TASKS

You should already have carried out in Unit 2:
- Activity 1 to practice creation of ERDs
- Activity 2 to practice normalisation

The tasks for this unit are to:
- Implement a sample of the tables identified from Activity 2
- Carry out exercises to alter and manipulate the database.
- To export SQL scripts for use on a new remote database and place under version control.

For the purposes of these exercises you are to use Azure Data Studio and the docker instance that you created in the Unit 1 worksheet. You cannot carry out the implementation exercises unless you have completed the Unit 1 worksheet. Azure Data Studio will also be used to access the remote Microsoft SQL Server database issued to you for this module.

CONTEXT

When developing data driven applications you will need to be familiar with developing locally and deploying remotely. There may be times where you will not have a network connection and wish to work. Being able to minimise the impact of the loss of connection is therefore an important skill.

Additionally when developing your database it can be very easy to lose track of the changes that are being made. Therefore ensuring your scripts are exported and you hold them under your version control system is essential.

You can find information about how to use Azure Data Studio here
https://www.mssqltips.com/sqlservertip/6029/azure-data-studio-step-by-step-tutorial/

REMOTE DATABASE
For the purposes of this module only you have been allocated a database on the University instance of Microsoft SQL Server. The URL is socem1.uopnet.plymouth.ac.uk.

Your database log in details have been emailed to you separately at the start of this module. You MUST check them in the second week of the module as errors in connecting cannot be rectified immediately prior to the deadline for submission of work.

NOTE: The database should only be used for COMP2001 learning purposes. This database is not provided to you for the rest of your studies and will only be active until the module has been completed.

INSTRUCTIONS

Activity 3

Open your Docker desktop and start the container "mcr.microsoft.com/azure-sql-edge"

Open up Azure Data Studio and re-connect to the database system as you did in Unit 1.

Download the sql file accompanying this workbook (*Unit3_Worksheet.sql*). Using Azure Data Studio, and the connection to your Microsoft SQL database created in Unit 1, run the given SQL script.

Using the Servers side bar in Azure Studio, expand the test database and the tables folder, view the tables, the columns and the constraints. Are they what you would expect?
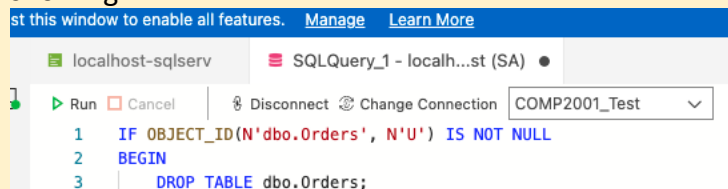
Annotate the sql file so that you label important concepts that are demonstrated there. Use the checklist at the side to help you consider what is important to note.

✓ What does "Check" do?
✓ How would you use it?

HINTS:
Password was *C0mp2001!*
Make sure in your connection box the COMP2001_Test database you created in Unit 1 is showing.

```
st this window to enable all features.  Manage   Learn More
   localhost-sqlserv        SQLQuery_1 - localh...st (SA)  ●
  ▷ Run □ Cancel    ⅄ Disconnect ↻ Change Connection  COMP2001_Test   ∨
    1    IF OBJECT_ID(N'dbo.Orders', N'U') IS NOT NULL
    2    BEGIN
    3        DROP TABLE dbo.Orders;
```

Activity 4

Taking the Student Module Enrolment System from the Normalisation exercise, create the appropriate tables in your test database.

Copy the SQL statement below and run this in Azure Data Studio. What happens? Why?

```
INSERT INTO dbo.Student (student_id, firstname, lastname)
VALUES ('S103', 'Martin', 'Read');
INSERT INTO dbo.Student (student_id, firstname, lastname)
VALUES ('S108', 'Atkinson');
INSERT INTO dbo.Student (student_id, firstname, lastname)
VALUES ('S108', ,'Atkinson');
INSERT INTO dbo.Student (student_id, firstname, lastname)
VALUES ('S1011', 'Andy', 'Smith');
```

Adjust the SQL statement so that it runs successfully with your tables.

Find the structure of your Student table by running the following command

```
exec sp_columns Student;
```

or

```
Select * From INFORMATION_SCHEMA.COLUMNS Where TABLE_NAME = 'Student' ORDER
BY ordinal_position;
```

Activity 5

ALTERING AND MANIPULATING YOUR DATABASE

Having created your database and carefully crafted the tables, you might review it and realise that you have missed something. Rather than delete the whole lot and start again you need to be able to alter and adapt.

Return to the original Orders and OrderDetails tables from Activity 2. In the Orders table, amend the column Customer so that it is CustomerID and is an integer.

Add a table called Customers that has a field called CustomerID that is the primary key.

Add a foreign key constraint so that Orders CustomerID is linked to the new Customers CustomerID Primary key

Add a new column to the OrderDetails table that is the UnitPrice. This should be a suitable data type for a monetary value.

Activity 6

Moving deployment to remote server. In this exercise you will create a set of sql scripts that will transfer your data structure to your remote database. Please note that only the structure of the tables can go across, the data does not.

The remote database should be considered as your production database. In this exercise we will create tables but you must remove them after you have finished the exercise.

The first step is to export your chosen database. Right click the table you wish to export and select Script as Create. Do File -> Save As and save the resulting sql file somewhere you can find it again.

Set up your connection in Azure Data Studio by adding a New Connection.
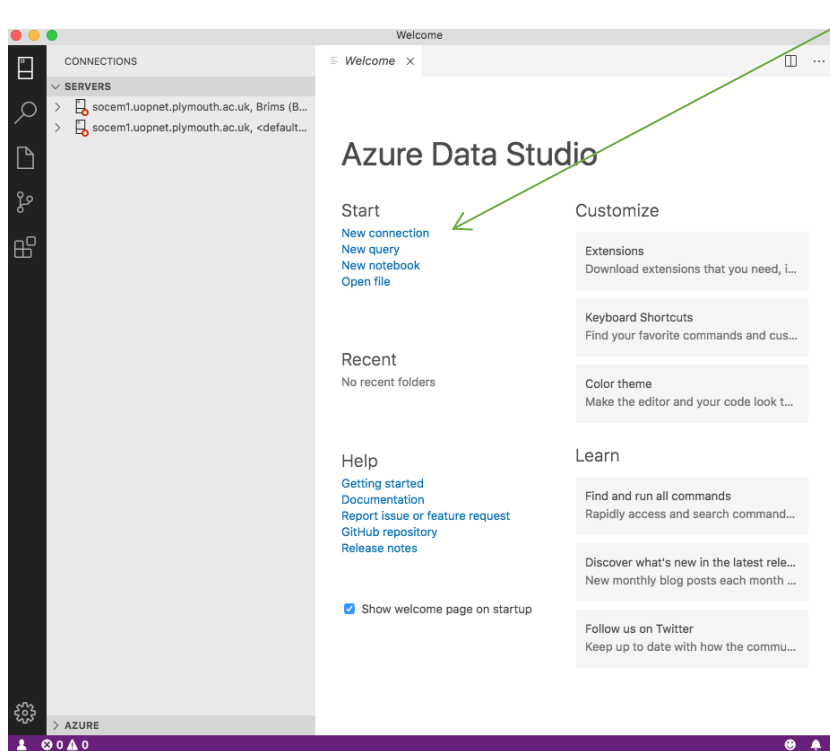
Complete the boxes in the following screen as right:

Server = **dist-6-505.uopnet.plymouth.ac.uk**

Username = Your username – see email

Password = Your password – see email

Database = Enter your database name as per email – *do not use the*

drop down box as it will only show "master" and "tempdb" you do

NOT want either of those.

In the server pane, expand the Databases folder. You will have full access to the database labelled COMP2001_yourname. Please do not try and run any scripts elsewhere as you will not have permissions.

Create a new Query, change the connection to your COMP2001 database and run the query. You should now see your database connected here.

It is recommended that you practice your coding using the docker image and once you are happy with the results transfer the structure of your data tables to the remote server. Prior to the submission of your coursework you must clear down any tables not related to the coursework. You will lose marks if you do not keep your production database in a clean and tidy state.