A-level Computing

COMP 3: Querying a database using SQL

Querying a database using SQL (Section 3.3.5 of specification)

This document provides guidance on the SQL statements that candidates will be expected to be able to use in the COMP3 examination.

Candidates will be expected to be able to use the following SQL commands to retrieve data from multiple tables:

```
SELECT <fieldnames>
FROM <tables>
WHERE <conditions>
ORDER BY <fieldnames>
```

Where a query retrieves data from more than one table, candidates may use either the INNERJOIN command in the FROM clause of the statement or a test for equality in the WHERE clause of the statement to ensure that the tables have identical values in common fields.

Candidates should know how to sort data in both ascending and descending order (ASC/DESC).

It is likely that questions will ask candidates to retrieve data from specific fields, so responses using the wildcard * in the SELECT clause are unlikely to gain full credit.

Candidates must be able to use the AND and OR operators together with standard comparisons such as =, >= etc. when specifying conditions in the WHERE clause.

Examples:

```
SELECT MemberName, NumberOfLates, DateTimeTaken, NoOfMinutesLoaned,
StartParkName, FinishParkName, Charge, LateReturn
FROM Member INNERJOIN Loan ON Member.MemberID=Loan.MemberID
WHERE MemberID = 'AX7340'
ORDER BY DateTimeTaken DESC

SELECT FoodItemName, Quantity, PackSize, Price
FROM FoodItem, RecipeIngredient, Recipe
WHERE Recipe.RecipeId = RecipeIngredient.RecipeId
AND RecipeIngredient.FoodItemId = FoodItem.FoodItemId
AND Dish = 'Feta Salad'
ORDER BY FoodItemName ASC
```

Inserting, Updating and Deleting Data

Candidates will be expected to be able to use the SQL commands `INSERT INTO`, `UPDATE` and `DELETE FROM` to insert data into tables, update data in tables and delete data from tables.

```
INSERT INTO <tablename>
VALUES ( <listofvalues> )

UPDATE <tablename>
SET <newvalues>
WHERE <conditions>

DELETE FROM <tablename>
WHERE <conditions>
```

Candidates will **not** be required to:

- use the `INSERT INTO` command to put values into only some fields in a table or into fields in a table in a different order to the order that the fields are defined in the table
- perform calculations when using `UPDATE`.

Examples:

INSERT INTO	INSERT INTO Cars VALUES ('MH09RCM', 'Ford', 'Mondeo', 1.8, '01/09/2008', 'Blue')
UPDATE	UPDATE Cars SET Colour = 'Red' WHERE RegNo = 'MH09RCM'
DELETE FROM	DELETE FROM Cars WHERE RegNo = 'MH09RCM'

Data Definition Language

Candidates will need to be able to specify the structure of a table using the `CREATE TABLE` command.

```
CREATE TABLE <tablename>
(
  <fieldname1> <type1>,
  <fieldname2> <type2>,
  ...
)
```

Candidates will only be expected to specify fieldnames and appropriate types, and to identify the primary key in a table. They will **not** be expected to add additional constraints such as specifying validation checks or enforcing referential integrity between tables.

Different database packages use different names for data types so, when responses to questions are marked, credit will be given to all reasonable types. Candidates will be expected to know appropriate data types for representing text, numbers (whole and real), dates and Boolean values.

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Candidates should know what the DROP and ALTER command do but will not be expected to write statements using them.

Example:

```
CREATE TABLE Cars
(
  REGNO          CHAR(7) PRIMARY KEY,
  MANUFACTURER   CHAR(16),
  ENGINESIZE     FLOAT,
  DATEREGISTERED DATE,
  COLOUR         CHAR(12)
)
```

General requirements

Candidates must know the appropriate symbols to use to enclose different data types:

- no symbols required for numbers
- quotation marks required for strings - double or single quotes are acceptable
- single or double quotes or hashes for dates.

Candidates should note that a semi-colon may be placed at the end of a complete SQL statement (but is not required in most implementations), but semicolons should **not** appear at the end of each clause in an SQL query. Candidates will lose marks for introducing incorrect punctuation into statements.

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