

**Question 5.** [8 MARKS]

Suppose I have a file called `nonsense.ddl` containing this:

```
DROP SCHEMA IF EXISTS rp CASCADE;
CREATE SCHEMA rp;
SET SEARCH_PATH TO rp;

CREATE TABLE Things (
    A INT PRIMARY KEY,
    B INT,
    C INT UNIQUE
);

CREATE TABLE Junk (
    G INT PRIMARY KEY,
    H INT,
    I INT,
    FOREIGN KEY (I) REFERENCES Things(A) ON UPDATE CASCADE ON DELETE CASCADE
);

CREATE TABLE Stuff (
    D INT,
    E INT,
    F INT PRIMARY KEY,
    FOREIGN KEY (E) REFERENCES Things(C) ON UPDATE RESTRICT ON DELETE SET NULL,
    FOREIGN KEY (E) REFERENCES Junk(G) ON UPDATE SET NULL ON DELETE CASCADE
);
```

**Part (a)** [2 MARKS]

Suppose I imported this file into postgresQL using the command `\i nonsense.ddl` and then a few weeks later the following happened when I tried to access table `Junk`.

```
dbsrv1% psql csc343h-dianeh
psql (9.1.15, server 9.1.14)
Type "help" for help.
```

```
csc343h-dianeh=> SELECT * FROM Junk;
ERROR:  relation "junk" does not exist
LINE 1: SELECT * FROM Junk;
          ^
```

Modify my interaction above so that the `SELECT` statement works.

**Solutions:**

The table Junk is still defined, but we haven't referred to it successfully. We can either give a fully qualified name for it:

```
csc343h-dianeh=> select * from rp.Junk;
 g | h | i
---+---+---
 3 | 2 | 9
 6 | 2 | 8
 8 | 5 | 9
 4 | 1 | 1
(4 rows)
```

or we can set the search path so that we don't have to:

```
csc343h-dianeh=> set search_path to rp;
SET
csc343h-dianeh=> select * from Junk;
 g | h | i
---+---+---
 3 | 2 | 9
 6 | 2 | 8
 8 | 5 | 9
 4 | 1 | 1
(4 rows)
```

**Part (b)** [2 MARKS]

What is the most important thing that is the same about PRIMARY KEY and UNIQUE?

**Solutions:**

For both, there can be no duplicates. That is, whether a set of attributes  $a_1, a_2, \dots, a_n$  is PRIMARY KEY or UNIQUE, there can be no two tuples with the same value for  $a_1$ , and the same value for  $a_2$  and ... and the same value for  $a_n$ .

What is one important difference between PRIMARY KEY and UNIQUE?

**Solutions:**

A table can declare any number of sets of attributes UNIQUE, but it can only have one PRIMARY KEY. Another difference is that the DBMS will / is highly likely to make an index on a PRIMARY KEY, but may not choose to do so for a set of attributes that is merely declared to be UNIQUE.

**Part (c)** [2 MARKS]

Suppose the tables have been populated as shown below. Modify the data to show the contents of the three tables after this command is executed:

```
UPDATE Things SET C = 20 WHERE A = 8;
```

Things:	Stuff:	Junk:
a   b   c	d   e   f	g   h   i
---+---+---	---+---+---	---+---+---
3   2   3	3   4   1	9   0   3
4   2   5	1   6   3	3   2   9
8   2   6	2   9   5	6   2   8
1   5   4	2   3   4	8   5   9
9   8   7		4   1   1
2   2   9		

**Solutions:**

There is no change to the tables, because the update is rejected:

```
csc343h-dianeh=> UPDATE Things SET C = 20 WHERE A = 8;
```

```
ERROR: update or delete on table "things" violates foreign key constraint "stuff_e_fkey"
on table "stuff"
```

```
DETAIL: Key (c)=(6) is still referenced from table "stuff".
```

**Part (d)** [2 MARKS]

Suppose we began with the same original tables, shown below, but ran a different command. Modify the data to show the contents of the three tables after this command is executed:

```
DELETE FROM Things WHERE C = 3;
```

Things:	Stuff:	Junk:
a   b   c	d   e   f	g   h   i
---+---+---	---+---+---	---+---+---
3   2   3	3   4   1	9   0   3
4   2   5	1   6   3	3   2   9
8   2   6	2   9   5	6   2   8
1   5   4	2   3   4	8   5   9
9   8   7		4   1   1
2   2   9		

**Solutions:**

```
csc343h-dianeh=> DELETE FROM Things WHERE C = 3;
DELETE 1
```

```
csc343h-dianeh=> select * from Things;
```

```
a | b | c
---+---+---
4 | 2 | 5
8 | 2 | 6
1 | 5 | 4
9 | 8 | 7
2 | 2 | 9
(5 rows)
```

```
csc343h-dianeh=> select * from Stuff;
```

```
d | e | f
---+---+---
3 | 4 | 1
1 | 6 | 3
2 |   | 4
(3 rows)
```

```
csc343h-dianeh=> select * from Junk;
```

```
g | h | i
---+---+---
3 | 2 | 9
6 | 2 | 8
8 | 5 | 9
4 | 1 | 1
(4 rows)
```