

Oracle Familiarisation Session

Introduction / Aim

The aim of this exercise is to familiarise yourself with the Aqua Data Studio and its modules, particularly with respect to creating tables and entering data. Throughout this exercise you will be referred to relevant sections in the Oracle Minimal Manual (e.g. MM1.1- 1.2)

Setup

Go to the course Web Site and copy the Oracle Bank folder from the course web site into your ISD folder. The Bank folder contains initialisation files for use with the Bank database.

Read 'Oracle in the IT Lab' (MM1.1 – 1.2).

Look in the appendix for schema, ER diagram and listings of the files used in this exercise. Study the ER diagram and the schema now.

Tasks

1 Log into Aqua Data Studio and Change your Password

This requires the following steps:

- Read the introduction to the Aqua Data Studio (MM2.1)
- Open Aqua Data Studio and log on to the IT Database (MM2.2)
- Alter your **password to one that you can remember** (MM2.3)
- Leave Aqua Data Studio open, you'll need it later.

2 Create the Tables

In the printed Appendix, look at the listing CreateAllTables.sql and the Schema and notice the following:

- The 'Drop' commands remove the tables from the database. They are there to re-initialise the schema if you need to rebuild the database from scratch. During the first execution, however, they will cause error messages since you are trying to destroy tables that do not exist yet.
- For each table, columns are defined and any constraints declared.
- Notice the ALTER command at the end of the CREATE commands, which adds the foreign key constraint for branch manager in the *Branch* table. This cannot be specified until the *Employee* table exists. But we can't simply create the *Employee* table before the *Branch* table, because we also need to specify the foreign key constraint for branch number in the *Employee* table.

Use the **Query Analyser** to run this command file (script).

- Read about it (MM2.4)
- Open the Query Analyser and run the command file *CreateAllTables.sql* using the method from (MM2.4.1). When you run this file for the first time, you will get errors from the Drop commands. This is OK, since you have not yet created any files to be dropped. However, those DROP commands will be vital if you edit the *CreateAllTables* file in order to change the schema.

3 Examine the Tables in the Schema Browser

The easiest way to look at the tables that have been created is to use the Schema Browser, which is part of Aqua Data Studio. Follow instructions (MM2.5.1).

4 Enter Branch Data and Employee Data using SQL Insert

There are several ways of entering data into a table - see step 6 for another. This step uses the **SQL Insert** statement executed through the Query Analyser:

- In the printed appendix, look at the files EmployeeData.sql and BranchData.sql. Read the comments. Notice that the bank branch number is assigned from an automatically generated sequence.
- In Aqua Data Studio, choose File: Open Script and navigate to BranchData.sql in your Bank folder.
- Repeat for EmployeeData.sql

5 View the Data in the Tables

There are two ways of viewing the data in your tables. Use each to see the data that you have just inserted.

- Use the **Table Editor** in the Schema Browser (MM2.5.3).
- Use an **SQL Select** command in the Query Analyser. The command

```
SELECT * FROM tablename  
go
```

displays all the data in the specified table (MM2.4.2).

6 Enter Account, Customer and Owner Data using the SQL Loader

This step demonstrates the import of data from a file. The three tables have control files containing their data. Import consists of the following steps:

- Read about the import of data (MM2.7)
- Import the *Customer* control file into the table customer. Use the Next button to go to the options tab, then set the Destination 'Import into Database'.
- Check the contents of this table by
 - either using the Table Editor
 - or typing `Select * from tablename` in the Query Analyser.
- Import the *Account* control file. This contains one deliberate error! One of the branches in the Account data is branch number 1. Besides, the date is in a wrong format. Correct the data and import.

- o Look at the contents of this table as discussed before.
- o Finally import the *Owner* control file. Again, view the contents of the table. What do you think would have happened if you had imported the Owner data before any of the other tables?
- o Your database should now be fully populated with data.

7 Try out a few simple SQL Commands

SQL commands can be on more than one line, the line breaks can be chosen for clarity. Enter these examples, one by one, in the upper input pane of the Query Analyser. Don't forget the go command.

```
SELECT *
FROM Branch
WHERE branchNo = 3
go
```

```
SELECT * FROM Branch
WHERE branchNo < 5
go
```

```
SELECT * FROM Branch WHERE branchNo = 1
go
```

8 Test SQL Error Handling

If you make an error, you will get a helpful (?) message highlighting the problem. Try the following:

```
SELECT * FROM Branch WHERE branch = 3
go
```

```
SELECT * FROM Branches
go
```

Note - the error is that there is no field called *branch* in the first and there is not table called *Branches* in the second.

9 Create and Save a Command File to Store a Query

Usually you will want to keep SQL command(s) for future reference so that you can re-run queries or updates. Learn how to do this for the following command (MM2.4.3).

This is an example of extracting data from more than one table. Introduce a few errors into your typing to get the experience of correcting and rerunning the command.

```
SELECT forename, surname, balance
FROM Customer, Owner, Account
WHERE id = custID
      AND accno = accountno
      AND balance < 0
ORDER BY balance
go
```

10 Command History

Explore the Command history (MM2.4.5).

11 More SQL

Using the examples of the SQL commands that you have seen so far, try the following questions, creating a script (text file) for each command, running it, correcting errors, and saving output.

- o Find customer ids for any customers with occupation 'Student'. (Single quotes necessary for text, case is important)
- o Find the names of employees who work at branch 6.
- o Find the staff number for David Lee.
- o Find the occupation for the customer with an Id of 187.
- o Find the address of branch 3.
- o Find the account number and branch of all current accounts, listed in order of account number.
- o Find the name of any employee who works at branch 4 with a staff number > 256.

12 Create More Tables (Optional but recommended)

Using the techniques learnt in this lab using the text files supplied as templates, and using the CREATE TABLE command:

- Create a table for Business Customers containing the fields shown below, then enter a few customers using the SQLLoader.
 - BCustId *primary key*
 - BCustName
 - BCustType
- Create a table for Business Owners and enter some data (Accounts then Owners) using the Table Editor.
 - BCust } *composite primary key*
 - BAccNo }

BCust will be a foreign key referring to the customer id number in the Business Customer table.
BAccNo will be a foreign key referring to the account number in the Account table.
- Create a table for Transactions and enter a few transactions using the SQL INSERT Command. Transaction numbers for each date are used instead of Time, because it is awkward using Time in Oracle.
 - The fields will be:
 - TrAccount } *composite primary key*
 - TrDate }
 - TrNumber } e.g. 1,2,3 for each date
 - TrType (e.g. Cheque, direct debit, cash withdrawal,...)
 - TrSum : Sum deposited or withdrawn

TrAccount will be a foreign key referring to the account number in the Account table.