University of Glasgow
Dip / MSc Information Technology
Information Systems and Databases

Exercise **ISD5** *Started* **Week 7** *Due*

More on Oracle

Introduction / Aim

This exercise involves extending the database you worked on last week. Currently it has details about bank accounts and their owners, braches and employees. There are two parts to this lab. The first task is to extend the schema in order to hold information about transactions. The second is to execute the queries in SQL listed below. You could do question 4 before 1-3 if you like.

Tasks

Task A

1. A transaction is the payment of a sum of money from an account. How will we add this to the database? One answer is to create a table linked to the account. Create this table either as a strong entity table with a system-wide unique transaction number to act as a primary key, or as a weak entity type with this time the transaction number only being unique within the transaction – i.e. each account has a first transaction, a second one, etc. The transaction should also have the sum, the date, the payee (i.e. who or what the money is paid to) and which customer authorised the transaction.
2. Enter a little data into the table.
3. Consider the following questions and give a general account of what the database system must allow us to do to answer them.
   a) Entering a transaction into the table doesn't actually do anything. What we need to do to keep the database consistent?
   b) How can we work out how much has been withdrawn from the account?
   c) How could we check that the person authorising the cheque was an owner of the account?
   d) How could we make the database cope with both ends of a transaction – i.e. having the money withdrawn from one account?
   e) If this was a database for one bank how could we deal with transactions involving other banks?

Task B

Note (for questions from (f) onwards) – if table A has a foreign key, FK, to the primary key of table B, PK, and you want the value of column X in table B for records which match records in table A where column Y = 1, you do:

```
SELECT X     FROM A, B    WHERE Y=1  AND  FK=PK
```

4. Retrieve the following information from the original database.
   a) The set of branch numbers.
   b) The set of customer names.
   c) The address of branch 3.
   d) The name of customer 198.
   e) The names of the employees of branch 3.
   f) The name(s) of the owners of account 23520.
   g) The address of the branch that Rosemary Hodge works in.
   h) The balance(s) of the account(s) owned by Brian Carmichael.
5. Retrieve the following information using the new Transaction table.
   i) The sums withdrawn from account 23501 – note you should enter some transactions withdrawing money from this account.
   j) The names of anyone who authorised a transaction in account 23503.
   k) List the sums withdrawn from accounts in branch 4.