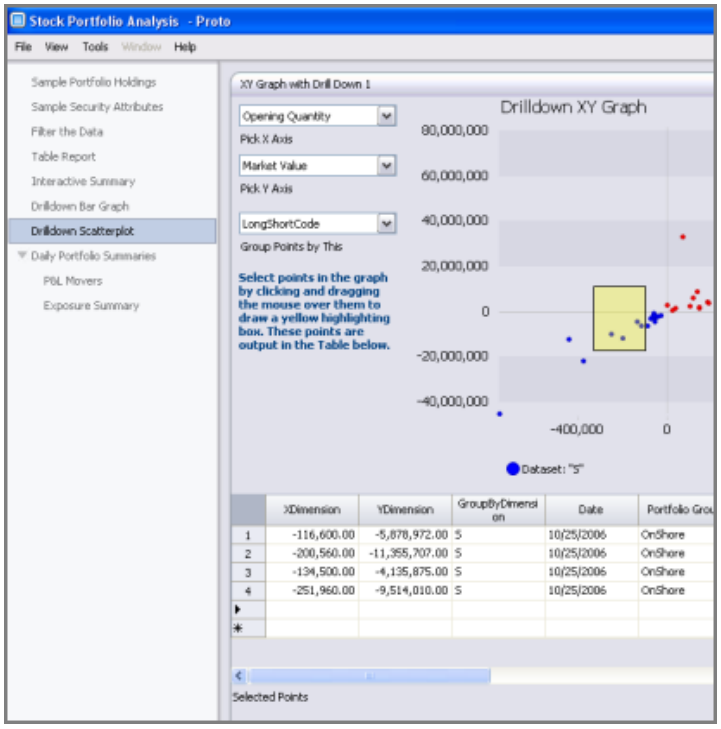
Getting Started with Proto

Lesson 1



In the first lesson, you will create a simple dashboard to combine two sets of data and then analyze the results using interactive reports.

This tutorial should take 40-60 minutes to complete.

Lesson Overview

In this introduction, we will cover the following functionality and concepts:

- Launch, edit and save new Proto dashboards.
- Insert and connect basic Modules and Components to create new functionality.
- Create new steps in a workflow dashboard.
- Merge two datasets, filter data, enrich data and present data in dynamic reports.

You will be building upon a dashboard provided with the lesson, which has two related sets of data embedded in it. In this lesson we'll cover how to combine these data sets, add a simple filter to eliminate some of the data, and then experiment with some dynamic reports like a drill down pie graph, an aggregation report and an XY scatter plot. The data used in this lesson is from a mock stock portfolio, but the techniques you learn should apply to combining and analyzing any related data.

Before you start this lesson, you will need to have installed Proto Professional Version 1.9 and downloaded the lesson files from the Proto website. The lesson files can be downloaded in a zipped format from Proto's website at
http://www.protosw.com/devcenter

Before jumping into the tutorial, you might want to take a quick moment to explore and understand the Proto dashboard that you will be creating. To do so,

1. Locate the folder named "Lesson 01" in the folder titled "Proto Getting Started Lessons."
2. Open the file named "Lesson 01 (Completed) - Stock Portfolio Analysis.proto."
3. Click "OK" if prompted that the file has VBA macros.

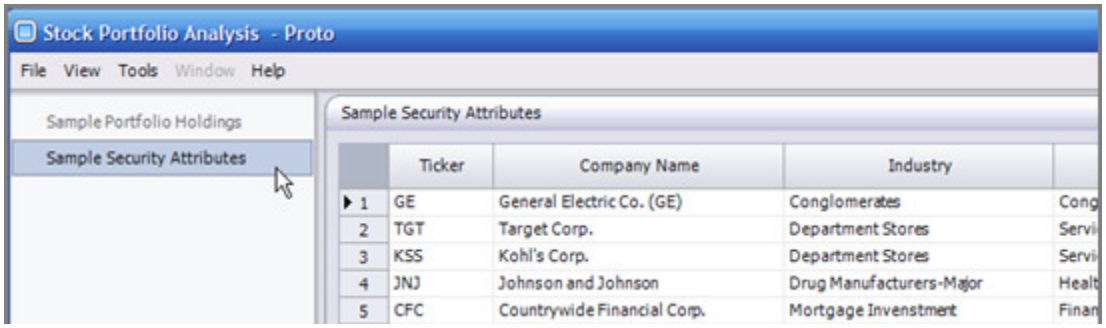
> ***Note:*** *When you open a Proto file that uses VBA, you will be prompted with a Security Warning dialog box. You should always be careful when opening files from someone you don't know. However, you can repress this warning from showing in the future. To do so, go to Proto's application settings by choosing Tools > Options from the application menu bar. Then check the box in the "Security and Privacy" section titled "Don't show VBA Warning dialog on load."*

To begin building the dashboard, first open the lesson file and save a copy as "Stock Portfolio Analysis.proto."

1. Locate the folder named "Lesson 01" in the folder titled "Proto Getting Started Lessons."
2. Open the file named "Lesson 01 (Begin) - Stock Portfolio Analysis.proto" by double-clicking on the file.
3. Save this Proto dashboard with a new name in the "Lesson 01" folder. To do so, select File > Save As from the application menu bar. Then browse to the appropriate location and save the file as "Stock Portfolio Analysis.proto."

Exploring the Lesson File

When you open the lesson file, Proto will create a window with a menu bar, some clickable steps on the left and content area on the right with a table in it. Try clicking between the two steps to see the content area change:



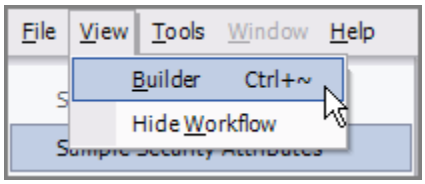
This window is called the **Viewer**, and end-users of dashboards work within this screen to click through data integration, cleaning, analysis and reporting steps. The Viewer is also where you as the dashboard developer will adjust the position and size of controls on the screen.

Every Proto dashboard is represented in two separate interfaces: the Viewer and the **Builder**. You will define the functionality of the dashboard in the Builder.

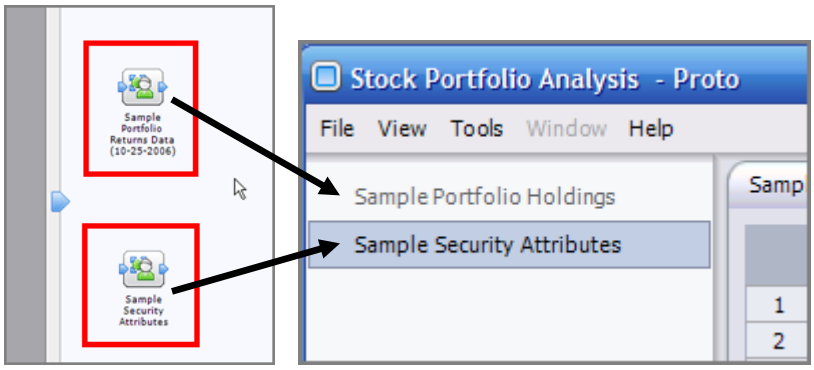
For a comprehensive introduction to the Proto Environment, please watch the video, *An Introduction to Proto*, available on the Developer Center. If you are feeling bold or just like gain an overview through direct experience, you can charge ahead with the lesson and probably pick things up as you go.

Now switch over to the Builder and familiarize yourself with that window.

4 Click **Control + ~** from the keyboard or select View > Builder from the menu bar.



In the Builder window, you will see central area bordered by a toolbar on top, a help pane on the right and some additional buttons. For now, focus on the middle area with the two **Components** on it named "Sample Portfolio Returns Data (10-25-2006)" and "Sample Security Attributes." These Components correspond directly to the two steps on the Viewer as shown below:



Some Context: Multi-step Workflows in Proto

The introductory lessons are intended to help you understand the Proto paradigm by way of hands-on examples. Hopefully you have a decent grasp of the product architecture, development environment and intended use from watching *An Introduction to Proto.* However, it is worth spending a few extra minutes to draw a comparison between Proto Components, sections of the Viewer called *workflow steps*, and a particularly common and problematic data analysis scenario that is routinely carried out in Excel: long, repetitive, manual tasks to integrate and analyze disparate sources of data.

Workflow Steps and Components

In Proto, you can create guided workflows in which each "step" of the workflow is shown by clicking through a list of named buttons on the left-hand side of the Viewer. The steps don't necessarily have to represent a sequential process, but they do divide the functionality of a Proto dashboard into discrete sections. Under the hood, each step is represented by a separate Component on the Builder. And as we'll see, Components do a nice job of dividing and encapsulating functionality in Proto as well. Together, Components and workflow steps make it fast and easy to assemble new dashboards that guide end users through common data integration, analysis and reporting tasks.

We'll talk later about how you build, store and share Components, but first let's look at some examples of Components, how they're used and how that relates back to step-by-step workflows. Components can:

- Get data (read data in, query data dynamically, get data input from users)
- Do stuff with data (calculate, filter, join, clean, analyze, etc.)
- Present the data on screen (dashboard, dynamic analysis, visualization, tables, etc)
- Output the data and take action (write to Excel, update databases, run scripts, etc.)
- Do all kinds of other things.

Specific examples include:

- Get current pipeline data from a sales database
- Calculate the Month-to-Date P&L for a set of transactions

- Show a portfolio manager a summary of his Top 10 and Bottom 10 holdings
- Write correct Security IDs back to a database after a user types overrides into Proto
- Send an email, write an HTML file to a directory, etc.

Some Components serve very simple functions like deleting columns from a dataset or providing the user with a Listbox to select an item, and some Components perform more sophisticated operations and contain many user interface controls.

Components are added to the Builder, connected in sequence to define the functionality of the dashboard, and grouped together to create new Components. On the Viewer, Components can optionally be exposed as steps, sub-steps and other groups with the user interface controls positioned and sized as needed.

The Parallel between Workflow Steps and Manual Excel Processes

In Excel, users frequently describe repetitive workflows in a series of actions that they perform such as:

1. First I get the latest data from our accounting system by opening the "POS-Current.CSV" file in Excel and then copying and pasting that data into the tab in my workbook called "Positions."
2. Then I delete all of the columns except for Date, Security ID, Quantity, etc.
3. Then I type over the foreign Security IDs that I know are wrong.
4. Then I create a VLOOKUP formula to look up the Sector, Market Cap, etc. from another tab in the workbook that links to our market data source.
5. And the list goes on…

When we design a dashboard in Proto to parallel an existing analysis workflow, *we start by identifying source data sets, and writing down what needs to happen to them in order to arrive at results.* The list of abstract steps may start out very broad like this:

1. Get latest data from a daily CSV
2. Remove unnecessary columns
3. Override certain known incorrect values
4. Enrich the data with values from another data set
5. Etc.

And then as we focus on a particular step, they become more detailed:

1. Get latest data from a daily CSV
   - 1.1 Provide the user with a button to pop-up a File Browser dialog box to select a file.
   - 1.2 Read in the CSV data with another Component that takes a file path to a CSV and outputs a dataset
   - 1.3 Display the new data in a Table
   - 1.4 Etc.

These steps, or operations, that need to happen to the data in sequence, are eventually translated into Components. The vast majority of Components will be hidden in the Builder, and end-users will only interact with controls that are necessary to direct the flow of operations, enter data, make decisions and see results. Once all these Components are assembled together, the workflow is captured in a dashboard with clear steps that included the end-user at the necessary points to complete the data integration, cleaning, analysis and output.

Data Flow in Proto

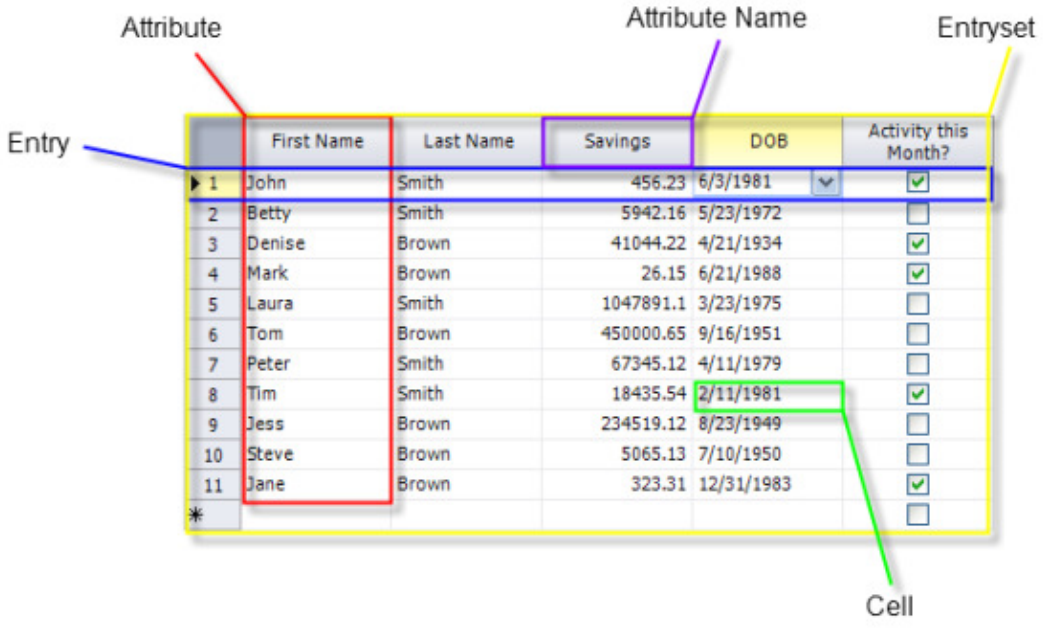
As described above, Components define a series of operations, user interfaces and other processes that act on data to achieve a result. Clearly data must flow between Components in some form for this all to work. A full discussion of data management in Proto is beyond the scope of this lesson, but a small set of concepts and corresponding vocabulary will help you develop a deeper understanding of Proto as you go through these exercises.

There are two basic types of data in Proto.

- Single values like dates, numbers, text values, etc.
- Tables of data that store rows and columns of data (single values and other tables)

Both of these types of data flow across one-way connections from one Component to another. Though the data is not actually copied at every step, each Component can behave as though it has a full copy of the data.

Tabular data in Proto is contained in **Entrysets**. An Entryset is like a "table" and has "rows" of data called **Entries** and "columns" of data called **Attributes**. In the tutorials you may see reference both to columns and attributes as well as rows and entries. We sometimes use these terms interchangeably when discussing portions of a dataset that has rows and columns.



Merging the Two Datasets

Let's return to the Viewer to inspect the two sets of data that we will work with. The first set of data is numerical values representing profit & loss associated with each security in a stock portfolio. The second set of data is a set of qualitative attributes associated with each of the securities. If you are not familiar with the financial terms used, you can just think of these two sets of data as being generic "items" with some numerical values and some categorizations. For example, the data could be quarterly sales per account, and the categorizations could be the account rep, account region, account type, etc.

These data sets were previously pulled into Proto and saved along with the lesson file so that you do not have to import your own data to work with. This will help keep the screenshots and descriptions you see in this lesson consistent with what you see on your screen. In a real workflow dashboard, "Get Data" steps could allow a user to pick a new Excel file, refresh a query from a database, paste data into a table, read in a CSV or get data in a variety of other ways.

Additionally, these data sets are already clean and well-formed so that you can combine and use them immediately. This is rarely the case with real-world disparate data sources, but for the purpose of these lessons, assume that the two data sets already have had the benefit of cleaning and normalization steps. Most of those steps would be automated operations to add and delete columns, replace values, etc. and others would likely involve the end-user to check the inputs, add data, correct exceptions and typos, etc.

During this lesson, we will mostly rely on Components to incorporate more sophisticated functionality and introduce the concept of workflow steps. However, combining data is a fundamental and common process in Proto, and we will use a primitive Module, called the Entryset Join Module, to merge the two sample data sources. In the next couple sections you'll learn how to:

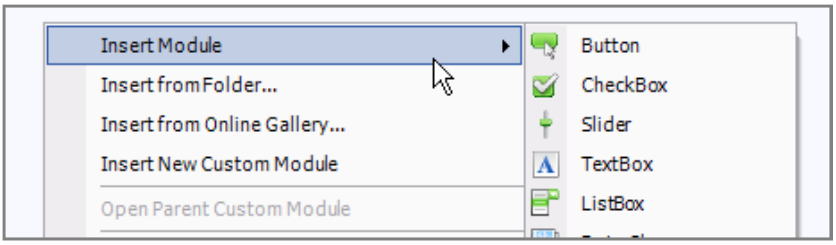
I. Add the Entryset Join Module to the Builder (*referred to herein as the Join Module).*
II. Make connections from the sample data Components to the Join Module.
III. Configure the Join Module settings through its Property Panel to combine the columns of the two datasets based on related columns of data.
IV. View the Output of the Join Module.

Add the Join Module to the Builder.

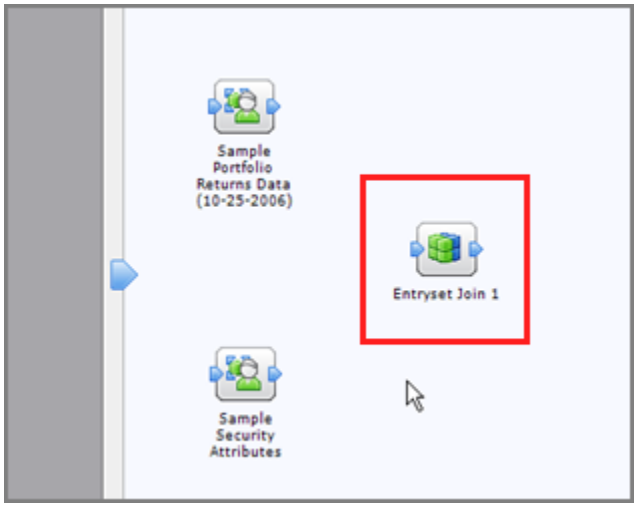
You can add primitive modules to the Builder in two ways:

1 Use the toolbar at the top of the Builder window

2 Or right-click anywhere on the background of the Builder and select the primitive module from the "Insert Module" menu:



Try adding the Join Module to the Builder now. After you insert it, your Builder window should look similar to the screenshot below. Note that nothing has changed in the Viewer, because the Join Module does not expose a user interface control.



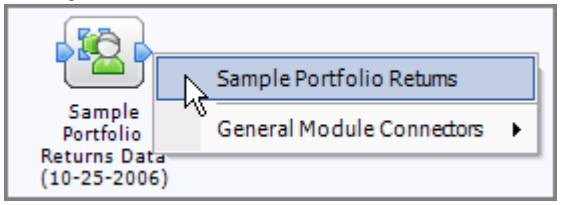
***Note**: Because this is the first time you have inserted a Join Module in this dashboard, the name will be appended with the number "1." If you were to add another Join Module, it would be appended with the number "2", and so on.*

Make Connections from the Sample Data to the Join Module

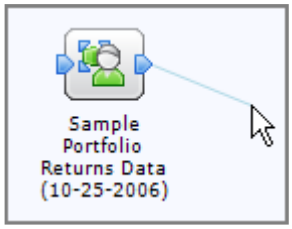
In the next series of steps you will make two Connections that will send data from the sample data Components to the Join Module.

1 Go to the Builder

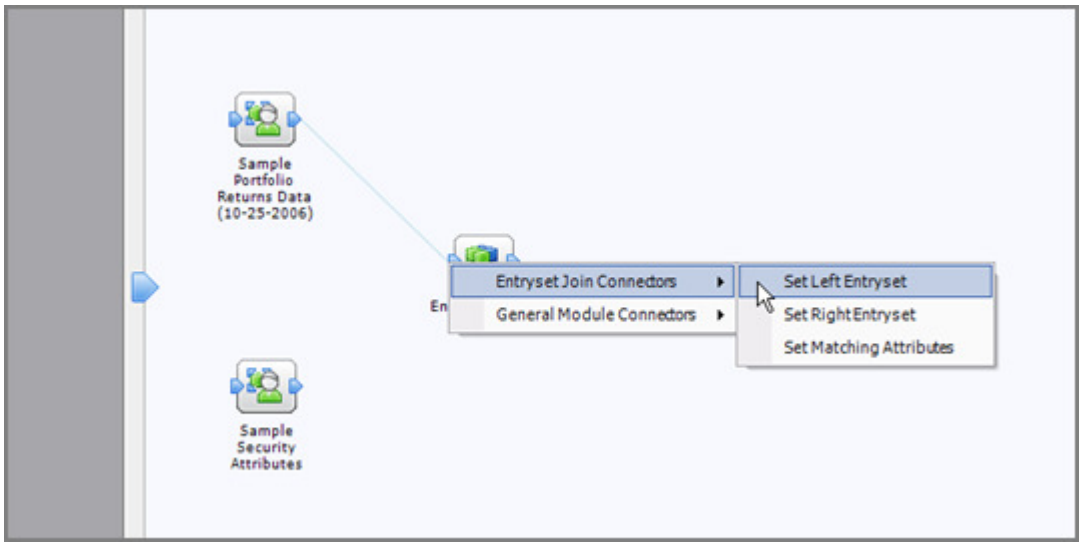
2 Click on the small blue arrow on the right side of the "Sample Portfolio Returns Data (10-25-2006)" Component to select an output connector from this Component.



3 Click on the menu item titled "Sample Portfolio Returns" to start the Connection. A blue line will now follow the mouse as shown below.



4 Click on the small blue arrow on the left side of the Join Module to select an input connector to this Module.



5 Click on the "Set Left Entryset" input to complete this Connection.

To save space, throughout the rest of the Lessons we will describe Connections without showing the screenshots using the following notation:

From:	Module or Component name
Output:	*Output Name*
To:	Module or Component Name
Input:	*Input Name*

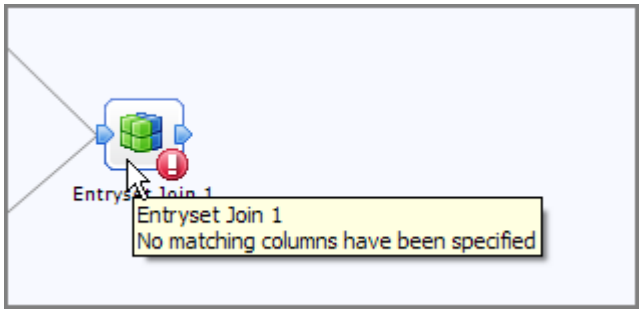
For example, you just made the following connection:

From:	Sample Portfolio Returns Data (10-25-2006)
Output:	*Sample Portfolio Returns*
To:	Entryset Join 1
Input:	*Entryset Join Connectors > Set Left Entryset*

6 Now connect from the Sample Security Attributes data to the Join Module.

From:	Sample Security Attributes
Output:	*Sample Security Attributes*
To:	Entryset Join 1
Input:	*Entryset Join Connectors > Set Right Entryset*

7 When you make the second Connection, the Join Module will error with the message, "No matching columns have been specified." When you made the second Connection, the Join Module tried to process its inputs, combining them into a merged output Entryset. However, this failed because we have not told the Join Module which columns in the two inputs are related. We will do that in the Property Panel shortly.



What Does the Join Module Do?

The Join Module takes two Entrysets as inputs, and combines the columns to create a single Entryset output. If you are familiar with database operations, the Join Module does the equivalent of a Left Outer Join. If you are familiar with the VLOOKUP function in Excel, you can think of the Join Module as adding *all* of the columns in a lookup table to the destination. If you are not familiar with either of those operations, it may be easiest to experiment with the Join Module on your own to understand its functionality.

The Join Module operates on two Entryset inputs, a Left Entryset and a Right Entryset. All of the new columns of the Right Entryset will be added to the Left Entryset. To determine which row of data in the Right Entryset should be added next to a row in the Left Entryset, a set of unique identifiers is compared in each of the two Entrysets.

In the example below, the common identifier is the letter "A", "B" or "C" found in the "Left ID" column in the Left Entryset and the "Right ID" column in the Right Entryset. Note in the example below that the rows with "A" and "B" in the Left Entryset find matching rows in the Right Entryset, but the row with "C" does not and the cells in the resulting Entryset are empty.

Left Entryset

Left ID	Col 1	Col 2
A	100	Brn
B	300	Wht
A	435	Wht
C	982	Wht
B	-234	Wht
B	981	Brn

Right Entryset

Right ID	Col A	Col B
A	Jon	Doe
B	Kevin	Smith

Combined Entryset

Left ID	Col 1	Col 2	Col A	Col B
A	100	Brn	Jon	Doe
B	300	Wht	Kevin	Smith
A	435	Wht	Jon	Doe
C	982	Wht		
B	-234	Wht	Kevin	Smith
B	981	Brn	Kevin	Smith

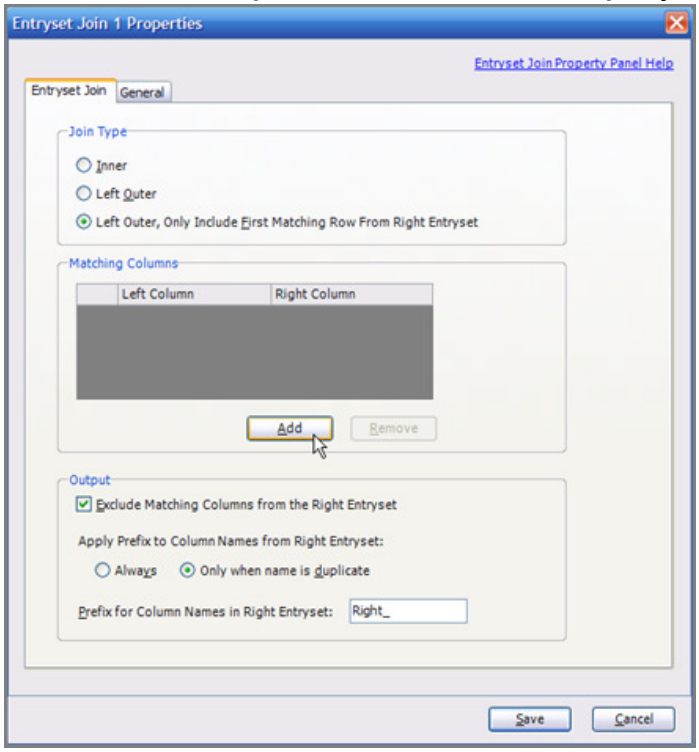
In more complex situations, there may be multiple columns that together represent the unique identity of a given row. For example, the Join Module may relate the rows of two Entrysets by matching two columns, “First Name” and “Last Name,” in the Left Entryset with two columns, “Name” and “Surname,” from the Right Entryset.

The Property Panel of the Join Module allows you to specify as many relationships as needed to properly relate, and merge two data sets.

Configure the Join Module

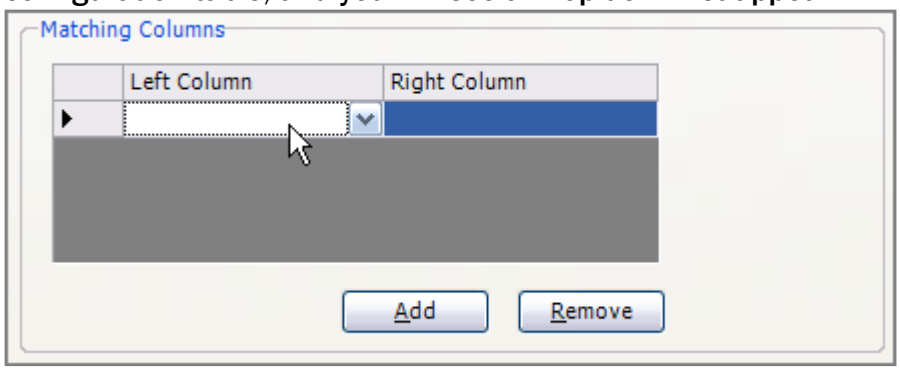
Now we’ll configure the Join Module so that it correctly merges the two sets of portfolio data. To do so we will open the Property Panel and specify a relationship between the Left Entryset and Right Entryset in the section titled “Matching Columns.”

1 Double-click on the Join Module or right-click and select “Properties” from the context menu to open the Join Module’s Property Panel.

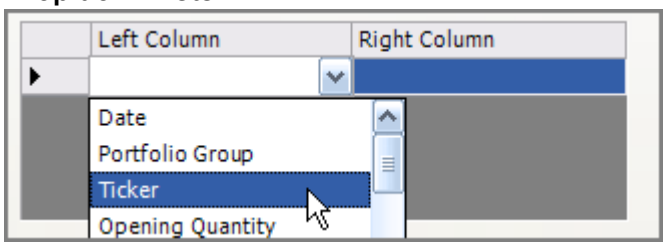


2 To add a Matching Columns constraint, click the “Add” button in the Matching Columns section of the Property Panel.

3 Next, click once on the empty cell below the header “Left Column” in the configuration table, and you will see a Drop-down list appear.

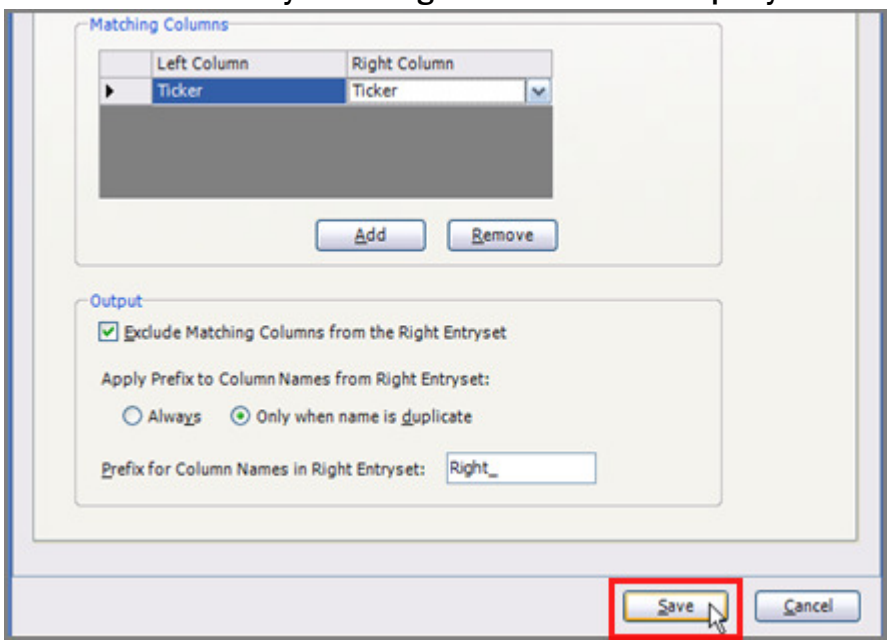


4 Select “Ticker” for the Left Column and “Ticker” for the Right Column using the Drop-down lists.



***Note:** The names of the related columns do not have to be the same. For example the column may be called “Ticker” in one Entryset and “Stock Symbol” in another.*

5 Click “Save” to save your changes and close the Property Panel.

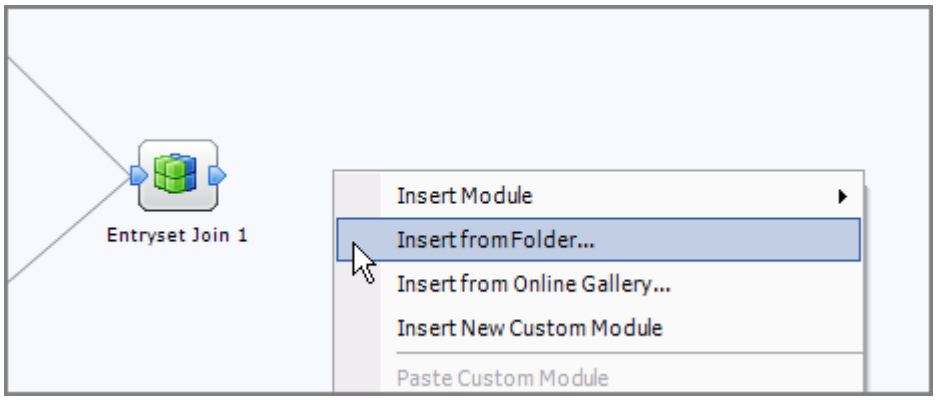


Add a Table Report Component to View the Output from the Join Module

Later on, we will build reporting Components and work with primitive Modules like Tables to view and edit Entrysets. However for now, we will use a pre-built Component called the Table Report to keep moving ahead and further illustrate the connection between Components and workflow steps.

The Getting Started Components used in this Lesson are available to download from the Developer Center on the Proto website as "All Getting Started Components.zip." If you downloaded "All Lessons, MiniTutorials and associated files.zp" you should already have the necessary files. If you don't have the Getting Started Components, download them now from http://www.protosw.com/devcenter.

1 On the background of the Builder window, right-click and then select "Insert from Folder..." from the context menu.

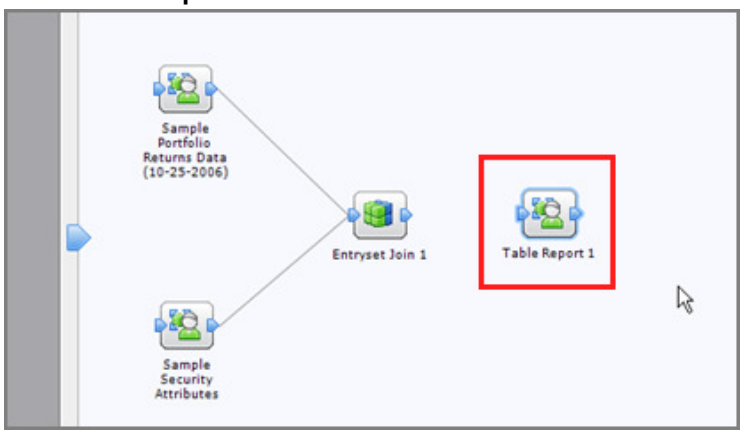


2 Browse to the following folder in the Getting Started Components directory:
..\Getting Started Components\Presentation and Analysis

3 Select the file:
Table Report.proto

4 Click the "Open" button on the Open Module dialog window.

5 The Table Report will be added to the Builder as shown below.



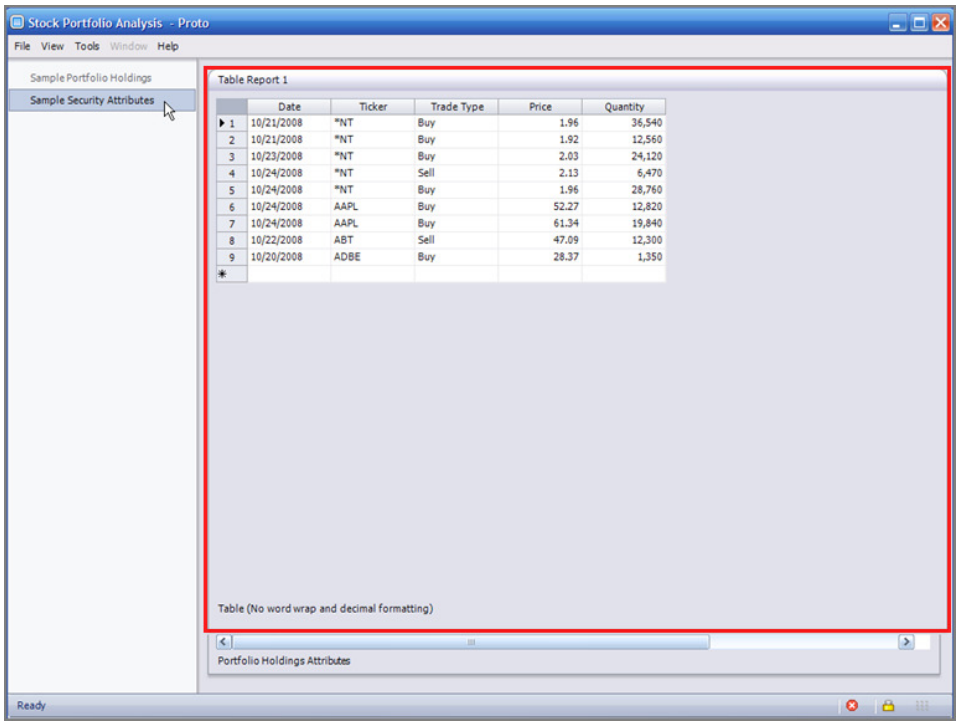
Throughout the rest of the lessons, directions to insert a Component will appear in the following format:

Location: *..\Getting Started Components\Presentation and Analysis*
Component: Table Report.proto

***Note**: You can change the name of any Module (both primitive Modules and Components) by double-clicking on it in the Builder and typing in a new name in the Label field on the General tab in the Property Panel.*

6 Now switch to the Viewer by selecting "View > Viewer" from the Application menu or clicking the "Switch to Viewer" icon in the bottom right hand side of the Builder.

7 Click between the two workflow steps and note that the Table Report Component always stays on top and is not part of the workflow structure yet. We'll change that in the next section.



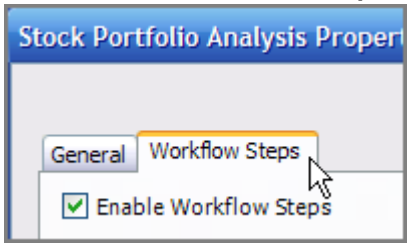
Note: *There is already data in the Table Report Component. This data was saved along with the Component when it was created or last saved. When we inserted the Component into a new dashboard, the old data came along with it. When we make connections to the Table Report Component in the Builder, the old data will be flushed out by the output Entryset from the Join Module, and the data shown in the table will update.*

Make the Table Report Component a Workflow Step

1 Return to the Builder by selecting "View > Builder" from the Application menu.

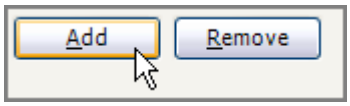
2 Double-click anywhere on the white background area of the Builder, and a Property Panel will be shown for the dashboard you are building.

3 Click on the Workflow Steps tab in the Property Panel

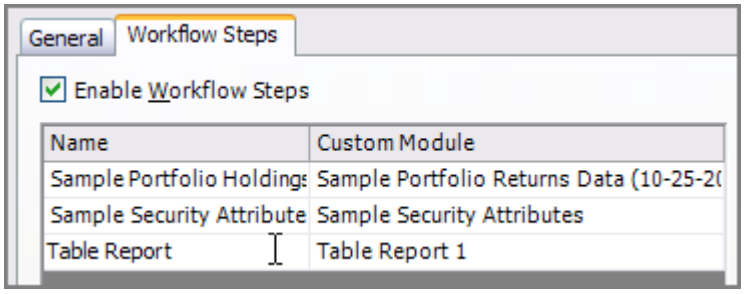


4 Note that the Workflow Steps are already enabled, and there is a step defined for each of the sample data Components.

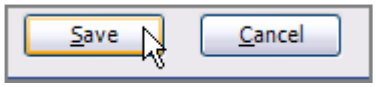
5 Click the button titled "Add" at the bottom of the list of workflow steps



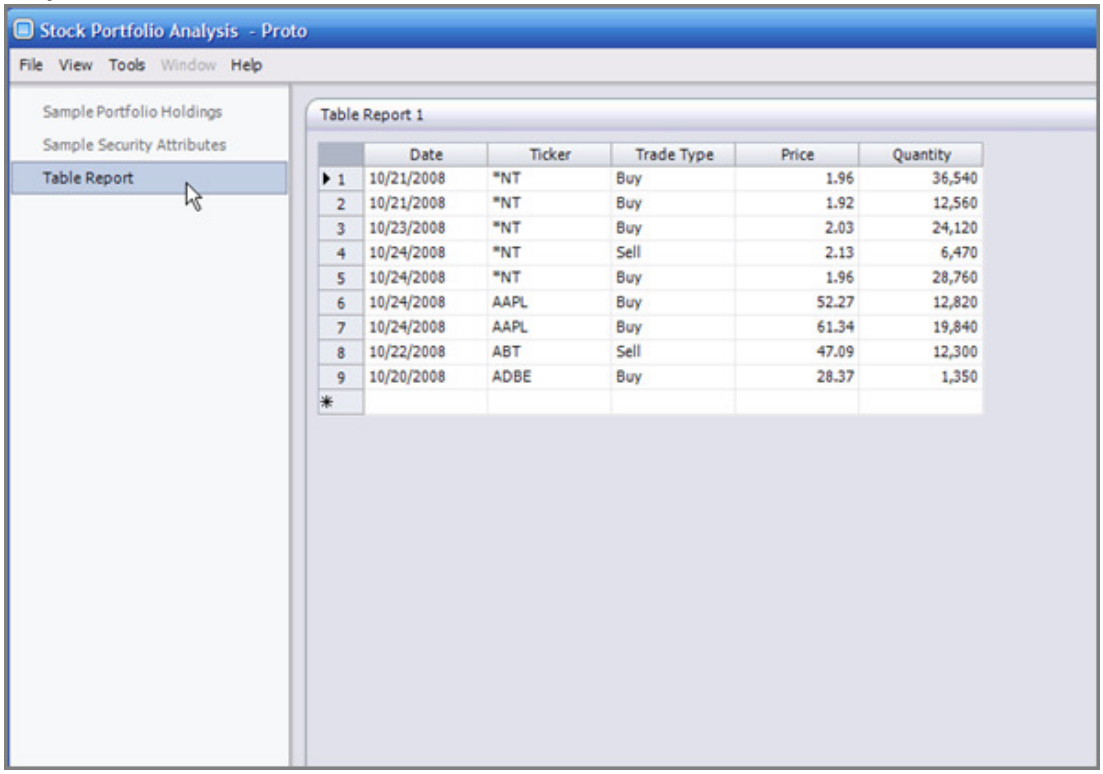
6 Proto will automatically add a workflow step as long as there is still an unmapped Component on the Builder. If all the Components are mapped to workflow steps, the "Add" button will have no effect. In this case the Table Report Component will be detected and added. Rename the step to "Table Report" by double-clicking in the Name column and changing the text.



7 Click Save at the bottom of the Property Panel.



8 Return to the Viewer, and click on each of the steps once again. Notice that now the visibility of the Table Report Component is being controlled by the workflow step buttons.



	Date	Ticker	Trade Type	Price	Quantity
1	10/21/2008	*NT	Buy	1.96	36,540
2	10/21/2008	*NT	Buy	1.92	12,560
3	10/23/2008	*NT	Buy	2.03	24,120
4	10/24/2008	*NT	Sell	2.13	6,470
5	10/24/2008	*NT	Buy	1.96	28,760
6	10/24/2008	AAPL	Buy	52.27	12,820
7	10/24/2008	AAPL	Buy	61.34	19,840
8	10/22/2008	ABT	Sell	47.09	12,300
9	10/20/2008	ADBE	Buy	28.37	1,350

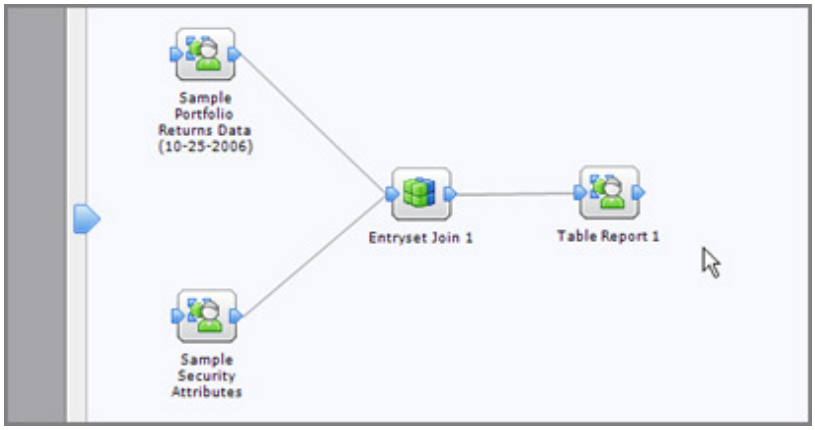
Connect the Join Module to the Table Report Component

1 Return once more to the Builder.

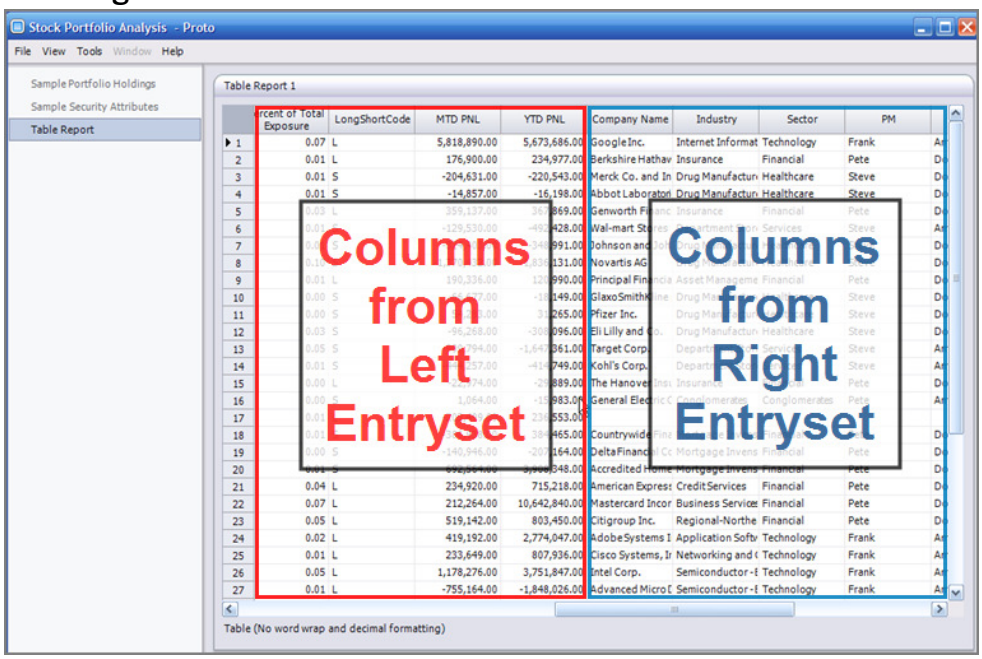
2 Then make a Connection from the Join Module to the Table Report Component.

From:	Entryset Join 1
Output:	*Entryset Join Connectors > Get Joined Entryset*
To:	Table Report 1
Input:	*Input Entyrset*

3 Your Builder window should look similar to the screenshot below.



4 Go back to the Viewer and confirm that the Table Report Component now shows the merged data.



Congratulations! You are through the basic principles of the Viewer, the Builder, Modules, Connections, and creating workflow steps.

In the next few pages, you'll see how to add and configure more sophisticated Components to analyze and explore the merged data set.

Add a Component to Filter Out a Row of Data

In the next couple of steps, we'll add a filtering Component to eliminate an unwanted row from the merged data set. Unlike the Table Report Component, the filtering Component needs to be configured to be useful. In particular we need to specify the conditions we want to use to filter out rows of data. We'll cover two techniques to configure Components.

I. You can display the Component's user interface in a pop-up window, make necessary configuration settings, and then close the pop-up window. Once you close the pop-up window, the Component will not be shown to the end user or displayed as a workflow step. If you ever need to change its configuration you can locate it in the Builder, pop-up its user interface, make changes, and close it again. This mirrors the process of configuring a primitive Module through its Property Panel, as you did with the Join Module.

II. You can display the Component as a workflow step, embed it elsewhere in the Viewer or embed it in another Component. When you do this, end users will be able to see the Component and interact with it as needed.

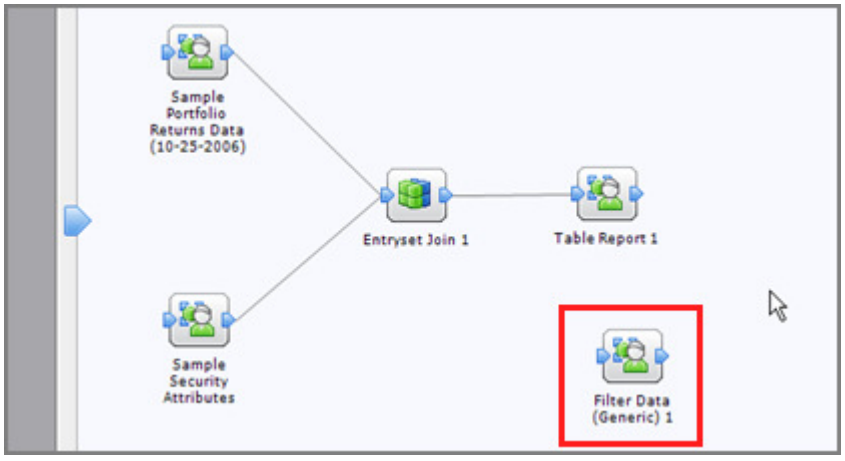
Some Components are pretty clearly user-facing, like a graphing Component or the Table Report you just used. Other Components need to be configured once, but aren't likely to change thereafter or require user input. The filtering Component doesn't clearly fall into one camp or the other. In some applications the filtering criteria will never change, and in other applications an end user may want to be able to change the criteria interactively as part of an analytical process. Fortunately you can make a judgment call to do what's best for end users, and as you'll see later on, it's easy to change how a Component is presented.

Add the filtering Component to the Builder

1 Go to the Builder, right-click on the background and select "Insert from Folder..."

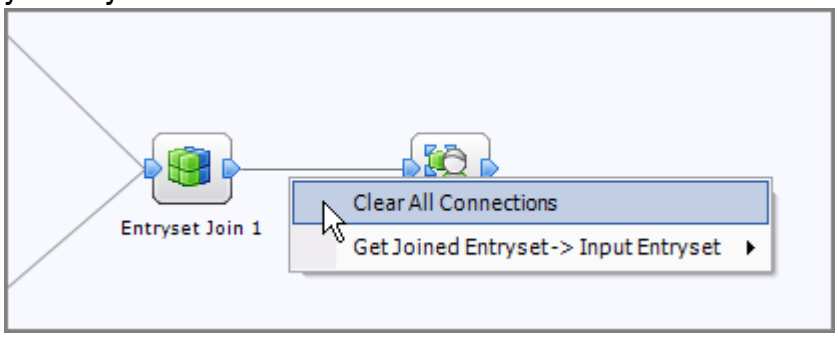
2 Browse through the Getting Started Components and insert the filtering Component:

Location:	*..\Getting Started Components\Do Stuff with Data\Sort and Filter Data*
Component:	Filter Data (Generic).proto

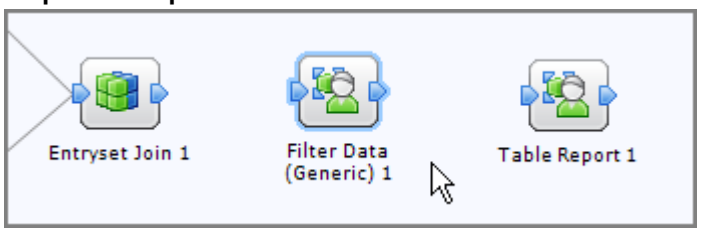


Delete and remake Connections to incorporate the Filter Data Component

1 Delete the Connection between the Join Module and the Table Report Component by right-clicking on the Connection and selecting "Clear All Connections" or clicking on the Connection once, turning it light blue, and then hitting the Delete key on your keyboard.



2 Now position the Filter Data Component between the Join Module and the Table Report Component.

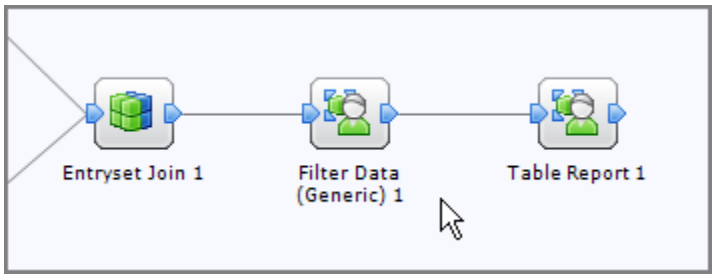


3 Then make the following Connections:

From:	Entryset Join 1
Output:	*Entryset Join Connectors > Get Joined Entryset*
To:	Filter Data (Generic) 1
Input:	*Input Entryset*

From:	Filter Data (Generic) 1
Output:	*Filtered Entryset*
To:	Table Report 1
Input:	*Input Entryset*

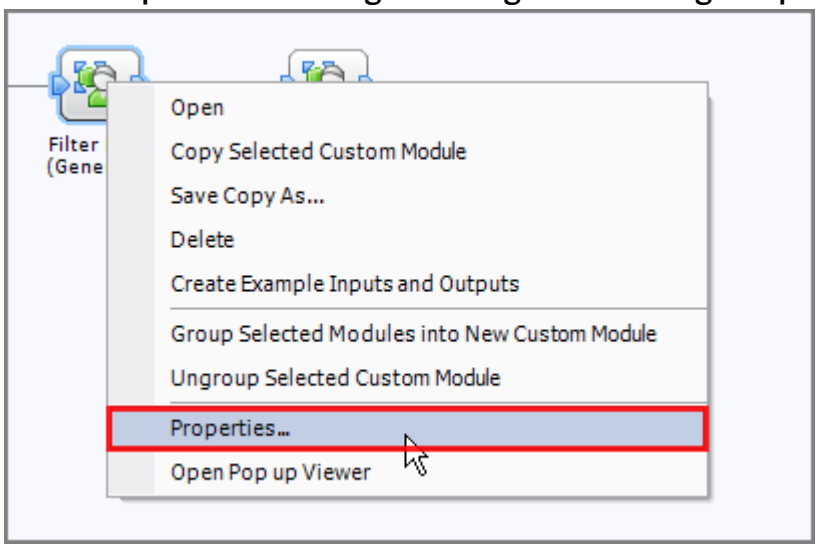
Your Builder window should now look like this.



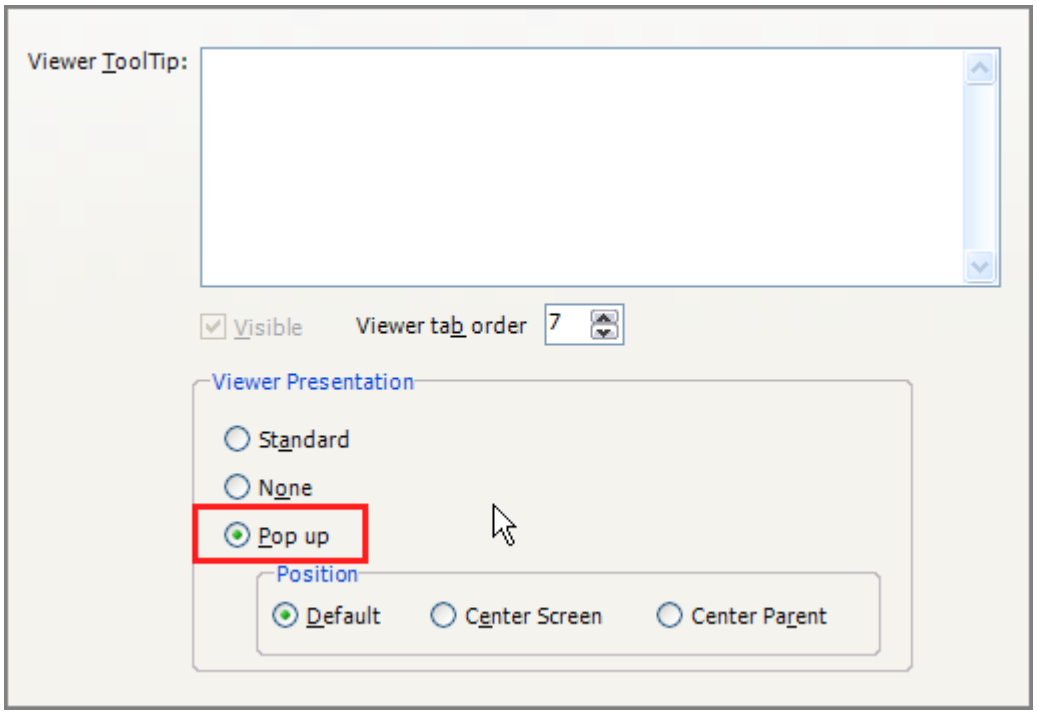
Open the Filter Component in a Pop-up Window

To configure a Component's functionality through a pop-up window, you will first have to set its presentation style to "Pop up." A Component can present its user interface in a few different ways, and you can change the presentation style through the Component's Property Panel.

4 Open the Filter Data Component's Property Panel by double-clicking on the Filter Data Component icon or right-clicking and selecting "Properties…"



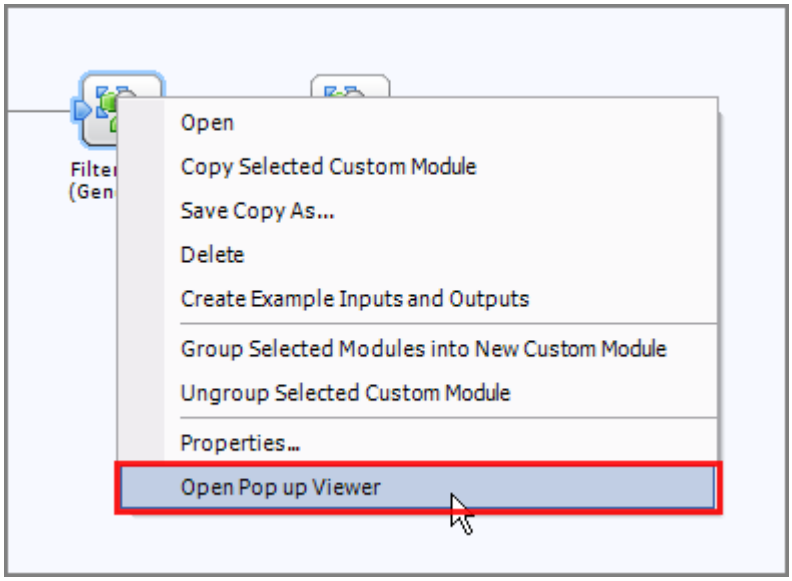
5 If the Viewer Presentation selection is not already set to "Pop up," make that selection now:



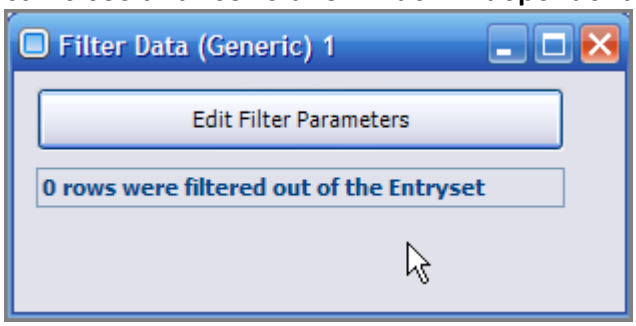
6 Click Save to close the Property Panel and save your changes.

7 Go to the Viewer and confirm that the Filter Data Component is not visible on the Viewer.

8 Return to the Builder and "Pop up" the Filter Data Component by right-clicking on it and selecting "Open Pop up Viewer."



9 The user interface for the Component will open in a detached, pop-up Viewer. You can close and resize this window independently of the primary Viewer window.



Configure the Filter Data Component

The Filter Data Component allows you to set filtering criteria to filter out certain rows from an Entryset. Behind the scenes, it is a very simple Component that wraps up a primitive Entryset Filter Module with some logic to display how many rows were filtered out of the Entryset. You will learn how to build Components out of primitive Modules and other Components in later lessons.

We will configure the Filter Component to eliminate the USD position from the portfolio data (the row where the Ticker is "USD"). However you can experiment with other filtering criteria on your own.

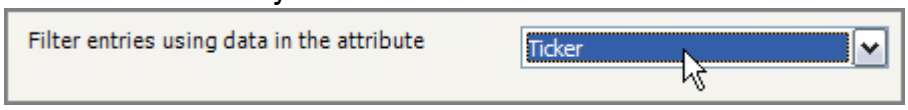
1 Click the button named "Edit Filter Parameters."

Note: *This button is connected in the Builder so that it launches the Property Panel for the primitive Filter Module that is contained inside the Filter Component. This Property Panel is similar to the Property Panel for the Entryset Join Module that you*

configured earlier in this Lesson, or the generic Property Panel you opened for this Component to change its presentation style. It is a built-in Proto Property Panel, and is unrelated to the "pop-up" functionality of the Filter Data Component. Certain primitive Modules have user-friendly Property Panels, and from time to time you may want to expose them via buttons on the Viewer as illustrated by this example.

2 Click the "Add" button to create a new condition.

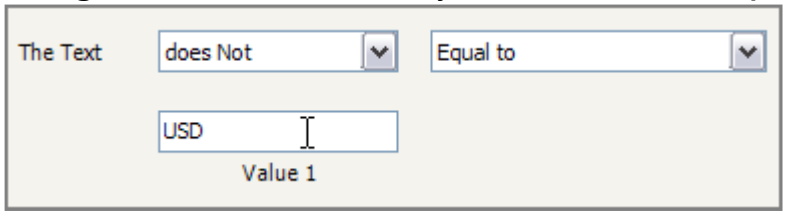
3 In the "Edit Conditions" section, set the first Listbox to "Ticker" to filter on that attribute of the Entryset.



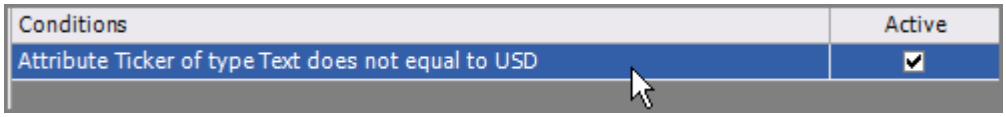
4 Set the next Listbox to "Text" which allows you to define text based filtering comparisons like "Starts with" or "Contains."

5 Then click on the Checkbox named "Where" which will enable additional conditions.

6 Configure the next section to say "The Text does Not Equal to USD" as below.

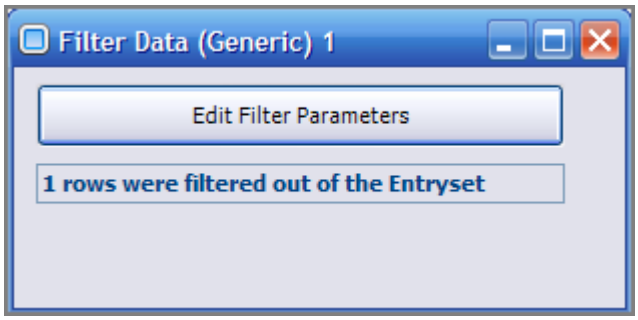


7 The entire condition is summarized in the "Conditions" table at the top of the Property Panel for reference. You can add more conditions in the same way, and you can activate and deactivate them with the checkboxes in the "Activate" column.



8 Click the Save button to close the Property Panel.

9 Note in the Pop-up Viewer that the label on the Filter Data Component has been updated to say that 1 row was filtered out as expected.

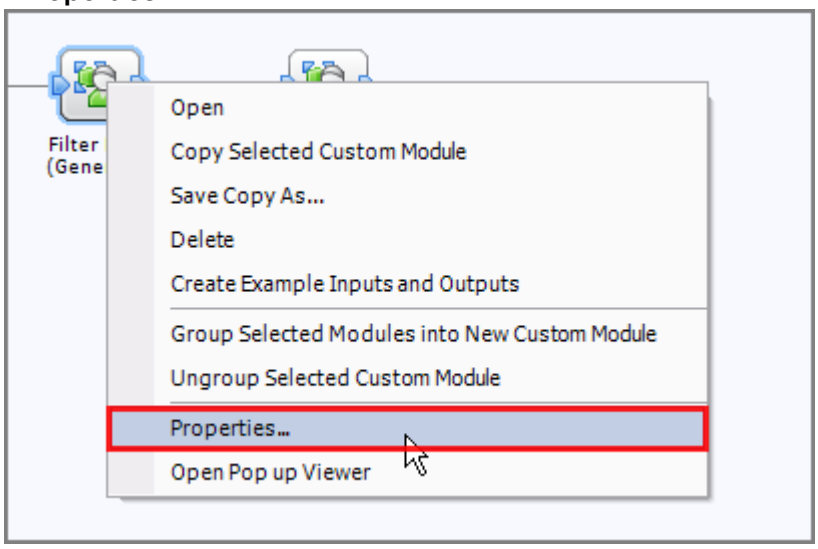


10 Close the Pop-up window.

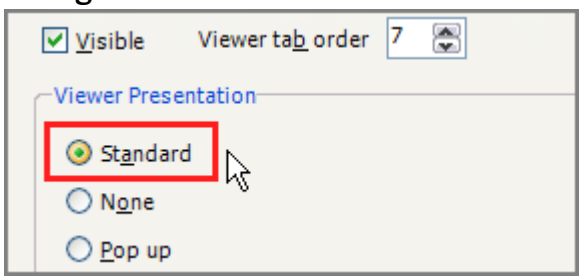
Include the Filter Data Component as a workflow step

Above, we saw how to make a Component display its user interface in a separate, pop-up window. Now we'll expose it to end users in the primary Viewer as a workflow step, just as we did with the Table Report Component.

1 First go to the Builder and open the Filter Data Component's Property Panel by double-clicking on the Filter Data Component icon or right-clicking and selecting "Properties..."

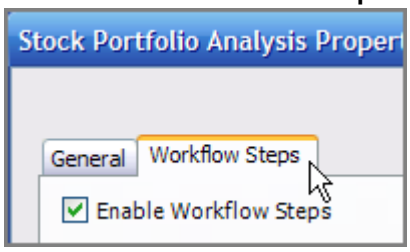


2 Change the Viewer Presentation mode to "Standard" and click Save.

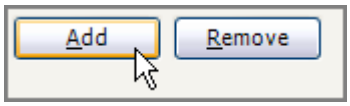


3 Now add the Filter Data Component as a workflow step, just as you did with the Table Report Component. First double-click anywhere on the white background area of the Builder to launch the Property Panel for the Stock Portfolio Analysis dashboard.

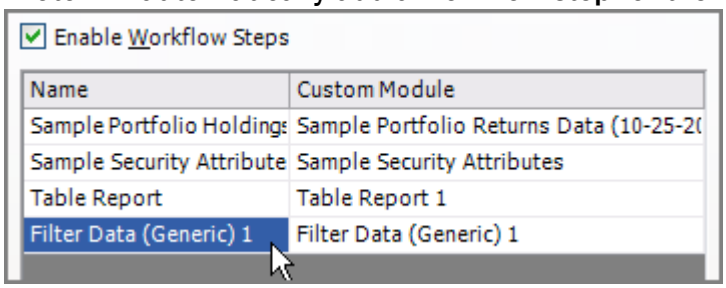
4 Click on the Workflow Steps tab in the Property Panel



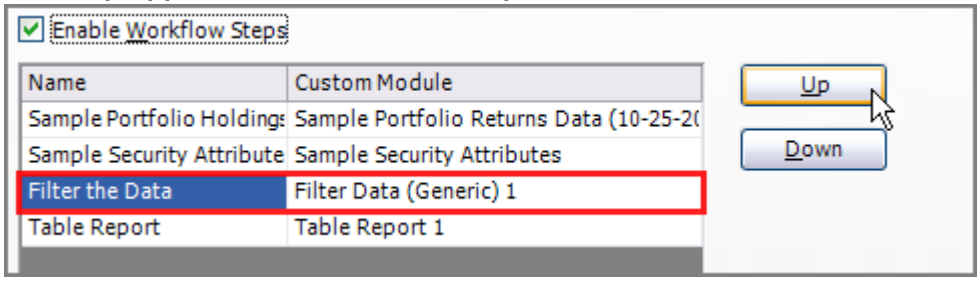
5 Click the button titled “Add” at the bottom of the list of workflow steps



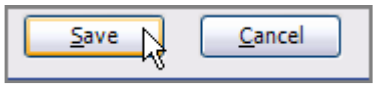
6 Proto will automatically add a workflow step for the Filter Data Component.



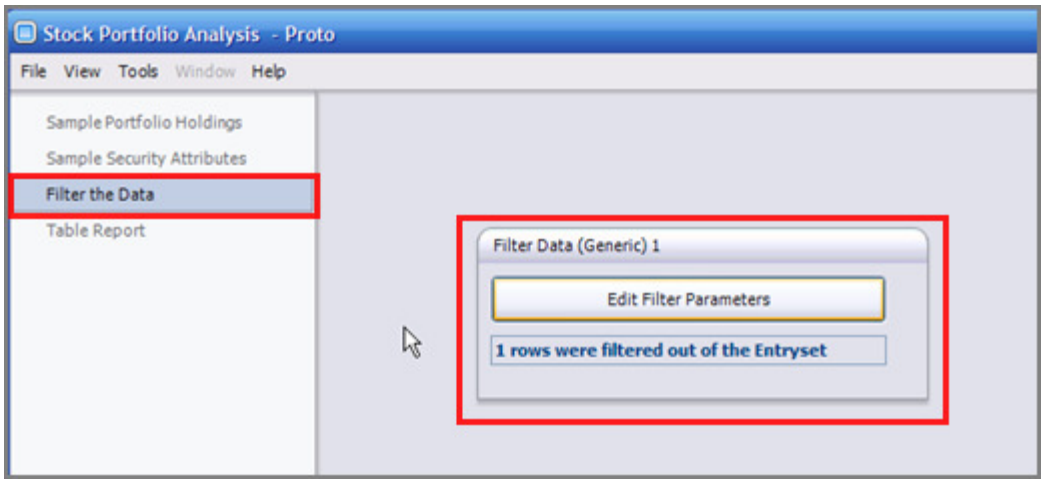
7 Double-click on the Name field in the table and change the name to “Filter the Data.” Then click the “Up” button on the right side of the workflow steps to make this step appear before the Table Report on the Viewer.



8 Click Save at the bottom of the Property Panel.

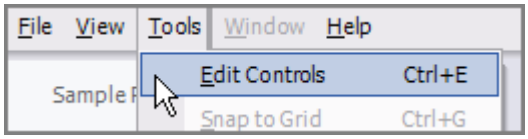


9 Go to the Viewer, and click on the workflow step called “Filter the Data.” Note that the Component may not appear in the top left of the Viewer if you moved it while it was shown as a pop-up window.

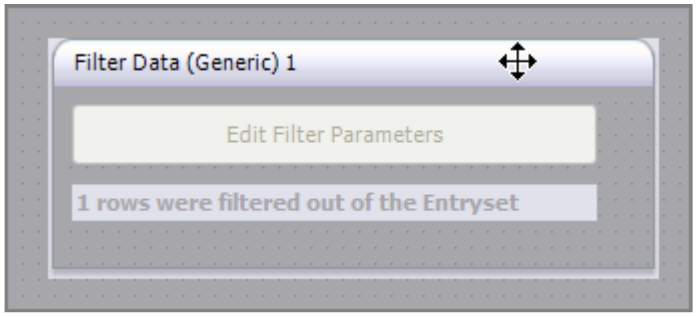


10 To position and size controls on the Viewer, you can enter Edit Mode and then drag and resize them appropriately.

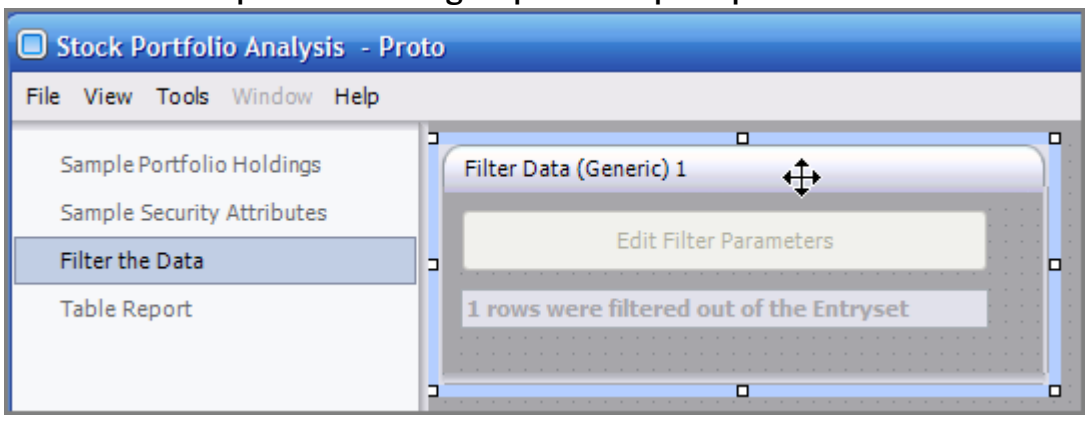
11 To enter Edit Mode, select Tools > Edit Controls from the application menu bar.



12 The Viewer will turn grey, and the borders of the controls and Components will change visually. When you mouse over the border of the Filter Data Component, the cursor will change to indicate that you can select and drag the Component.



13 Click on the Component and drag it up to the top left portion of the Viewer.



***Note**: When you first click on the border of a large Component in Edit mode, the Viewer window may auto-scroll to fit the Component in the visible area of the Window. When you start to move the Component, this auto-scrolling can creating a jerking effect. As you drag the Component up and to the left or resize it so that it no longer causes the window to show scroll bars, the jerking adjustments will stop.*

14 Exit Edit Mode by again selecting Tools > Edit Controls from the application menus.

Click through the workflow steps and note that the Filter Data Component is now displayed alongside other steps in the Viewer.

Create Four Interactive Analysis Components

Now you are going to add four Components that will allow you to experiment with some of Proto's interactive analysis and reporting capabilities. You will follow the same series of building steps to insert, connect and configure the Components.

Three of the Components are general purpose, and could work with virtually any dataset. The fourth Component is intentionally specialized for portfolio management, and in particular the sample portfolio data you are using. When you begin to develop analysis, data cleaning and reporting Components that use common data formats, you will undoubtedly develop highly specialized functionality that you can then mix and match later in new ways. The "Daily Portfolio Summary Views" Component illustrates how entire sections of your workflow dashboards can be wholesale repurposed.

Add four Components to the Builder

1 Go to the Builder and right-click to browse for a Component to insert.

2 Insert the following four Components

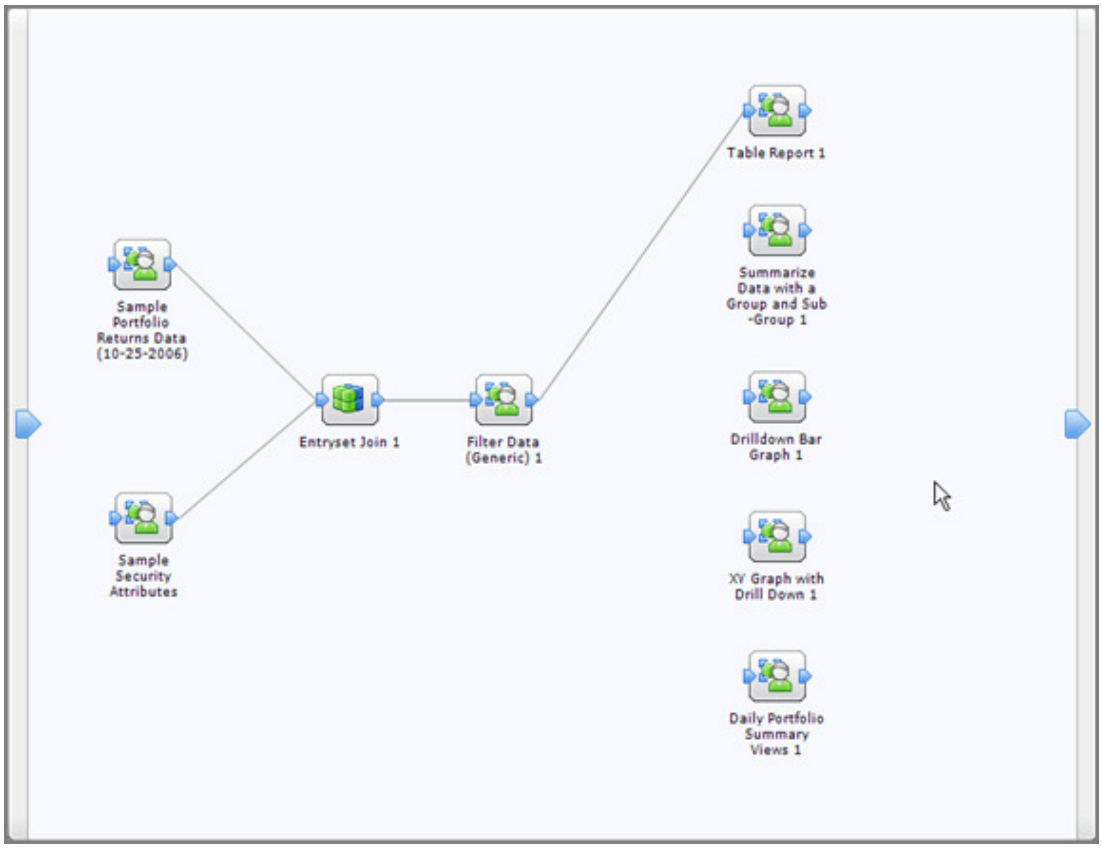
Location: *..\ Getting Started Components\Presentation and Analysis*
Component: Summarize Data with a Group and Sub-Group.proto

Location: *..\Getting Started Components\Presentation and Analysis*
Component: Drilldown Bar Graph.proto

Location: *..\Getting Started Components\ Presentation and Analysis*
Component: XY Graph with Drill Down.proto

Location: *..\ Getting Started Components\DEMO - Portfolio Analysis Components*
Component: Daily Portfolio Summary Views.proto

3 You can arrange the four new Components and the Table Report on the Builder as shown below.



Add the four new Components as workflow steps

1 Double-click on the background of the Builder, go to the Workflow Steps tab, and click the "Add" button four times to add the Components you just inserted.

***Note**: Some of the Components may have been automatically added as workflow steps for you. This can happen when a Component was last saved while it was a "step" of another dashboard. As such, you may only have to actually add one or two of the Components yourself.*

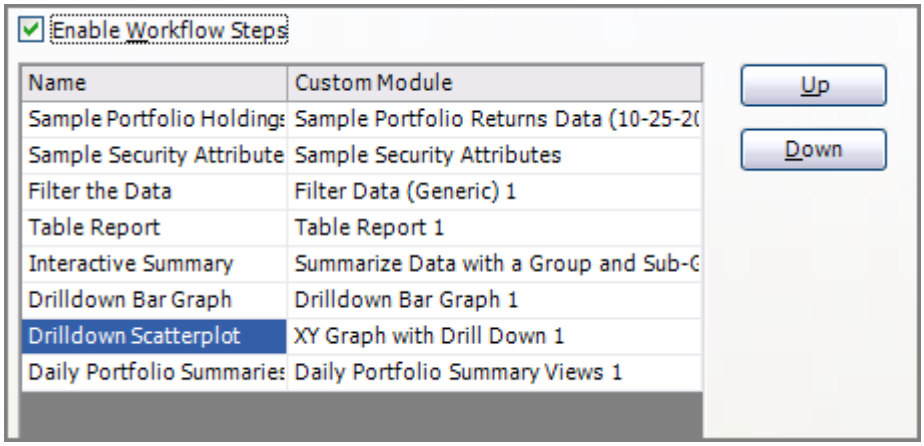
2 Name the summarization Component "Interactive Summary."

3 Name the drilldown bar graph Component "Drilldown Bar Graph"

4 Name the XY graph Component "Drilldown Scatterplot"

5 The daily metrics Component should already be named "Daily Portfolio Summaries."

6 Reorder the steps if necessary by clicking on the name of the step and using the "Up" and "Down" buttons. This will change the order in which the steps appear on the Viewer.



7 Click the “Save” button at the bottom of the Property Panel.

Go to the Builder and connect the Filter to the Presentation Components

1 Go to the Builder

2 Make the following four Connections, and for now ignore any error messages you may get when you connect to the Components.

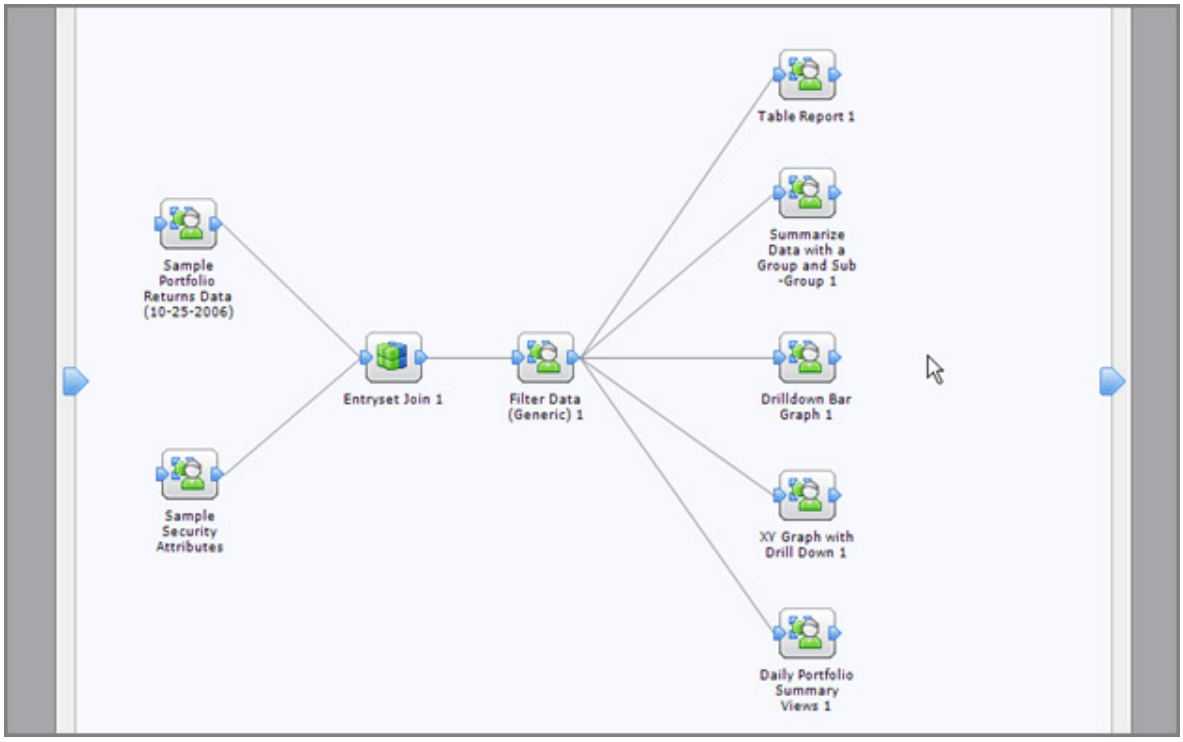
From:	Filter Data (Generic) 1
Output:	*Filtered Entryset*
To:	Summarize Data with a Group and Sub-Group 1
Input:	*Input Entryset to Summarize*

From:	Filter Data (Generic) 1
Output:	*Filtered Entryset*
To:	Drilldown Bar Graph 1
Input:	Set Entryset

From:	Filter Data (Generic) 1
Output:	*Filtered Entryset*
To:	XY Graph with Drill Down 1
Input:	Set Entryset

From:	Filter Data (Generic) 1
Output:	*Filtered Entryset*
To:	Daily Portfolio Summary Views 1
Input:	*Daily Portfolio Data*

Your Builder window should now look like this.



Congratulations! You have finished assembling the Components for this lesson. Now return to the Viewer to configure and explore some of the analysis Components you just added.

Select File > Save from the application menu bar to save your work.

Explore the Analysis Components

Click through each of the steps to quickly review what you have built:

- You are combining two sources of data
- Filtering out some of the rows
- And presenting the resulting data in five separate analysis screens

In the remainder of this lesson, you will get a quick introduction to each of the analysis Components, but mostly you are encouraged to explore them on your own.

The Interactive Summary Screen

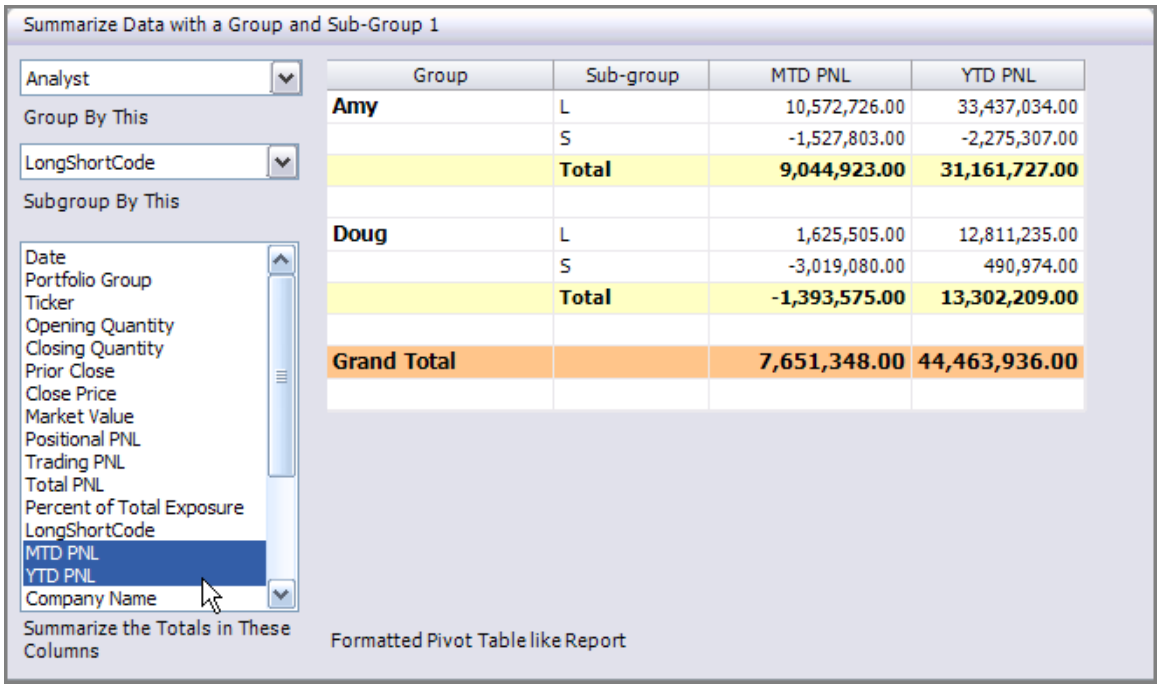
Go to the Viewer and click on the Interactive Summary step to experiment with the Summarize Data with a Group and Sub-Group Component.

This Component allows you to dynamically create simple aggregation reports. Try the following settings and then experiment on your own.

3 Set the Group By Listbox to “Analyst”

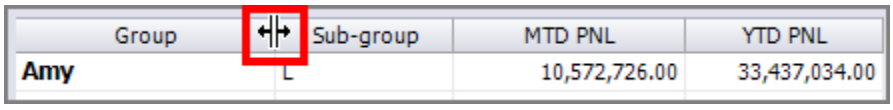
4 Set the Subgroup By Listbox to “LongShortCode”

5 Select the “MTD PNL” and “YTD PNL” fields from the summarization columns Listbox.



***Note**: You can select multiple items in the “Summarize the Totals in These Columns” Listbox by holding down the Control key.*

***Note**: You can resize the Table columns by clicking and dragging on the Table header between columns. When you position the mouse between columns, the cursor will change to indicate that you can begin resizing the column.*



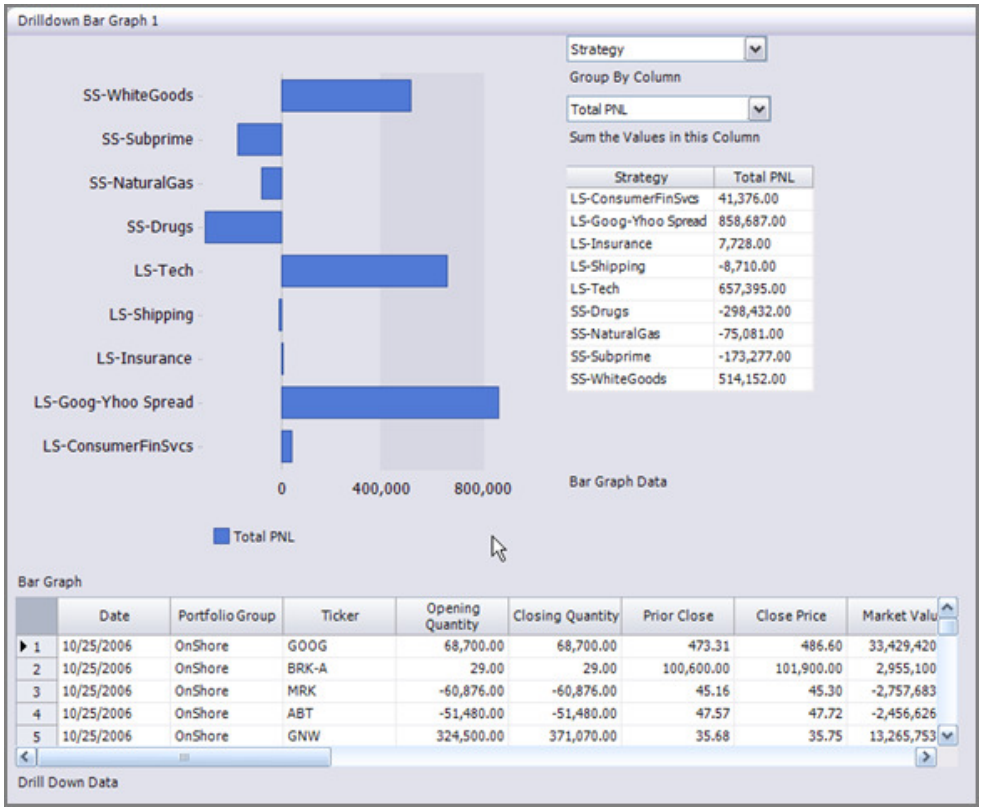
The Drilldown Bar Graph

Click on the Drilldown Bar Graph step to experiment with the bar graph analysis Component. To configure this Component, you will have to select a numeric column to sum over, and a reasonable category to group by for the individual bars.

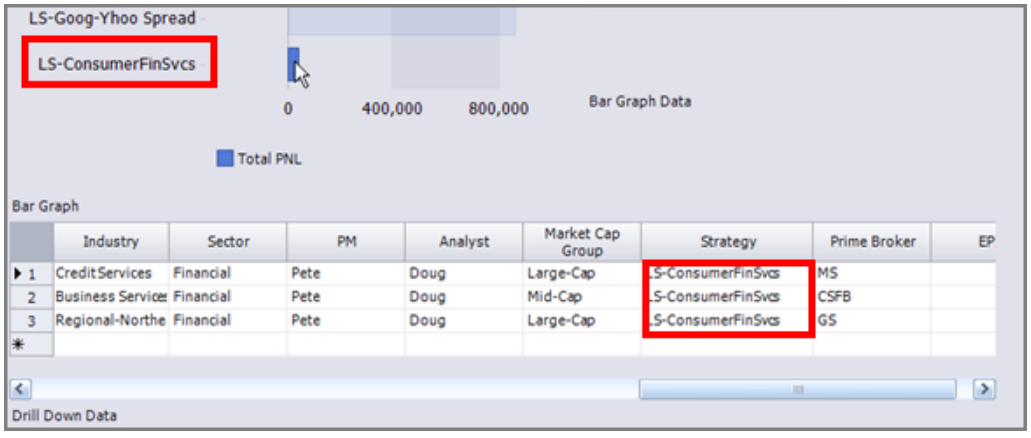
Try the following settings and then experiment on your own.

6 Set the Group By Listbox to “Strategy” and ignore any error you get which is due to the “sum” column not being numeric.

7 Set the Listbox called “Sum the Values in this Column” to “Total PNL” and then try “MTD PNL” and “YTD PNL” to compare them.



8 Next, click on one of the bars, such as “LS-ConsumerFInSvcs” on the bottom of the bar graph to “drill down” into the data that is used to calculate the value of that bar. It’s easiest to see if you scroll the Table at the bottom of the screen over to a point so that the column you’re grouping on is visible.



The Drilldown Scatter Plot

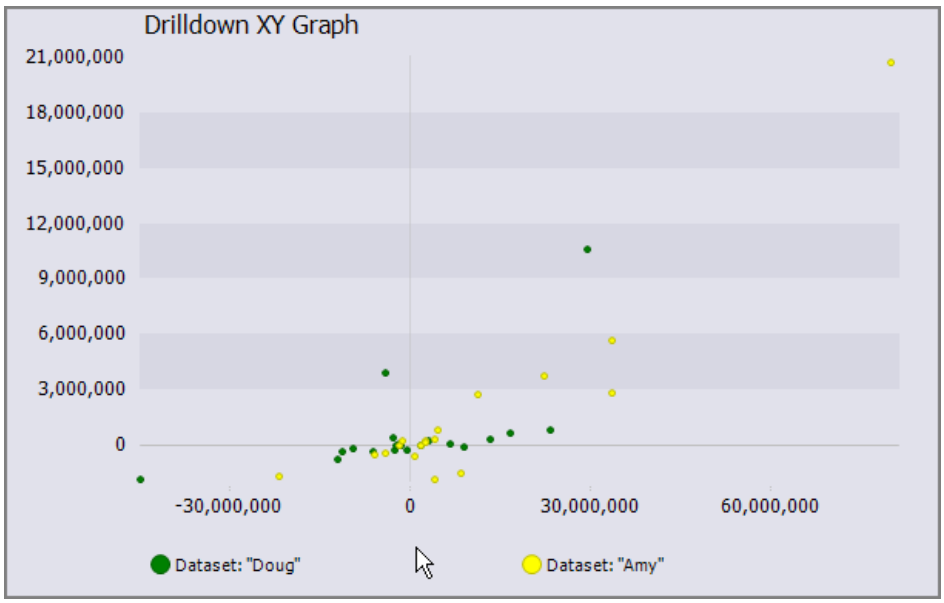
Click on the Drilldown Scatterplot step to experiment with the drill down XY analysis Component. To use this Component, you select two numeric metrics to compare on X and Y axis. For example, you can configure this Component to compare the Year-to-Date profits with a position's Market Value to see how well positions are performing relative to their inherent risk. If you group by the analyst as well, you can get a sense for who is making the best security selections. Then click and drag on the graph to drill down to see specific positions of interest.

Configure this Component as follows.

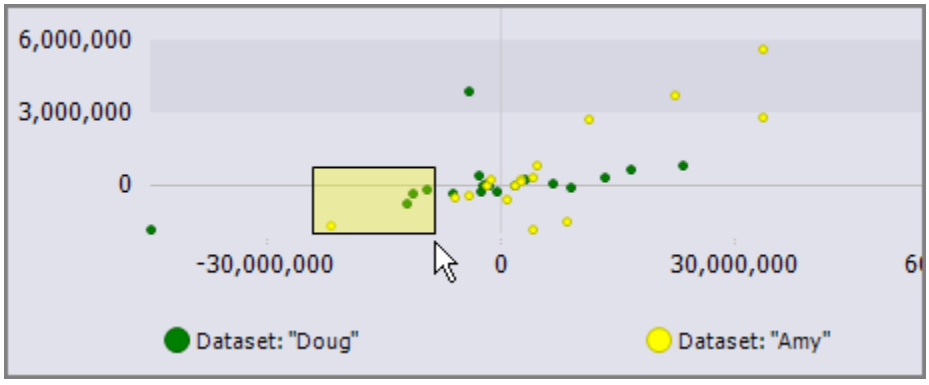
9 Set the Pick X Axis Listbox to "Market Value"

10 Set the Pick Y Axis Listbox to "YTD PNL"

11 Set the Group Points by This Listbox to "Analyst."



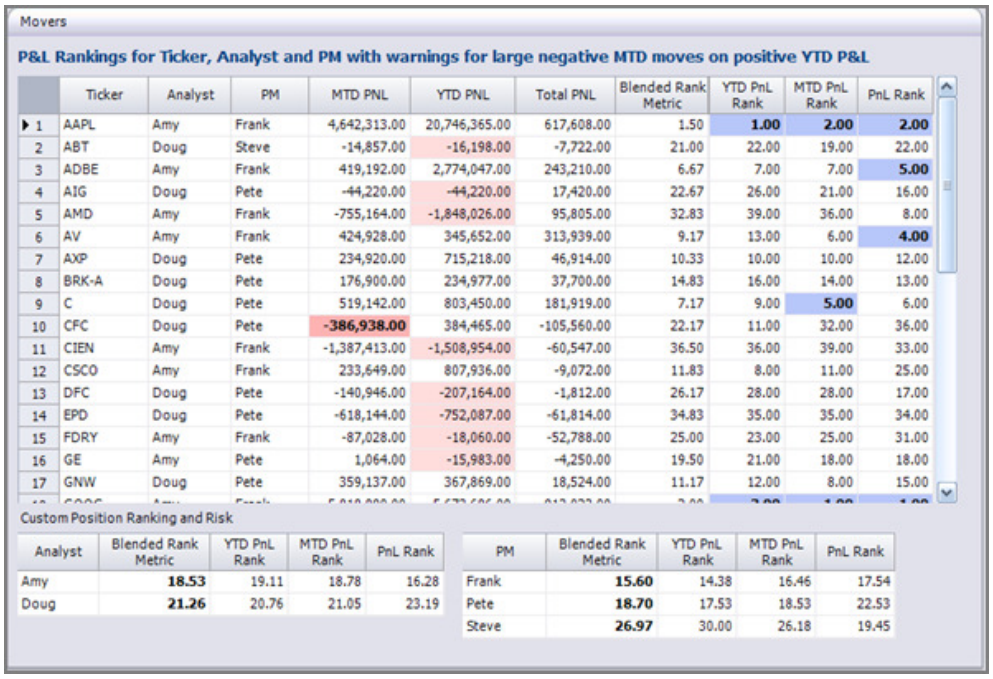
To drill down to specific positions, click and drag on the graph to highlight a group of points or an individual point. Note that the rows in the Table show the selected positions.



Daily Portfolio Summaries

The Daily Portfolio Summaries show two views of the combined portfolio data in two separate sub-steps. One screen shows a summary of P&L winners and rankings, and the other screen is an overview of various portfolio exposure metrics.

Movers



Movers

P&L Rankings for Ticker, Analyst and PM with warnings for large negative MTD moves on positive YTD P&L

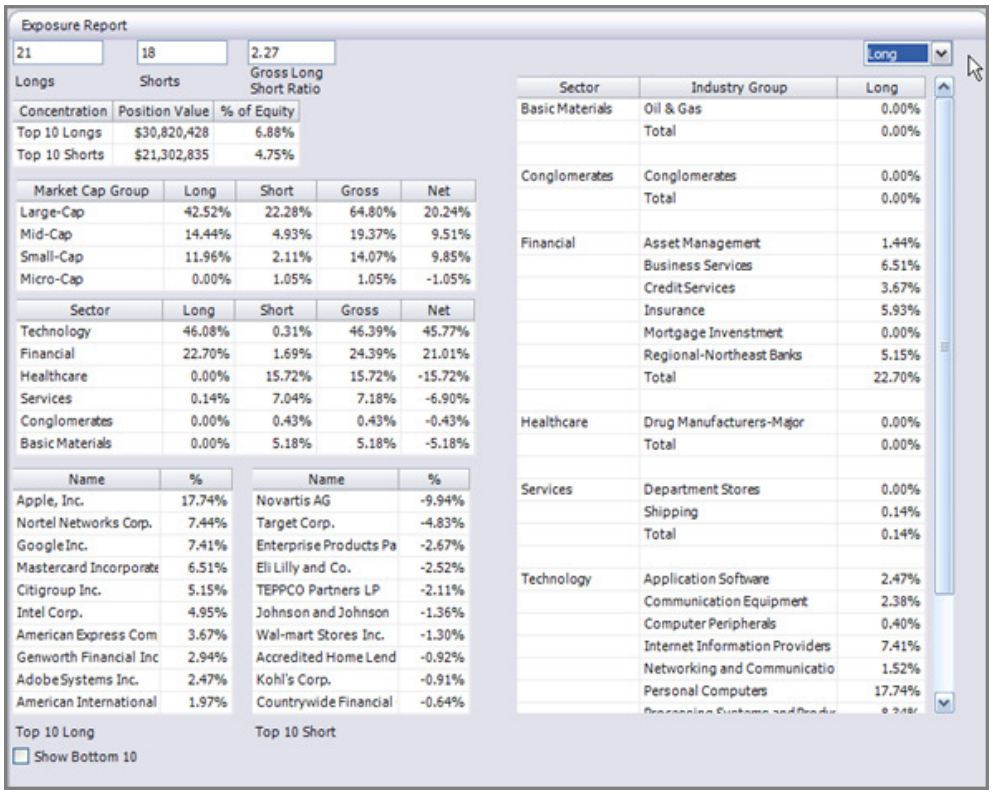
	Ticker	Analyst	PM	MTD PNL	YTD PNL	Total PNL	Blended Rank Metric	YTD PnL Rank	MTD PnL Rank	PnL Rank
1	AAPL	Amy	Frank	4,642,313.00	20,746,365.00	617,608.00	1.50	**1.00**	**2.00**	**2.00**
2	ABT	Doug	Steve	-14,857.00	-16,198.00	-7,722.00	21.00	22.00	19.00	22.00
3	ADBE	Amy	Frank	419,192.00	2,774,047.00	243,210.00	6.67	7.00	7.00	**5.00**
4	AIG	Doug	Pete	-44,220.00	-44,220.00	17,420.00	22.67	26.00	21.00	16.00
5	AMD	Amy	Frank	-755,164.00	-1,848,026.00	95,805.00	32.83	39.00	36.00	8.00
6	AV	Amy	Frank	424,928.00	345,652.00	313,939.00	9.17	13.00	6.00	**4.00**
7	AXP	Doug	Pete	234,920.00	715,218.00	46,914.00	10.33	10.00	10.00	12.00
8	BRK-A	Doug	Pete	176,900.00	234,977.00	37,700.00	14.83	16.00	14.00	13.00
9	C	Doug	Pete	519,142.00	803,450.00	181,919.00	7.17	9.00	**5.00**	6.00
10	CFC	Doug	Pete	**-386,938.00**	384,465.00	-105,560.00	22.17	11.00	32.00	36.00
11	CIEN	Amy	Frank	-1,387,413.00	-1,508,954.00	-60,547.00	36.50	36.00	39.00	33.00
12	CSCO	Amy	Frank	233,649.00	807,936.00	-9,072.00	11.83	8.00	11.00	25.00
13	DFC	Doug	Pete	-140,946.00	-207,164.00	-1,812.00	26.17	28.00	28.00	17.00
14	EPD	Doug	Pete	-618,144.00	-752,087.00	-61,814.00	34.83	35.00	35.00	34.00
15	FDRY	Amy	Frank	-87,028.00	-18,060.00	-52,788.00	25.00	23.00	25.00	31.00
16	GE	Amy	Pete	1,064.00	-15,983.00	-4,250.00	19.50	21.00	18.00	18.00
17	GNW	Doug	Pete	359,137.00	367,869.00	18,524.00	11.17	12.00	8.00	15.00

Custom Position Ranking and Risk

Analyst	Blended Rank Metric	YTD PnL Rank	MTD PnL Rank	PnL Rank
Amy	**18.53**	19.11	18.78	16.28
Doug	**21.26**	20.76	21.05	23.19

PM	Blended Rank Metric	YTD PnL Rank	MTD PnL Rank	PnL Rank
Frank	**15.60**	14.38	16.46	17.54
Pete	**18.70**	17.53	18.53	22.53
Steve	**26.97**	30.00	26.18	19.45

Exposure Overview



Exposure Report

21 Longs | 18 Shorts | 2.27 Gross Long Short Ratio

Long

Concentration	Position Value	% of Equity
Top 10 Longs	$30,820,428	6.88%
Top 10 Shorts	$21,302,835	4.75%

Market Cap Group	Long	Short	Gross	Net
Large-Cap	42.52%	22.28%	64.80%	20.24%
Mid-Cap	14.44%	4.93%	19.37%	9.51%
Small-Cap	11.96%	2.11%	14.07%	9.85%
Micro-Cap	0.00%	1.05%	1.05%	-1.05%

Sector	Long	Short	Gross	Net
Technology	46.08%	0.31%	46.39%	45.77%
Financial	22.70%	1.69%	24.39%	21.01%
Healthcare	0.00%	15.72%	15.72%	-15.72%
Services	0.14%	7.04%	7.18%	-6.90%
Conglomerates	0.00%	0.43%	0.43%	-0.43%
Basic Materials	0.00%	5.18%	5.18%	-5.18%

Name	%
Apple, Inc.	17.74%
Nortel Networks Corp.	7.44%
Google Inc.	7.41%
Mastercard Incorporate	6.51%
Citigroup Inc.	5.15%
Intel Corp.	4.95%
American Express Com	3.67%
Genworth Financial Inc	2.94%
Adobe Systems Inc.	2.47%
American International	1.97%

Top 10 Long

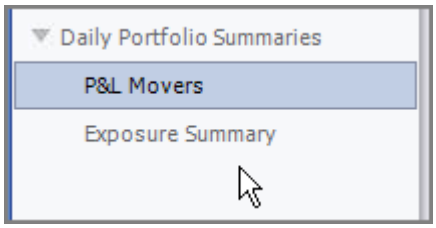
Name	%
Novartis AG	-9.94%
Target Corp.	-4.83%
Enterprise Products Pa	-2.67%
Eli Lilly and Co.	-2.52%
TEPPCO Partners LP	-2.11%
Johnson and Johnson	-1.36%
Wal-mart Stores Inc.	-1.30%
Accredited Home Lend	-0.92%
Kohl's Corp.	-0.91%
Countrywide Financial	-0.64%

Top 10 Short

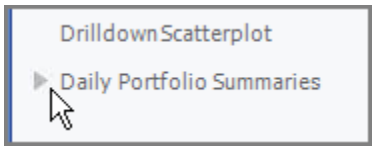
Show Bottom 10

Sector	Industry Group	Long
Basic Materials	Oil & Gas	0.00%
	Total	0.00%
Conglomerates	Conglomerates	0.00%
	Total	0.00%
Financial	Asset Management	1.44%
	Business Services	6.51%
	Credit Services	3.67%
	Insurance	5.93%
	Mortgage Investment	0.00%
	Regional-Northeast Banks	5.15%
	Total	22.70%
Healthcare	Drug Manufacturers-Major	0.00%
	Total	0.00%
Services	Department Stores	0.00%
	Shipping	0.14%
	Total	0.14%
Technology	Application Software	2.47%
	Communication Equipment	2.38%
	Computer Peripherals	0.40%
	Internet Information Providers	7.41%
	Networking and Communicatio	1.52%
	Personal Computers	17.74%

Notice that these two individual Components are grouped together to create a pair of analysis screens that are expressed as sub-steps of the “Daily Portfolio Summaries” group in the Viewer. You will learn how to group Components in later lessons.



Try collapsing this group of steps by clicking on the arrow next to the “Daily Portfolio Summaries” label.



Thank You!

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