

Week 1

Introduction to the environment

Outline

- In the lab this week:
 - Architecture of an Oracle database
 - Client/server and SQL Developer - how to set up
 - Where to find SQL Developer
 - Setting up a connection
 - Accessing another schema
 - Running your queries
 - Saving your queries.

Oracle Architecture

- An oracle database consists of:
 - A large amount of stored data on disk.
 - An instance, which is a set of programmes that run and allow:-
 - Users to request services
 - Manipulation of the data on disk.
 - Without the instance, the database is not usable
 - It is like having a book and not being able to read.

Client / server architecture

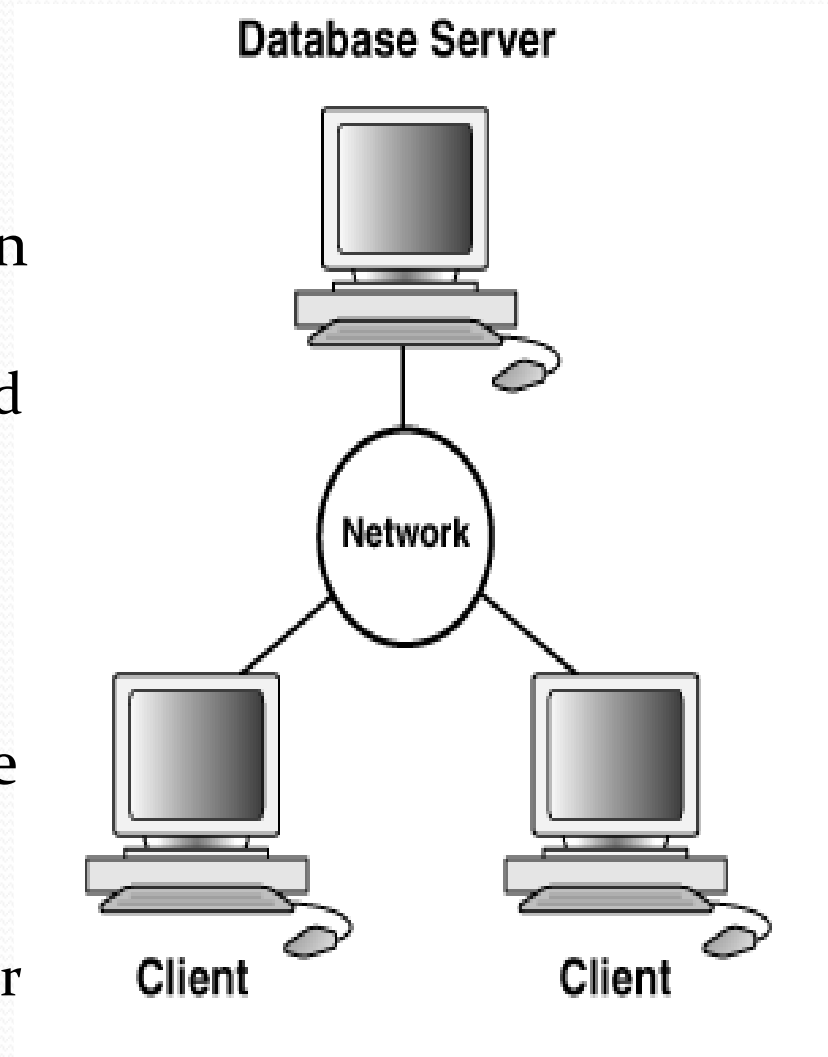
- The database application and the database are separated into two parts:
 - a front-end or **client** portion, and
 - a back-end or **server** portion

Client / server architecture

- The **client** runs the database application that accesses database information and interacts with a user through the keyboard, screen, and pointing device, such as a mouse.
- The **server** runs the Oracle software and handles the functions required for concurrent, shared data access to an Oracle database.
- The client and server may be on the same machine, but normally on a network, they are not.

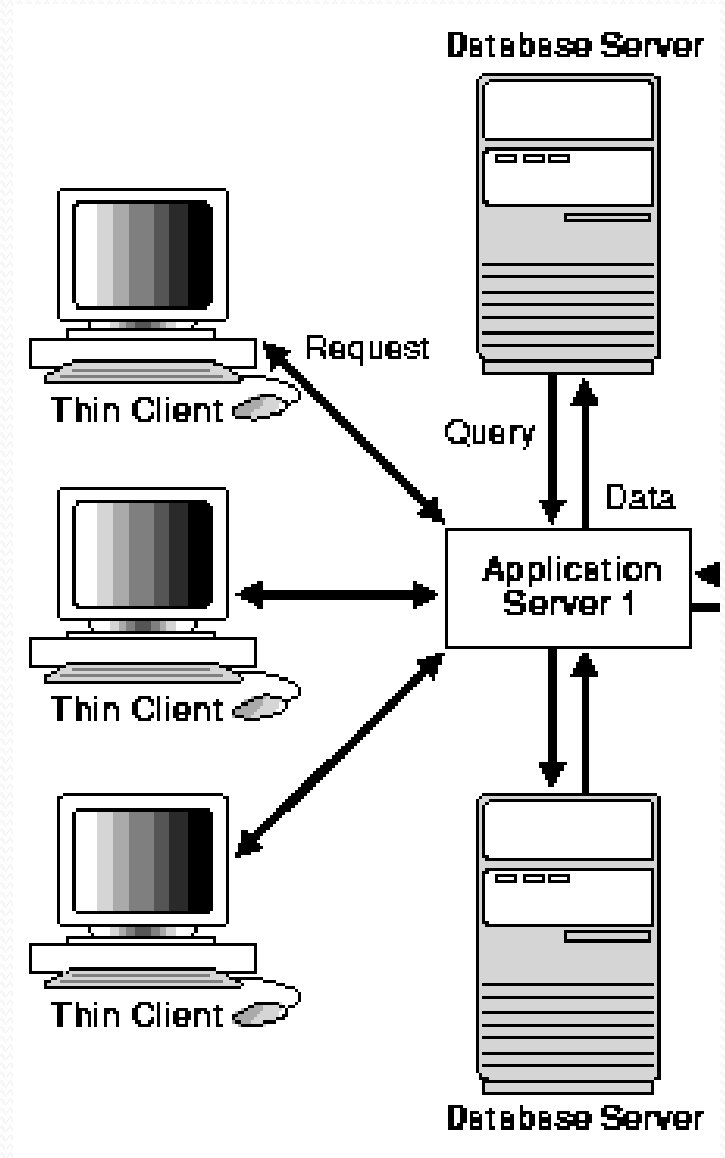
Architecture

- The data is held in a database on the server
 - Our server is called FERDIA and is on the COMP domain
 - Ferdia.comp.dit.ie
 - It hosts an Oracle 11g database.
- We access and manipulate the data using an application on the client.
 - Our client is on the GALWAY server. We access it through our thin-client CS network.



Architecture

- The client can access the server through an application that sits on the server.
 - E.g. Over the web.
 - This requires an application on the server, that can interact with the database server.
- The client then sends requests to the application server, which services them and returns a result.



Architectures used in this module.

- There are two ways in which you can access an Oracle database:
 - In the lab, using the college server
 - At home, using Oracle Express from your own machine.
- The lab and practical work should be carried out on the server provided:
 - A database server on ferdia.comp.dit.ie
 - A client with SQL Developer on galway.cs.dit.ie

Architectures used in this module.

- You can practice at home by downloading:
 - Oracle Express
 - SQL Developer
 - In this case, both the client and the server are on the same machine.
 - This requires that you set up Oracle Express and SQL Developer and configure one or more schemas on your own PC.
 - This is a drain on your computing resources, but the server can be stopped, when it is not in use.

Architecture and sessions

- SQL Developer is the client application we will use.
 - There is a text-based alternative, called SQL*Plus
 - There is a web-based alternative, iSQLPlus
 - It is not activated on this instance, as the application server does not start the service.

SQL Developer

- Through this application you can set up one or more ***sessions*** through which you access the database.
- Each session ***connects*** a user to a schema on the database server.
- Multiple sessions can be active from a single instance of SQL Developer.
 - They show up in different tabs.
- Each session acts as if it is isolated – each is unaware of all other connections.

Specifying your connection

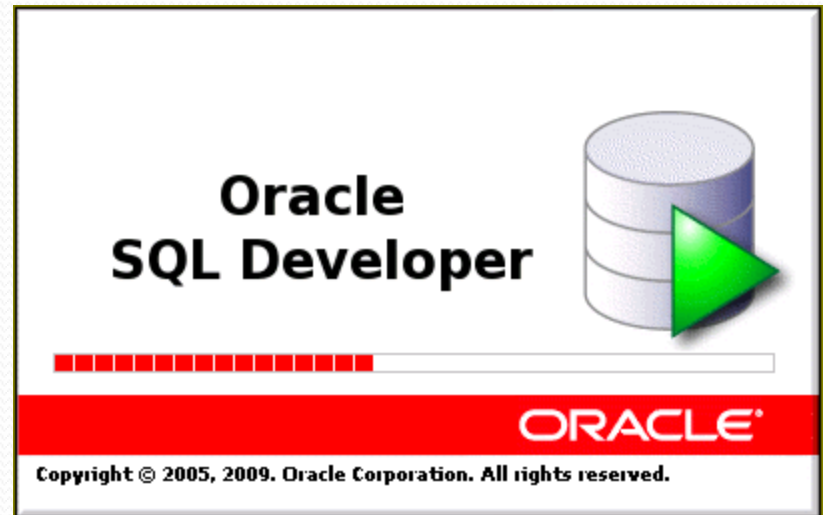
- The connection specifies:
 - A connection name (this is the name you decide to call it)
 - A username (usually the schema name)
 - A password (authenticated by the database to allow entry)
 - A host name (i.e. The name of the server)
 - A port id (the port on which it is listening for connections)
 - An instance name (Oracle may have more than one instance running on a server – each has a name)

SQL Developer

Getting Started

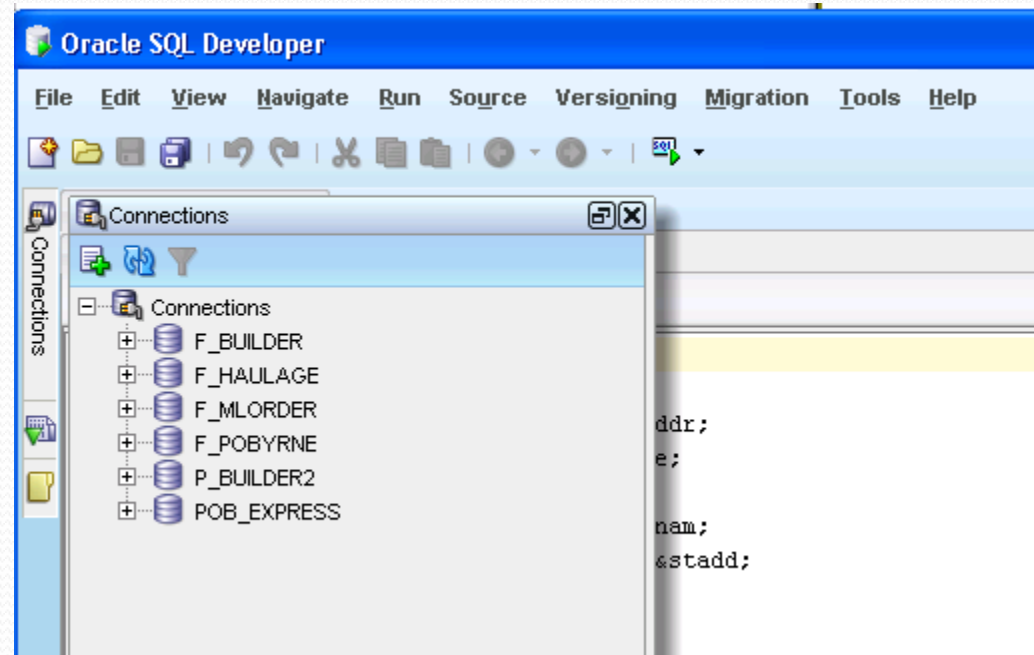
Opening screen

- Find the icon or menu item that starts SQL Developer.
 - It looks like the cylinder below, with the green arrow.



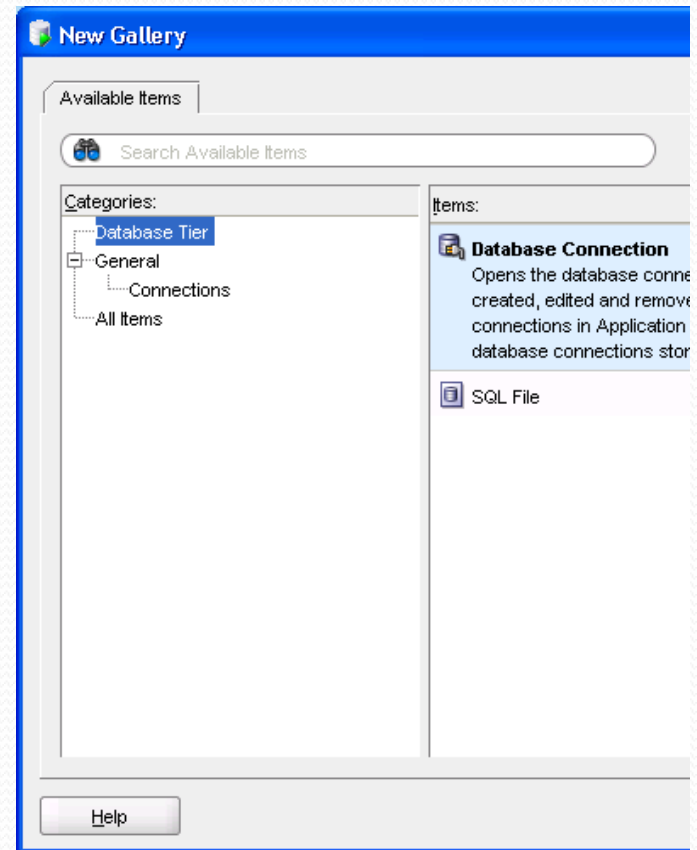
Starting up

- You may close the tip of the day.
- The top, right hand corner of the screen should look something like this.
 - This list of connections will not be there.
- You need to set up a new connection.

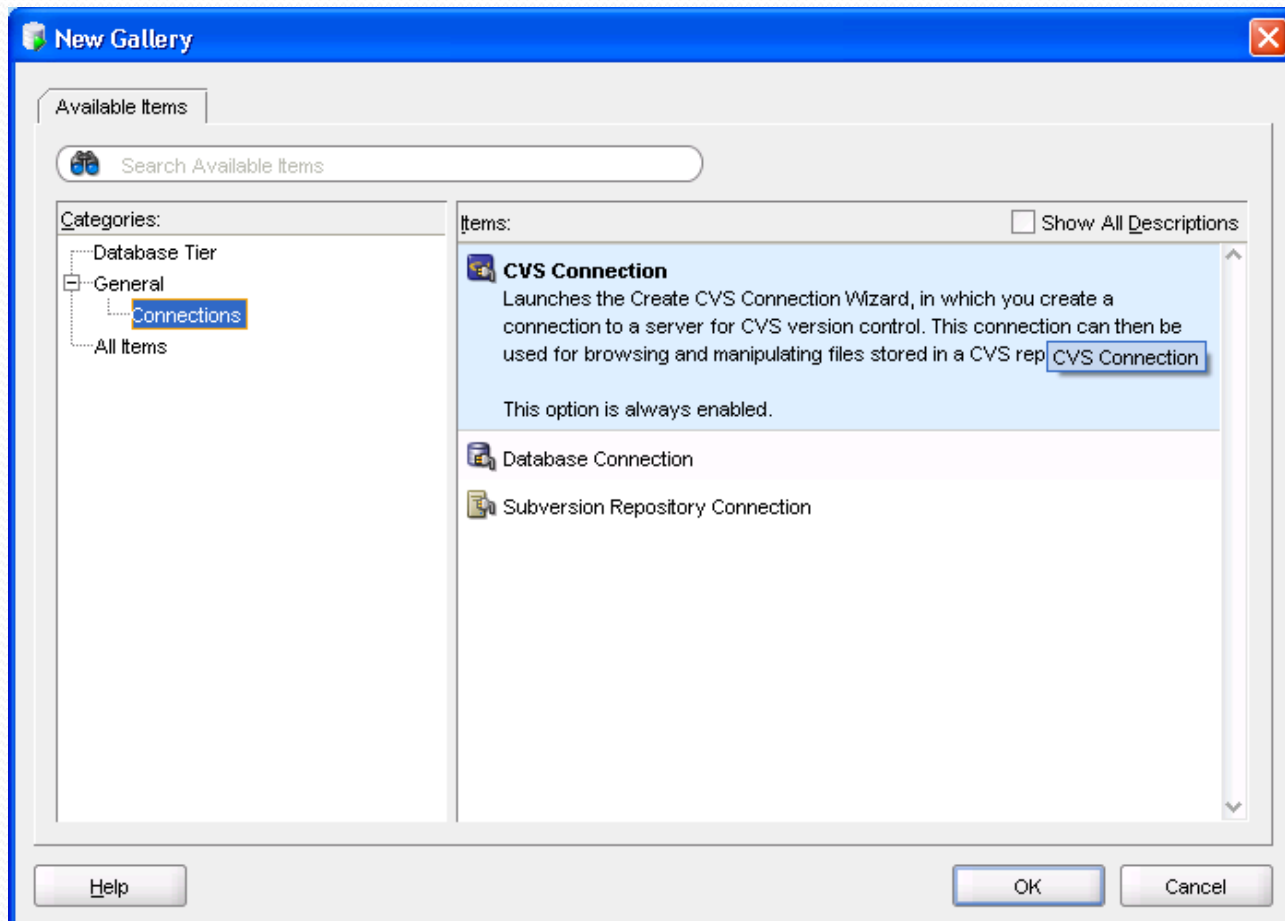


Setting up a new connection

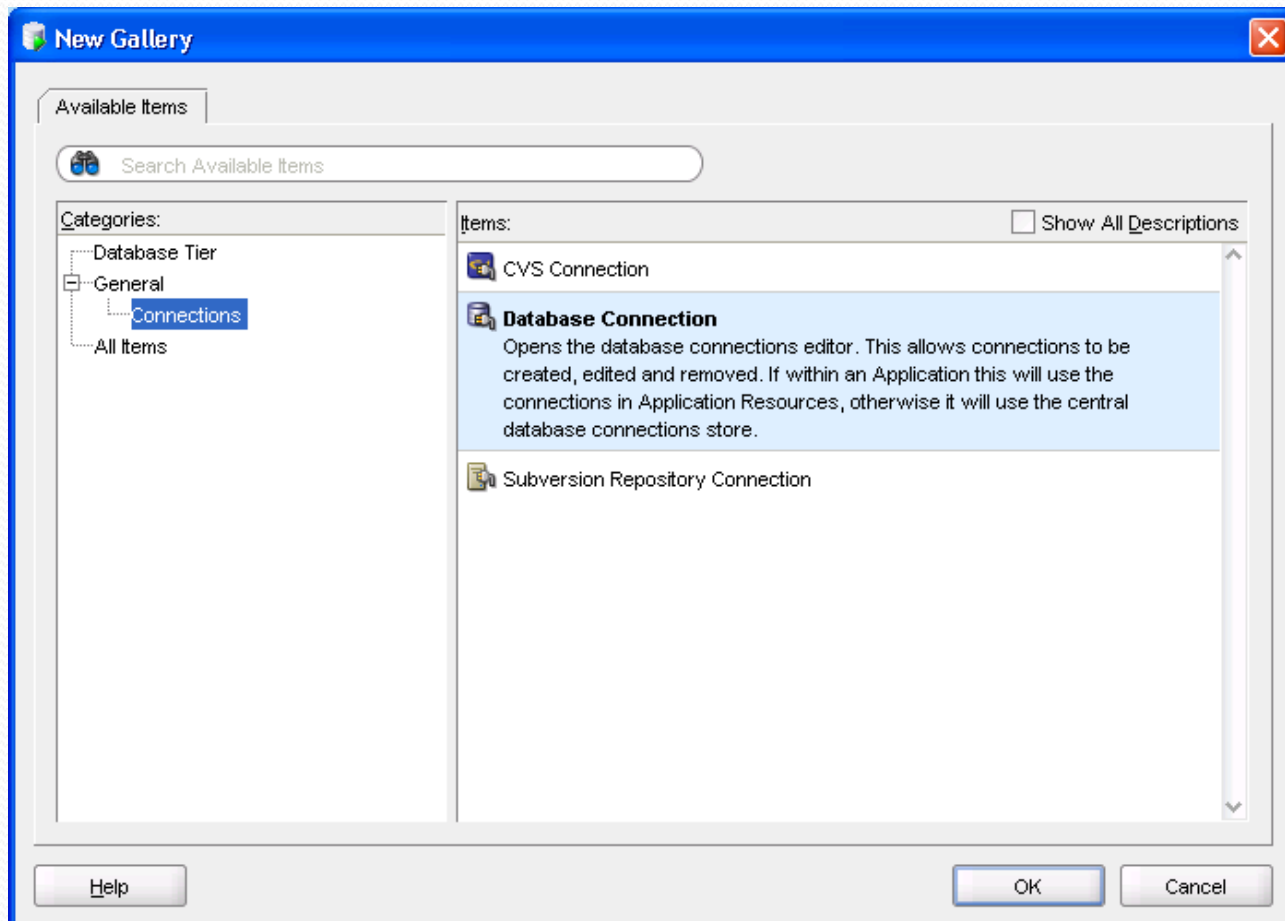
- Click 'File' and 'New'



Click 'connection'



Click 'Database Connection'



Click OK

This form will appear

- You will not have the connections on the left.
- See next slides for how to fill it in.

The screenshot shows the 'New / Select Database Connection' dialog box. On the left, there is a table of existing connections:

Connection N...	Connection D...
F_BUILDER	BUILDER2@//...
F_HAULAGE	HAULAGE@//...
F_MLORDER	MLORDER@//...
F_POBYRNE	POBYRNE@//...
P_BUILDER2	BUILDER2@//...
POB_EXPRESS	SYSTEM@Mo...

The main area of the dialog contains the following fields and options:

- Connection Name:** A text input field.
- Username:** A text input field.
- Password:** A text input field.
- ☐ **Save Password**
- Oracle Access** section:
 - Role:** A dropdown menu currently set to 'default'.
 - Connection Type:** A dropdown menu currently set to 'Basic'.
 - ☐ **OS Authentication**
 - ☐ **Kerberos Authentication**
 - ☐ **Proxy Connection**
- Hostname:** A text input field containing 'localhost'.
- Port:** A text input field containing '1521'.
- ☒ **SID**: A text input field containing 'xe'.
- ☐ **Service name**: A text input field.

At the bottom, there is a 'Status:' label and a row of buttons: Help, Save, Clear, Test, Connect, and Cancel.

Set up your own...

- In the example,
 - I called my connection F_POBTEST
 - The F stands for FERDIA
 - FERDIA is the name of the server
 - If you set up other Oracle connections, give them a prefix that suits the server they are on.
 - My username is POBYRNE – yours will be different.
 - Ask for your unique username.
- See Next Slide...

This is an example

- Don't forget to get a username and password for your SCHEMA.
 - Your username should be the one your lecturer gave you
 - Your password is the one your lecturer gave you.

Choose a connection name

New / Select Database Connection

Connection N...	Connection D...
F_BUILDER	BUILDER2@//...
F_HAULAGE	HAULAGE@//...
F_MLORDER	MLORDER@//...
F_POBYRNE	POBYRNE@//...
P_BUILDER2	BUILDER2@//...
POB_EXPRESS	SYSTEM@//Mo...

Connection Name:

Username:

Password:

☐ Save Password

Oracle Access

Role:

Connection Type:

☐ OS Authentication

☐ Kerberos Authentication

☐ Proxy Connection

Hostname:

Port:

☒ SID:

☐ Service name:

Status :

Use the username you were given

New / Select Database Connection

Connection N...	Connection D...
F_BUILDER	BUILDER2@//...
F_HAULAGE	HAULAGE@//...
F_MLORDER	MLORDER@//...
F_POBYRNE	POBYRNE@//...
P_BUILDER2	BUILDER2@//...
POB_EXPRESS	SYSTEM@//...

Connection Name: F_POBTEST

Username: POBYRNE

Password:

☐ Save Password

Oracle Access

Role: default

Connection Type: Basic

☐ OS Authentication

☐ Kerberos Authentication

☐ Proxy Connection

Hostname: localhost

Port: 1521

☒ SID: xe

☐ Service name:

Status :

Help Save Clear Test Connect Cancel

...and the password...

New / Select Database Connection

Connection N...	Connection D...
F_BUILDER	BUILDER2@//...
F_HAULAGE	HAULAGE@//...
F_MLORDER	MLORDER@//...
F_POBYRNE	POBYRNE@//...
P_BUILDER2	BUILDER2@//...
POB_EXPRESS	SYSTEM@//Mo...

Connection Name: F_POBTEST

Username: POBYRNE

Password: *****

☐ Save Password

Oracle Access

Role: default

Connection Type: Basic

☐ OS Authentication

☐ Kerberos Authentication

☐ Proxy Connection

Hostname: localhost

Port: 1521

☒ SID: xe

☐ Service name

Status :

Help Save Clear Test Connect Cancel

Change the hostname

New / Select Database Connection

Connection N...	Connection D...
F_BUILDER	BUILDER2@//...
F_HAULAGE	HAULAGE@//...
F_MLORDER	MLORDER@//...
F_POBYRNE	POBYRNE@//...
P_BUILDER2	BUILDER2@//...
POB_EXPRESS	SYSTEM@//Mo...

Connection Name: F_POBTEST

Username: pobyrne

Password: *****

☐ Save Password

Oracle Access

Role: default

Connection Type: Basic

☐ OS Authentication

☐ Kerberos Authentication

☐ Proxy Connection

Hostname: ferdia.student.comp.dit.ie

Port:

☒ SID

☐ Service name

Status: Success

Help Save Clear Test Connect Cancel

Change the Port and SID

New / Select Database Connection

Connection N...	Connection D...
F_BUILDER	BUILDER2@//...
F_HAULAGE	HAULAGE@//...
F_MLORDER	MLORDER@//...
F_POBYRNE	POBYRNE@//...
P_BUILDER2	BUILDER2@//...
POB_EXPRESS	SYSTEM@Mo...

Connection Name: F_POBTEST

Username: POBYRNE

Password: *****

☐ Save Password

Oracle Access

Role: default

Connection Type: Basic

☐ OS Authentication

☐ Kerberos Authentication

☐ Proxy Connection

Hostname: ferdia.student.comp.dit.ie

Port: 1521

☒ SID: ora11gdb

☐ Service name

Status: Success

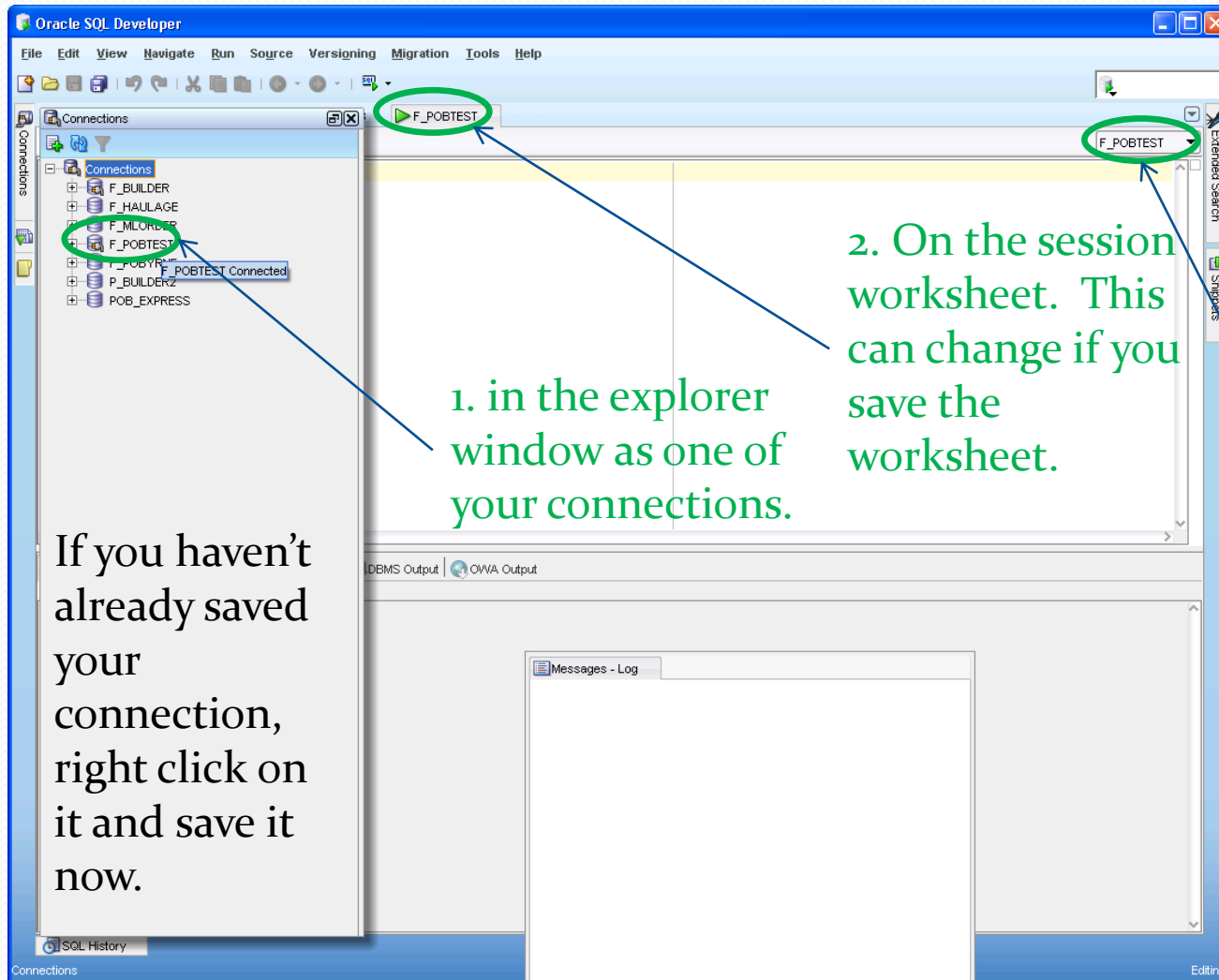
Buttons: Help, Save, Clear, **Test**, Connect, Cancel

Click **T**est
when you
are finished

Click **S**ave
If that
works.

Click 'Connect'

The session schema is shown:

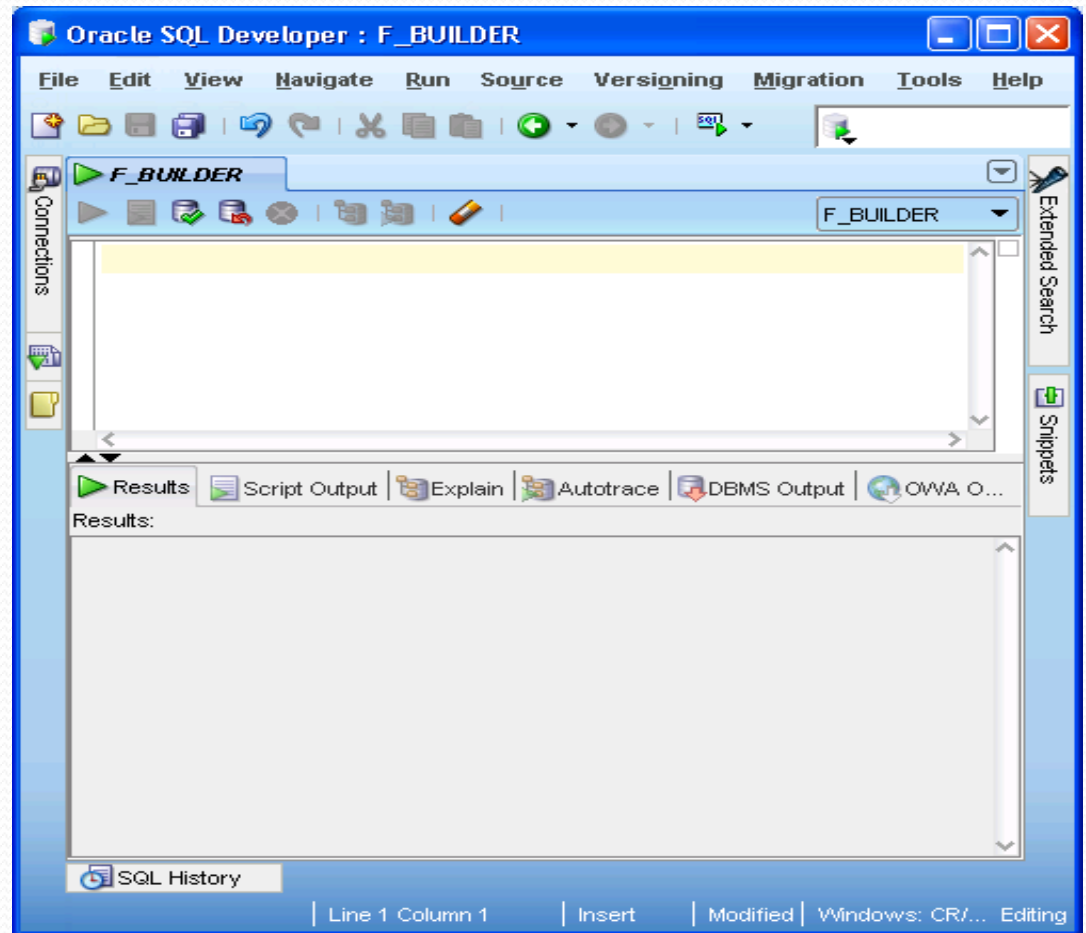


Debugging

- Didn't it work?
- Go back and check:
 - The username you were given
 - The password you were given
 - Did you spell the host name properly?
 - Did you use the correct port number?
 - Did you spell the SID correctly?
- Check with the lecturer that you have been set up with an account.

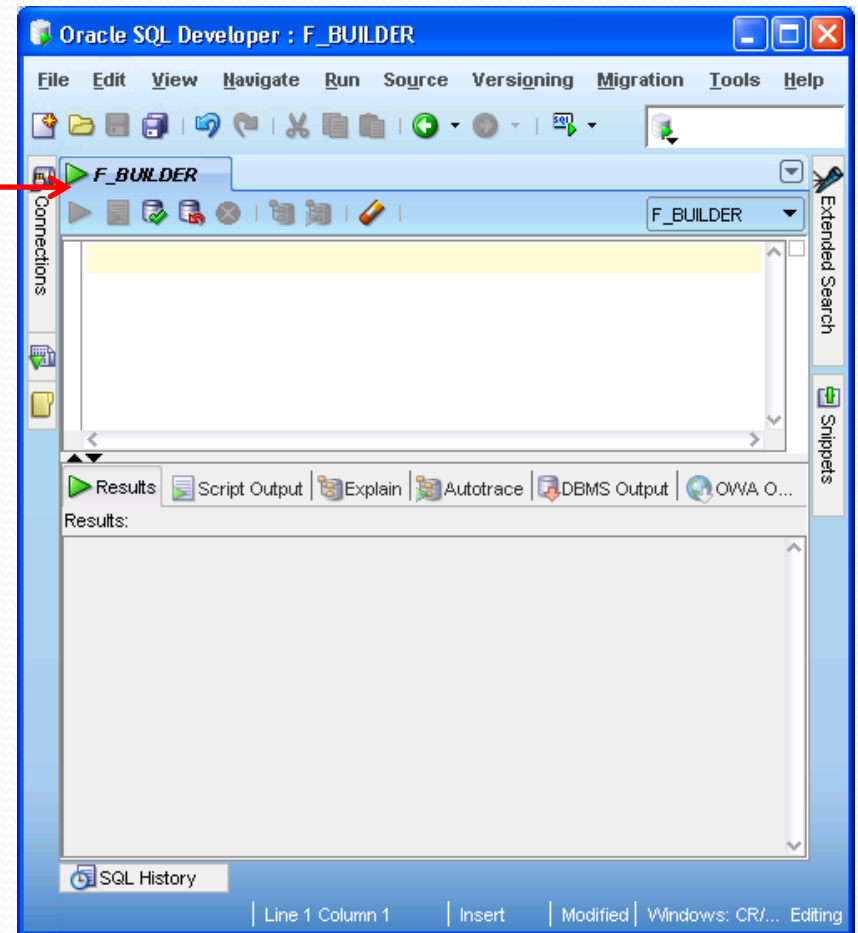
Using your schema

- When you have connected, click the leftmost bar to get rid of the explorer pane showing connections.
- An edit window will be shown.



Using your schema

- Enter any SQL commands into the top window and click 'run'.
 - i.e. The triangle icon.
 - Commands on next slide.
- In this session, we will use a schema that has already been set up.
 - You will point your session to that schema and query it.



Using another schema

- When you connect, your `current_schema` is your username.

- To change it, run the following SQL command:

```
Alter session set current_schema =  
builder2;
```

- This gives you access to the `builder2` schema.
- This is where the `Stock` table is.
 - You can now select from the `stock` table.

To do today..

- Return all the columns and rows in the stock table.
- NOTE:
 - Your still in the same schema – just reading from a different one.

The screenshot shows the Oracle SQL Developer interface. The title bar reads "Oracle SQL Developer : F_POBTEST". The menu bar includes File, Edit, View, Navigate, Run, Source, Versioning, Migration, Tools, and Help. The toolbar contains icons for file operations, execution, and search. The left sidebar shows "My Computer". The main editor displays the following SQL code:

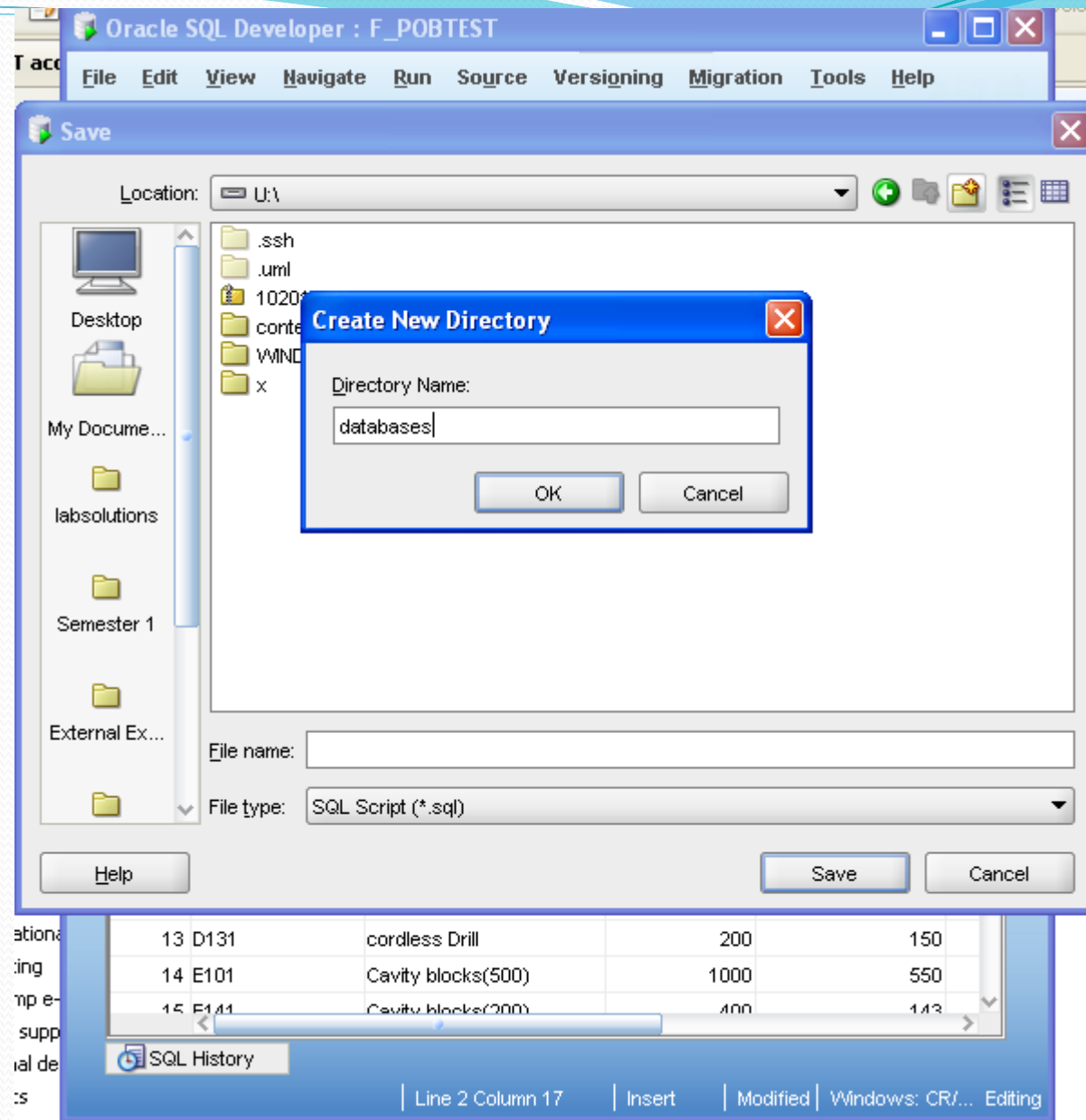
```
ALTER SESSION SET CURRENT_schema=builder2;  
select * from stock;
```

The "Results" tab is active, showing a table with 5 columns: STOCK_CODE, STOCK_DESCRIPTION, UNIT_PRICE, and UNITCOSTPRICE. The table contains 15 rows of data. The status bar at the bottom indicates "All Rows Fetched: 22", "Line 2 Column 17", "Insert", "Modified", and "Windows: CR/... Editing".

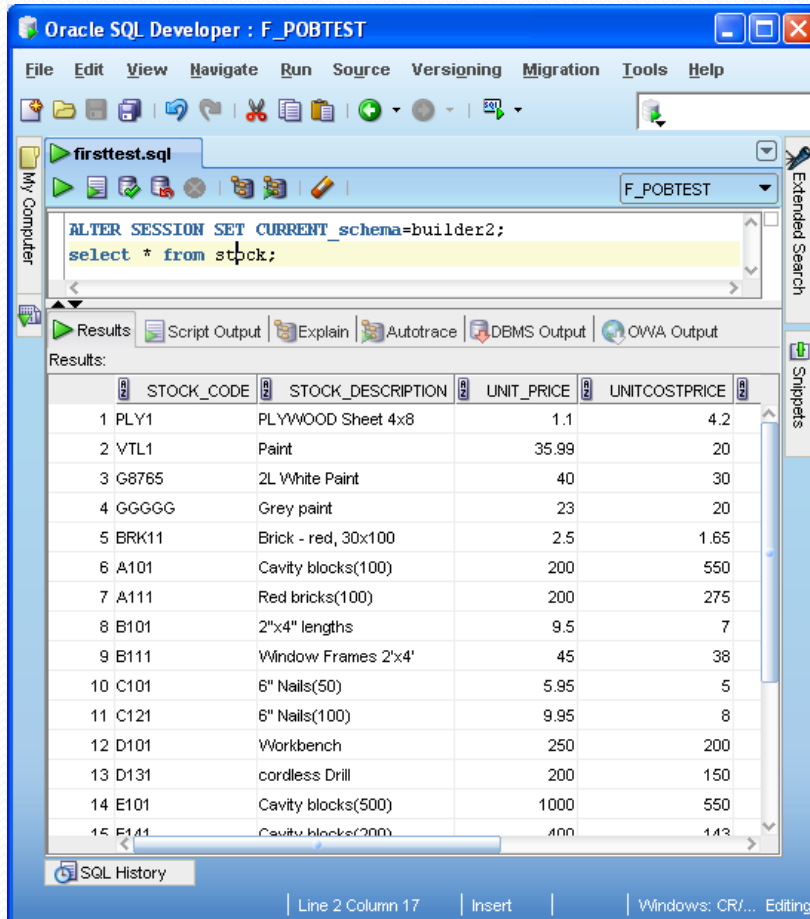
	STOCK_CODE	STOCK_DESCRIPTION	UNIT_PRICE	UNITCOSTPRICE
1	PLY1	PLYWOOD Sheet 4x8	1.1	4.2
2	VTL1	Paint	35.99	20
3	G8765	2L White Paint	40	30
4	GGGGG	Grey paint	23	20
5	BRK11	Brick - red, 30x100	2.5	1.65
6	A101	Cavity blocks(100)	200	550
7	A111	Red bricks(100)	200	275
8	B101	2"x4" lengths	9.5	7
9	B111	Window Frames 2'x4'	45	38
10	C101	6" Nails(50)	5.95	5
11	C121	6" Nails(100)	9.95	8
12	D101	Workbench	250	200
13	D131	cordless Drill	200	150
14	E101	Cavity blocks(500)	1000	550
15	E141	Cavity blocks(200)	400	143

Saving your queries

- To save your queries
 - Use either the File menu or the Save icon to save.
 - Create a directory on your U drive called databases. Save the script in there.



Change after saving



- Please note:
 - When you have saved a script, the worksheet name changes to the name of the saved file.
 - You will need to save ALL of your queries as you may be asked to produce them.
 - **You are STRONGLY advised to keep a back up on a memory stick.**