Solutions to Exercise Sheet 1

Exercise 1

s. i. SELECT lastname, firstname
    FROM staff
    WHERE office = 211;
    Result from database:
    | lastname | firstname |
    |----------|-----------|
    | Yao      | Xin       |

ii. SELECT office
    FROM staff
    WHERE title = 'Dr' AND firstname = 'Mark' AND lastname = 'Ryan';
    Result from database:
    | office |
    |--------|
    | 237    |

iii. SELECT lastname, firstname
     FROM staff
     WHERE office >= 100 AND office < 200;
     Result from database has 44 rows.

iv. SELECT lastname, firstname
    FROM staff
    WHERE title = 'Prof';
    Result from database:
    | lastname | firstname |
    |----------|-----------|
    | Barnden  | John      |
    | Jung     | Achim     |
    | Kwiatkowska | Marta  |
    | Reddy    | Uday      |
    | Sloman   | Aaron     |
    | Yao      | Xin       |
    | Claridge | Ela       |

Exercise 3

a. SELECT *
   FROM staff
   ORDER BY title, lastname DESC;

b. SELECT cid
   FROM courses
   WHERE (level=3 OR level=4) AND credits>10 AND NOT (semester=2 OR semester=3);
   (There are ten such courses.)

c. SELECT lastname
   FROM staff
   WHERE office IS NULL OR phone IS NULL;
   (There are nine such lecturers in the database.)
d. Single SELECT query

```sql
SELECT lastname
FROM staff
WHERE office IS NULL AND phone IS NOT NULL;
```

Multiple SELECT queries:

```sql
SELECT lastname
FROM staff
WHERE phone IS NOT NULL
EXCEPT
SELECT lastname
FROM staff
WHERE office IS NOT NULL
```

(There are four such lecturers in the database.)

e. SELECT DISTINCT bc
FROM allmarks03
(There were 72 courses with students taking exams.)

f. SELECT DISTINCT cid
FROM lecturing
WHERE year=2003
(There were 71 courses that were taught.)

To find the mismatches, we will need to write SELECT queries with *multiple tables*, so that we can combine the cid data from the `lecturing` table with bc data that can be found in the `courses` table. Writing such queries will be a topic for the next Exercise Sheet.

g. SELECT cid FROM lecturing
WHERE year=2001
EXCEPT
SELECT cid FROM lecturing
WHERE year=2000 OR year=1999;
(There are eight such courses.)

Note that a single SELECT query as below does not work:

```sql
SELECT cid FROM lecturing
WHERE year=2001 AND (NOT (year=2000 or year=1999))
```

The reason is that each record of the `lecturing` table talks about a particular year. So, if we find a record for 2001, there is no point in checking whether it is also not a record for 2000 or 1999. It won’t be. Instead, we must check whether there is a separate record for 2000 or 1999. So, we need multiple SELECT queries connected by EXCEPT.