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Using the New IMS Explorer to Access Your IMS Data Hands-on Lab, Part 1 of 2

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This hands-on lab (part 1 of 2) provides the opportunity to access IMS databases from a distributed runtime environment provided by IBM's IMS Enterprise Suite Explorer for Development. This first lab, applicable to both IMS 11 and IMS 12 environments walks through the process of creating the metadata needed for database access and storing it on your workstation. Part 2, the next lab, showcases the new IMS Catalog and is therefore only applicable to IMS 12 systems.

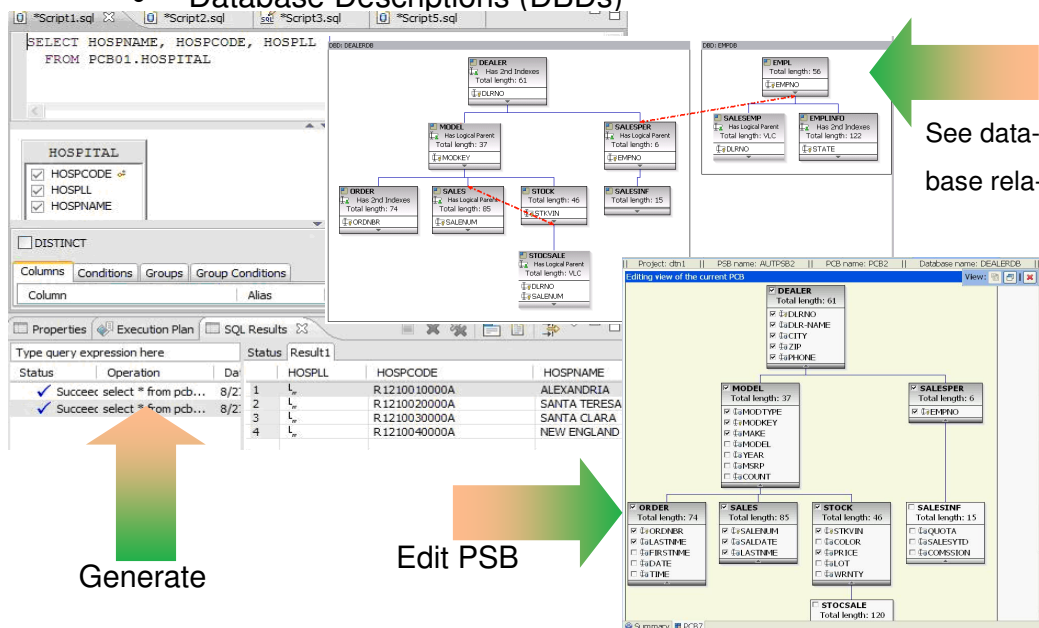
The IMS Enterprise Suite Explorer for Development

The IMS Enterprise Suite Explorer for Development is an Eclipse-based integrated development environment (IDE) for IMS application developers and database architects

- It can also be integrated with other IBM Eclipsed based tools (RAD, RDz, Optum Data Studio)
- Provides end-to-end application development cycle

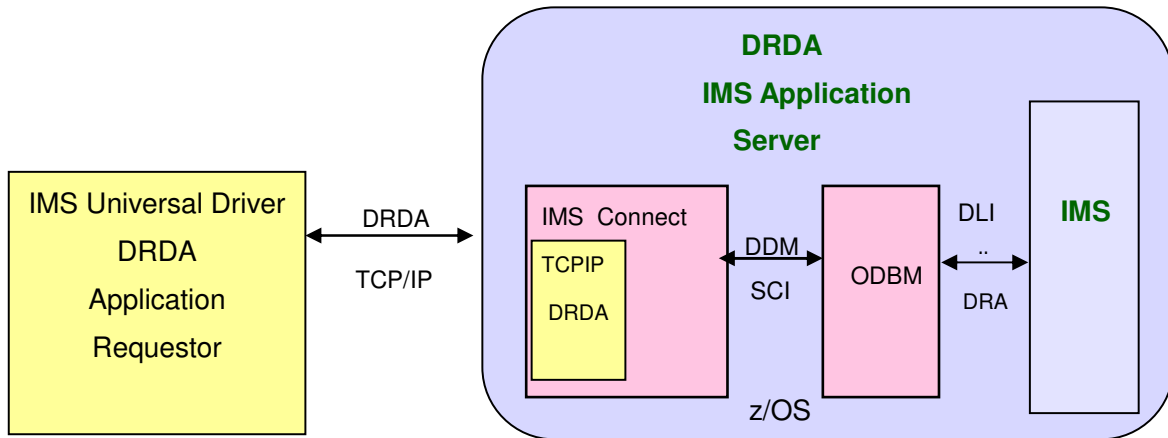
Graphical editors are used for the development and visualization of

- Program Specification Blocks (PSBs)
- Database Descriptions (DBDs)



IMS Universal JDBC driver type-4 connectivity provides:

- Relational view of IMS data
- Graphical assistance to build SQL statements



New support which incorporates the DLIModel Utility and an IMS 12 Catalog functionality:

- Provides current existing functionalities from IMS DLIModel Utility
- Provides migration support of existing DLIModel Utility projects
- Provides Metadata source for update to IMS Catalog
- Provides Metadata access from the IMS Catalog

Distribution of the IMS Explorer is through a download capability

- IMS Enterprise Suite V2.1 at <http://www.ibm.com/ims>

IMS Connect and Open Database Manager

- Open Database Manager (ODBM) is a Common Service Layer component
 - Receives database connection requests from IMS Connect
 - Translates incoming database requests from the DDM protocol into DLI calls expected by IMS
 - Translates responses to the client into the DDM protocol
 - Manages connections to IMS DB
 - Implements the DRA interface

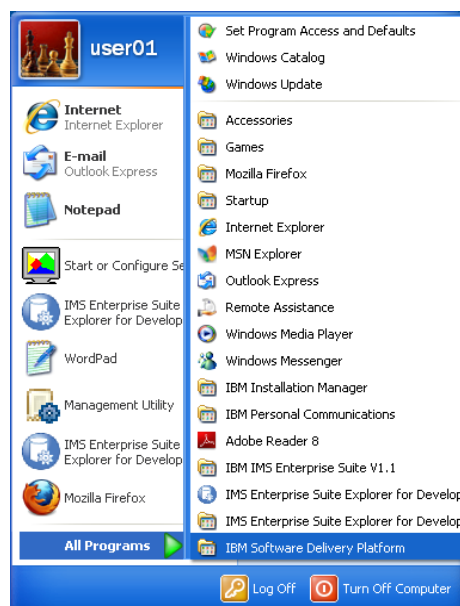
IMS Enterprise Suite Explorer for Development

In this part of the lab, the IMS Explorer is used to create the IMS Java Database View metadata by parsing the IMS PART Database PSB and DBD sources.

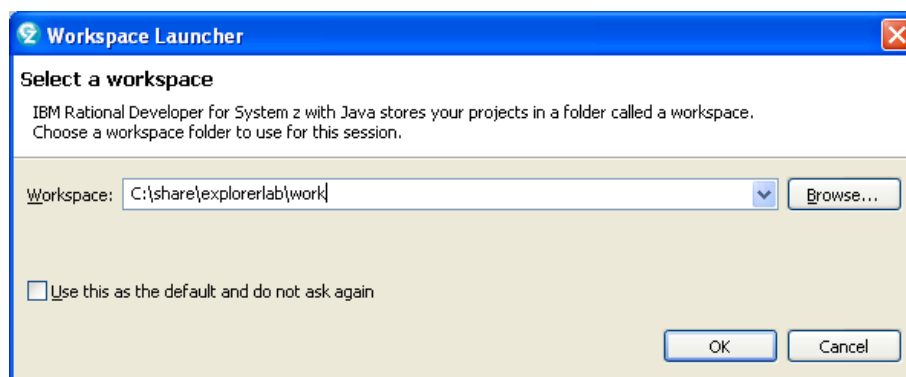
Note that in your workstation environments, the IMS Explorer is a plug-in to Rational Developer for System z.

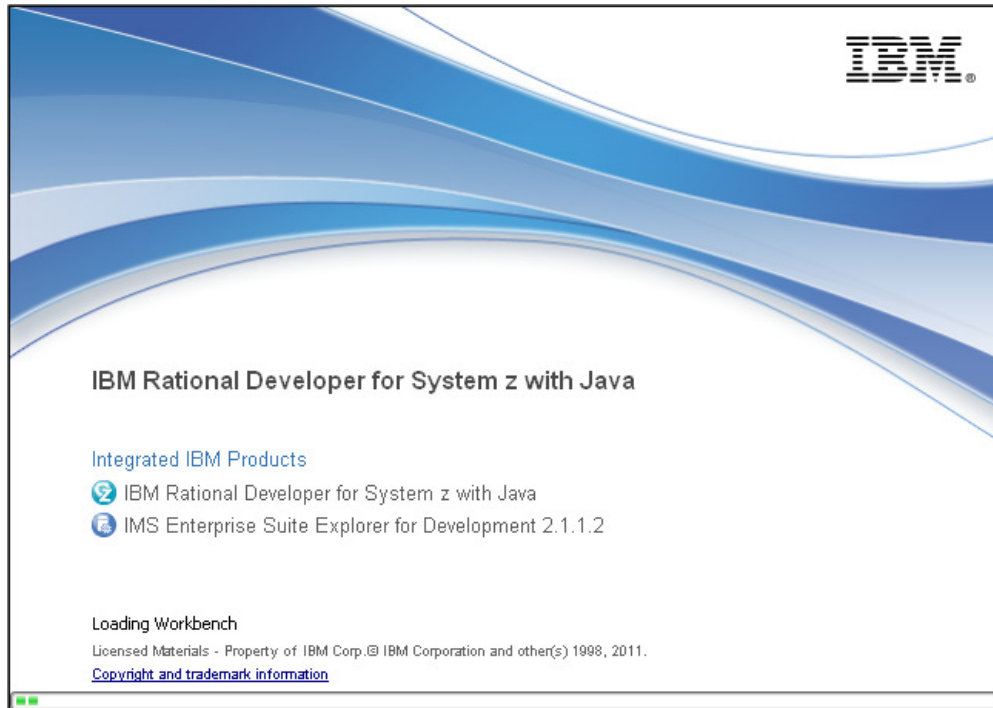
1. Start Rational Developer for System z

Click on Start > All Programs > IBM Software Delivery Platform > IBM Rational Developer for System z with Java V8.0.3 > IBM Rational Developer For System z with Java



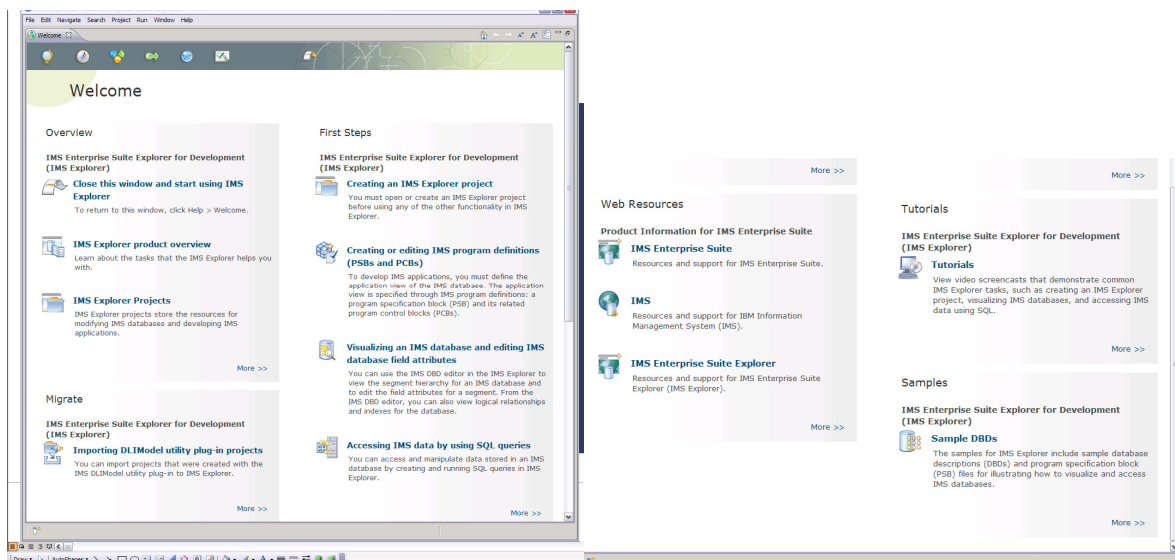
You may be prompted to select a workspace. A workspace is a directory that stores all of the files for the projects. You can select your own directory, e.g., **C:\share\explorerlab\work** or any name you choose.



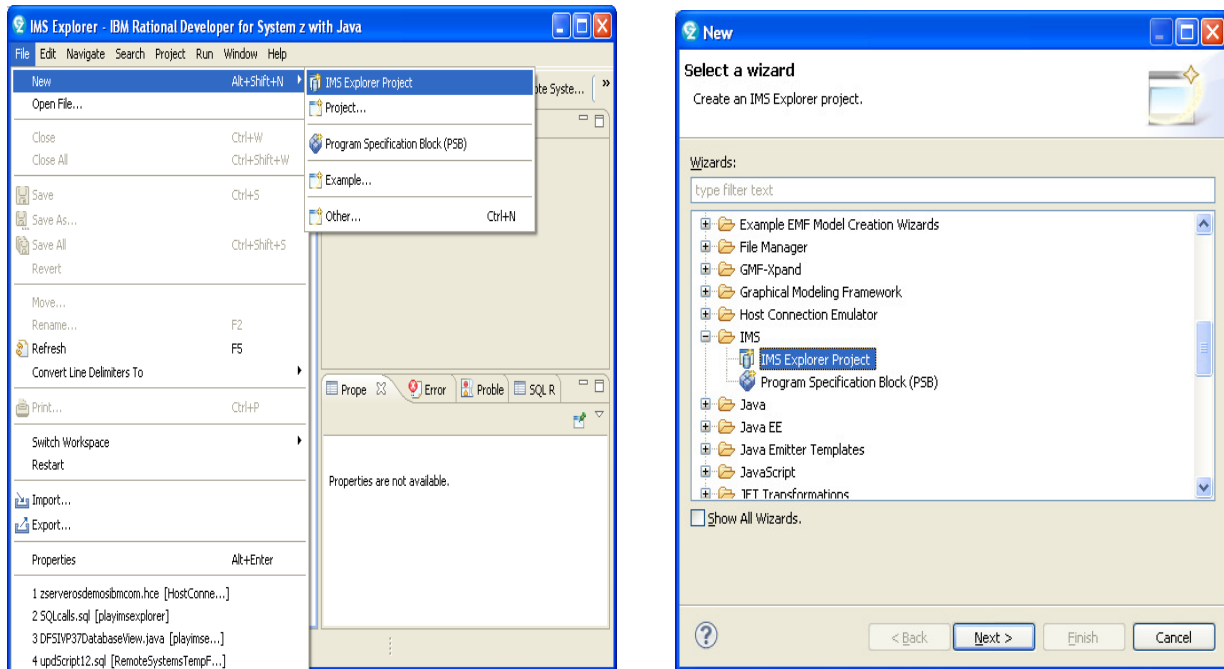


You will see RDz start up – note that IMS ES Explorer for Development has been installed as a plugin.

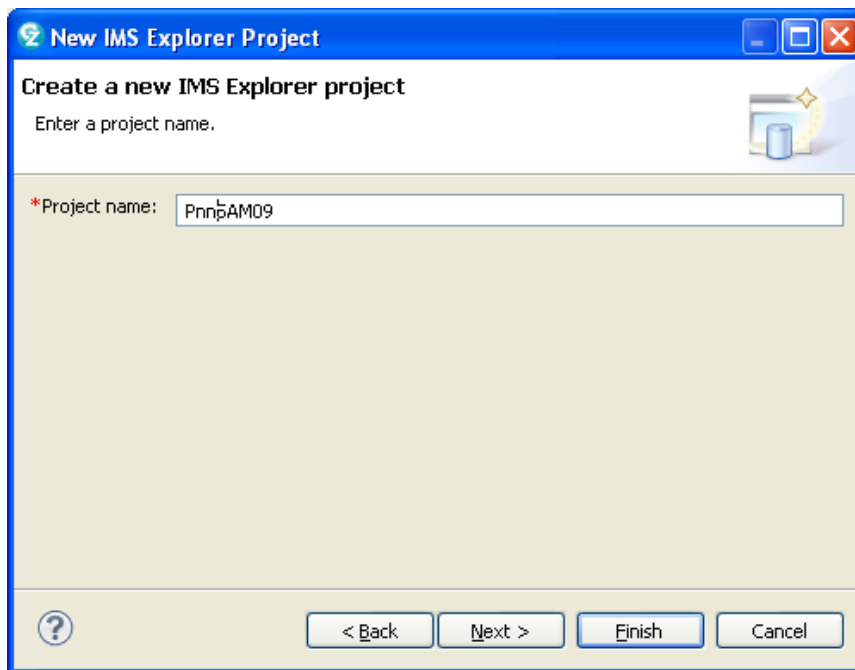
When Explorer startup is complete, you may be shown the Welcome Screen. If so, close the Welcome page (x the tab at the top of the screen on the left).



2. Click on **File > New > IMS Explorer Project**. (If you don't see "IMS Explorer Project" as a choice then click on File > New > Other and open the IMS folder)



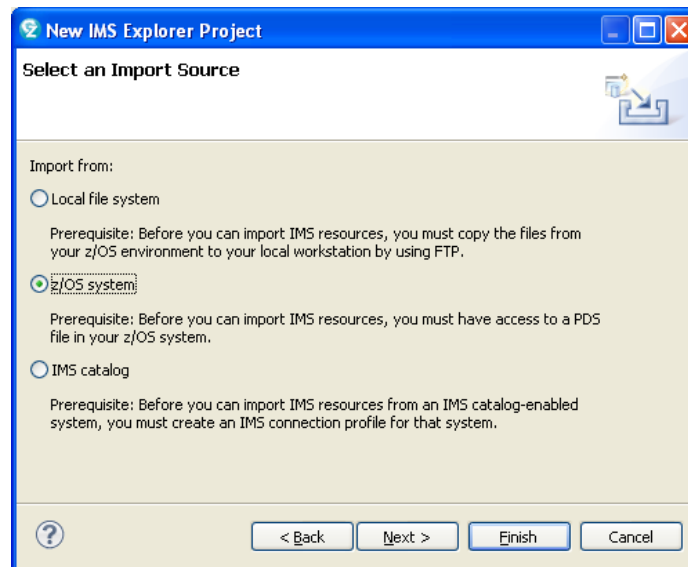
3. Define a Project Name, e.g., **PnnSAM09** where **nn** is your team number



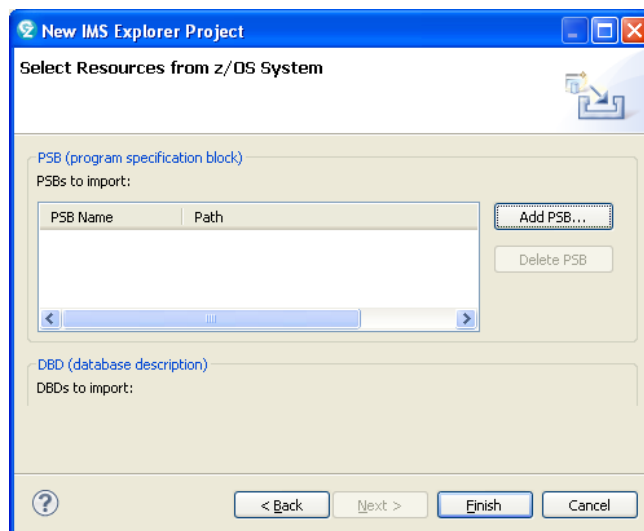
Click **Next**.

On the **Select an Import Source** window you can: (a) Use a Local file system if you have previously downloaded the source PSB and DBD files to your workstation, (b) Select a z/OS system and connect directly to where your DBDs/PSBs are stored, or (c) If your IMS is at Version 12 with the Catalog function enabled, you can obtain the Metadata directly from the IMS Catalog. **For this lab (Part 1) we will use a connection to the z/OS system and download source from z/OS to create the Metadata.**

4. Select z/OS system to obtain the source.



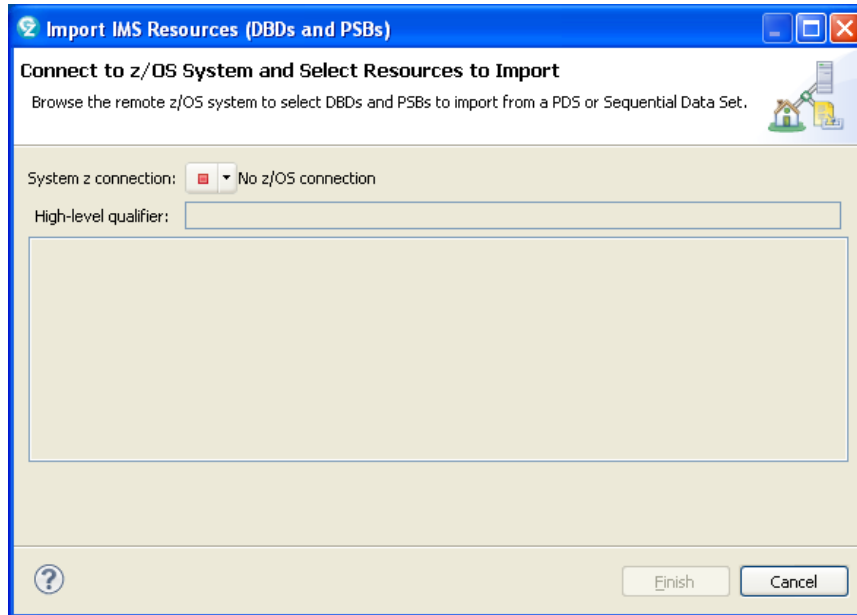
Click **NEXT**.



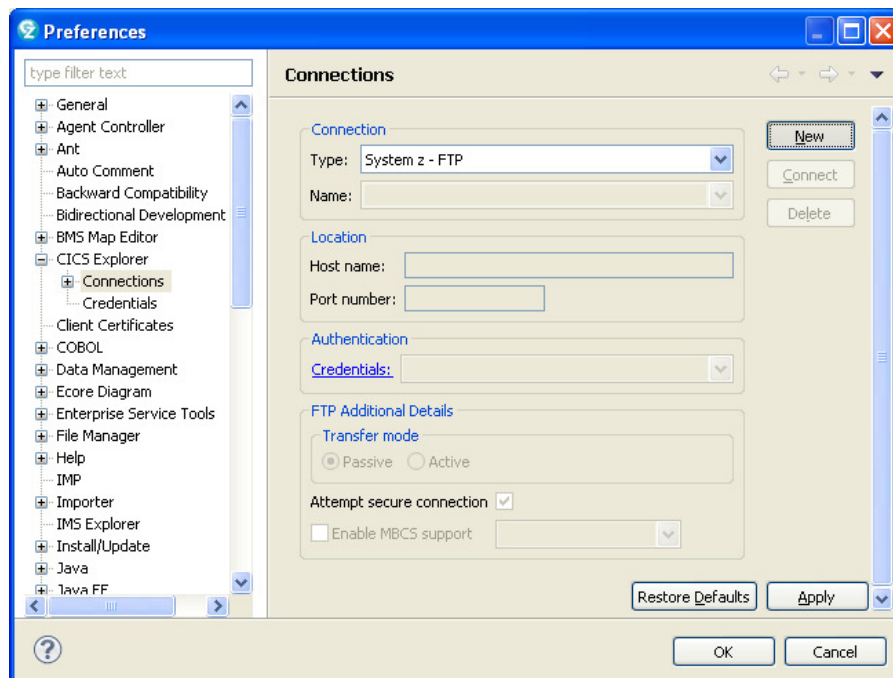
Select the **Add PSB** button.

You will be asked to provide the z/OS connection information.

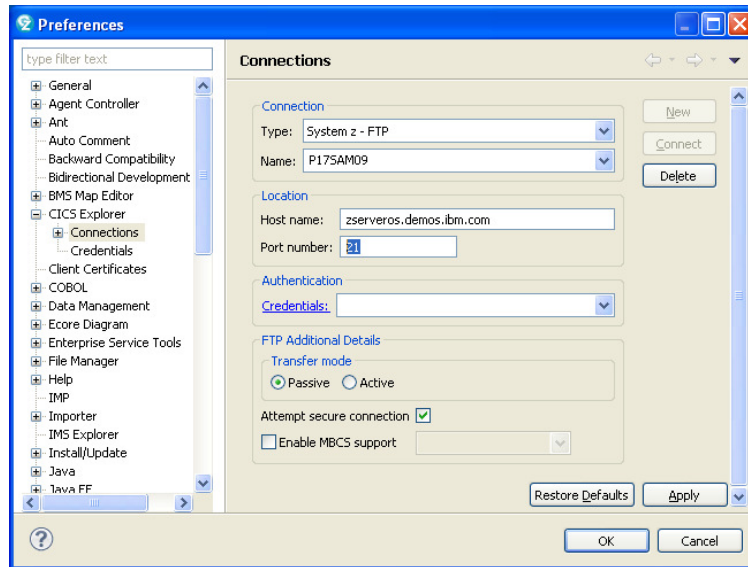
5. On the **Connect to z/OS System and Select Resources to Import** screen, click on the **No z/OS connection** to open the Connections box.



Select **New**.

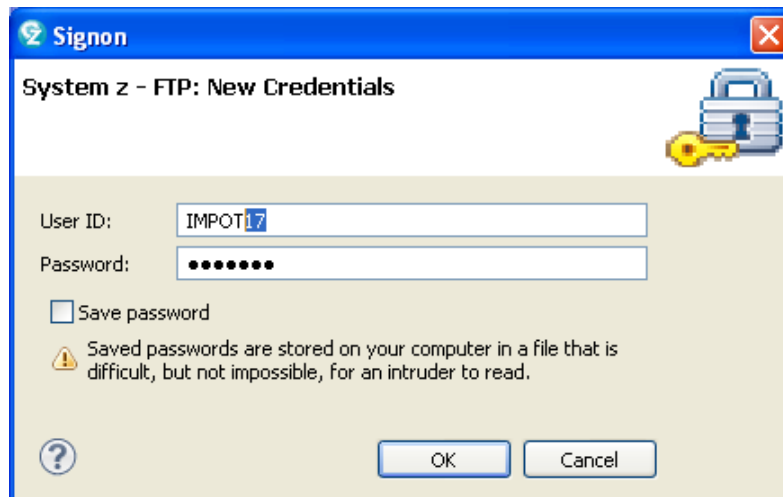


In the **Name** field enter P~~nn~~SAM09 where ~~nn~~ is your team number
 In the **Host name** field enter **zserveros.demos.ibm.com**
 Keep the **Port Number** as 21 (FTP port) and **Transfer mode** as Passive.
 Click **Apply** and then **OK**.



You will return to the **Connect to z/OS System and Select Resources to Import** box which now has your connection name.

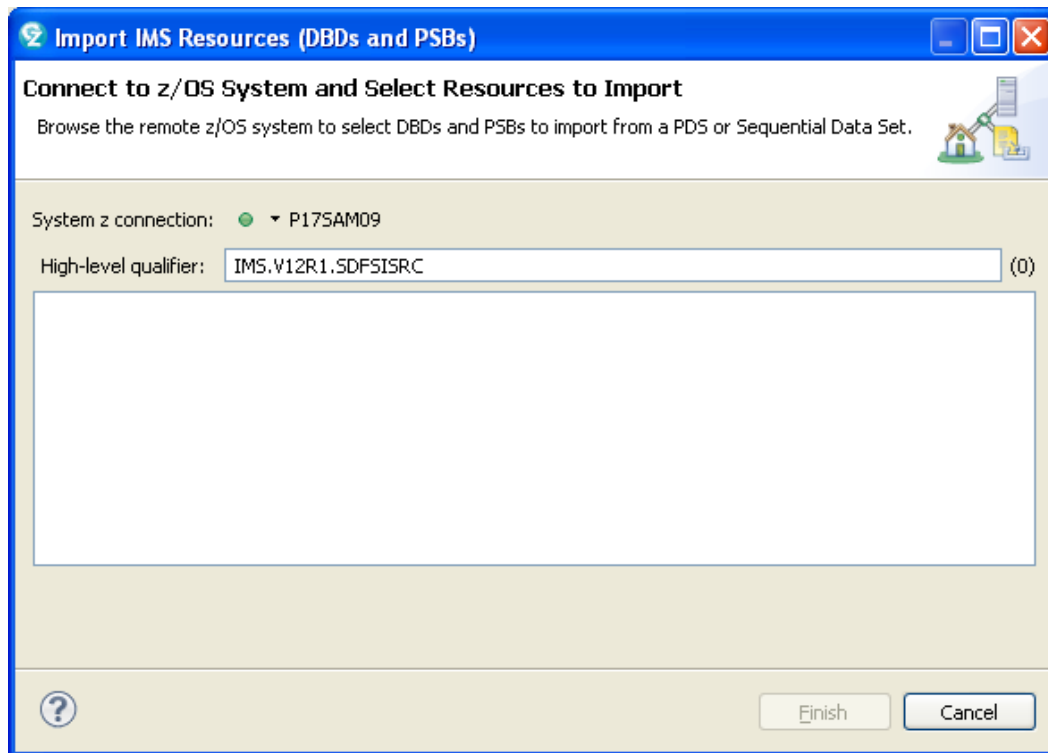
To establish a connection, **click the orange box** (choose the connection you created) to open the **System z –FTP New Credentials** box.



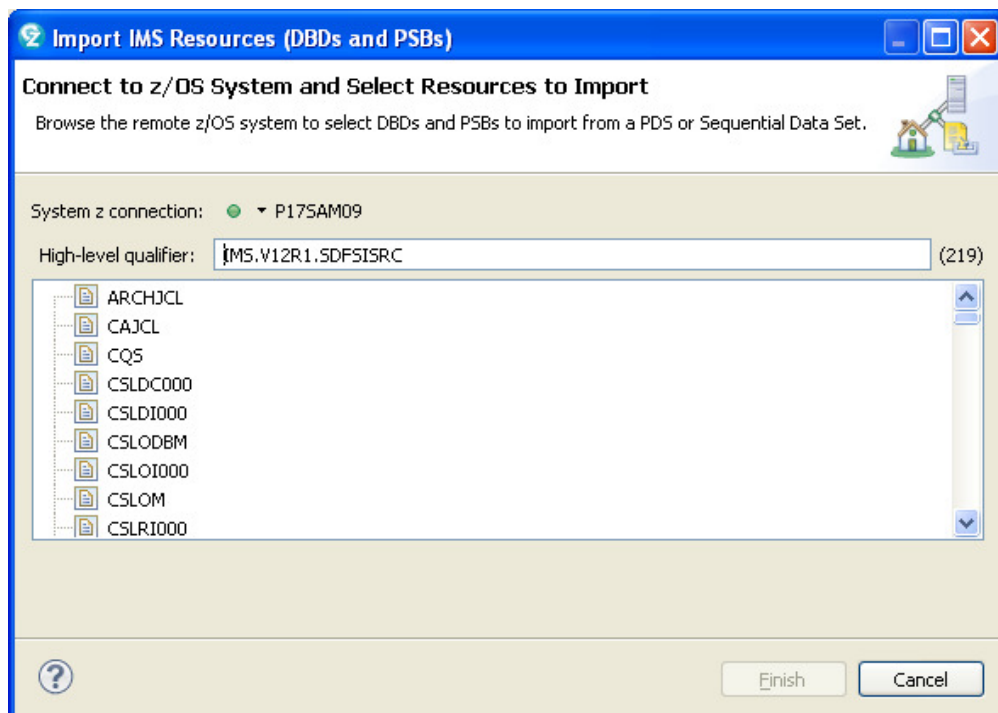
In the userid field enter IMPOT~~xx~~ where ~~xx~~ is your team number.
 In the password field enter IBM07POT.

Click **OK** to establish the connection.

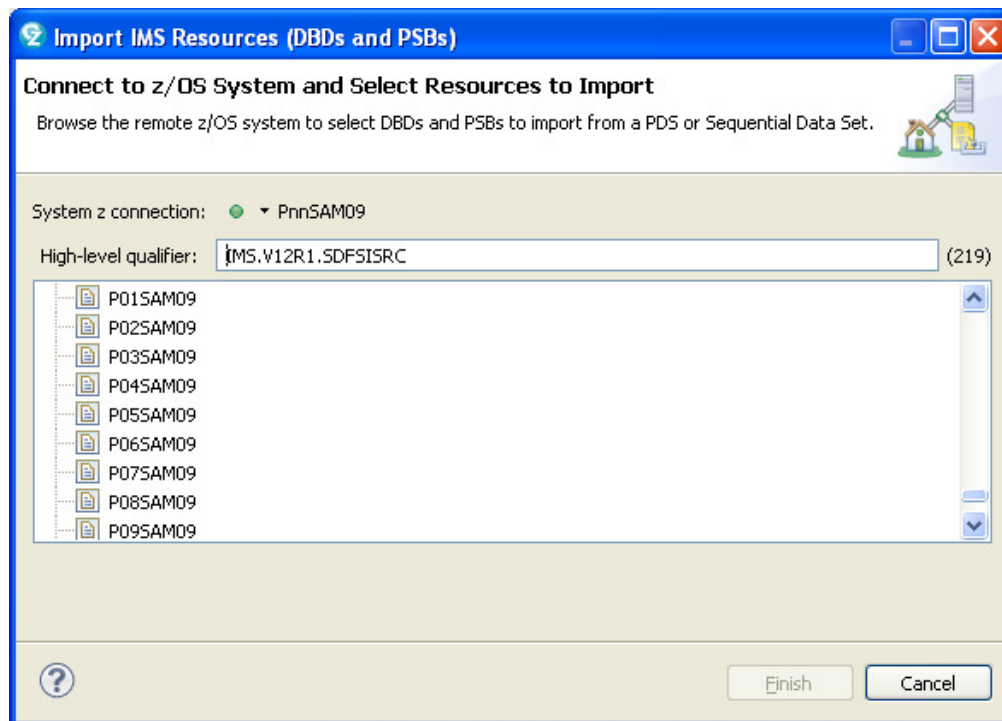
6. You are now ready to retrieve your IMS resources.



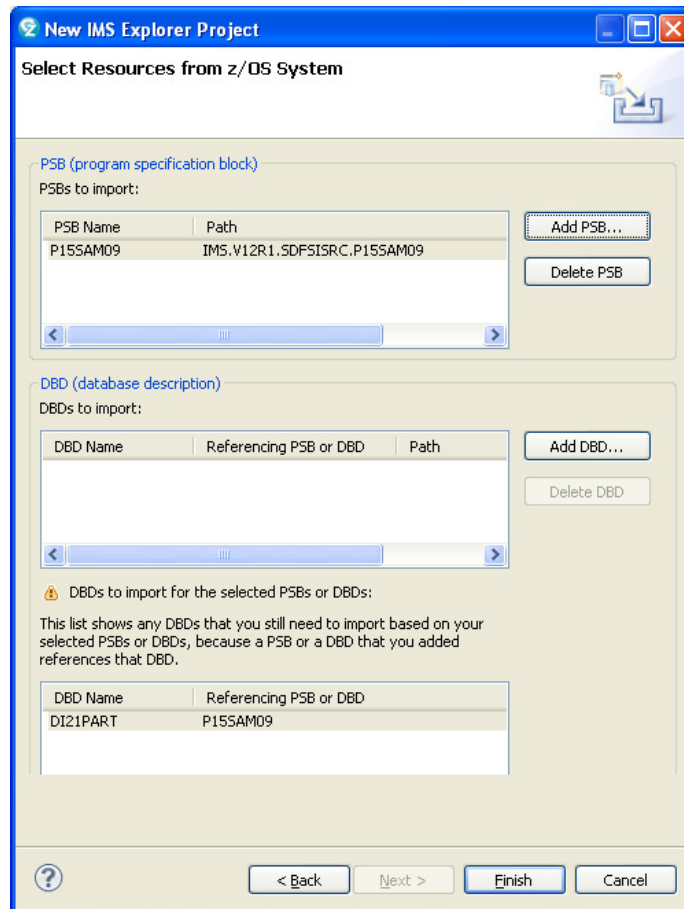
Change the **High-Level qualifier** field to **IMS.V12R1.SDFSISRC** and hit **Enter** on your PC keyboard.



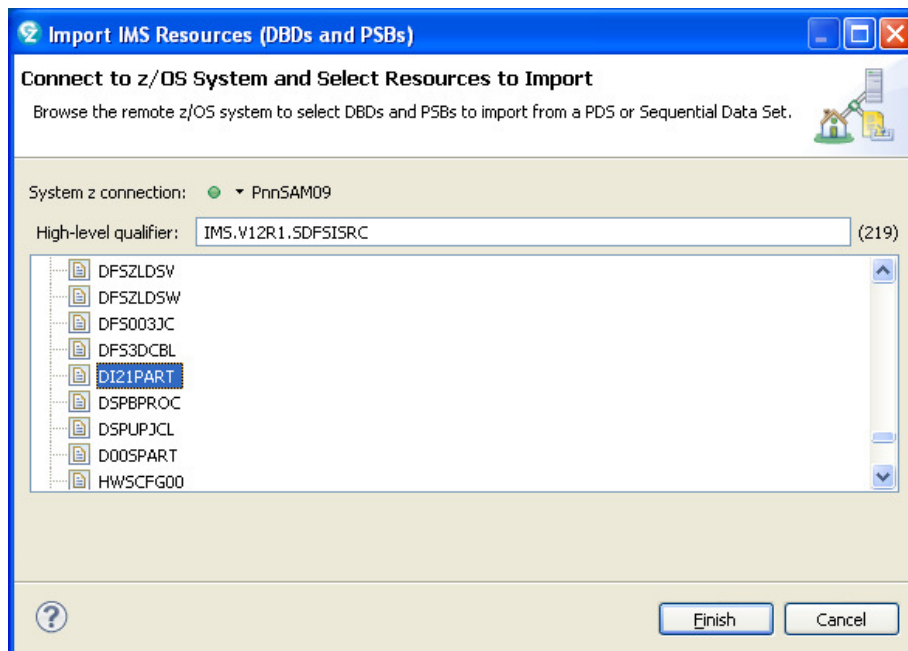
Scroll down the list and select your **PnnSAM09** PSB where **nn** is your team number.



Click **Finish** to activate the parsing of the PSB and DBD.



Note you will be prompted to add the DBD DI21PART. Select the **ADD DBD** button and then scroll and then select **DI21PART** Click **FINISH**.



After parsing completes, your project is created.

The dialog box is titled "New IMS Explorer Project" and "Select Resources from z/OS System". It contains two sections: "PSB (program specification block)" and "DBD (database description)".

PSB (program specification block)
PSBs to import:

PSB Name	Path
P155AM09	IMS.V12R1.SDFSISRC.P155AM09

Buttons: Add PSB..., Delete PSB

DBD (database description)
DBDs to import:

DBD Name	Referencing PSB or DBD	Path
DI21PART	P155AM09	IMS.V12R1.SDF

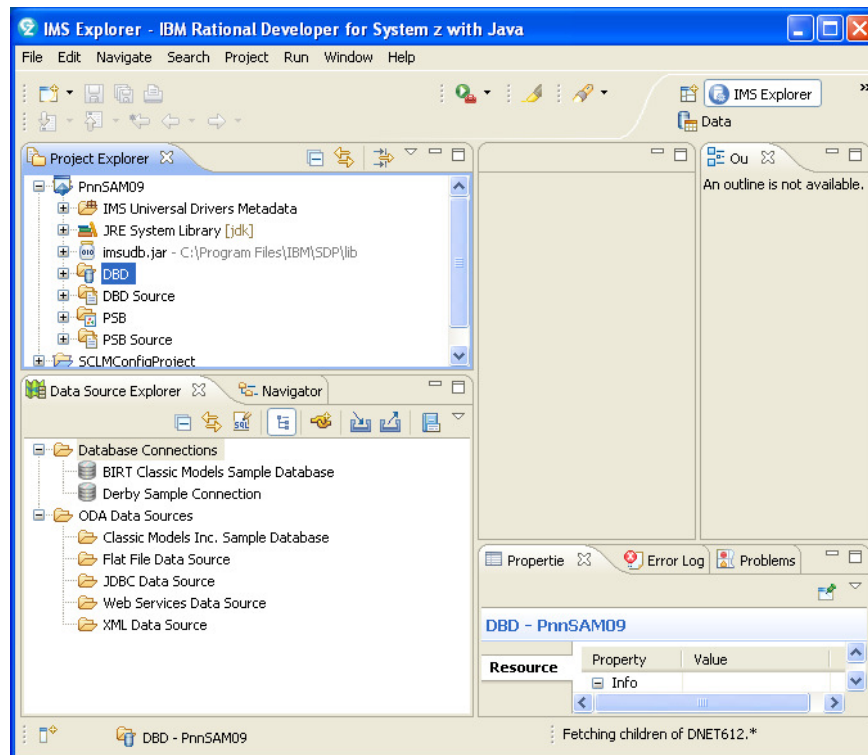
Buttons: Add DBD..., Delete DBD

Navigation buttons at the bottom: < Back, Next >, Finish, Cancel.

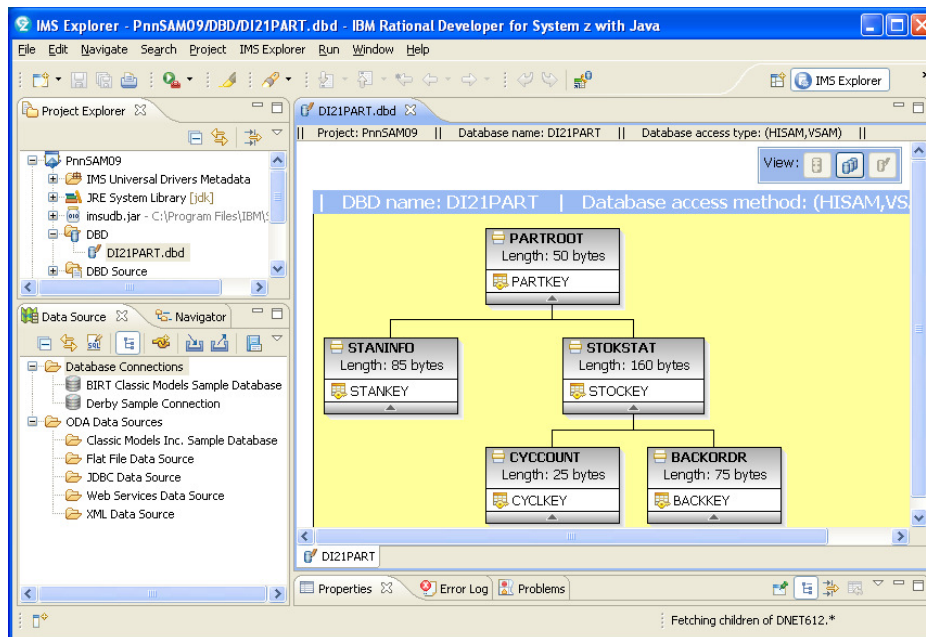
Click on **Finish**.

Now it is time to add the fields to the segments that were not defined in the DBD but are available in a Cobol Copybook.

7. In the **Project Explorer** box, click the + to open your **PnnSAM09** project and navigate to the **DBD** folder.

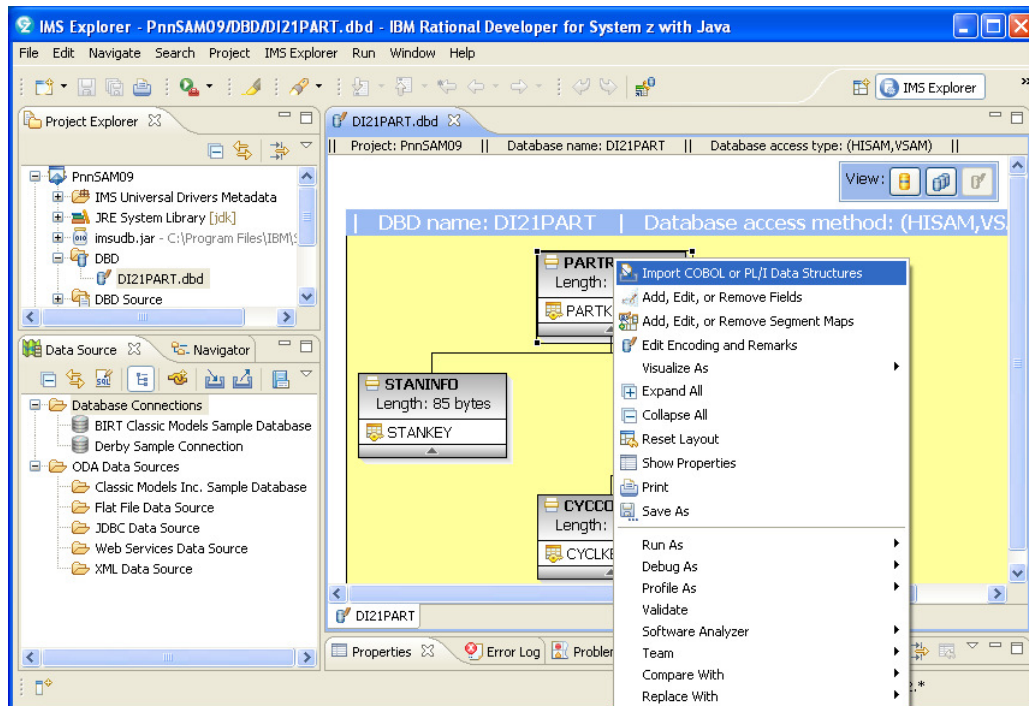


To open the basic view double click on **DI21PART**.



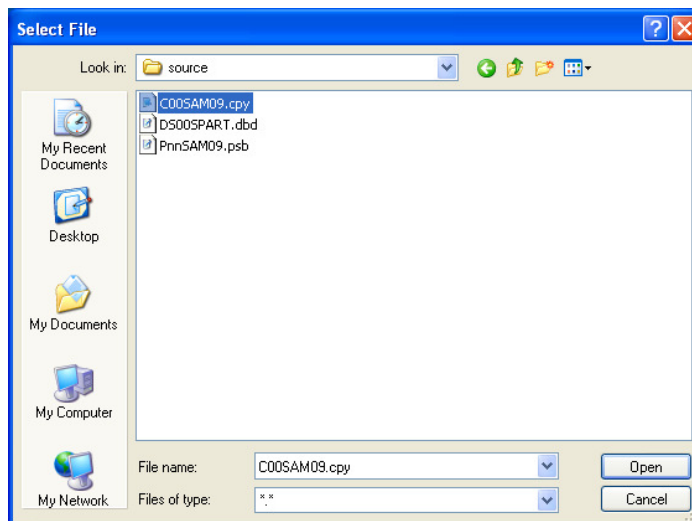
You will see a graphical representation of the database.

The Manage Fields function is used to add more fields to the segment since only the key fields are defined. Right click on PARTROOT and select **Import COBOL or PL/I Structures**.



The **Import Data Structures** box opens. You will need to import the COBOL structures. The copybook was previously downloaded to your workstation. Select the **Browse** button and look for the following directory **C:\share\anaheim2012\lab\source**.

Select **C00SAM09** and click **Open**.



Use the Drop down list to specify the structure for the PARTROOT segment.

Import
Import Data Structures
Import COBOL or PL/I data structures (from copybooks or includes) from the local file system.

* Source folder: C:\share\anaheim2012\lab\source

* Data structure file: C00SAM09.cpy **Browse...**

* Data structure name: **PART-ROOT** * Segment name: **PARTROOT**

Map name: Unmapped fields Case name: **Add**

The imported data structures in the following table are added as new fields to the associated segment or to the associated map case within the segment when you click Finish.

Segment Name	Data Structure...	Map Name	Case Name	Data Structure...
--------------	-------------------	----------	-----------	-------------------

Remove

Finish **Cancel**

Select **Add** button.

Import
Import Data Structures
Import COBOL or PL/I data structures (from copybooks or includes) from the local file system.

* Source folder: C:\share\anaheim2012\lab\source

* Data structure file: C00SAM09.cpy **Browse...**

* Data structure name: **PART-ROOT** * Segment name: **PARTROOT**

Map name: Unmapped fields Case name: **Add**

The imported data structures in the following table are added as new fields to the associated segment or to the associated map case within the segment when you click Finish.

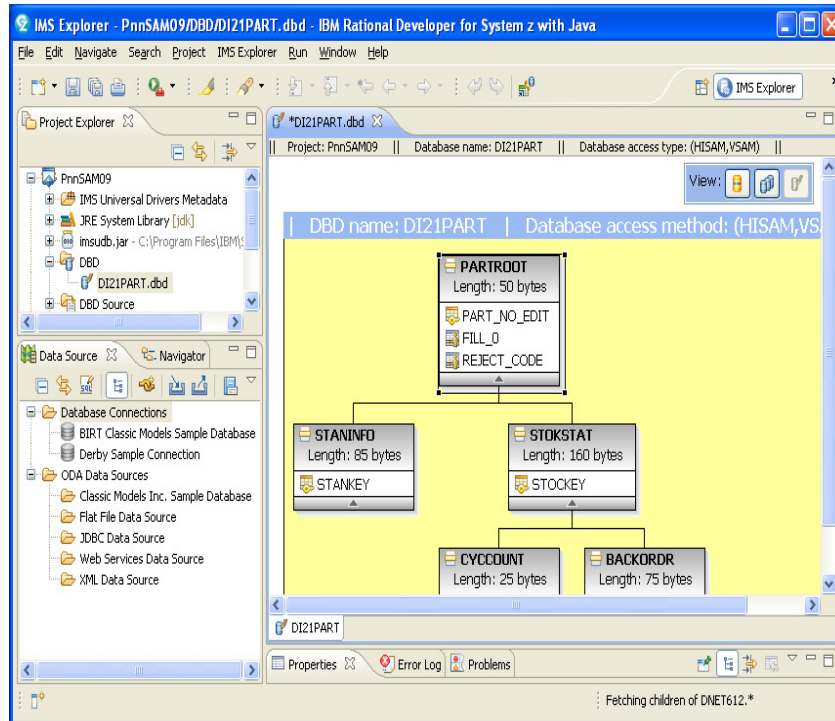
Segment Name	Data Structure...	Map Name	Case Name	Data Structure...
PARTROOT	PART-ROOT	Unmapped fields		C:\share\anah...

Remove

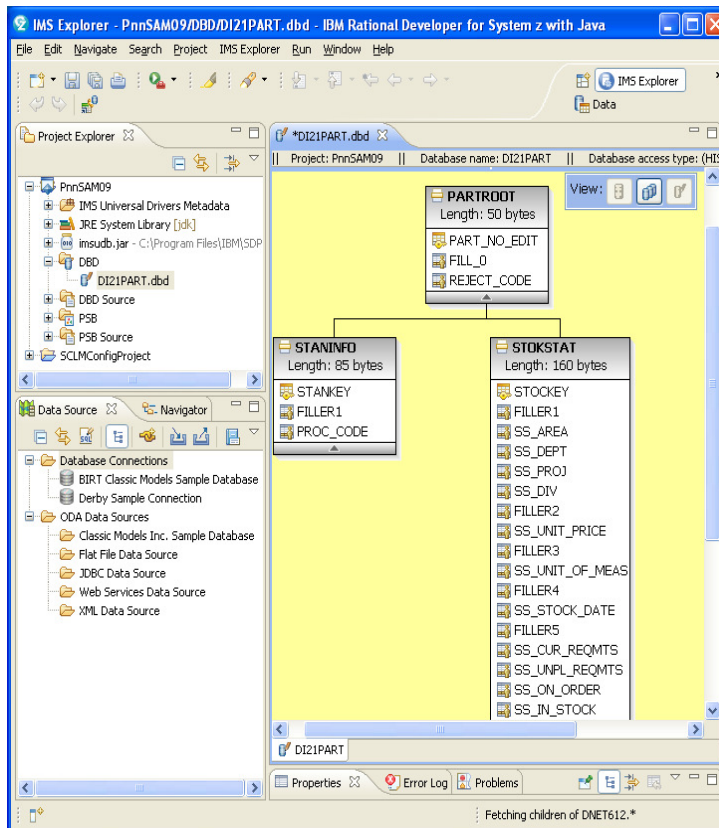
Finish **Cancel**

Click **Finish** to complete the import process.

The PARTROOT segment (table) will now have all the fields (columns).



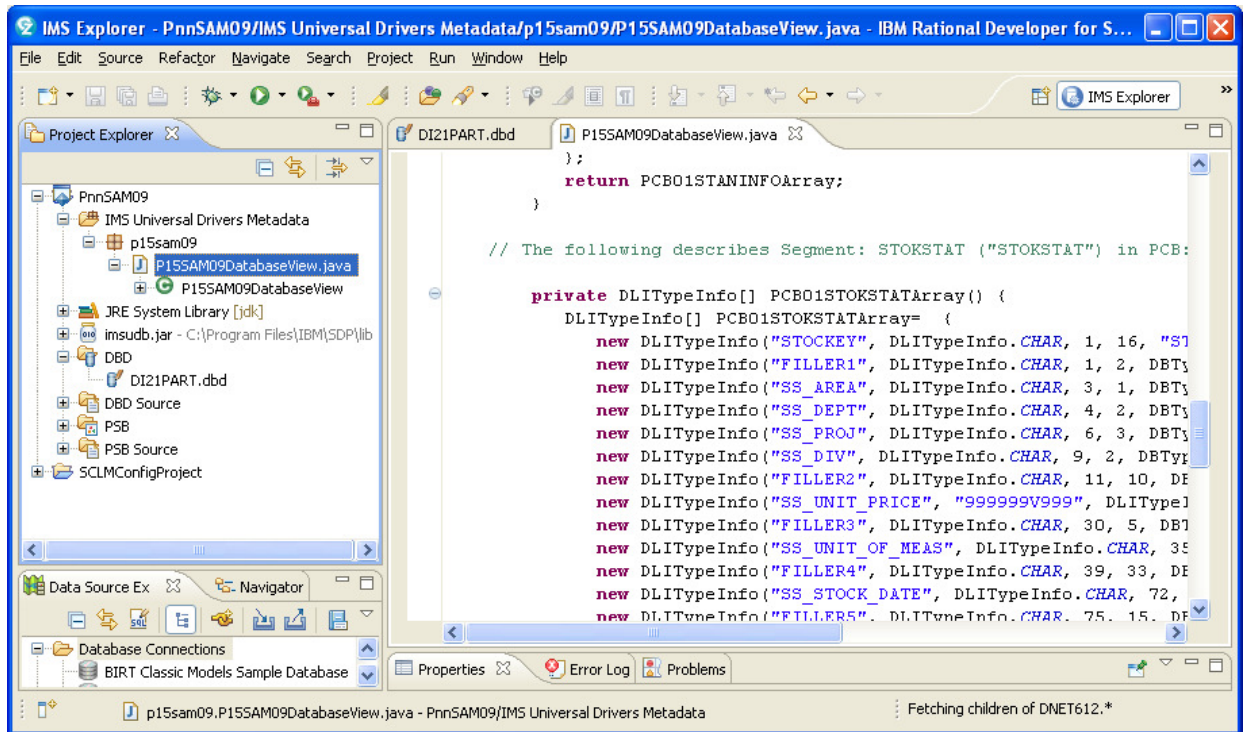
Repeat the above process for the other segments.



This completes the field definitions.

Use **Ctrl-S** to save the changes or just use the **x** tab to close the view.

In the **Project Explorer** box, Follow the path **IMS Universal Drivers Metadata > Pnnsam09** and double-click **PnnSAM09DatabaseView.java** to view the updates to the metadata.



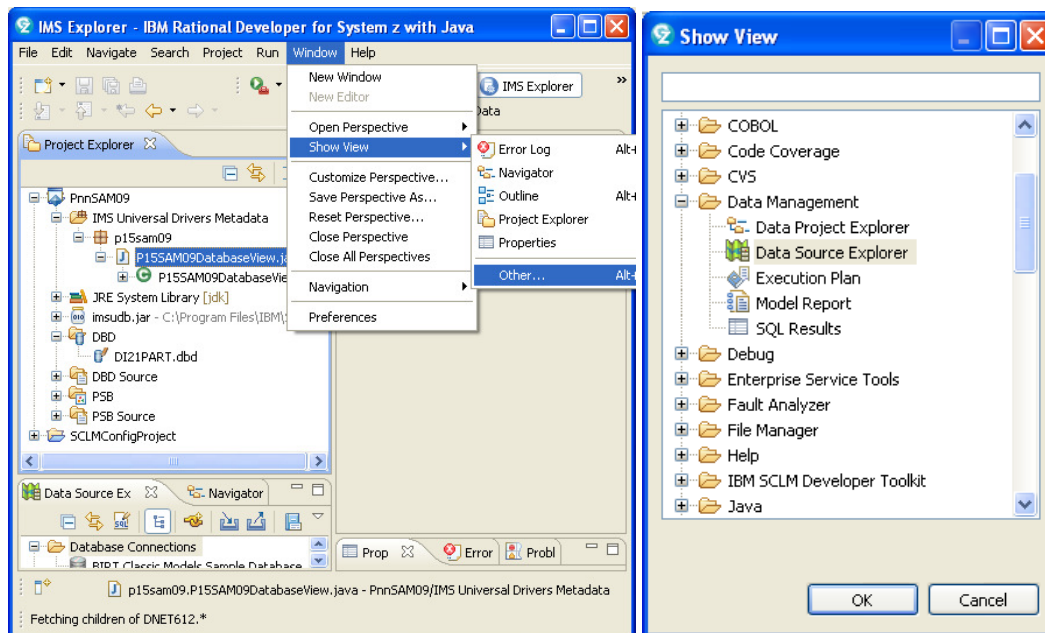
This completes the building of the metadata.

8. You are now ready to use the Data Store Explorer (DSE) to access the IMS PART database using the metadata you just created.

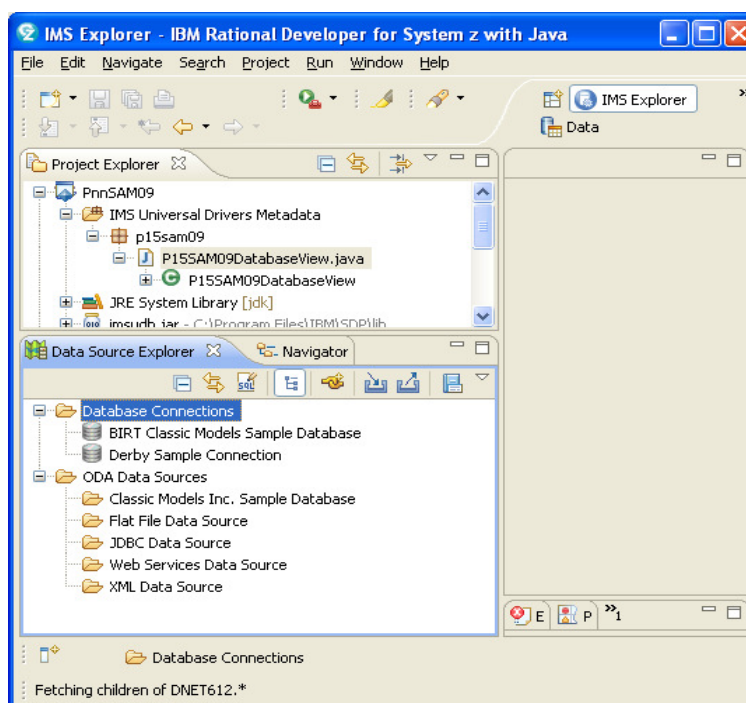
To connect to an IMS database use the **New Connection** wizard to create a connection profile, so that you can connect to an IMS database and browse existing data objects.

If you already have the **Data Source Explorer** box open at the bottom of your RDz window then you can skip the following instructions.

If you do not have the **Data Source Explorer** box then click on the **Window** tab at the top of the RDz tool and follow the following: **Show View > Other**. In the **Show View** box, click **+ Data Management**, select **Data Source Explorer** and click **OK**.



In the **Data Source Explorer**, right-click the **Database Connections** folder, and click **New**.



The **New Connections** box opens up. Select **IMS** as the database manager and the driver name **IMS Universal JDBC Driver** as the JDBC driver.

New Connection

Connection Parameters

You must specify a valid port number for your database server.

Connection identification

☒ Use default naming convention

Connection Name:

Select a database manager:

- Cloudscape
- DB2 for i5/OS
- DB2 for Linux, UNIX, and Windows
- DB2 for z/OS
- Derby
- Generic JDBC
- HSQLDB
- IMS**
- Informix
- MaxDB
- MySQL
- Oracle
- SQL Server
- Sybase
- Websphere

JDBC driver:

Properties

General | Tracing | Optional

*Connection name:

Data store:

*Host:

*Port number:

User name:

Password:

☐ Save password

Default schema:

Metadata source

The IMS Universal JDBC driver uses this information to process SQL calls to IMS. Select a PSB or specify a Java metadata class (generated by the DLIModel utility plug-in or IMS Explorer).

☐ **IMS Catalog**

PSB:

☒ **Local IMS Explorer project**

Project:

PSB:

☐ **Local file system**

File location:

Metadata class:

In the **Connection Name** field enter **IMPOTxx** where xx is your team number

In the **Data Store** field enter **IMSD**

In the **HOST** field enter **zserveros.demos.ibm.com**

In the **Port number** field enter **7001**

In the **userid** field enter **IMPOTxx** where xx is your team number

In the password field enter **IBM07POT**

Scroll down to **Local IMS Explorer project** and select the radio button

From the **Project** drop down list, select your project, e.g., **PnnSAM09**

New Connection

Connection Parameters
Select the database manager, JDBC driver, and required connection parameters.

Connection Identification
☒ Use default naming convention
Connection Name: IMPOTxx

Select a database manager:
Cloudscape
DB2 for i5/OS
DB2 for Linux, UNIX, and Windows
DB2 for z/OS
Derby
Generic JDBC
HSQLDB
IMS
Informix
MaxDB
MySQL
Oracle
SQL Server
Sybase
WebSphere

JDBC driver: IMS Universal JDBC Driver Default

Properties
General Tracing Optional

*Connection name: IMPOTxx
Data store: IMSD
*Host: zserveros.demos.ibm.com
*Port number: 7001
User name: IMPOTxx
Password: [masked]
☐ Save password
Default schema:

Metadata source
The IMS Universal JDBC driver uses this information to process SQL calls to IMS. Select a PSB or specify a Java metadata class (generated by the DLIModel utility plug-in or IMS Explorer).

☐ IMS Catalog
PSB:

☒ Local IMS Explorer project
Project: PnnSAM09
PSB: P1SSAM09

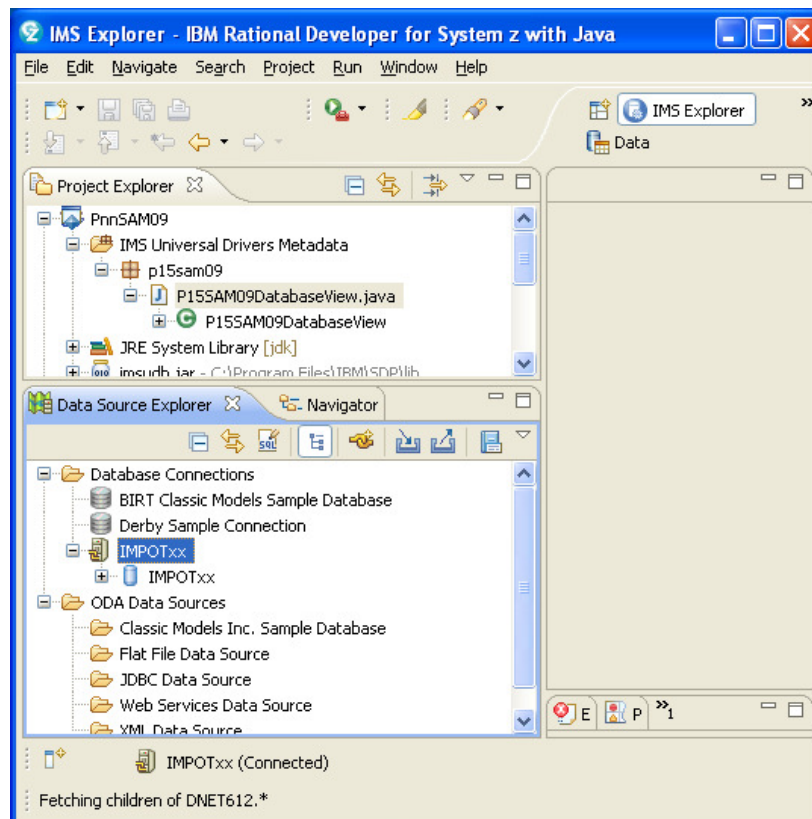
☐ Local file system
File location: [] Browse...

Test Connection

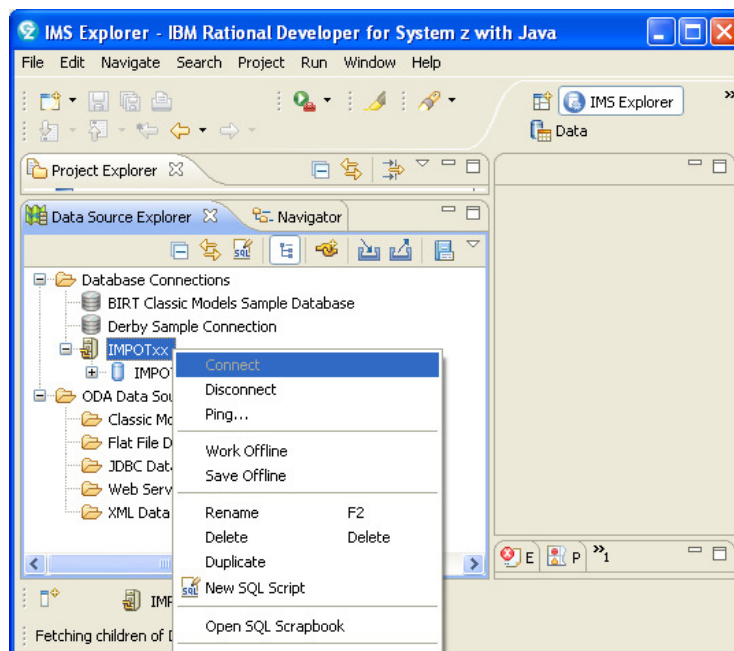
< Back Next > Finish Cancel

Click **Finish**.

The connection is displayed in the Data Source Explorer.

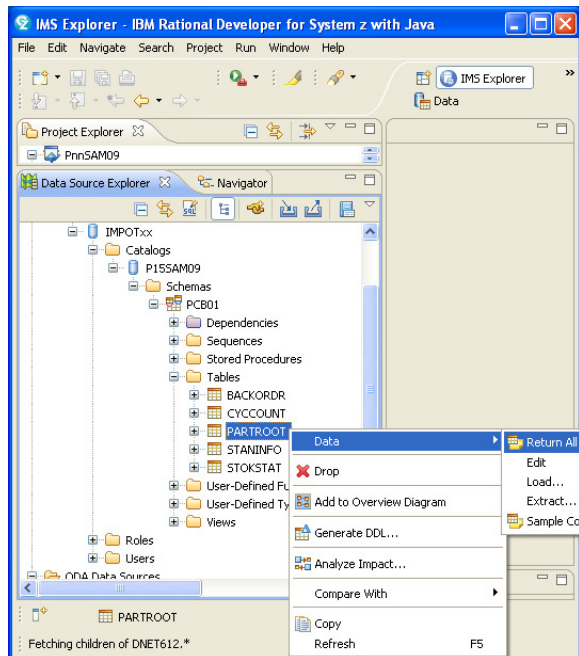


The preceding picture shows that the connection is active. If you need to disconnect or re Connect, all you have to do is right click on the connection name and choose your action.

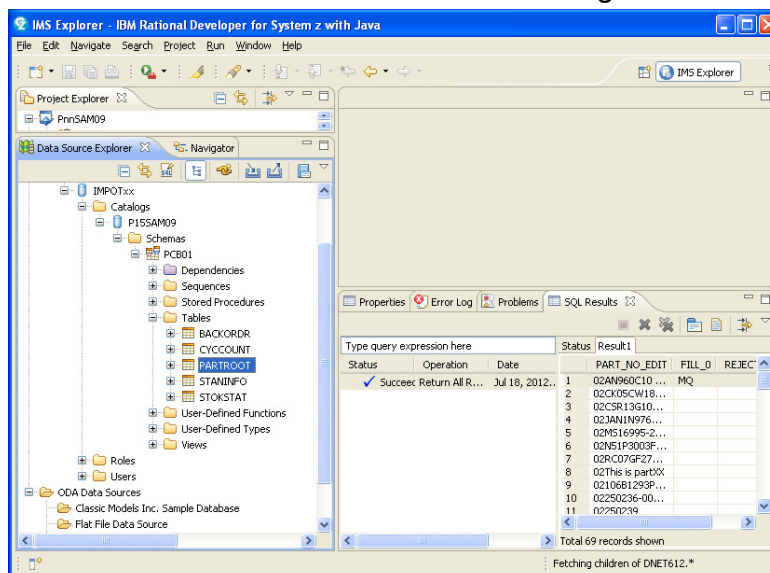


To test the connection in the **Data Source Explorer** section under **Database Connections**, right click on the connection name you defined, e.g., **IMPOTxx**.

Expand the path until you can select **PARTROOT**. Right click and select **Data** then click on **Return All Rows** to return data.



The results will be available in the box on the right under **SQL Results**.

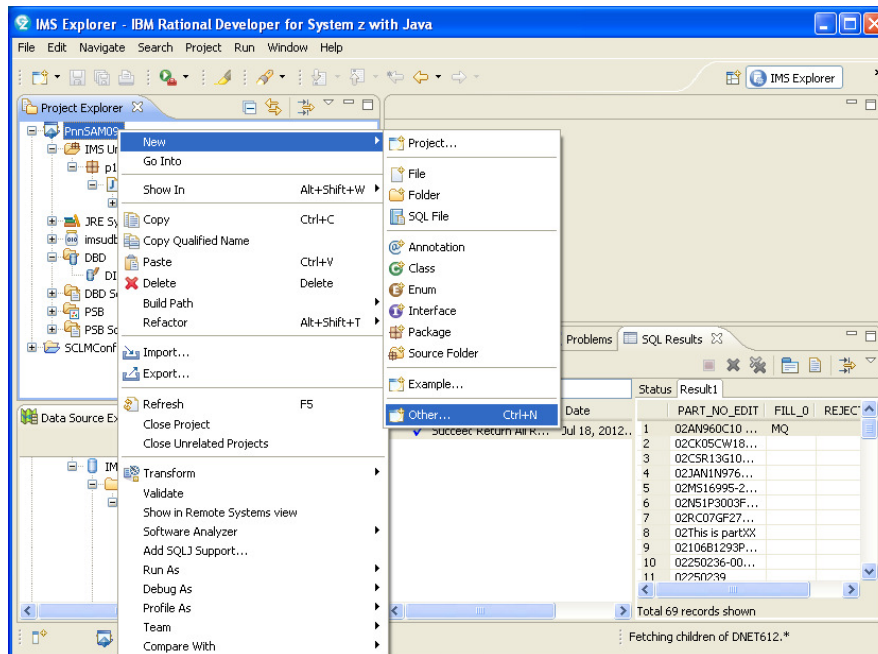


You can now also issue additional queries. In between queries, you might need to disconnect/reconnect the connections. Try looking at other tables/columns.

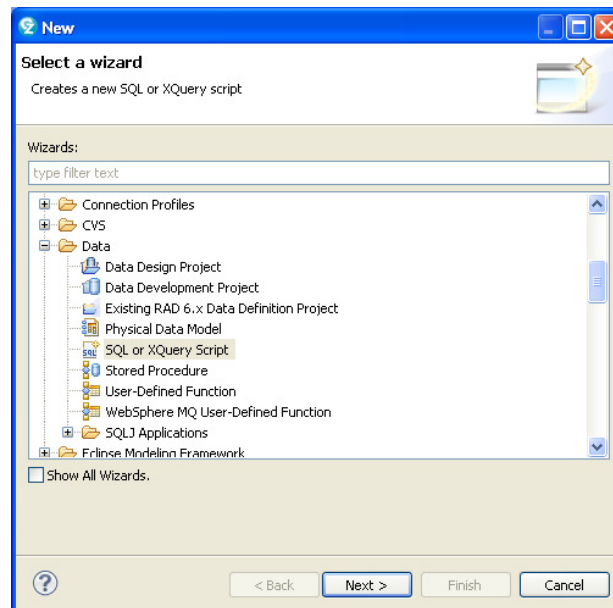
9. You can also try creating SQL calls using the **SQL Query Builder**.

In the **Project Explorer** box, select your project e.g., **PnnSAM09**.

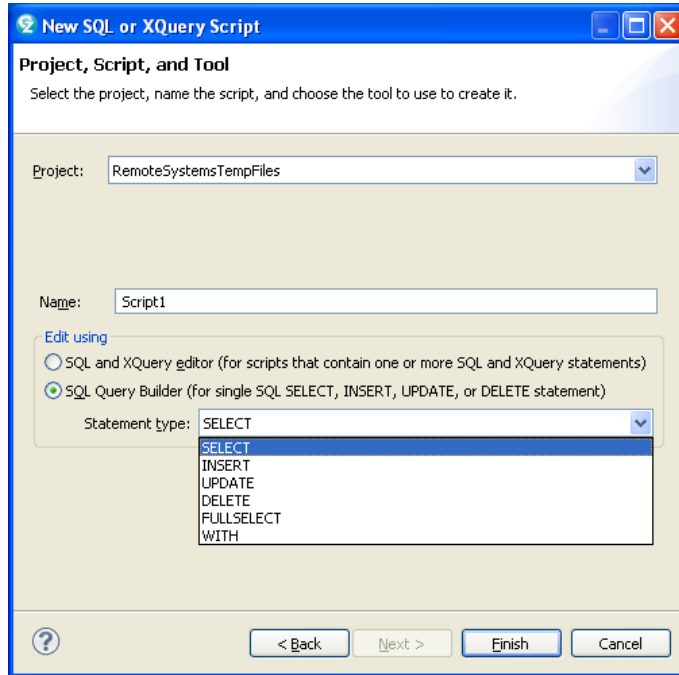
Right click **New > Other**



In the **Select a Wizard** box expand the **Data** folder and select **SQL or XQuery Script** then click **Next**.

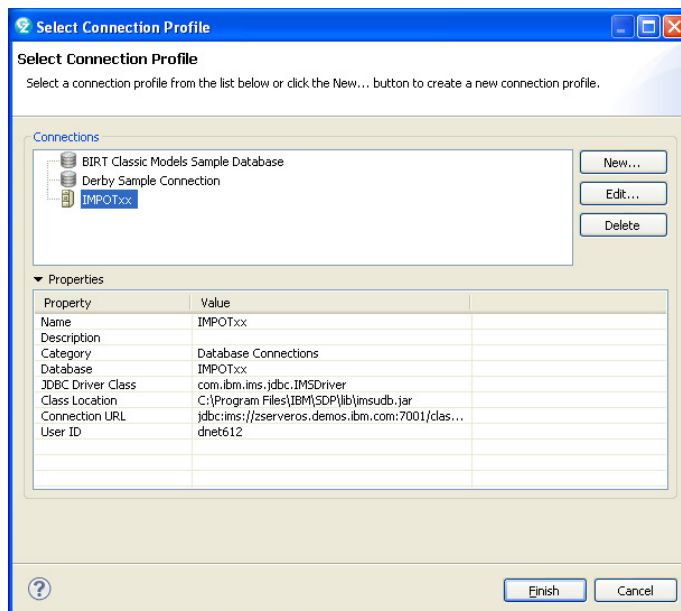


You will see the **New SQL or Xquery Script** box change **Name** to **SelectScript1**. Choose your **Project PnnSAM09** from the dropdown list. Under the radio button **SQL Query Builder** note that you can choose your Statement type. The default is **Select**.



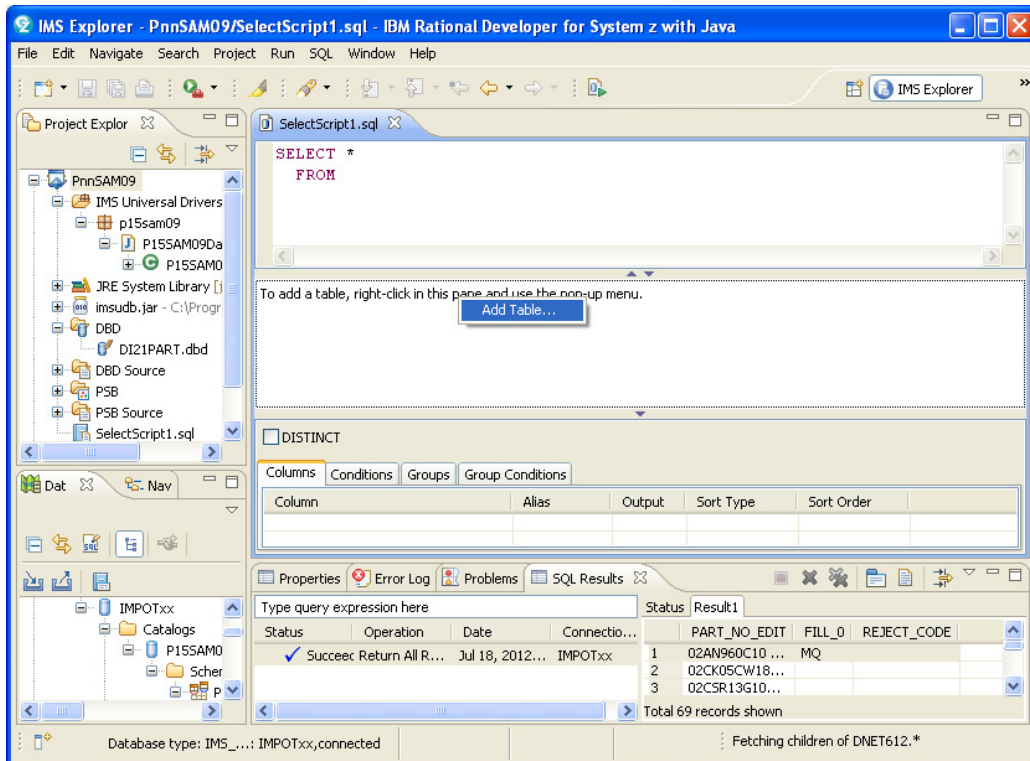
When you have changed the values, click **Finish**.

You will need to select a connection profile for the database you want to access. Choose the one you created earlier, e.g., **IMPOTxx**. Click **Finish**.

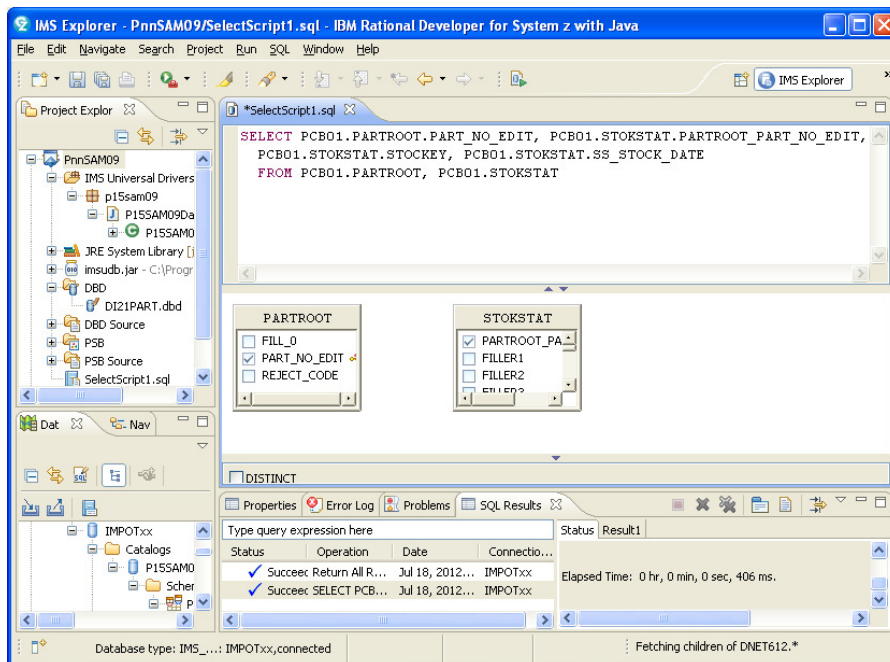


The SQL Query Builder Box opens up!

In the **Add a table** window right click and select **Add Table**.

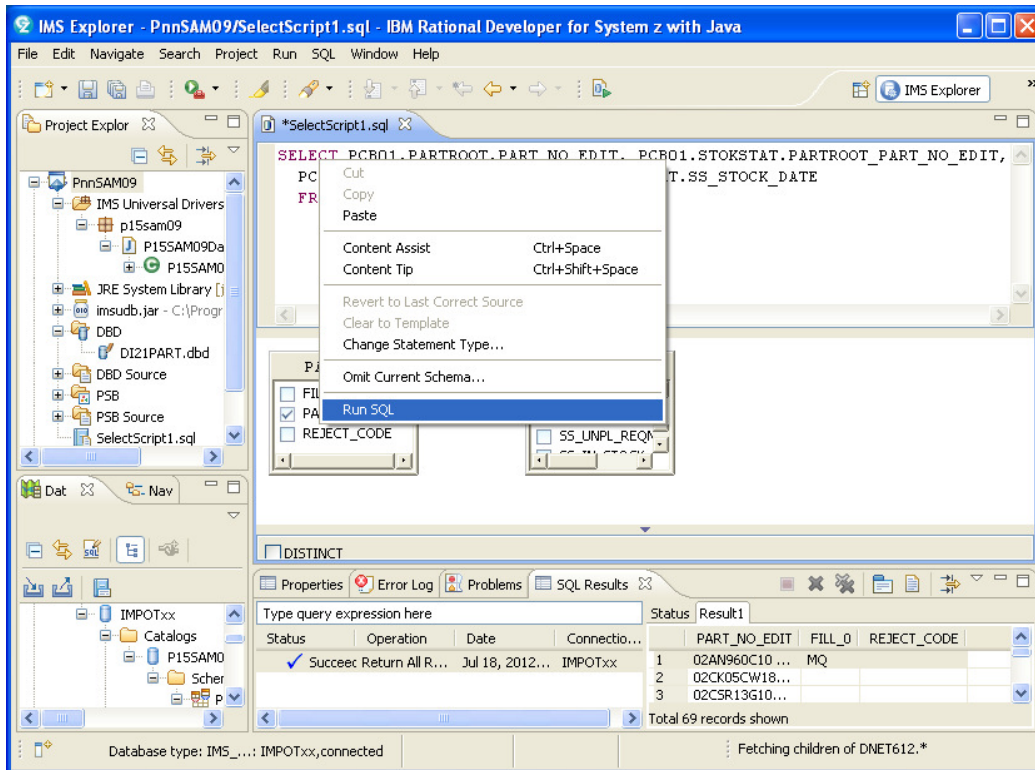


You will be able to choose which tables to add, and check which columns to include.

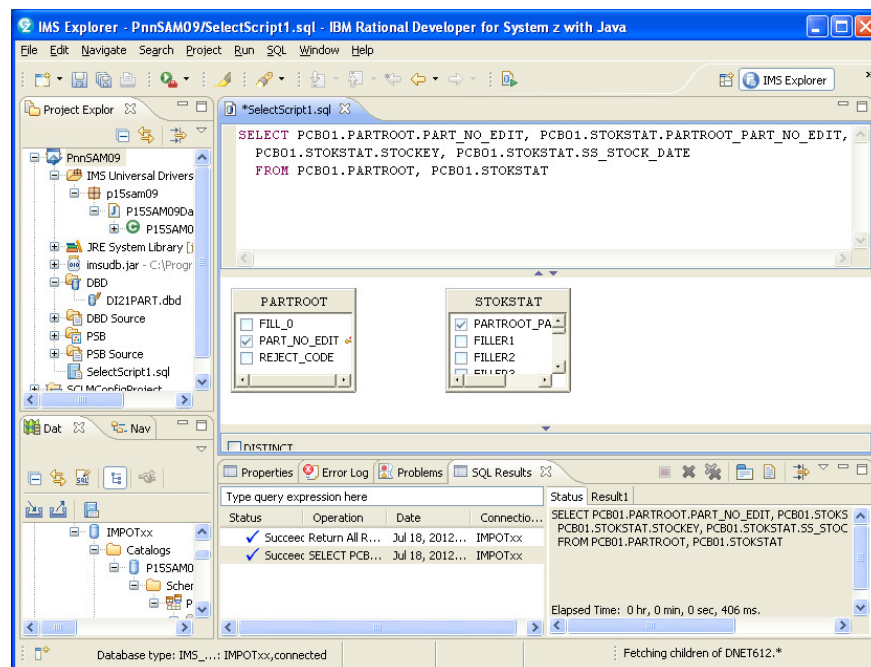


Note how the script is built.

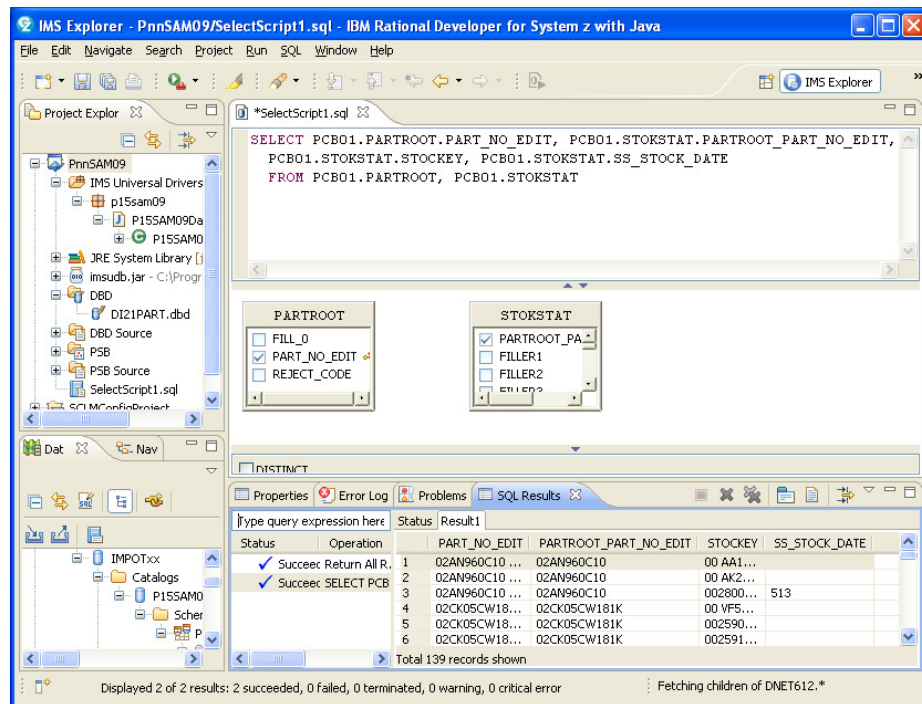
When you are done, position your cursor to the upper box, right click on the **Select** statement that was built and choose the **Run SQL** option.



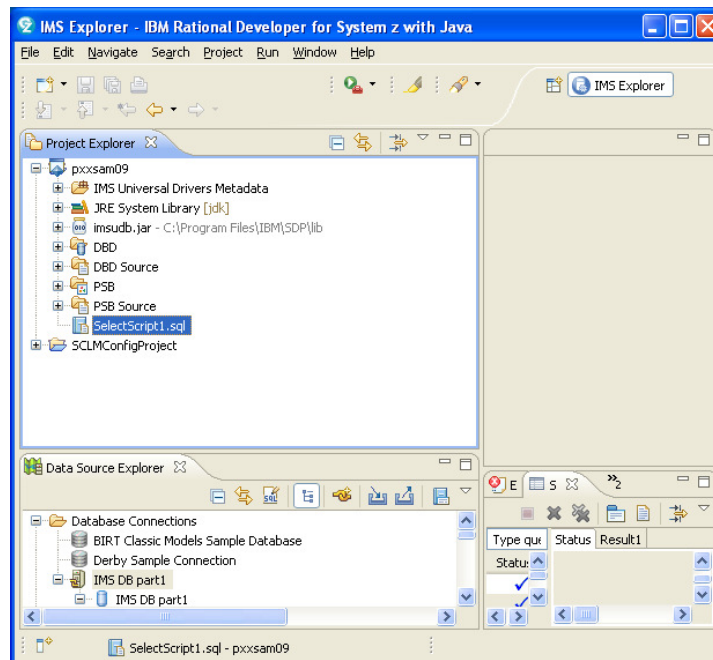
The results can be viewed in the bottom box.



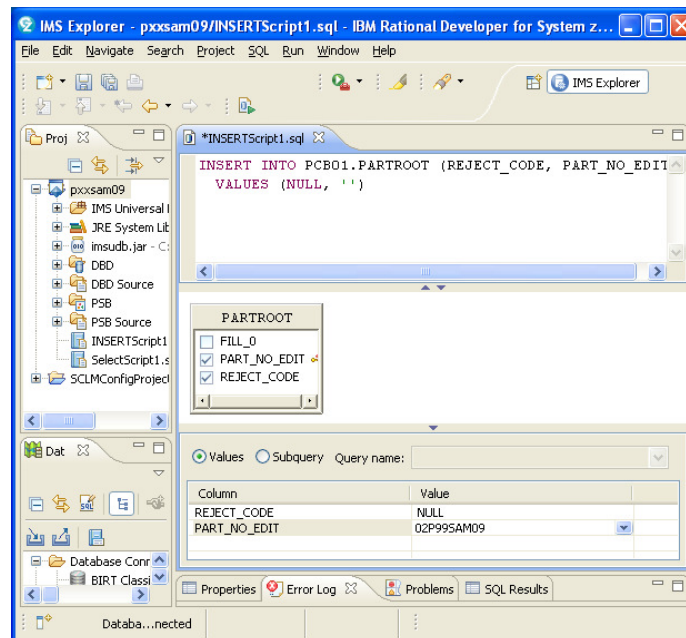
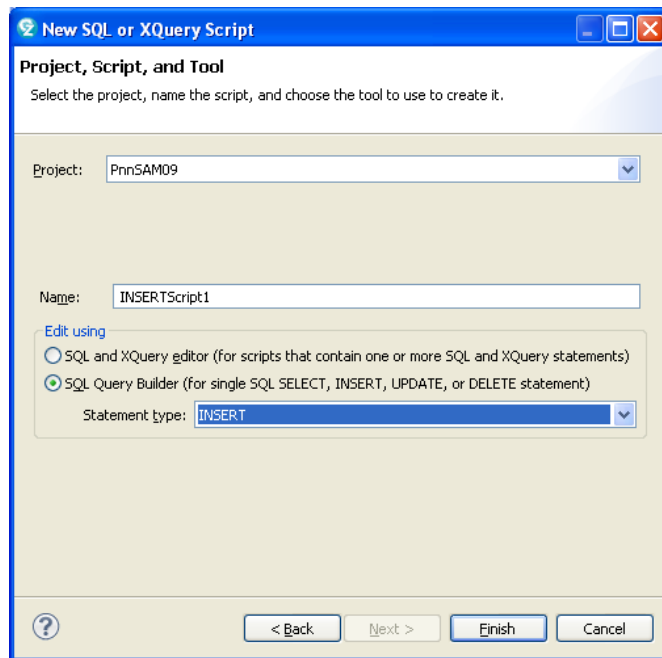
Note that there are two tabs. One for **Status** and one for **Results**.



Save the **SelectScript1.sql** script you created by either issuing Ctrl-s or x out of the tab at the top.

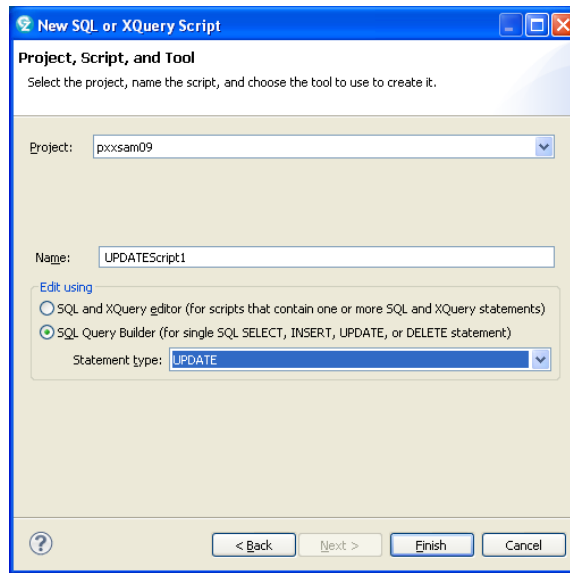


Take the time now to continue using the same wizard to **INSERT** a new PARTROOT e.g., Use 02P~~nn~~SAM09 (where ~~nn~~ is your team number) for the partkey value.

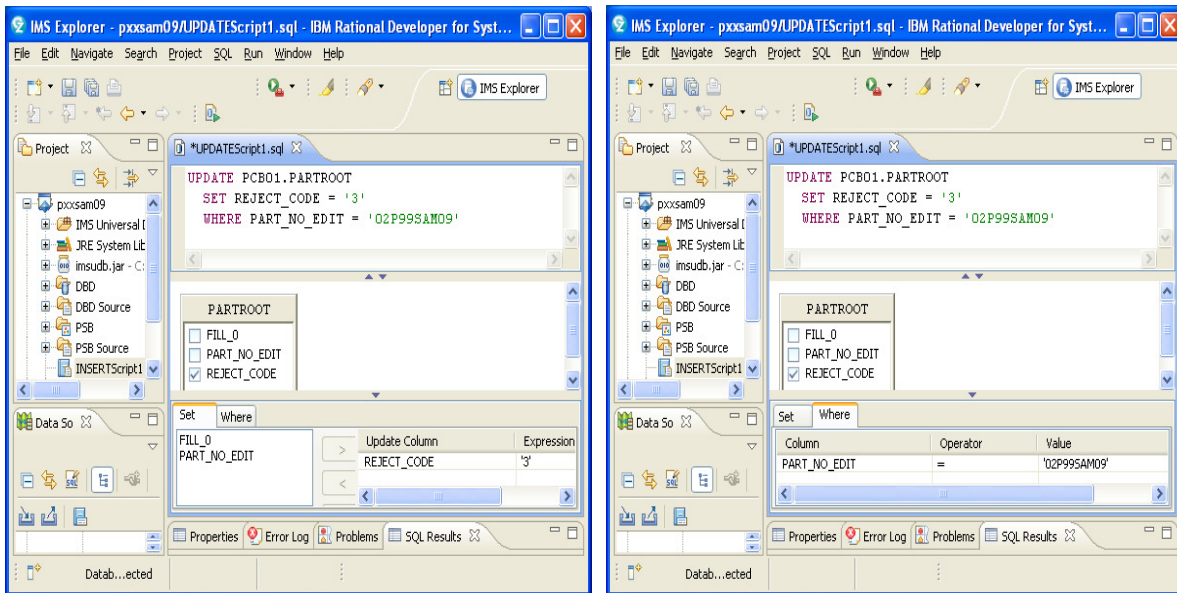


Run the SQL statement when you are done. Check the SQL Results at the bottom tab to make sure it ran to successful completion.

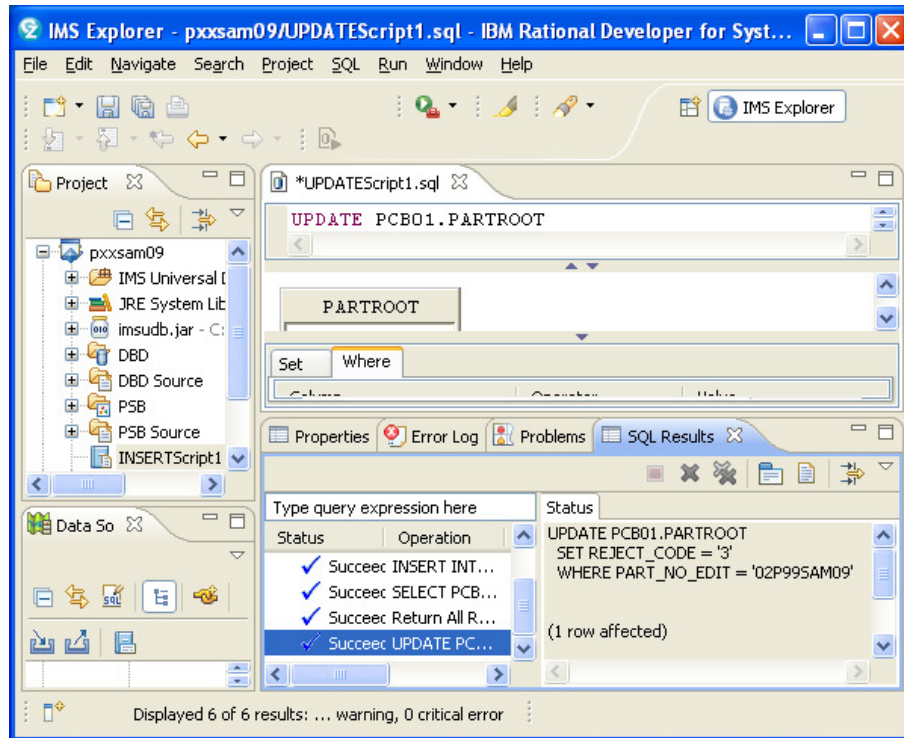
You can also try an UPDATE.



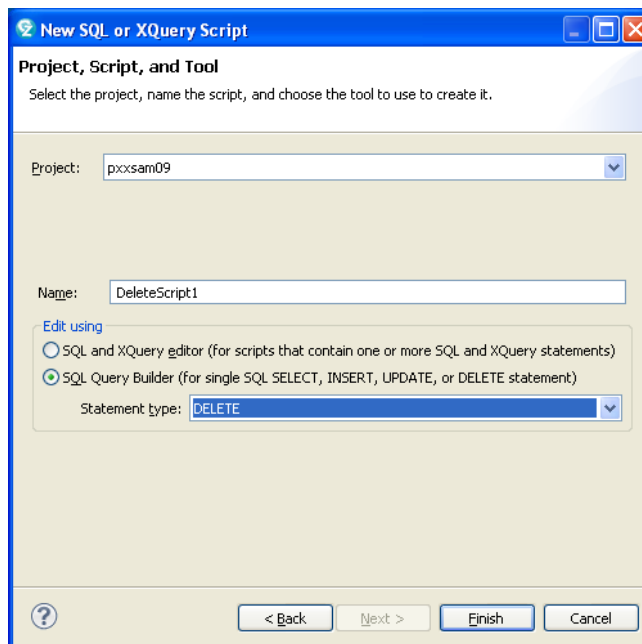
Note for an UPDATE you will need to use the **Set** and **Where** tabs in the box that allows you to choose your tables. For example you can specify a different value for the REJECT_CODE and qualify the call using the partkey PART_NO_EDIT = 02PnnSAM09.

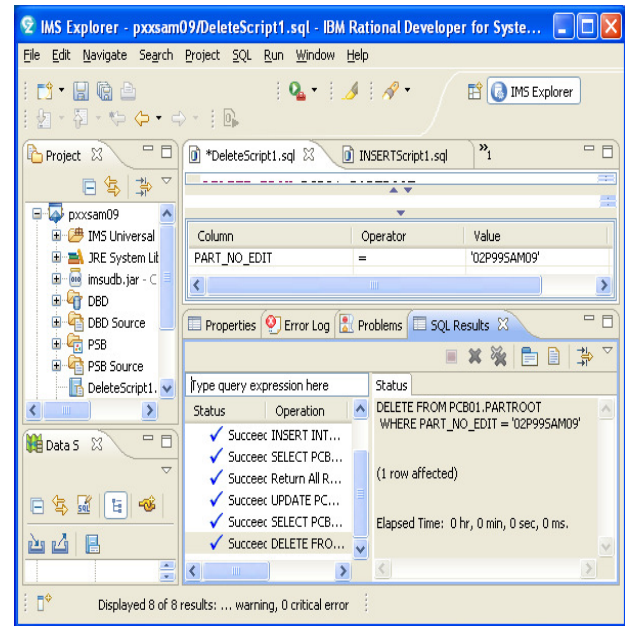
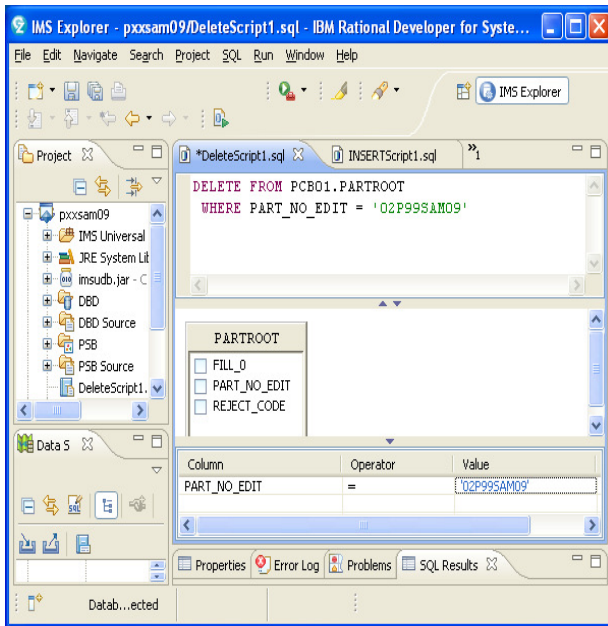


Check the SQL Results tab at the bottom of the window.



Finally, try the DELETE and remove the 02P~~nn~~SAM09 part that you previously created.





This completes the hands-on_lab Part 1.