sort/Calculation window.

Report headers and footers are not displayed on the Report Summary page.



The column is added to the **Add Column** menu in the Report Layout window. You would then place the column in the Report Summary area.

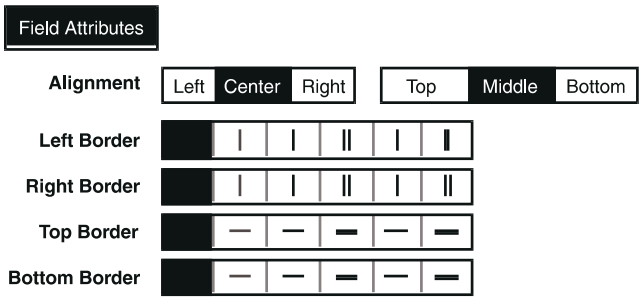


To create a report summary:

1. Open the Report Summary work area.
2. Add the information you want to appear at the end of the report by adding the appropriate column to the Report Summary work area.

Formatting Fields

The Field Attributes panel allows you to specify the position of the contents of a field and add a border around a field.



An additional choice for the **Alignment** field, **Decimal**, appears for numbers. Select **Decimal** to align columns of numbers according to the position of the decimal point.

To format your page header, for example, so that the text is centered within the field, and add a border, you would use the fields in the Field Attributes panel.

To format a field in the report:

1. Select a field and open its options window.
2. Click on the **Field Attributes** toggle button to open the Field Attributes panel.
3. Select the alignment and type of border for the field.

Hiding Field Borders

You may want to hide the field borders in the Report Layout window to see how the report looks when it is generated.

To hide the field borders, click on the **Hide Field Borders** button in the Report Layout window header. The field borders disappear, and the button changes to **Show Field Borders**.

To display the field borders in the window again, click on the **Show Field Borders** button.

Adding Columns to a Report

You can add columns that were copied into the Layout tool or created in the Sort/Calculation window to your report.

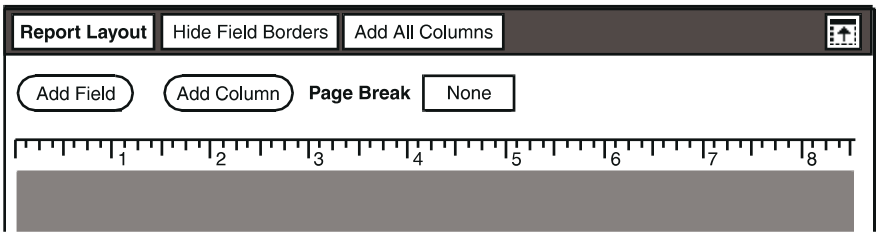
There are two ways to add columns to a report:

The **Add All Columns** button places all of the columns depicted in the Sort/Calculation window into the Data work area.

The **Add Column** button allows you to select specific data columns to place in the Data work area.

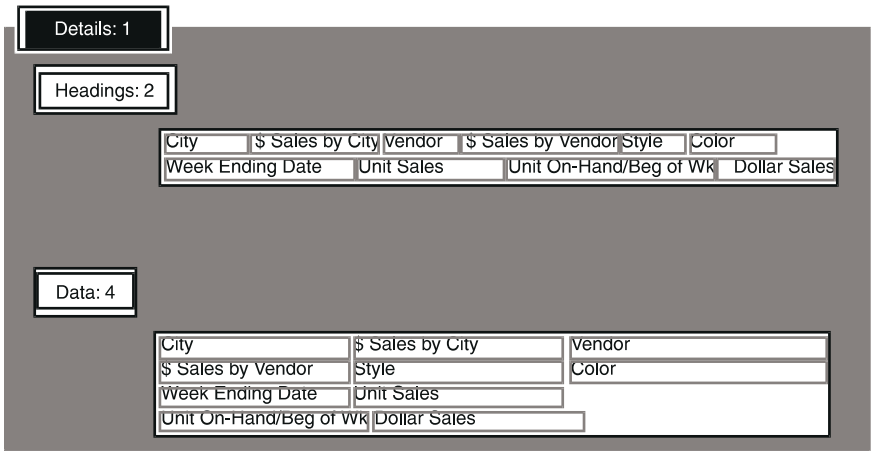
Using the Add All Columns Button

The **Add All Columns** button appears in the Report Layout window header if you have not yet added any columns to the report using the Quick Report window or the **Add Column** button.



To place all of the columns into the Data work area of the report, click on the **Add All Columns** button.

The columns appear in the Details Data work area and their headings appear in the Details Headings work area. In both work areas the columns are wrapped, as shown in the following illustration.



Using the Add Column Button

The **Add Column** button is located at the top of the Report Layout window.

To select specific data columns to add to the report:

1. Click on the **Add Column** button and hold down the mouse key.
2. Select a column from the menu, and lift your finger off the mouse key.

   The pointer changes into a bucket.
3. Click in the Data work area where you want to place the column.

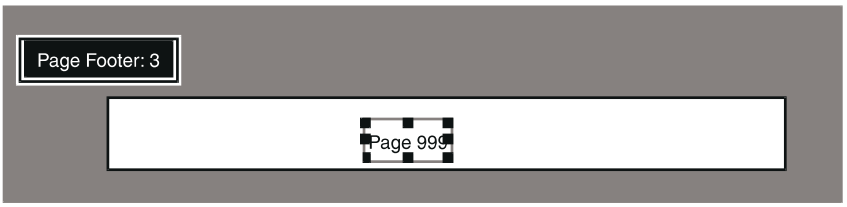
   The column appears in the Data work area and its heading appears in the Headings work area.

Once you add a column to the Details area using the **Add Column** button, the **Add All Columns** button disappears.

Manipulating Fields and Columns in a Work Area

Once a field or column is placed in a work area, it can be selected, moved, and sized similar to the way you manipulate a window on the desktop.

To select a field or column in a work area, click on or inside the border. Handles appear on the sides and corners of the border.



Resizing Fields and Columns

When you generate your report, there may be a field or column that is not wide enough to display its contents. A gray area, instead of the data, appears in the report. You can resize the column so that the contents are displayed.

To resize a field or column:

1. Select the field or column.
2. Click and hold on one of the handles, and drag the handle until the border is the desired size.

Moving Fields and Columns

Use the following guidelines when moving fields and columns in the report:

You can only move fields and columns within a work area, not between work areas.

When you move a column in the Data work area, the associated heading in the Headings work area moves also. However, if you move the heading, the data column does not move.

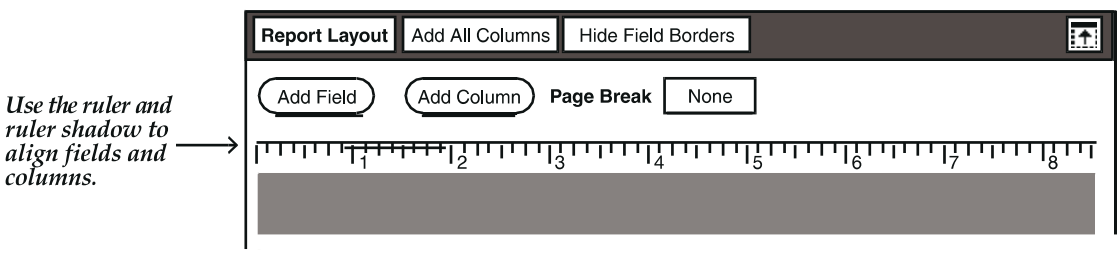
In general, you should move the data columns to their desired position before moving headings. If you move the headings first, you lose the vertical alignment of the data and its heading.

To move a field or column:

1. Select the field or column.
2. Place the pointer in the center of the highlighted field, and drag the field to the new location.

Aligning Fields and Columns Using the Ruler

The ruler at the top of the Report Layout window is a visual guide that provides feedback when moving fields within work areas. The ruler's units can be inches or centimeters, depending on the settings in the Set Preferences window in the IDS Special menu. When you move a field, a *ruler shadow* appears on the ruler to indicate the current position of the field in the work area.



Specifying Page Breaks

The **Page Break** field allows you to specify where page breaks occur in the report. By default, the Layout tool does not place automatic page breaks in a report. A report is, however, broken into pages when it is printed, but these page breaks are not an actual part of the report, and may not occur where you would like them. For that reason, it is recommended that you specify where to cause page breaks, such as after every data row or when the value of a sort column changes.

The sort columns, or break groups, in a report become the choices in the **Page Break** field. For example, using the report you built in “Specifying the Sort Order and Type” on page 19, the choices would be City, Vendor, Style, and Unit Sales.

Suppose you want to start a new page every time the data for a different city is displayed. You would select City in the **Page Break** field.

If you want to start a new page after every unique data row, you would select the **Data Row** choice in the **Page Break** field.

Chapter 7. Formatting a Report

By default, the report uses the format characteristics set in the Layout Options window. You can set specific formats for a column or field using individual options windows.

This chapter describes how to format:

- Work areas
- Column headings
- Data

This chapter also describes how to:

- Set special cases for data
- Hide data
- Cancel changes

Formatting Work Areas

The Report Layout window allows you to format each work area of a report. Each work area that contains at least one line has its own options window in which you can set the height, space above and below, and borders of a work area, and specify whether or not the work area appears in the printed report. Formatting options are explained in the following sections.

Specifying the Space Around a Work Area

You can specify the space above and below a work area to add white space to your report.

For example, suppose you want to format the page header work area in your report so that there is 0.5 inches of space separating it from the surrounding work areas. You would make the appropriate selections in the Page Header Options window.

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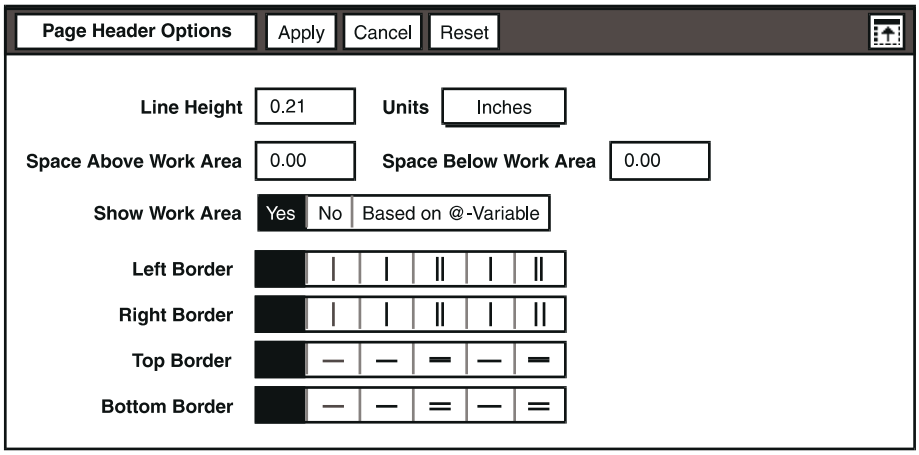


To add space around a work area:

1. Select a work area and open its options window. For example, select the Page Header work area, and open the Page Header Options window.

   The setting of the **Line Height** field is dependent on the font and font size you have selected, but you can change the value for a more compact or more open appearance. The **Units** field shows the measurement system being used, Inches or Centimeters; you can change this setting also, if desired.

2. Enter a new number in the **Space Below Work Area** field.

   For this example, set the **Units** field to inches and type a .5 in the **Space Below Work Area** field.

3. Click on the **Apply** button or close the Page Header Options window.
4. Click on the **Update Report** button to apply the changes to your report.

Alternatively, you can leave blank lines in the work area.

Adding a Border Around a Work Area

You can add a border to a work area to emphasize it in a report.

For example, suppose you want to enclose the title of the report with a border. You would make the appropriate selections in the Title Page Options window.

To add a border around a work area:

1. Select a work area and open its options window. For example, select the Title Page work area, and open the Title Page Options window.
2. Select a choice in one or more of the **Border** fields.
3. Click on the **Apply** button or close the Title Page Options window.
4. Click on the **Update Report** button to apply the changes to your report.

Adding a Row Separator

The **Row Separator** field, which is the last field in the Details Data Options window, allows you to specify a row separator to display between each row of unique data in the report.

For example, suppose each row of your detail data is defined by a new value in the column, and you want to draw a line between each row. You would specify a row separator in the Data Options window.

To display a row separator:

1. Select the Data work area and open the Data Options window.
2. In the **Row Separator** field, select a line to use as a separator.
3. Click on the **Apply** button or close the Data Options window.
4. Click on the **Update Report** button to apply the changes to your report.

New York	Retail	$ Sales	% of Total	$ Begin OH	% of Total	Sell Through	Units Received
Spirit Half-Moon							
Burgundy	21.75	174	16.67	2,958	27.04	5.88	0
Red	21.75	175	16.67	2,849	26.04	6.11	0
Royal	21.75	348	33.33	2,588	23.66	13.45	0
Silver	21.75	348	33.33	2,545	23.26	13.68	0
Total for Half-Moon		1,044	100.00	10,940	100.00	9.78	0

Specifying the Location of Column Headings

By default, the column headings appear in the page header. You can specify that the column headings display at the top of the detail data of the report in either the Data Options or Headings Options window.

To display the column headings in the top of the detail data:

1. Select the Heading or Data work area, and open the options window.
2. In the **Column Heading Location** field, select **Break Before Detail Data**.
3. Click on the **Apply** button or close the options window.
4. Click on the **Update Report** button to apply the changes to your report.

The settings in the Heading Options window override the settings in the Data Options window.

Formatting Headings

The Column Heading Options window allows you to change the label, font style, font size, appearance, and field formats of a column heading.

Changing a Column Heading Label

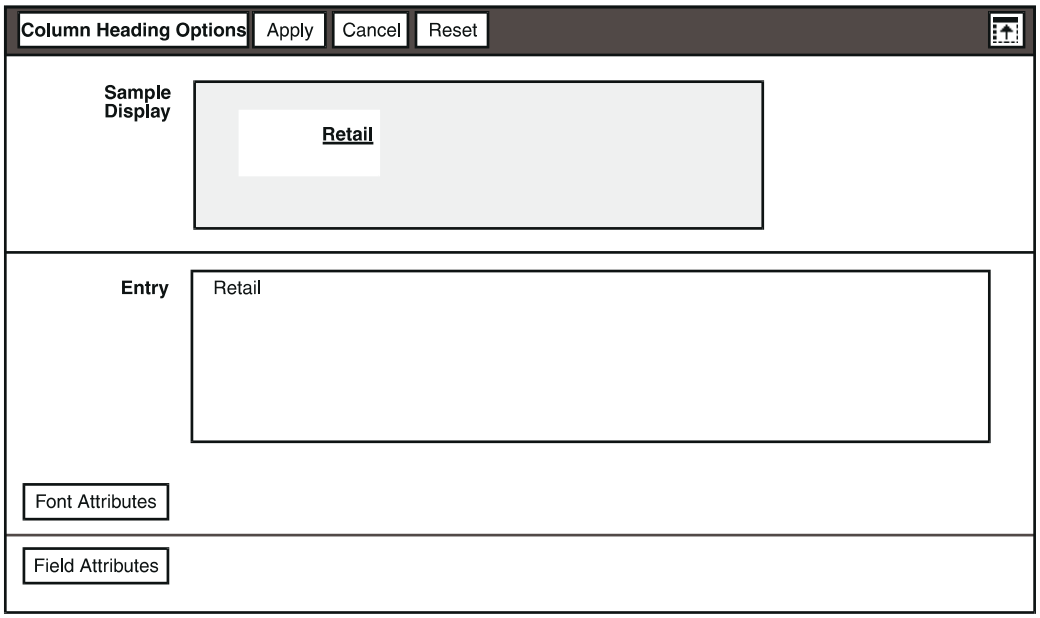
You can change a column heading in the report to a label that is shorter or possibly more descriptive than the name from the source icon.

To change the column heading label:

1. Select a column heading in the Headings work area.
2. Open the Column Heading Options window.
3. Type the new label in the **Entry** field.

   The **Sample Display** field reflects the new label.

   The **Sample Display** field is a read-only field. Use the **Entry** field to enter and edit the column label.



4. Click on the **Apply** button or close the Column Heading Options window.
5. Click on the **Update Report** button to apply the changes to your report.

Hiding a Column Heading

You can hide a column heading without deleting it from the Heading work area using the Data Column Options window.

To hide the column heading:

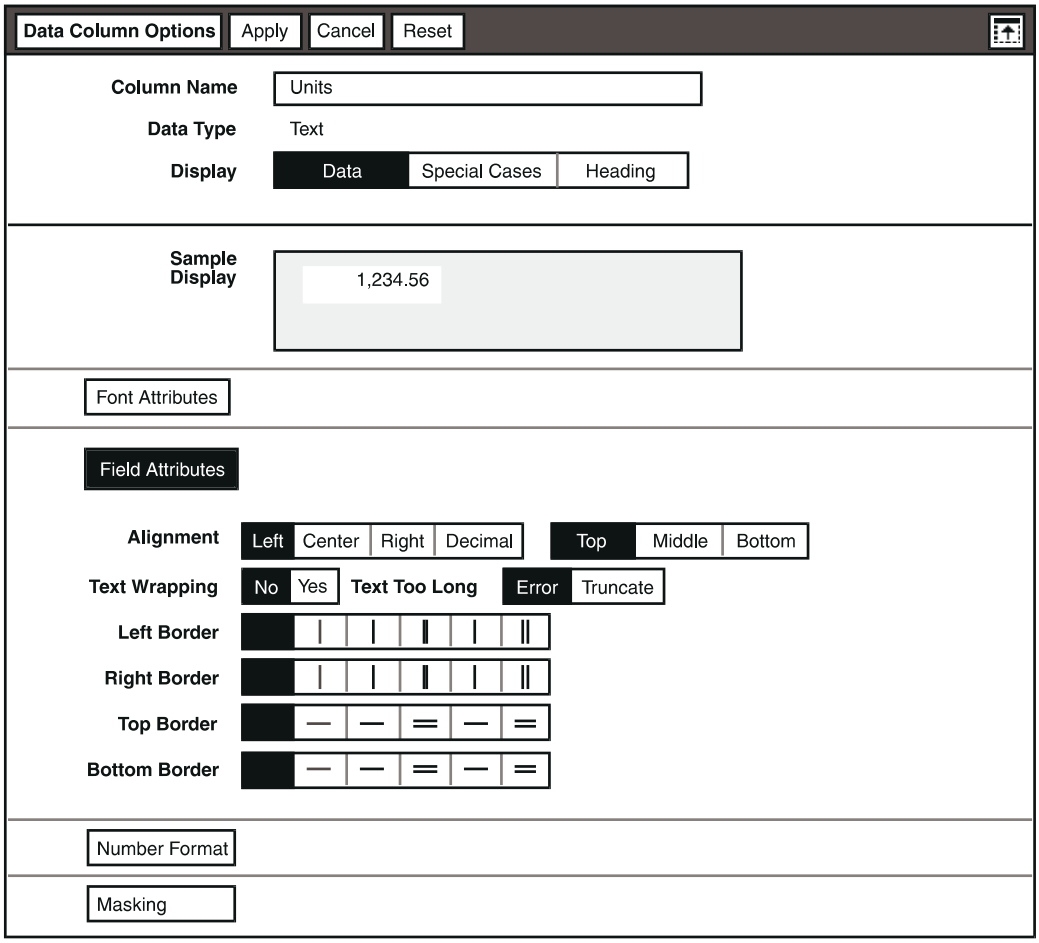
1. Select a column in the Data work area and open the Data Column Options window.
2. In the **Display** field, select **Heading**.
3. In the **Column Heading** field, select **No**.
4. Click on the **Apply** button or close the Data Column Options window.
5. Click on the **Update Report** button to apply the changes to your report.

To display the heading in the report again, select **Yes** in the **Column Heading** field.

You can also use the Heading page of the Data Column Options window to enter a new heading label in the **Entry** field, and format the column heading.

Specifying the Appearance of Lengthy Data

The Field Attributes panel allows you to specify how data in the report appears if the field is not large enough to show it all.



To wrap lengthy data:

1. Select a column in the Data work area and open the Data Column Options window.
2. In the **Text Wrapping** field, select **Yes**.

   The **Adjust Height** choice appears in the **Text Too Long** field.
3. Select the appropriate choices in the **Text Too Long** and **Text Wrapping** fields, using the following table for guidelines.

Text Wrapping	Text Too Long	Results if the data is too long
No	Error	Data appears as a gray bar.
No	Truncate	Data is truncated.
Yes	Error	Data appears as a gray bar.
Yes	Truncate	Data is truncated at a word.
Yes	Adjust Height	Field height adjusts to accommodate the data.

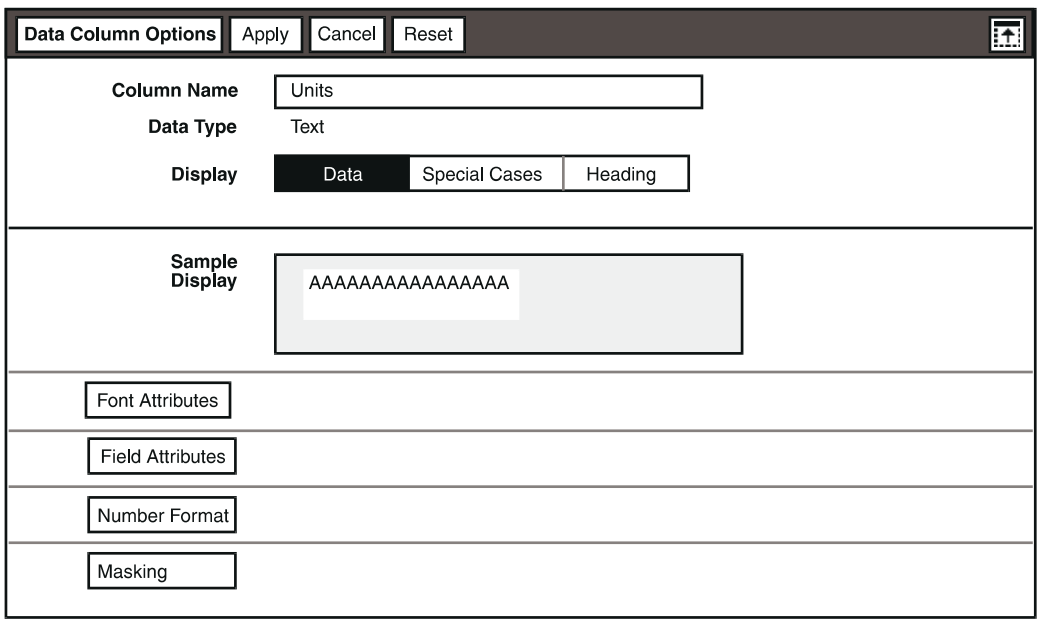
4. Click on the **Apply** button or close the Data Column Options window.
5. Click on the **Update Report** button to apply the changes to your report.

Formatting Data

In addition to the Headings page, discussed in “Hiding a Column Heading” on page 72, the Data Column Options window has two pages that allow you to format the data in a column:

The Data page provides panels for changing the font and field attributes, and for specifying a mask for the data.

The Special Cases page allows you to change the appearance of data that meets a specified condition, as described in “Setting Special Cases” on page 76.



Using the Data Page

The Data page contains a variety of fields and panels that you should already be familiar with:

The **Column Name** field displays the current name of the column. This label can be changed, as discussed in “Changing a Column Heading Label” on page 71.

The **Data Type** field shows the data type of the column, and cannot be changed.

The **Show Value on First Occurrence Only** field appears only if the selected column is a sort column and has been placed in the Details area. This field allows you to hide data, and is discussed in “Hiding Repeated Rows of Data” on page 84.

Other panels appear in the Data page depending on the data type of the column selected. For example, if the column contains numbers, the Number Format panel also appears in the window. For information about these formatting options, see “Setting Global Formats” on page 9 and “Formatting Fields” on page 63.

The Masking panel, described in the next section, allows you to change the way some data displays by applying a *mask* to the data.

Specifying a Mask for the Data

You can specify that certain data is to be displayed differently than it is stored by defining a mask. For example, suppose your report contains handbag style numbers that you want to display with a hyphen following the first number. The **Mask** field in the Masking panel allows you to enter a series of characters as a symbolic representation of the pattern in which you want the data to be displayed. One of the characters is designated as a place holder, to be replaced by the data. Other characters are displayed as part of the data, although they are not actually contained in it.

To create a mask for data in the report:

1. Select any data column in the report.
2. Open the Data Column Options window.
3. Click on the **Masking** toggle button to open the Masking panel.
4. In the **Use Mask** field, select **Yes**.

   The **Mask** and **Character to Replace** fields appear.

5. In the **Mask** field, enter a pattern.
6. In the **Character to Replace** field, specify the character you are using to create the mask.
7. Click on the **Apply** button or close the Data Column Options window.
8. Click on the **Update Report** button to apply the changes to your report.

Table 3 gives some examples of data and the effects of various masks.

Table 3. Effects of masks on data

Data	Mask	Character to Replace	Results
123456789	XXX-XX-XXXX	X	123-45-6789
123456789	XXX-XXX	X	123-456
123456789	000xxx	x	000123
John Smith	Mr. *	*	Mr. John Smith
12.45	xx-xx	x	12-.4

You can turn off the mask format at any time by selecting **No** in the **Use Mask** field. If you decide you want to use a mask again, select **Yes**. If you select **No**, the settings are retained until you close the icon.

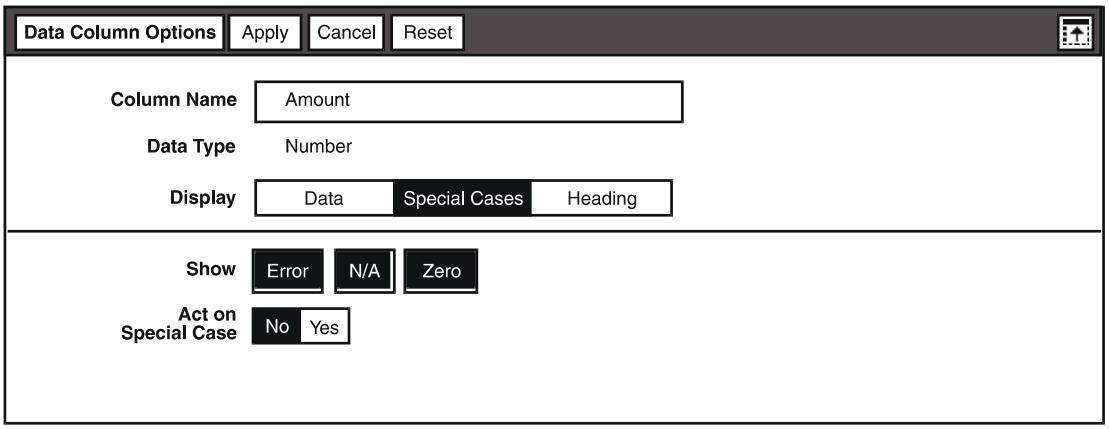
As you can see from Table 3, the asterisk character can be used to insert all the data in a field. Otherwise, if you specify fewer characters in your pattern than are in the data, the data is truncated.

Setting Special Cases

You can choose not to display data containing the values Error, N/A, or zero, and can change the appearance of data that meets a specified condition by making the appropriate selections in the Special Cases page. For example, you might want to display the dollar sales over 130,000 in bold typeface. Special cases can be set on any column in the report, including calculations. Settings in the Special Cases page override the settings in the Layout Options window.

To display the **Special Cases** controls:

1. Select a data column in the Report Layout window, and open the Data Column Options window.
2. Select **Special Cases** in the **Display** field.



3. Decide whether to display data values in your report for source data that is either Error, N/A, or is a zero. Clicking on the choice boxes toggles the display of this type of data on or off. The default is for all three to display in the report. The zero choice is not displayed for non-numeric columns.
4. Select **Yes** in the **Act On Special Case** field.

   Fields for setting special cases appear, as shown in Figure 7.

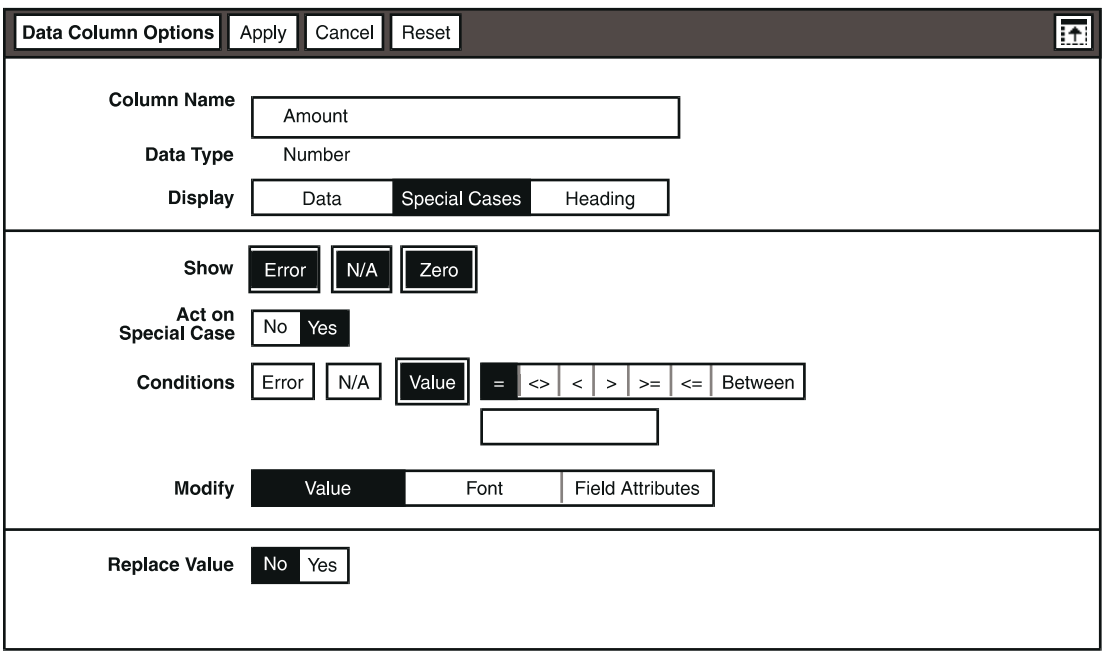


Figure 7. Special Cases fields

At this point, you can:

Specify the column values you want handled as a special case

Specify replacement value and the type of formatting to be applied to the special cases

Specifying the Data

You specify the column values in your report that you want to format differently. You can specify more than one condition as a special case (such as N/A, Error, or Zero values), but you cannot use a different appearance for each condition. For example, if you want both N/A values and values under 1000 to be handled as special cases in the same report, they would both have the same format, such as bold.

The default condition is **Value**, which allows you to specify the value or values to format in the report. The operators only appear when **Value** is selected. You can also direct the Layout tool to format Error and N/A values in the report.

To specify the values to format:

1. In the **Conditions** field, select the data type (**Error** or **N/A**) or values you want to format.
2. If you leave **Value** selected, select an operator.
3. Enter the appropriate value in the field provided.

The operator you select determines the fields that appear. Table 4 outlines each operator and its function.

Table 4. Special cases operators

Operator	Formats values
=	Equal to the value entered
<>	Not equal to the value entered
<	Less than the value entered
>	Greater than the value entered
<=	Less than or equal to the value entered
>=	Greater than or equal to the value entered
between	Within the range of values entered, inclusive

When you select the between operator, two unlabeled entry fields appear beneath it, allowing you to specify a value range. Use the topmost field to enter the beginning value and the field beneath it to enter the ending value. When you use the between operator, the Layout tool applies the format you chose to data that is inclusive of the values specified in the entry fields. For example, if you set the options in the Special Cases page as shown in the following illustration, the Layout tool would apply the format to those dates within the period ranging from March, 1994 through December, 1994.

You can also enter @-variables into the operator fields. For more information see “Using Layout in a Capsule Application” on page 92, or the *Capsule User's Guide*.

Specifying the Format

You can change any combination of the value, font, and field attributes for the data you specify. Special cases settings only affect the way that the data appears in the report. The original values are still used when calculations are performed with the Layout tool.

To specify how you want the data to appear in the report, select one or more choices in the **Modify** field (the choices are not exclusive). Use the following table for guidelines.

Select	To change
Value	The value of the data as it appears in the report
Font	The font and size of the data
Field Attributes	The position of text within the field and the field border

Changing Values

Suppose you want to change N/A values to zeros in the following report.

New York	Retail	$ Sales	% of Total	$ Begin OH	% of Total	Units Received
Spirit - Half-Moon						
Burgundy	21.75	174	16.67	2,958	27.04	N/A
Red	21.75	175	16.67	2,849	26.04	N/A
Royal	21.75	348	33.33	2,588	23.66	N/A
Silver	21.75	348	33.33	2,545	23.26	N/A
Total for Half-Moon		1,045	100.00	10,940	100.00	N/A

You would specify that N/A values appear as zeros:

New York	Retail	$ Sales	% of Total	$ Begin OH	% of Total	Units Received
Spirit - Half-Moon						
Burgundy	21.75	174	16.67	2,958	27.04	0
Red	21.75	175	16.67	2,849	26.04	0
Royal	21.75	348	33.33	2,588	23.66	0
Silver	21.75	348	33.33	2,545	23.26	0
Total for Half-Moon		1,045	100.00	10,940	100.00	0

To change the value of specified data:

1. Select **Value** in the **Modify** field.

   The **Replace Value** field appears.

2. Select **Yes**.

   The **Display Text** field appears.

3. Type the text you want to display in the report in place of the specified value.

You can also enter @-variables in the **Display Text** field. See “Using Layout in a Capsule Application” on page 92, or the *Capsule User's Guide* for more information.

Changing Font Formats

Suppose you want to emphasize all sales data that is greater than $130,000 for each city by having this data appear underlined and in bold typeface in the report.

	Retail	$ Sales	% of Total	$ Begin OH	% of Total	Units Received
White Plains						
Sun Spot - V Flap						
Bronze	45.00	180	5.66	5,715	24.90	0
Burgundy	45.00	1,440	45.28	6,435	28.04	0
Navy	45.00	1,140	35.85	5,850	25.49	0
Sand	45.00	420	13.21	4,950	21.57	0
Total for V Flap		3,180	100.00	22,950	100.00	0
Total for Sun Spot		11,525		76,763		
Total for White Plains		1,044		**138,677**		

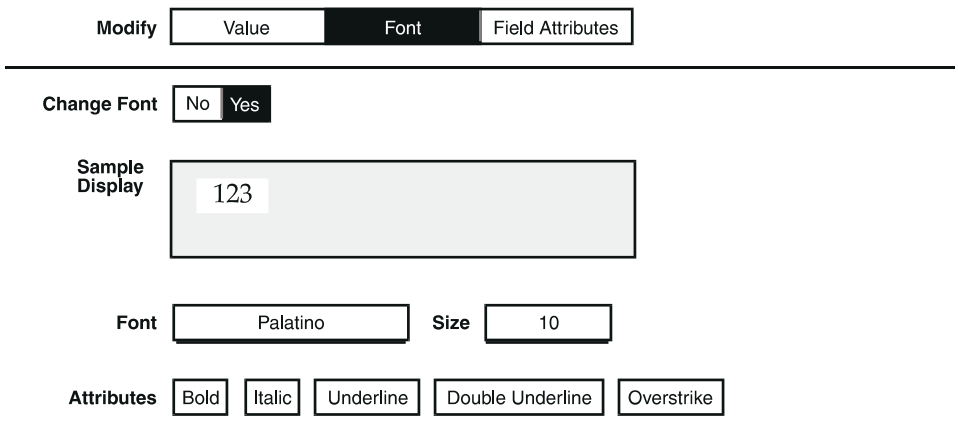
To change the font of specified data:

1. Select **Font** in the **Modify** field.

   The **Change Font** field appears.

2. Select **Yes**.

   Fields appear for formatting fonts.



3. Select the appropriate choices in the fields. For more information about changing the font formats, see “Formatting Text” on page 10.

Changing Field Attributes

Suppose you want to emphasize in your report handbags that make up less than ten percent of the total sales. You would specify that values under ten in the % of Total column appear with a border in the report.

White Plains	Retail	$ Sales	% of Total	$ Begin OH	% of Total	Units Received
Sun Spot - V Flap						
Bronze	45.00	180	5.66	5,715	24.90	0
Burgundy	45.00	1,440	45.28	6,435	28.04	0
Navy	45.00	1,140	35.85	5,850	25.49	0
Sand	45.00	420	13.21	4,950	21.57	0
Total for V Flap		3,180	100.00	22,950	100.00	0
Total for Sun Spot		11,525		76,763		
Total for White Plains		1,045		138,677		

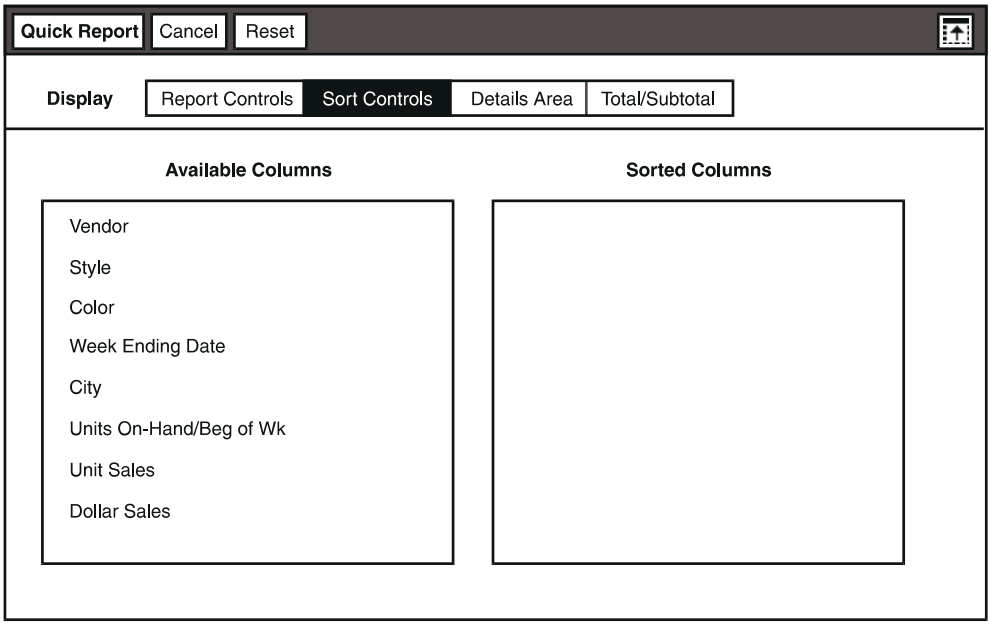
To change the field attributes of specified data:

1. Select **Field Attributes** in the **Modify** field.

   The **Change Field Attributes** field appears.

2. Select **Yes**.

   Several fields appear for changing field attributes.



3. Select the appropriate choices in the fields. For more information about changing the field attributes, see “Formatting Fields” on page 63.

To apply your formatting to the report:

1. Close the Data Column Options window or select **Value** in the **Modify** field.
2. Click on the **Update Report** button.

Overriding Global Formats in the Report

Formats you specify in individual options windows override the global formats in the report. You can return to the global formats specified in the Layout Options window by using the **Settings** field.

To specify the formats to be used:

1. Open the individual options window.
2. In the panel where you are setting the options, select **Specified Here** in the **Settings** field.

3. Specify the formats for the field or column.

4. Click on the **Apply** button or close the options window.

To return to the global formats:

1. Select **Global**.
2. Click on the **Apply** button or close the options window.

   If you select **Global**, any individual options you have set are lost when you close the Report Layout window.

Hiding Data

You can hide data in your report for:

An entire work area

Repeated rows of data

Error, N/A, and zero values

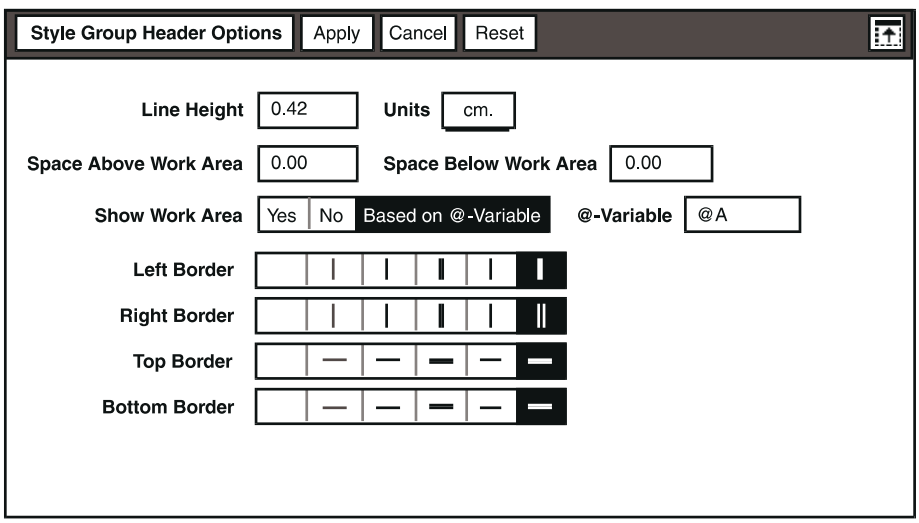
Hiding a Work Area

If you do not want to display sensitive or confidential information in a report, you can hide one or more work areas in the Report Layout window.

For example, suppose you have a report containing data for two different vendors, but you do not want to present the data for one vendor to the rival company. You would hide the Style Group Header work area that contains the Vendor-Style column.

To hide a work area:

1. Select a work area and open its options window. For example, select the Style Group Header work area, and open the Style Group Header Options window.



2. In the **Show Work Area** field, select **No**.
3. Click on the **Apply** button or close the window.
4. Click on the **Update Report** button to apply the changes to your report.

If you are using the Layout tool in a capsule application, you can conditionally hide a work area, based on whether a specified @-variable in the Capsule tool's User Input Control window has a value specified for it. That is, if the @-variable has a value, the work area is hidden; if the variable is left blank, the work area is displayed.

To hide a work area based on the contents of an @-variable:

1. Select a work area and open its options window.
2. In the **Show Work Area** field, select **Based on @-Variable**.

   The **@-Variable** field appears.
3. Enter an @-variable, such as @A in the field.
4. Click on the **Apply** button or close the window.

When you define a value in the **@A** field of the Capsule tool's User Input Control window and run the Capsule application, the work area is hidden.

For more information, see “Using Layout in a Capsule Application” on page 92.

Hiding Repeated Rows of Data

Sort columns in the report contain similar rows of data that are grouped together. When you place a sort column in the Details work area, repeated rows of data may appear in the report. You can specify that only the first occurrence of a repeated value appear in the report by hiding redundant grouped values.

To hide repeated rows of data:

1. Select a sort column in the Data work area and open the Data Column Options window.
2. In the **Show Value on First Occurrence Only** field, select **Yes**.
3. Click on the **Apply** button or close the Data Column Options window.
4. Click on the **Update Report** button to apply the changes to your report.

Hiding Error, N/A, and Zero Values

You can choose to hide error, N/A, or zero values, or any combination of the three in the Layout report. The values are still contained in the report even though they are hidden.

To hide error, N/A, or zero values in the report:

1. Select a data column in the Report Layout window, and open the Data Column Options window.
2. In the **Display** field, select **Special Cases**.

The **Show** field contains toggle buttons that you can turn on or off. You can select all, some, or none of these buttons. Clicking on a button that is not selected turns it on. Clicking on a selected button turns it off.

3. In the **Show** field, specify the values that you want to hide by clicking on the appropriate button to turn it off.
4. Click on the **Apply** button or close the Data Column Options window.

   The specified values are hidden in the report.

Canceling Changes

The **Cancel Changes** choice in the Special menu allows you to cancel changes made to a report.

You cannot use **Cancel Changes** to restore the window to its previous state if you saved your report by closing the Layout window. Once you close the Layout window, the changes are set.

To restore the report to the same state it had when last you opened it:

1. Select **Cancel Changes**.

The Layout window closes, and the report reverts to the last saved version.

If you select **Cancel Changes** and you have not saved the report by closing the Layout window, you cancel all changes and lose the entire report.

Chapter 8. Using Expert Features

Once you have created a report and become familiar with the Layout tool, you can begin to use its more advanced features.

This chapter describes how to:

- Add new data columns to a report
- Browse and constrain columns
- Clear data from the report
- Use Layout in a capsule application

Adding New Data Columns to a Report

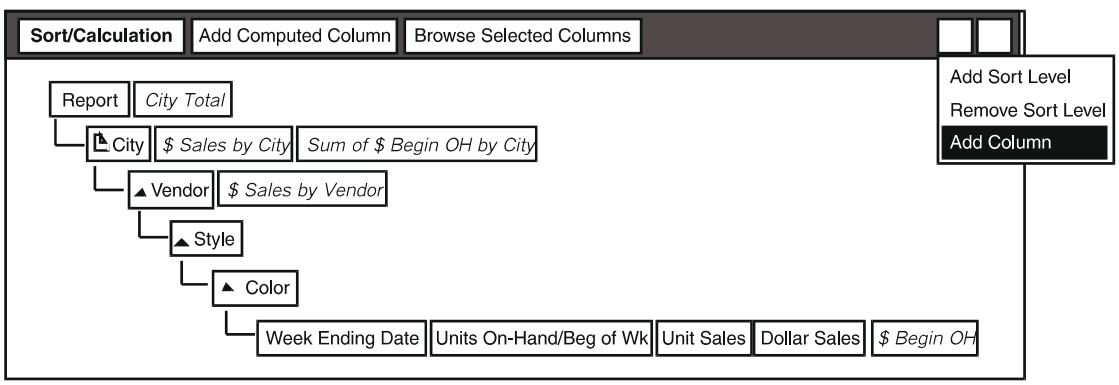
The Sort/Calculation window allows you to add new data columns to a report.

You may want to add columns when, for example, you want to copy data from a different source icon into a Layout tool that already contains data.

Suppose you have a report to which you want to add information about the current retail price of each handbag and the number of units received by each vendor. Simply copying the new data into the Layout tool would not produce the desired results; the Layout tool compares the new columns of data against those it already contains, and discards any for which it does not already have a definition. Therefore, to add the new price and unit data, you would create two new columns in the Layout tool before transferring the data into the tool.

To add a column to the data tree:

1. Open the Sort/Calculation window.
2. Select **Add Column** from the Special menu.



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The Data Column Options window automatically opens, as shown in Figure 8 on page 87.

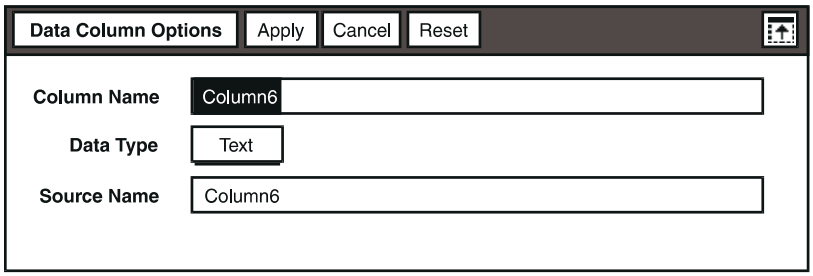
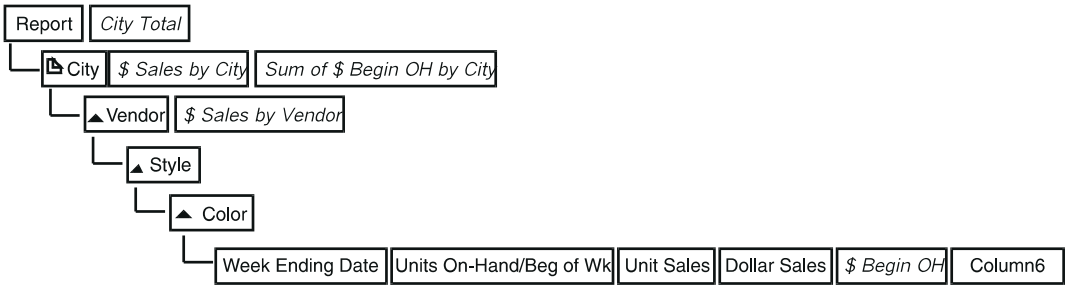


Figure 8. Data Column Options window

The new column is automatically added to the last row of columns in the window.

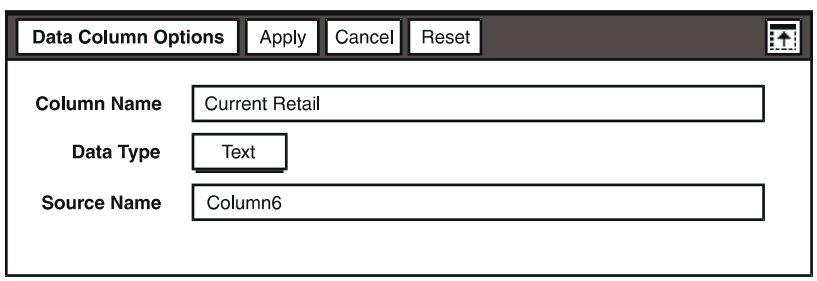


Naming the New Column

When you create a column, it has a generic name, which is shown in the **Column Label** field, Column6 in our example. You can rename the column with a meaningful name that identifies the data contained in the column.

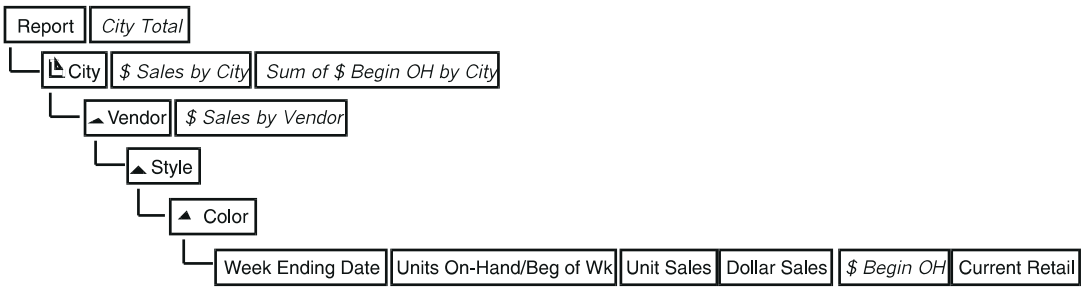
To rename the computed column:

1. Enter the new label in the **Column Name** field.



2. Click on the **Apply** button or close the Data Column Options window.

   The name of the column changes in the Sort/Calculation window.

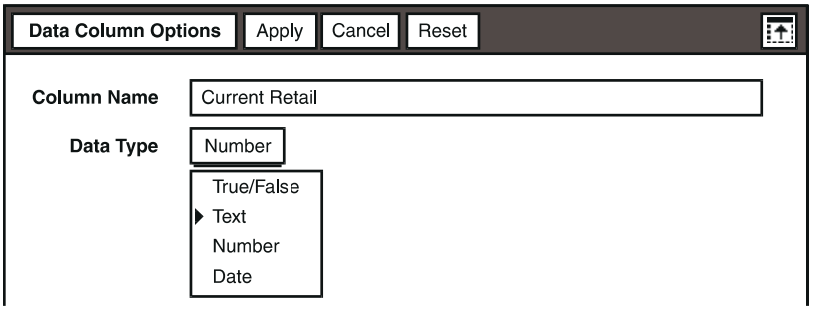


Specifying the Data Type and Source

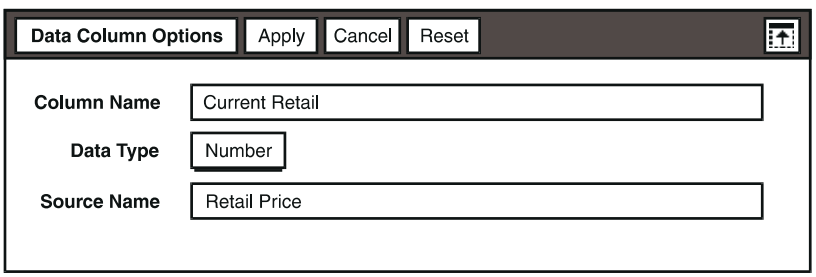
When you specify the data type and source for a column, you must match the data type and name of the column in the source icon.

To specify the data type and source for a column:

1. In the **Data Type** field, select the data type.



2. In the **Source Name** field, enter the name of the source column.



3. Click on the **Apply** button or close the Data Column Options window.

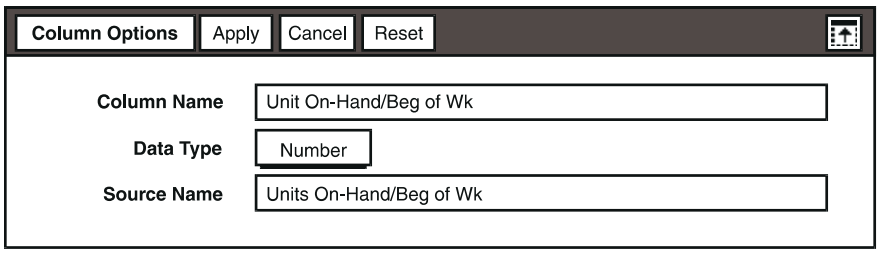
Changing the Label and Source of an Existing Column

You can change the column label and the source data used for a column in the Column Options window. When you first open a Column Options window, it displays:

The column label, which becomes the column heading when the report is generated

The data type of the column

The name of the column from the source that was copied into the Layout tool

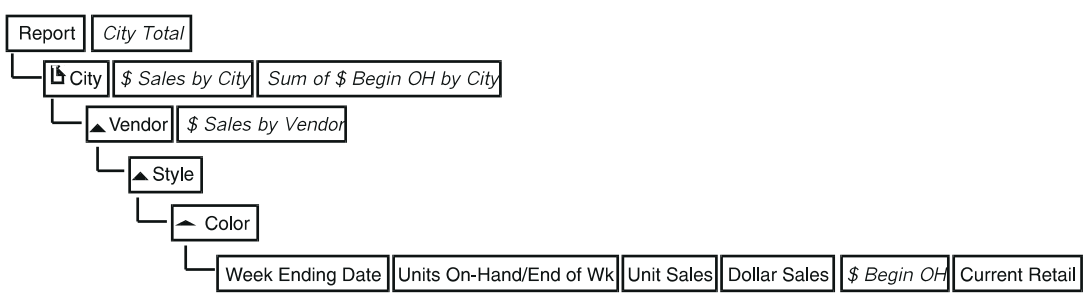


Suppose you want to re-use the formatting in an existing report for a source icon that contains similar data, except for one column that contains data about the inventory at the end of the week rather than at the beginning of the week. You would change the column label and source for the Units On-Hand/Beg of Wk column.

To change a column label and source:

1. Select a column in the Sort/Calculation window, and open the Column Options window.
2. In the **Column Name** field, type in the new column label.
3. In the **Source Name** field, type in the name of the new source column. The name must match the name of the source column exactly.
4. Click on the **Apply** button or close the window.

   The Sort/Calculation window reflects the new name for the column.



You can now transfer new source data to the Layout tool.

Changing a column label does not automatically change any associated column heading, because the headings are set when the data is originally copied into the tool. To change a heading, you must also explicitly change the heading using the Report Layout window. The data column's name is automatically changed in the Report Layout window to reflect the new source column name.

Once you add a new column, the Layout window changes and a clean display area appears. Additionally, the **Update Report** button disappears from the window.

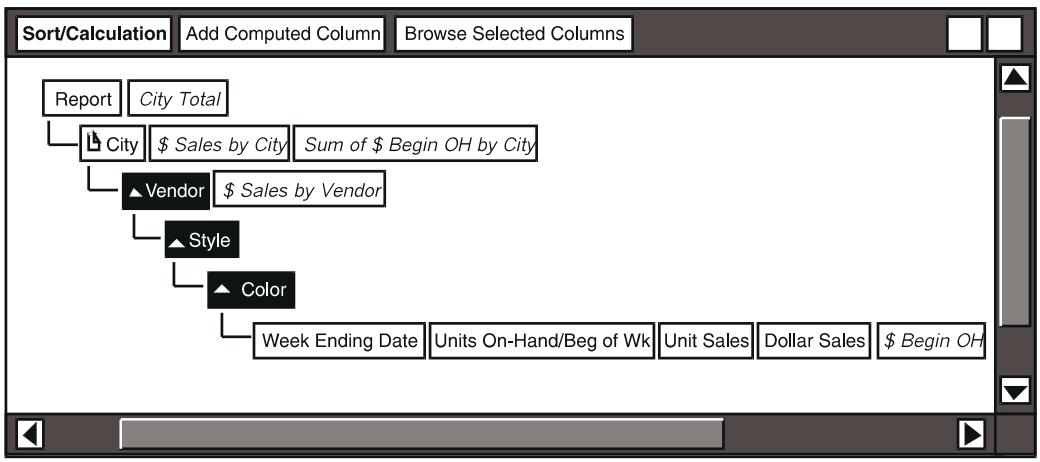
Browsing and Constraining Columns

When you copy new data into a Layout tool, you might not know the type and range of data that each column contains. You also might need to see the range of data values to choose any special case values. You can display the contents of any column by browsing it in the Sort/Calculation window. When you browse a computed column, formula results are displayed in the Browse window.

For example, suppose you want to find out what styles and colors of handbags are available from each vendor. You would use the Browse window to quickly find out the information, instead of opening the source icon.

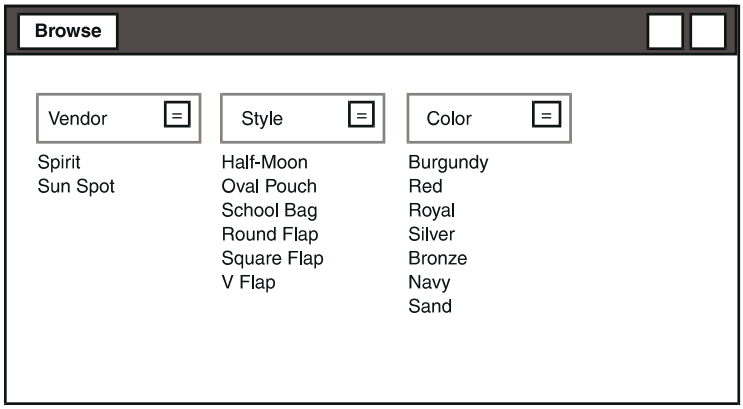
To browse and constrain a specific column or columns:

1. Select one or more columns in the Sort/Calculation window. In this example, you would select the Vendor, Style, and Color columns.

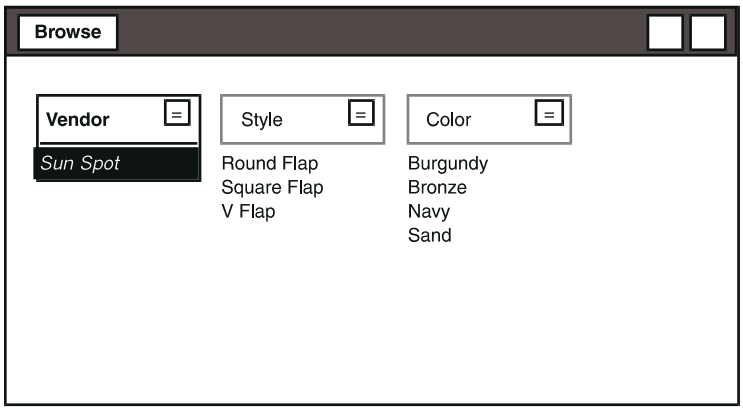


2. Click on the **Browse Selected Columns** button.

   The Browse window opens displaying the data contained in the columns.



3. Select on an item to constrain the column. For example, select Sun Spot and then Vendor to collapse the columns so that they show only the styles and colors available from the Sun Spot company.



To remove the constraint from a column, select the constrained item.

All of the data appears in the Browse window.

Clearing Data from the Report

The **Clear Data** button removes all the data from your report without affecting the layout and formats specified in the Sort/Calculation and Report Layout windows. The **Clear Data** button is useful if you want to use the same report settings for different sets of data. It is also useful when you are sending applications using electronic mail, because it reduces the size of the Layout tool, making the electronic transfer faster.

To remove data from your report without affecting the layout and formats:

1. Click on the **Select All** button.
2. Click on the **Clear Data** button to remove the data from the report.

If you inadvertently clear the data from your report and you have not closed the Layout icon, you can recover your data by selecting **Cancel Changes** from the Special menu. When you select **Cancel Changes**, the Layout icon closes. All changes you made since the last time you closed the icon are lost.

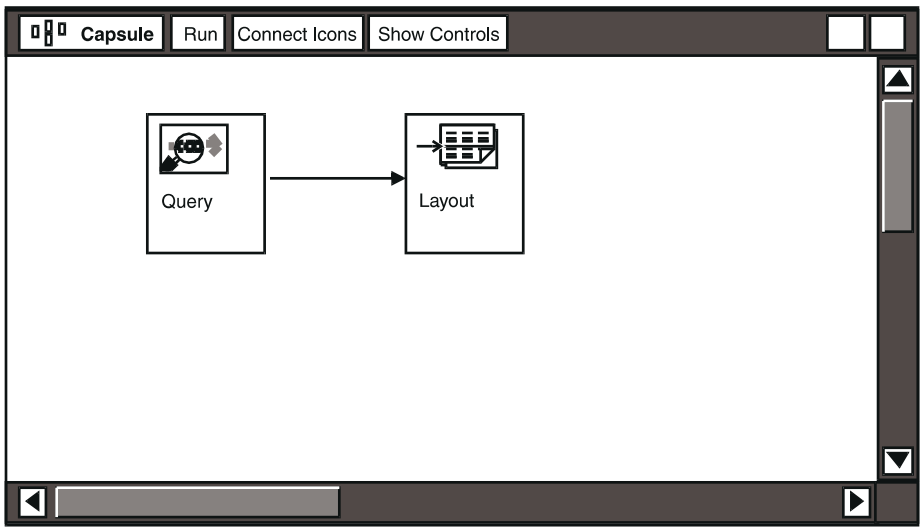
Using Layout in a Capsule Application

Within a capsule application, data is automatically transferred from icon to icon. The Layout tool can be used in a capsule application with other tools to easily update your report on a periodic basis. For example, if you create a report for monthly sales figures, you can update the source icon monthly, but always use the same report.

To use the Layout tool in a capsule application:

1. Copy a previously formatted Layout icon into the capsule window or format an icon in the Capsule tool.
2. Copy the source icon into the capsule window.
3. Connect the source icon to the Layout icon.
4. Click on the **Run** button in the capsule window header.

The following illustration shows a Query icon as the source and a Layout icon as the destination in a capsule application.



When you use the Layout tool in a capsule application, you can use @-variables with assigned values in the Capsule tool's User Input Control window to constrain data in

the query, and generate titles and headings for reports. The Layout tool automatically retrieves the @-values when data is transferred to it and when you click the **Update Report** button. See the *Capsule User's Guide* for information about defining @-variables.

You can also use @-variables in such areas in the report as the report title, or as column headings.

Using @-Variables in a Report Title

You can use @-variables in your report title by entering the @-variable in a text field in the Title Page work area.

For example, suppose you specified a report title similar to:

Sales Report for @A

If you had logged on as Smith and set the @-variable in a spreadsheet or capsule application as @A=@USER, your report title would appear as:

Sales Report for Smith

Using @-Variables in Column Headings

You can use @-variables in column headings also, by entering them in the Data Column Options or Column Heading Options windows.

Layout Output

You can export the Layout report to your PC desktop by using the Rich Text Format (RTF) file format. This format supports Text Box Format due to free-form placement in the Layout tool. You cannot import RTF format into the Layout tool.

Appendix A. Troubleshooting

Creating a report with the Layout tool can produce unexpected results. This chapter lists some of the more common problems you may encounter and provides solutions and recommendations.

This chapter does not cover all possible situations that could affect your report. If the problem you are experiencing is not listed here, or if a recommendation does not seem to work, contact your system administrator. For more detailed information about error messages, see *Messages and Codes*, or ask your system administrator.

The problems described in this chapter are arranged according to the task you are performing:

- Copying data into the Layout tool
- Sorting data
- Displaying data in a report
- Creating work areas in a report
- Formatting reports

Copying Data into Layout

Problem: The Layout tool does not accept the data.

Suggestion: Ensure that the first row of data in the source icon does not contain numeric data. Use these guidelines:

- The first row of data must contain alphanumeric characters.
- Each column heading must be unique.

These requirements are discussed in “Acceptable Types of Data” on page 6.

If you add new columns and copy the data into the tool, you need to explicitly add the columns to the report, as described in “Adding New Data Columns to a Report” on page 86.

There is a limit of 64K rows for input data and 64K of items that are unique. Each unique value in a cell creates a new item.

Sorting Data

Problem: When I move a computed column to a different sort level, an arrow appears in the Sort/Calculation window.

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Suggestion: The arrow indicates that a double-pass calculation is performed on the computed column it is pointing to, as discussed in “Double-Pass Calculations” on page 38.

Displaying Data

Problem: Quick Report wraps details columns.

Suggestion: Because the default width of your report, set in the Printing Controls window, allows only a certain number of fields to be displayed on a line, you should make the fields narrower and move them to fit across the line.

Problem: The default titles, page numbers, and runtime dates do not fully display in the Quick Report.

Suggestion: Modify the width of the fields or the fonts used to display the fields in full.

Creating Work Areas

Problem: I cannot add a column to a group header or footer.

Suggestion: Ensure that the column is at the same or lower sort level than the break group.

Formatting Reports

Problem: The position of my column titles changed when I moved data columns.

Suggestion: Always move the data columns first. The corresponding column titles move along with the data, but moving a column title does not move the data columns associated with it.

Appendix B. Building Blocks for Calculations

The Layout tool includes predefined building blocks to help you create formulas that perform aggregate, date and time, and string calculations on the data you specify. Formulas are contained in computed columns within the report. You can combine these building blocks to perform complex tasks, such as turning a date or a number into a string, finding a substring of that converted string, and based on the results of that operation, you can use other functions to generate a result.

The Layout tool provides the following building blocks for calculations:

Operators

Miscellaneous and logical functions

Aggregate and running aggregate functions

Date and time functions

String functions

This appendix describes each of the operators and functions provided by the Layout tool, including syntax and examples.

In syntax examples, the following conventions are used:

Braces (**{ }**) denote optional text. Do not type the braces.

Slanted type denotes variables. Substitute your own values for variables.

The variable *period* refers to a time span. Substitute the appropriate period from the **Periods** menu.

Operators

You can build formulas by combining operators (such as +, -, *, and /) with values to produce a new value in the computed column containing the formula, for example:

([dollar sales]/sum of [$ sales] 1 .)

If you use more than one operator in a formula, the order of calculations is based on the precedence level assigned to each operator. The table below lists the operators from top to bottom in the order of decreasing precedence level. For example, multiplication takes precedence over addition. Operators of equal precedence are evaluated from left to right. You can override operator precedence by placing part of a formula in parentheses. For example, (1+2)*3 results in 9 because expressions in parentheses are evaluated first.

The Layout tool uses the following arithmetic, relational, and logical operators:

Arithmetic operators: + (addition), - (subtraction), * (multiplication), / (division).

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Relational operators: =(equal), <> (not equal), > (greater than), < (less than), >= (greater than or equal to), <= (less than or equal to). These operators work with any of the data types.

Logical operators: and, not, or.

Operator	Description
***,** /	Multiplication, division
+, -	Addition, subtraction
=, <>**,** > **=,** < **=,** >**,** <	Relational operators
and, not, or	Logical operators

Operators are located in the **Operators** menu. Table 5 on page 98 lists the relational and logical operators in the **Operators** menu and provides syntax examples and brief descriptions.

Table 5. Relational and logical operators

Operator	Example	Description
=	[SalesTax]=[Discount]	A relational operator that returns True if the arguments are equal; otherwise returns False.
<**=**	[UnitSales]<=10,000	A relational operator that returns True if the value of the argument on the left side is less than or equal to the value of the argument on the right side; otherwise returns False.
>**=**	[DollarSales]>=250,000	A relational operator that returns True if the value of the argument on the left side is greater than or equal to the value of the argument on the right side; otherwise returns False.
<	[RegionSales]<[TotalSales]	A relational operator that returns True if the value of the argument on the left side is less than the value of the argument on the right side; otherwise returns False.
>	[SubTotal]>[RunTotal]	A relational operator that returns True if the value of the argument on the left side is greater than the value of the argument on the right side; otherwise returns False.
and	([UnitSales] > 10,000 and [UnitSales] < 20,000)	A logical operator that returns True if both arguments in the statement are true and False if either argument in the statement is false.
not	not([Discount]>[Total])	A logical operator that returns True if the argument is false and False if the argument is true.
not=	[Discount]not=0	A relational operator that returns True if the arguments are not equal; otherwise returns False.
or	([UnitSales] < 10,000 or [UnitSales] > 100,000)	A logical operator that returns True if either argument in the statement is true, and False if both arguments in the statement are false.

Using Miscellaneous and Logical Functions

The **Operators** menu also contains special-use values and the logical function IF. Table 6 on page 99 lists the other functions in the **Operators** menu and provides syntax examples and brief descriptions. Detailed information about the IF function follows.

Table 6. Miscellaneous functions

Special-use values	Example	Description
ascend	rank([UnitSales], [Region], ascend)	Can be used with the RANK function to create a new column of data that ranks a sort column in relation to a specified column from smallest to largest.
descend	rank([UnitSales], [Region], descend)	Can be used with the RANK function to create a new column of data that ranks a sort column in relation to a specified column from largest to smallest.
error	if([InvNum]=error, 0, [InvNum])	Can be used in an IF statement as an argument that returns the value False.
false	if(8>10,true, false)	Can be used in an IF statement as an argument that returns the value False.
if	if([Amount]>[SalesTax], [Discount]+ [Total], [RunTotal+[Total])	Evaluates a condition and returns one of two specified values depending on whether the condition is true or false.
na	if([UnitSales]=na,0,[UnitSales])	Returns True if a specified column contains an N/A value; otherwise returns False.
true	if(8<10,true,false)	Can be used in an IF statement as an argument that returns the value True.

If — Evaluating Conditional Statements

Use the IF function to construct conditional formulas. Conditional formulas resolve to one of two values determined by whether the results of the argument(s) are true or false. You can also use conditionals to evaluate text strings and dates.

For example, the formula if([City Total]>=1 , .1, .2) returns 0.1 if the value of the City Total column is greater than or equal to 10,000; it returns 0.2 if the value of the City Total column is less than 10,000.

Syntax

if(condition,result1,result2)

where:

condition	Is a boolean expression in the form of value-operator-value argument. The value is a single-cell reference, a literal number, or a formula. The operator is one of the logical operator or relational operator symbols (and, or, not, =, not=, <, >, <=, or >=).
result1 and result2	Are columns, literal numbers, text, or one of the Boolean constant expressions (true or false). Both result1 and result2 must have the same data type.

Remarks

The condition in a formula can include more than one comparison, as illustrated in the following example.

Examples

if(([Amount],) or ([Amount]>1), < or > ,1)

Using Aggregate Functions

The Layout tool provides nine aggregate functions located in the **Aggregate** menu. Each function, including syntax and examples, is described in Table 7. Detailed information about each function follows the table.

When you use aggregate functions with the Layout tool:

N/A values are ignored.

Arguments are columns or numbers. See the description of the function for restrictions on the column sort-level of the arguments.

Table 7 (Page 1 of 2). Aggregate functions

Function	Syntax	Example	Description
average	average(*list*)	average([UnitSales]) average([Amount])	Returns the average value of the list of numeric items. The list parameter can resolve to either a multi-value or a single value. In the latter case, average simply returns that single value.
count	count(*list)*	count([CustNum]) count([Regions])	Returns the number of rows in a specified column. The list parameter can resolve to either a multi-value or a single value. In the latter case, count simply returns 1.

Table 7 (Page 2 of 2). Aggregate functions

Function	Syntax	Example	Description
first	first(*column*)	first([Region])	Returns the first value in the specified column. The list parameter can resolve to either a multi-value or a single value.
last	last(*column*)	last([Region])	Returns the last value in the specified column. The list parameter can resolve to either a multi-value or a single value.
max	max(*list*)	max([Amount]) max([Discount]) max([Total])	Returns the maximum value found in the specified list. Can be used with any data type. If multiple parameters are used, they must resolve to single values.
min	min(*list*)	max([Amount]) max([Discount]) max([Total])	Returns the minimum value found in the specified list. Can be used with any data type. If multiple parameters are used, they must resolve to single values.
rank	rank(*column, sort column, order*)	rank([UnitSales], [Region], ascend)	The rank of the first column within the sort column. The column parameter must resolve to a single value; the sort column parameter must be a higher sort level than column.
runtotal	runtotal(*list, sort column*)	runtotal([Total], [Region])	Creates running sums of values for a column. The column parameter must resolve to a single value.
sum	sum(*list*)	sum([UnitSales]) sum([UnitPrice]) sum([Amount]) sum([Discount])	Returns the sum of the values of a list of items. If multiple parameters are used, they must resolve to single values.

Average — Calculating the Average

Use the AVERAGE function to find the average value of the contents of one or more columns.

Syntax

average(list)

where list is either a single column or a list of columns or values separated by commas.

Remarks

If a single column is the argument, it must be at a lower sort level than the computed column that contains the formula. Multiple columns or values must be single numbers for the function to execute.

The second example below finds the average of the two columns at the selected sort level if each column is a single number at the sort level. The example would require the calculated column to be placed at the Store level.

Examples

average([Amount])
average([Q1 Sales by Store],[Q2 Sales by Store])

Count — Counting Rows or Columns

Use COUNT to determine the number of rows in a specified column that contains either text, dates, or numbers, or to determine the number of columns in a specified range of columns. N/A and error values are not counted.

Syntax

count(list)

where list is either a single column or a list of columns separated by commas.

Remarks

If a single column is the argument, it must be at a lower sort level than the computed column that contains the formula.

If multiple columns or values are in the list, the function counts how many columns or values were specified in the list, not how many were contained in each column.

Examples

count([CustNum])

count([Regions], [City], [Store]) returns 3

First — Finding the First Value

Use FIRST to determine the first value in a column.

Syntax

first(column)

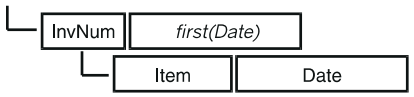
where column is a specified column.

Remarks

Any type of data can be compared.

The specified column must be at a lower sort level than the computed column that contains the formula. No sorting is done by FIRST, only by the sort columns.

This function allows you to display a lower-level column at a higher sort level where there is a one-to-one relationship between the levels. The example below shows the first invoice date for a selected customer, and is based on the following setup in the Sort/Calculations window:



The data in the Date column can be all the same data or different dates.

Example

first([Date])

Last — Finding the Last Value

Use LAST to determine the last value in a column.

Syntax

last(column)

where column is a specified column.

Remarks

One common use of this function is to find the latest value for data that changes over time, such as a customer's address.

See the remarks under “First — Finding the First Value” for more information.

Examples

last([Runtotal])

last([InvNum]) returns the last value in the InvNum column

Max — Finding the Maximum Value

Use MAX to determine the largest value in a specified list. You can use the MAX function with dates.

Syntax

max(list)

where list is either a single column or a list of columns or values separated by commas.

Remarks

If a single column is the argument, it must be at a lower sort level than the computed column that contains the formula.

See the remarks under “First — Finding the First Value” on page 103 for more information.

Min — Finding the Minimum Value

Use MIN to determine the smallest value in a specified list. You can use the MIN function with dates.

Syntax

min(list)

where list is either a single column or a list of columns or values separated by commas.

Remarks

If a single column is the argument, it must be at a lower sort level than the computed column that contains the formula.

See the remarks under “First — Finding the First Value” on page 103 for more information.

Examples

min([InvNum], [Discount]) returns the first value in the InvNum column.

Rank — Ranking a Sort Column

Use RANK to create data values in which each item in the column you are ranking is assigned a number. This number shows the rank of the item according to the column's sort order, and can be done in either ascending or descending order.

Syntax

rank(column, sort column, order)

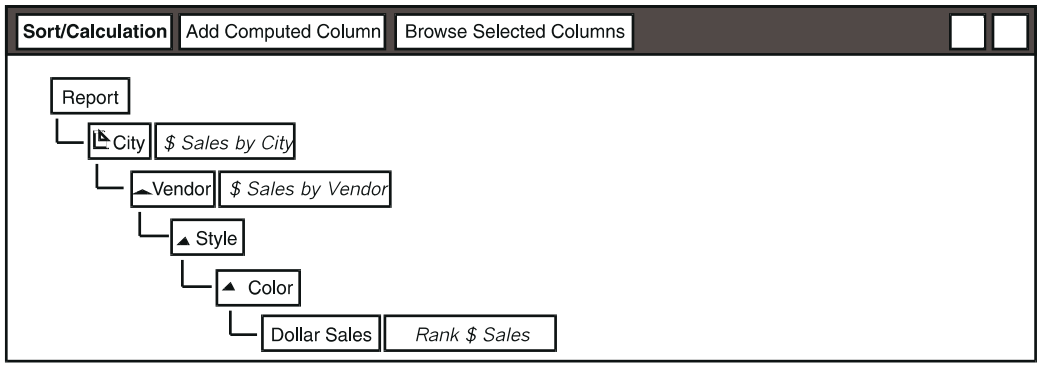
where:

column	Is a source data column.
sort column	Is the sort column used as the basis for ranking the source data column.
order	Is either ASCEND or DESCEND.

Remarks

The calculated column is placed at the level of the column that is being ranked, not at the sort column level.

To sort your data based on rank, first build the formula at the level of the data being ranked, then move the calculated column up to the desired sort level as shown in the following example.



Examples

rank([Dollar Sales],[Style],descend)

The calculated column would appear as shown in the following sample:

	Rank	$ Sales
New York		
Sun Spot - Round Flap		
Bronze	2	600
Burgundy	4	350
Navy	3	400
Sand	1	750
Total for Round Flap		21000

rank([UnitSales], [Region], ascend)
rank([Amount], [CustName], descend)

As another example, suppose you have a report that contains unit sales information for cities. The data in the report is sorted by cities in alphabetic order.

City	Unit Sales
Glendale	10,000
Los Angeles	20,000
New York	40,000
Toronto	15,000

If you want to leave the cities sorted in alphabetic order, but show which cities have the highest sales figures, you would use the RANK function in the formula rank([Unit Sales], [City], descend). The results of the RANK function are shown in the following report.

City	Unit Sales	Rank
Glendale	10,000	4
Los Angeles	20,000	2
New York	40,000	1
Toronto	15,000	3

You could also use the RANK calculated column as the sort column, resulting in the following report.

City	Unit Sales	Rank
New York	40,000	1
Los Angeles	20,000	2
Toronto	15,000	3
Glendale	10,000	4

Runtotal — Summing Values

Use RUNTOTAL to create a running sum of values for a column of data.

Syntax

runtotal(column, sort column)

where:

column	Is a source data column.
sort column	Is the column used as the basis for accumulating the total.

Remarks
See the description of the RANK function for additional information.

Examples
runtotal([Dollar Sales],[Vendor])
runtotal([Unit Sales],[City])

For example, suppose you have a report that shows the unit sales for each city, and you also want to show the accumulated number of units sold in each city. You would use the formula runtotal([Unit Sales],[City]) to get the results shown in the following report.

City	Unit Sales	Runtotal
Glendale	10,000	10,000
Los Angeles	20,000	30,000
New York	40,000	70,000
Toronto	15,000	85,000

Sum — Adding Values
Use SUM to find the sum of the contents of a group of data or series of numbers.

Syntax
sum(list)

where list is either a single column or a list of column separated by commas.

Remarks
If a single column is the argument, it must be at a lower sort level than the computed column that contains the formula.

The first example below adds all the values in both columns to a single number.

The second example sums all the values in the column.

Examples
sum([Unit Sales], [Unit Price])
sum([Amount])

Using Date Functions

The Layout tool provides three date functions. You can use date functions to:

Determine dates from character strings

Obtain the current date

Calculate the time between two dates

The date and time functions are located in the **Date and Time** menu. Each function, including syntax and an example, is described in Table 8. Detailed information about each function follows.

Table 8. Date and time functions

Function	Syntax	Examples	Description
date	date(*date{,period}*)	date('May 5, 1994',month) returns May 1994	Returns the date in the specified time period. The date parameter can be either a date string or a date, and must resolve to a single value.
interval	interval(*date1, date2 {,period}*)	interval(May,June, month) returns 1	Returns the time between two dates with the specified time period. The date1 and date2 parameters must resolve to single values.
now	now(*period*)	now(month) now(day)	Returns the current date in the specified period when you generate the report.

You can select from the **Periods** menu for the variable *period*.

Date — Determining a Date

Use DATE to convert a character string or column to a date of a specified time period.

Syntax

date(date{,period})

where:

date — Is a column or an alphanumeric character string representing a time period, such as October 1, 1994.

period — Optionally specifies the time period of the returned date.

Remarks

A date string must be enclosed in double quotes.

Allowable time periods that can be selected from the **Periods** menu are: day, week, qweek (for quadweek), month, bimonth (for odd bimonth), ebimonth (for even bimonth), quarter, and year, as defined in Table 9 on page 109.

If you do not specify a period, the function returns the value you specified.

Examples

The following formats are in effect for the dates in Table 9: standard date, standard separator, yyyy year, and MDY date order.

Table 9. IDS date formats

Date format	Meaning	October 1, 1994 becomes
day	Day of the month.	October 1, 1994
week	Date starting on a Sunday, containing the specified date.	week of September 25, 1994
quadweek	Exactly 4 weeks, starting on a Sunday, containing the specified date.	quad week of October 2, 1994
month	Calendar month.	October, 1994
even bimonth	Two months, ending on an even month.	SO, 1994
odd bimonth	Two months, ending on an odd month.	ON, 1994
quarter	The quarter of the year containing the date.	4Q 1994
year	Calendar year.	1994

Interval — Calculating the Time Between Dates

Use the INTERVAL function to calculate the time between two dates.

Syntax

interval(date1, date2{,period})

where:

date1 — Is a column or alphanumeric character string that has already been converted to a date type, representing the most recent endpoint of the time period, such as a month, day, and year.

date2 — Is a column or alphanumeric character string that has already been converted to a date type, representing the most distant endpoint of the time period, such as a month, day, and year.

period — Is an optional argument that specifies the time period of the returned value.

Remarks

Allowable time periods that can be selected from the **Periods** menu are defined in Table 9 on page 109.

If you do not specify a period, the function returns a result with the same precision as the dates you supplied. In the case of dates with differing precision, the function returns the same precision as the date having the higher precision. For example, if one date is a year and another a month, the function returns a month.

Examples

interval([Delivery Date],[Invoice Date],day) returns the number of days between the dates

interval(date("October, 1994"),date"July 15, 1994"),day) returns 3

Now — Obtaining the Current Date

Use NOW to obtain the current date. The date is updated each time the report is opened. Use the NOW function to date work that is generated on a regular basis, such as daily or weekly reports.

Syntax

now(period)

where period is the period resolution desired.

Remarks

Allowable time periods that can be selected from the **Periods** menu are shown in Table 9 on page 109. If you do not specify a period, the current day is displayed.

Examples

now(month) returns the current month and year

now(day) returns the current day, month, and year

now(year) returns the current year

Using String Functions

The Layout tool provides eight string functions. You can use string functions to:

Compare strings in conditional expressions

Manipulate strings by changing the order of words, adding or removing words, or concatenating several strings

Convert characters to numeric values or numbers to strings

Remove spaces or tabs from the ends of strings

Repeat strings to create a pattern

The string functions are located in the **String** menu. The functions, including syntax and examples, are described in Table 10 on page 111. Detailed information about each function follows.

Table 10. String functions

Function	Syntax/Example	Description
concat	concat(*list of strings*)	Combines several character strings into one string.
find	find(*string to search,string to find{,character start position}*)	Locates the position of a specified character string within another character string.
		The parameters must resolve to single values.
left	left(*string, number of characters to return*)	Returns the specified number of characters from the left end of the string.
		The parameters must resolve to single values.
len	len(*string*)	Counts the number of characters in a string.
		The string parameter must resolve to single values.
mid	mid(*string, starting point, number of characters to return*)	Extracts a character sequence from a specified start position in a string and returns the specified number of characters.
		The parameters must resolve to single values.
right	right(*string, number of characters to return*)	Returns the specified number of characters from the right end of the string.
		The parameters must resolve to single values.
string	string(*number to convert{,number of decimal places}*)	Converts a number to a text string with an optional number of decimal places.
		The parameters must resolve to single values.
val	val(*string*)	Converts a text string to a number. If the string cannot be converted, the number zero is returned.
		The string parameter must resolve to single values.

Concat — Concatenating Strings

Use CONCAT to combine the character strings from several columns into one column. Use the CONCAT function, for example, to combine columns that contain names and addresses.

You can also concatenate a list of numeric values, or columns that contain numeric values, but the result is of type text. For example, to build identification numbers you would use the formula concat(1,2,3) to return the text string 123.

Syntax
concat(list of strings)

where list of strings is a specified list of character strings or numeric values, or columns that contain character strings or numeric values. The values are separated by commas.

Remarks
Spaces and commas are not automatically included in the concatenated string; you must specifically enter them (within quotes) in the formula. For example, the formula concat("Bozeman", "MT") returns BozemanMT, without any spaces or commas. The correct formula is concat("Bozeman",", ","MT") or concat("Bozeman",",","MT"), which return Bozeman, MT.

There is a 2,000-character limit on concatenated strings.

Examples
The following values are used for the columns in the examples below:

[Vendor] = Sun Spot	[Style] = Round Flap	[Color] = Burgundy
[City] = Los Angeles	[State] = CA	[Code] = 90005

Table 11.

This expression	Results in
concat([Vendor]," – ", [Style])	Sun Spot – Round Flap
concat("Color "," ", [Color])	Color Burgundy
concat([City],", ",[State], " ", [Code])	Los Angeles, CA 90005

Find — Finding a Substring Within a String
Use FIND to locate the position of a specified character string within another character string. The FIND function is case sensitive. If a match is not found in the string being searched, a zero is returned. Otherwise, a number representing the position of the character substring within the string is returned.

Syntax
find(string to search, string to find {,character start position})

where:

string to search	Is a character string, or a column containing a character string, that you want to search.
string to find	Is a character string, or a column containing a character string, that you want to locate within the string to search.
character start position	Is the optional number of characters from the left (including spaces) where you want the search to begin.

Remarks

If a value is not entered to specify the character start position, the search begins with the first character.

If a numeric value is encountered during the search, an error is returned.

Examples

find("Goldtip Books", "oo", 6) returns 10

find("Goldtie Dress Accessories", "ss", 14) returns 19

Left — Extracting Characters from the Left End of a String

Use LEFT to extract a character sequence from the left end of a character string.

Syntax

left(string, number of characters to return)

where:

string	Is a character string or a column that contains a character string from which you want to extract a substring.
number of characters to return	Specifies the number of characters that you want to return from the left end of the specified string.

Remarks

If a numeric value is encountered during the search, an error is returned.

Examples

left('Clyde Dale's Footwear',12) returns Clyde Dale's

left('Alex Curcin', 4) returns Alex

left([CustName],9) returns the first nine letters from the customer's name

left('Mountain View, CA 94 43',13) returns Mountain View

Len — Counting the Number of Characters in a String

Use LEN to count the number of characters in a string.

Syntax

len(string)

where string is a character string or a column that contains a character string.

Remarks

If a numeric value is encountered during the search, an error is returned.

Examples

len([CustName]) returns the number of characters in the customer's name

len('Tenspeed Bikes') returns 14

len('Ferrotable Magnetic Products') returns 28

Mid — Extracting a Substring from a String

Use MID to extract a character sequence from within a character string. Use the MID function when the LEFT and RIGHT functions do not extract the exact characters that you require because they include characters at either end of the string.

Syntax

mid(string, starting point, number of characters to return)

where:

string	Is a character string or a column that contains a character string from which you want to extract a substring.
starting point	Specifies the number of characters from the left (including blank spaces and the character in the specified position) where you want the extraction to begin.
number of characters to return	Specifies the number of characters to return from the string.

Remarks

If a numeric value is encountered during the search, an error is returned.

A negative value used to specify the starting point or the number of characters to return from a string returns the entire string.

Examples

mid('Gyroder Top Spinners',9,3) returns Top

mid([CustName],3,4) returns the third through the sixth characters of the customer's name

Right — Extracting Characters from the Right End of a String

Use RIGHT to extract a character sequence from the right end of a character string. For example, use the RIGHT function when you have rows that contain a city, state, and zip code and you want to use only the zip code.

Syntax

right(string, number of characters to return)

where:

string	Is a character string or a column that contains a character string from which you want to extract a substring.
number of characters to return	Specifies the number of characters to return from the right end of the string.

Remarks

If a numeric value is encountered during the search, an error is returned.

Examples

right('Degan's House O'Marbles',7) returns Marbles

right('Palo Alto, CA 943 1', 5) returns 94301

right([CustName],9) returns the nine rightmost characters of the customer's name

right('Missoula, MT 5 9 1',5) returns 50901

String — Converting a Number to a String

Use STRING to change a positive value to a character string.

Syntax

string(number to convert {,number of decimal places})

where:

number to convert	Is a number or a column that contains a numbers.
number of decimal places	Specifies the optional number of decimal places that you want to display in the result; the result is rounded to that number of places.

Remarks

The number to convert must be positive.

If a number of decimal places is not specified, the default number of decimal places is zero.

Specifying a value for the optional number of decimal places causes the results to override the **Decimal Precision** field setting in the Layout Options window.

Examples

string(35.876,) returns 36

string([UnitSales], 4) returns a string formatted with four decimal places

string(193.453,2) returns 193.45 as text

Val — Converting a Number Entered as Text to a Value

Use the VAL function to convert numbers entered as text to values.

Syntax

val(string)

where string is a character string or a column that contains character strings.

Remarks

If the STRING argument contains non-numeric characters, a zero is returned.

Examples

val('1994') returns 1,994.00

val('1994') returns 1994 as a number

val('Jan 1994') returns 0.00

val('1994 jan') returns 0.00

Glossary

aggregate function. A calculation that combines values. Examples of aggregate calculations are Average and Sum.

argument. A variable required by many functions. It supplies additional information used by the function.

@-value. The value assigned to an @-variable in the Capsule tool's User Input Control window.

@-variable. A control variable used to represent a value in any tool that can be run inside a capsule application. These values are frequently used as constraints and variable titles in the Query, Plot, Spreadsheet, Layout, and other IDS tools.

Boolean value. A value that is limited to one of two possible values, such as true or false, yes or no, 1 or 0.

break group. A separation of data into logical subunits. Break groups can be used for subtotaling and pagination purposes.

Capsule tool. A tool for building an automated processing sequence using icons that represent IDS tools and PC applications.

cardinal. Numbers indicating a quantity (3, 10, or 31) rather than an order (3rd, 10th, or 31st).

data type. The type of information represented by data in a database column. Data types generally available in the IDS logical tables are integer, real, character, and date. Other data types available in some IDS logical tables include null, long varchar, varchar, time, and timestamp.

details area. The part of the report that contains the data.

double-pass sort. A calculation from which the results are used as a factor in another operation.

function. A special command that performs calculations on specified values, known as arguments, and returns a result.

mask. A series of characters arranged in a pattern used to format data in a report. For example, 999-99-9999 is a character pattern for a United States social security number. You can define a mask that the Layout tool uses to format data in the report.

N/A value. A data value that indicates that information for that item is not available.

ordinal. Numbers indicating an order (3rd, 10th, or 31st) rather than a quantity (3, 10, or 31).

pad. Adding characters, such as zeros, to artificially extend the varying length of items in a column to a fixed length.

quick report. A basic report created with the Quick Report window that contains subtotals and grand totals.

ruler shadow. A shaded area on the ruler in the Report Layout window that you can use to manipulate fields in a work area.

run date/time. A value that can be inserted in your reports, specifying the date and time at which the report was updated.

share calculation. A calculation that divides a number by a total of which it is part, deriving the item's percentage of the whole.

sort indicator. An arrow or text icon graphic added next to the sort column name. An up-arrow indicates an ascending sort; a down-arrow a descending sort. The text icon graphic indicates that the sort order is determined by entries within a text document.

sort level. The columns within a report according to which other data is sorted or ranked.

source icon. An icon used to pass information to other icons.

special cases. Conditions for formatting data.

tabular data. Data arranged as in a table, in columns and rows.

work area. Areas in the Report Layout window used to place fields and columns in the report. Work areas include the page header, details, page footer, and report summary.

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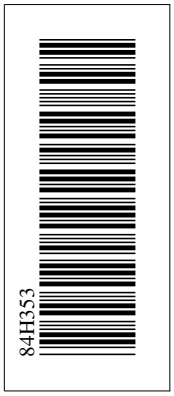

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