

Essentials of IBM® Rational® Functional Tester

Module 2: Creating data-driven tests



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This presentation will provide an overview of scripting with Rational Functional Tester version 6.1 and describe the steps necessary to work with data-driven tests.

Module 2

This introduction helps the students put the objectives into context.

Make sure the students understand that this is not an architecture course!

- Objectives: Creating Data-Driven Tests.
- The following topics are covered in this module:
 - Data-driven testing
 - Creating data-driven test scripts
 - Creating and editing datapools
 - Running a data-driven test
 - Exporting and importing datapools
- Upon completion of this module, you will be able to:
 - Define data-driven testing and explain why you would use it.
 - Create a data-driven test
 - Create and edit a datapool
 - Run a data-driven test
 - Export and import datapools

The objective of this module is to introduce data-driven tests. Topics covered include data-driven testing, creating, editing, running, exporting, and importing datapools and data-driven test scripts.

Limitations of hard-coded scripts

- When you record a test script using literal values, that data is hard-coded into the script.
- A script with hard-coded data:
 - Runs only one test case, or one set of valid test inputs
 - Is difficult to maintain and reuse

There are limitations to testing when using hard-coded scripts. This module will explore the benefits of data driven tests.

When recording a test script using literal values, that data is hard-coded into the script. A script with hard-coded data runs only one test case, or one set of valid test inputs, and is difficult to maintain and reuse.

Data-driven tests use variable data

In data-driven testing, you separate the data from the test script. Instead of hard-coding data into the script, the script is coded to accept variable data from an external source.

Because data is separated from the test script, you can:

- Modify test data without affecting the test script
- Add new test cases by modifying the data, not the test script



When hard-coding data into the script, the script is coded to accept variable data from an external source. Because data is separated from the test script, you can modify test data without affecting the test script, and add new test cases by modifying the data, not the test script.

Datapools

- A datapool
 - is a collection of related data records
 - supplies data values to the variables in a test script
 - uses a different set of test data each time you play back a test
- Functional Tester allows you to
 - create datapools while recording a script
 - import existing datapools
 - Edit datapools you create within Functional Tester
 - Export and edit datapools you create
 - Share a datapool with multiple test scripts

A datapool is a collection of related data records. A datapool supplies data values to the variables in a test script during script playback. Datapools automatically pump a different set of test data to a test script each time you play back a test. Rational Functional Tester makes it easy for you to create datapools while you are recording a script. Alternatively, you can import existing datapools. Rational Functional Tester also allows you to edit datapools you create within Functional Tester, export and edit datapools you create, and share a datapool with multiple test scripts.

Functional tester data-driven testing scenarios

- Different scenarios for implementing data-driven testing in Functional Tester:
 - Create a datapool when recording a data-driven script within Functional Tester. Modify the datapool within Functional Tester.
 - Import an externally created datapool into Functional Tester and associate it with a data-driven test script.
 - Create a datapool when recording a data-driven script within Functional Tester. Export the datapool and edit it externally. Import the edited datapool to drive a test script.

There are different scenarios for implementing data-driven testing in Functional Tester, including:

Creating a datapool when recording a data-driven script within Functional Tester.

Modifying the datapool within Functional Tester

Importing an externally created datapool into Functional Tester and associating it with a data-driven test script

Creating a datapool when recording a data-driven script within Functional Tester.

Exporting the datapool and editing it externally

And, Importing the edited datapool to drive a test script.

Scenario 1: creating a data-driven test script and datapool

Functional Test allows you to create a datapool while you are recording a data-driven test script.

You can then edit and add records to the datapool within Functional Tester.

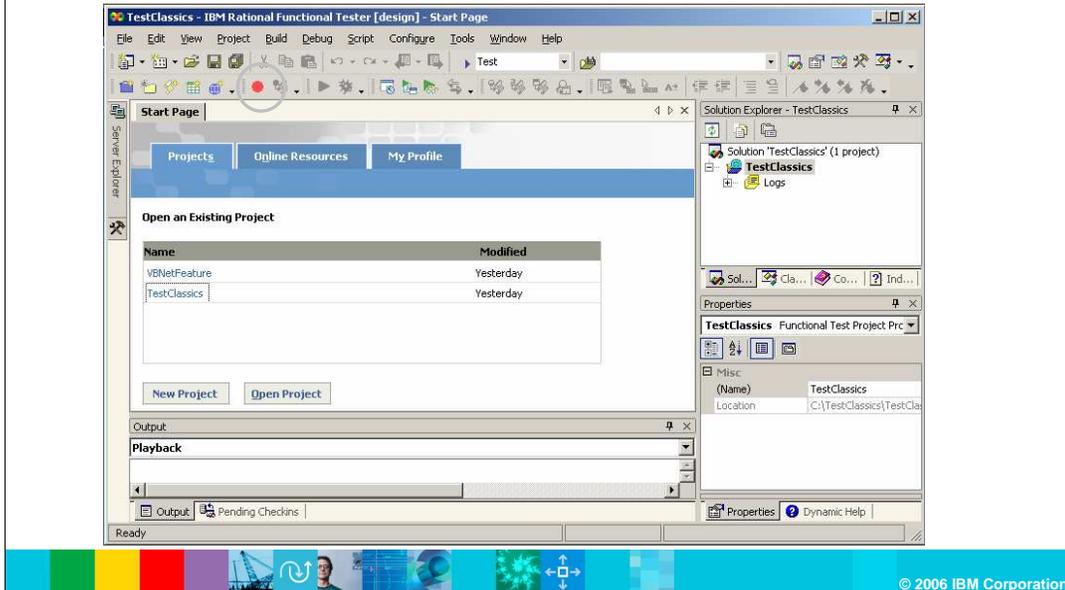


Scenario 1: Creating a data-driven test script and datapool.

This scenario takes you through the process of creating a datapool while you are recording a test script. You can then edit and add records to the datapool within Rational Functional Tester.

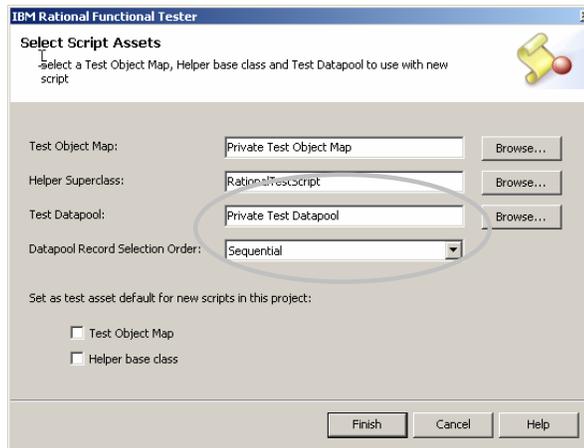
Recording a data-driven test script

Begin recording a test script by clicking the Record Test Script button on the Functional Test toolbar.



To begin recording a test script, click the Record Test Script button on the Functional Test toolbar.

Recording a data-driven test script (cont.)



A **Private Test Datapool** is associated with only one script.

A **Shared Test Datapool** may be shared by many scripts.

When Sequential is selected, the script pulls records from the datapool in order. When random is selected, the script randomly accesses every record in the datapool once.

A **Private Test Datapool** is associated with only one script, while a **Shared Test Datapool** may be shared by many scripts. When the Sequential Order option is selected, the script pulls records from the datapool in order, whereas when the Random Order option is selected, the script randomly accesses every record in the datapool once. Make sure you choose the correct datapool you want to use in the Test Datapool field and the correct datapool selection order.

Recording a data-driven test script (cont.)

Once you have selected an application to record the script against, the Recording toolbar appears.

The image shows a screenshot of the 'Recording' toolbar with 12 numbered callouts (1-12) pointing to specific icons. To the left is a 'Getting Started' dialog box with the following text:

Getting Started

To Record a script:

1. Select [icon] to configure and start the application under test
2. Record the script
3. Select [icon] to stop recording

You can also...

Select [icon] to pause recording

Select [icon] to add verification points to your script

Select [icon] to data-drive your script

Select [icon] to turn off Getting Started help

Recording Script OrderTotal Started

The toolbar icons are numbered as follows:

1. Stop Recording
2. Pause/Resume Recording
3. Start Application
4. Insert Verification Point or Action Command
5. Insert Data Driven Commands
6. Insert Script Support Commands
7. Display Help
8. Display Toolbar Only
9. Copy Selected Text
10. Clear All Monitor Text
11. Save Monitor Text As
12. Monitor Message Preferences

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Once you have selected an application to record the script against, the Recording toolbar appears. You can perform a number of functions as indicated in the toolbar above such as starting and stopping, and inserting verification points.

Inserting data-driven commands

When you are ready to data-drive your script, click the **Insert Data Driven Commands** button on the Recording toolbar.

The screenshot shows the Recording toolbar on the left and the Insert Data Driven Actions dialog box on the right. A yellow callout box contains the following text:

Recording pauses, and the Insert Data Driven Action dialog box appears.

Use the Object Finder to select objects in the application that you want to test or use the selection wizard to select particular test objects.

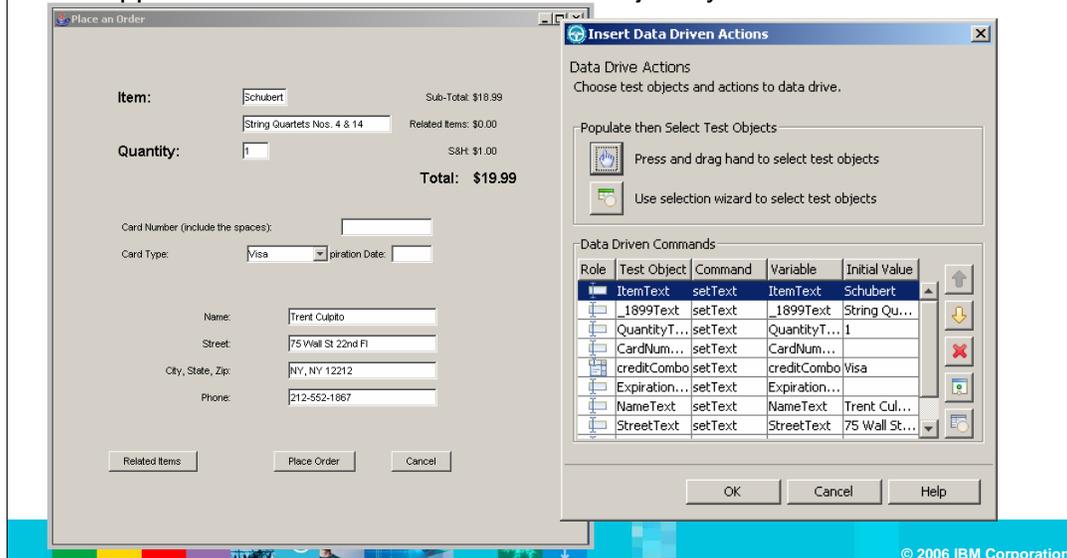
The Recording toolbar includes buttons for pausing, adding verification points, and inserting data-driven commands. The Insert Data Driven Actions dialog box has a section for selecting test objects and a table for defining data-driven commands.

Role	Test Object	Command	Variable	Initial Value

When you are ready to data-drive your script, click the **Insert Data Driven Commands** button on the Recording toolbar (shown on the right).

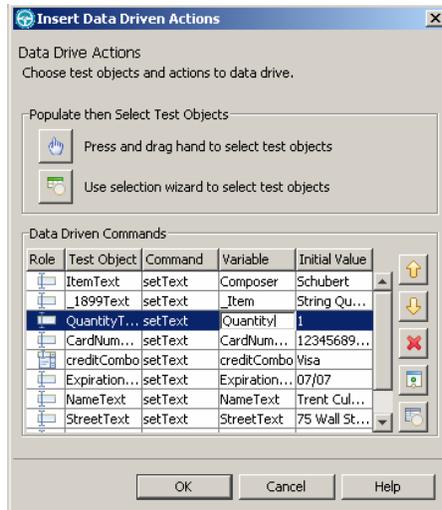
Inserting data-driven commands (cont.)

An object selected by the Object selector, is outlined in red. When you have selected the objects, release the mouse. The Insert Driven Actions dialog box appears with data collected about the objects you selected.



An object selected by the Object selector, is outlined in red. When you have selected the objects, release the mouse. The Insert Driven Actions dialog box appears with data collected about the objects you selected.

Editing data-driven commands

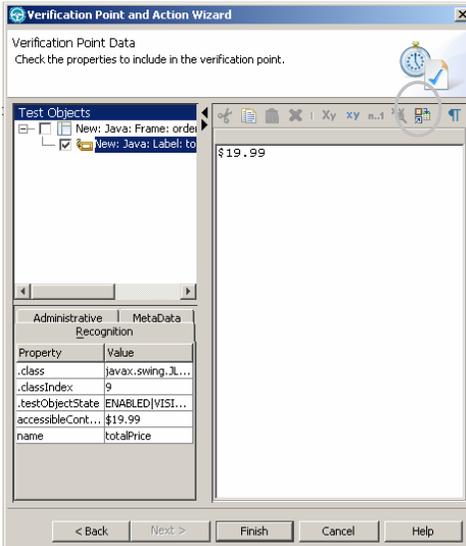


You can add descriptive headings to the data in the datapool. Meaningful headings make it easier to later add data to the datapool.

Once you create the command, you can add descriptive headings to the data in the datapool. Meaningful headings make it easier to later add data to the datapool.

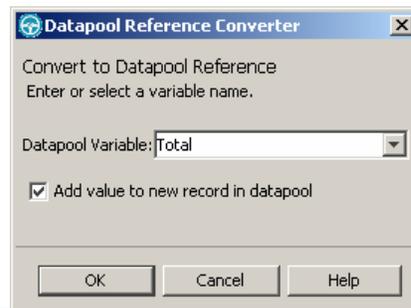
Inserting a verification point that references the datapool

When you insert a verification point in a data-driven script, you can create a datapool reference instead of a literal value.



Click the Convert Value to Datapool Reference button.

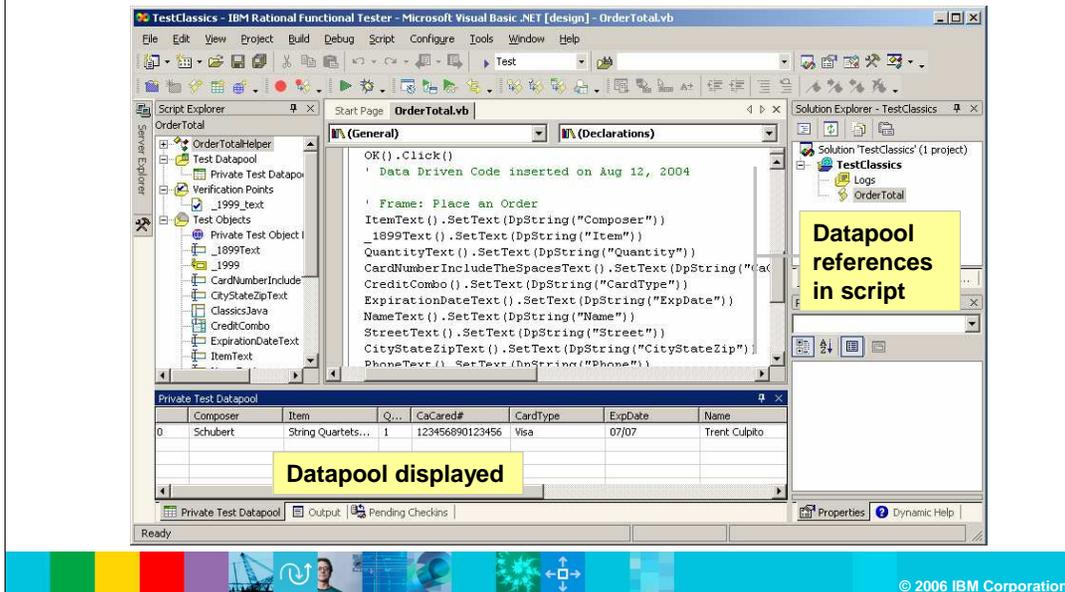
Type a name for the variable.
Check the Add value to new record in datapool checkbox to add the variable to your datapool.



When you insert a verification point in a data-driven script, you can create a datapool reference instead of a literal value. Remember, verification points are the components that can be used to check the differences in the actual values against expected values.

Datapool display

When you stop recording, the script and datapool information display.

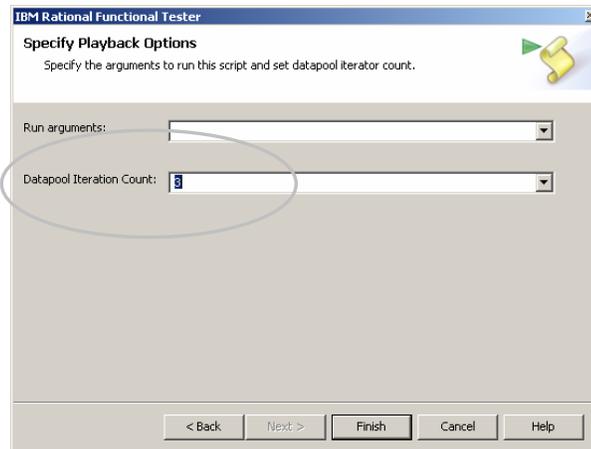


When you stop recording, the script and datapool information is shown here.

Data-driving a test script

When you play back the script, you set the datapool iteration count. Each time the script runs, it pulls a different record from the datapool.

Or, you can add a parameter to CallScript to iterate through the entire datapool:



The screenshot shows a dialog box titled "IBM Rational Functional Tester" with the subtitle "Specify Playback Options". Below the subtitle is the instruction "Specify the arguments to run this script and set datapool iterator count." There are two input fields: "Run arguments:" and "Datapool Iteration Count:". The "Datapool Iteration Count:" field is highlighted with a red circle and contains the value "3". At the bottom of the dialog box are five buttons: "< Back", "Next >", "Finish", "Cancel", and "Help".

```
CallScript ("myScript", DEFAULT_ARGS, DP_ALL)
```

You can add a parameter to CallScript to iterate through a datapool. When you play back the script, you set the datapool iteration count. Each time the script runs, it pulls a different record from the datapool.

Scenario 2: Importing an external datapool

Functional Test allows you to import data from:

- An external spreadsheet (.csv file)
- Another Functional Test datapool
- An existing IBM Rational TestManager datapool

However, keep in mind the following:

- The data must be imported into the same Functional Test project as the scripts that will access it.
- Spreadsheet data must be saved as a .csv file before you import it.
- To import data from a TestManager datapool, you must first associate the Functional Test project with the Rational project that contains the datastore



Scenario 2: Importing an external datapool

Functional Test allows you to import data from:

- An external spreadsheet (.csv file)
- Another Functional Test datapool or
- An existing IBM Rational TestManager datapool

However, keep in mind that:

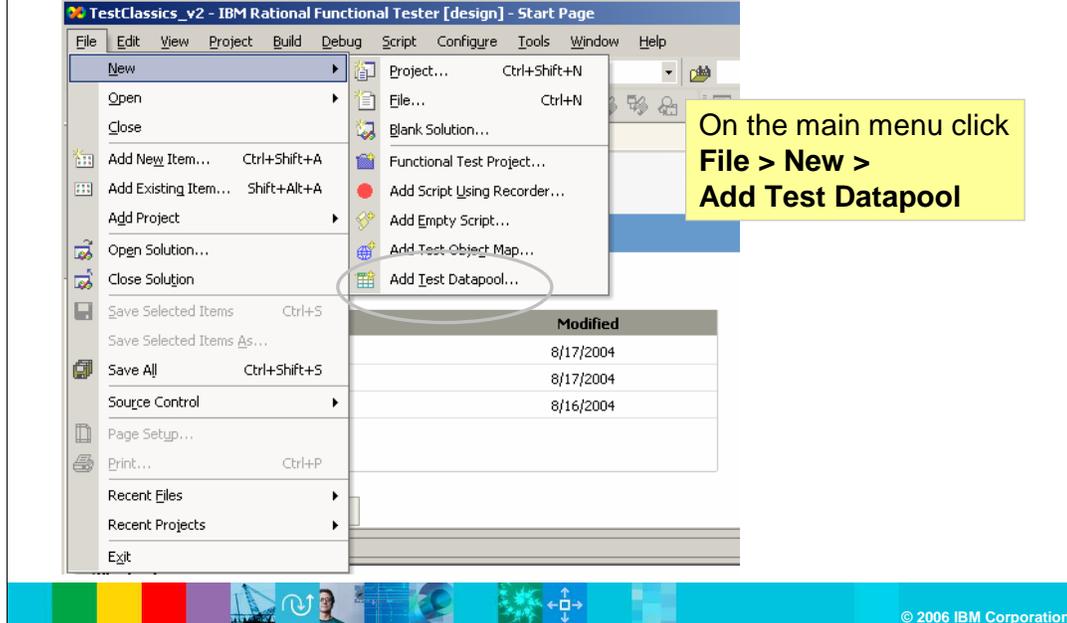
The data must be imported into the same Functional Test project as the scripts that will access it.

Spreadsheet data must be saved as a .csv file before you import it.

To import data from a TestManager datapool, you must first associate the Functional Test project with the Rational project that contains the datastore.

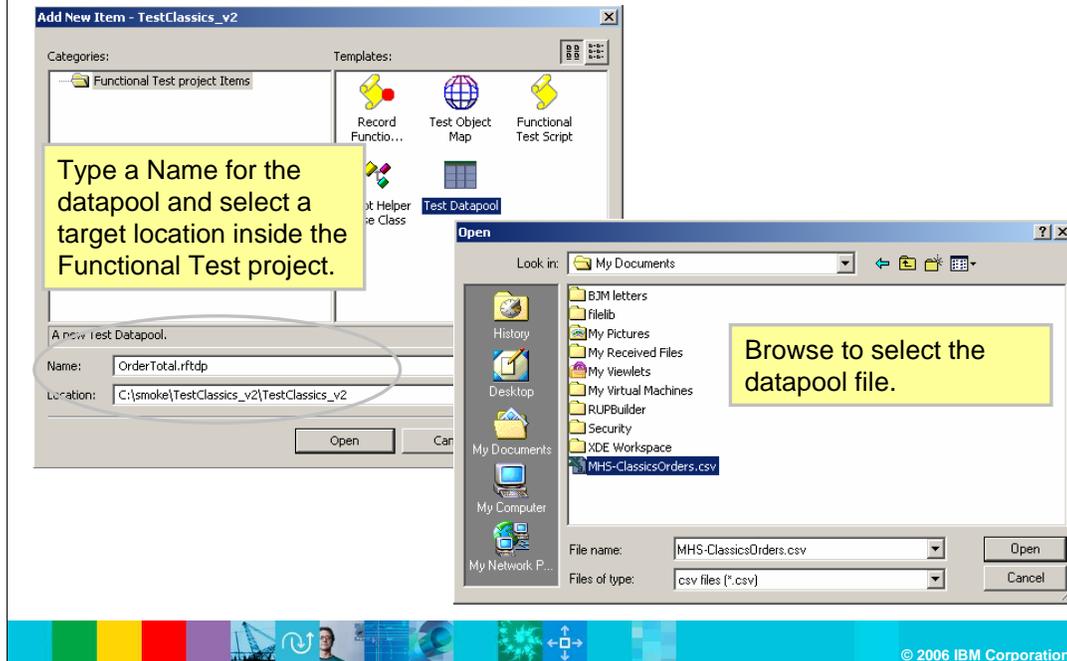
Importing an external datapool

First, import the datapool into a Functional Tester project.



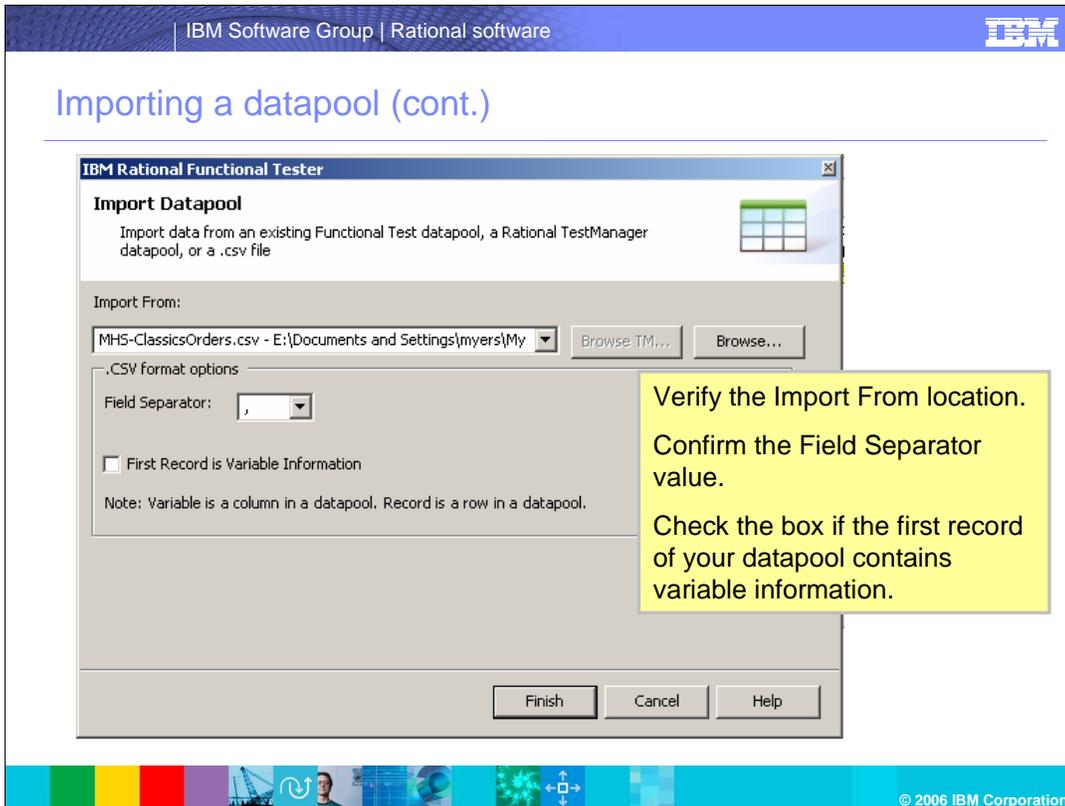
In this scenario, you import an external datapool (.csv file) into a Functional Test project and then associate it with a test script.

Importing a datapool (cont.)



This window shows how to import from the UI. Follow the directions above to import a datapool.

Importing a datapool (cont.)



Verify the Import From location and other information on this window.

Checking the datapool and editing the variable row

Once the datapool is imported, it shows up under the project in the Solution Explorer and opens in the datapool window. Verify the data.

	1	2	3	4
0	1	123456783456...	3-May	\$16.99
1	2	222233334444...	4-Jun	\$32.98
2	3	454561617979...	5-Jul	\$48.97
3	4	111177775555...	5-Aug	\$64.96
4	5	123456783456...	3-Sep	\$80.95
5	10	606015153737...	3-Oct	\$160.90
6	20	123412346565...	4-Mar	\$320.85

Edit the Variable row to include meaningful variable names.
Right-click > Edit Variable.

	Quantity	CreditCardNum	ExpDate	OrderTotal
0	1	123456783456...	3-May	\$16.99
1	2	222233334444...	4-Jun	\$32.98
2	3	454561617979...	5-Jul	\$48.97
3	4	111177775555...	5-Aug	\$64.96
		123456783456...	3-Sep	\$80.95
		606015153737...	3-Oct	\$160.90
		123412346565...	4-Mar	\$320.85

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Once the datapool is imported, it shows up under the project in the Solution Explorer and opens in the datapool window. Verify the data shown. You can also edit the variable row to include meaningful variable names.

Associating the Datapool with a Test Script

The screenshot displays the IBM Rational software interface. On the left, the Solution Explorer shows a project named 'TestClassics_v2' with a sub-project 'Logs' containing a file named 'OrderTotal'. A context menu is open over the 'OrderTotal' file, with the 'Associate With Script...' option highlighted. On the right, a dialog box titled 'Associate the Datapool With Scripts' is open, showing a list of scripts with 'OrderTotal' selected. A yellow callout box in the top right of the dialog says: 'Once you have recorded a test script, associate the datapool with the test script. In the Solution Explorer, right-click the datapool and click **Associate With Script** on context menu.' Another yellow callout box in the center of the dialog says: 'Select the test script that you want to associate with the datapool.' The dialog has 'Finish', 'Cancel', and 'Help' buttons at the bottom. The IBM logo and '© 2006 IBM Corporation' are visible at the bottom right of the screenshot.

Once you have recorded a test script, associate the datapool with the test script. In the Solution Explorer, right-click the datapool and click **Associate With Script** on context menu.

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Changing the verification point reference to the datapool

Open a verification point.

Click the **Convert Value to Datapool Reference** button.

From the **Datapool Variable** drop down list, select the variable that you want to replace the literal value.

Verification Point Editor - _1699_text

File Edit Test Object Preferences Help

Test Objects

- New: Java: Frame: orderFor
- New: Java: Label: totalP

\$16.99

Datapool Reference Converter

Convert to Datapool Reference
Enter or select a variable name.

Datapool Variable: OrderTotal

Add value to new record in datapool

OK Cancel Help

Property	Value
.class	javax.swing.JLabel
.classIndex	9
.testObjectState	ENABLED VISIBL...
accessibleConte...	\$16.99
name	totalPrice

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You can also change the Verification Point Reference to the Datapool here.

Replacing literals in the test script with variables

Click the **Find Literals and Replace with Datapool Reference** button to replace literal values in the script with variables.

In the Datapool Literal Substitution box, click **Find Next** to move to the next literal. To replace a literal, select a variable to from the **Datapool Variable** drop down list.

Quantity	CreditCard			
0	1	123456783		
1	2	222233334		
2	3	454561617		
3	4	111177775		
4	5	123456783456...	3-Sep	\$80.95
5	10	606015153737...	3-Oct	\$160.90
6	20	123412346565...	4-Mar	\$320.85

You can replace literals in the Replacing Literals in the Test Script with Variables. This feature allows you to check verification points dynamically.

Playing back the test script to test the datapool

The screenshot displays the 'Log: OrderTotal' interface. On the left, there are three sections: 'Failures' (containing '[_1699_text] failed'), 'Warnings' (empty), and 'Verification Points' (containing '[_1699_text] failed', '[_1699_text] passed', and '[_1699_text] passed'). A yellow callout box points to the 'Verification Points' section with the text 'Click verification point to navigate the test log.' The main log area shows three entries: 1. 'Script start [OrderTotal]' at 05:10:13.678 PM with details: line_number = 1, script_name = OrderTotal, script_id = OrderTotal.vb. 2. 'Start application [ClassicsJavaA]' at 05:10:14.459 PM with details: name = ClassicsJavaA, line_number = 24, script_name = OrderTotal, script_id = OrderTotal.vb. 3. 'Verification Point [_1699_text] failed.' at 05:10:34.518 PM with details: vp_type = object_data, name = _1699_text, script_name = OrderTotal, line_number = 42, script_id = OrderTotal.vb, baseline = resources\OrderTotal_1699_text.base.rftvp, expected = OrderTotal.0001_1699_text.exp.rftvp, actual = OrderTotal.0000.0001_1699_text.act.rftvp. A yellow callout box points to the 'View Results' link with the text 'Click to view verification point results in the comparator.' The bottom of the interface features a colorful bar with icons and the text '© 2006 IBM Corporation'.

After you playback the script, the log will be displayed, showing the results in the comparator.

Scenario 3: Exporting, editing, and importing a datapool

Functional Test also allows you to export a public or a private datapool from a Functional Test project. The datapool is exported to a .csv file. Exporting a datapool allows you to:

- Add data to the datapool using a spreadsheet application
- Use the datapool in a different Functional Test project



Scenario 3: Exporting, editing, and importing a datapool

Functional Test also allows you to export a public or a private datapool from a Functional Test project. The datapool is exported to a .csv file. Exporting a datapool allows you to:

Add data to the datapool using a spreadsheet application

Use the datapool in a different Functional Test project

Exporting a datapool

To export a private datapool, open the script the datapool is associated with. Right-click the datapool in the Script Explorer, and then click **Export** on the shortcut menu.

Choose a name and location, and select a field separator for the .csv file.

IBM Rational Functional Tester

Export

Export datapool to csv file

Export resources(OrderTotal.rftxdp) to destination

File: C:\Documents and Settings\pat\My Documents\Datapools\OrderTotal.csv

Field Separator: ,

Finish Cancel Help

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This window explains how to export the datapool. Follow the steps above to complete the export. For more information on exporting, editing, and importing a datapool, review the tutorials from the dynamic help menu.

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