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.

Page 11 of 29 CONT'D...

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:

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 $a_1, a_2, \ldots a_n$ 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 \ldots 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.

Page 12 of 29 Cont'd...

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	$g \mid h \mid i$
+	+	+
3 2 3	3 4 1	9 0 3
4 2 5	1 <mark>6</mark> 3	3 2 9
8 2 <mark>6</mark> 20	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:

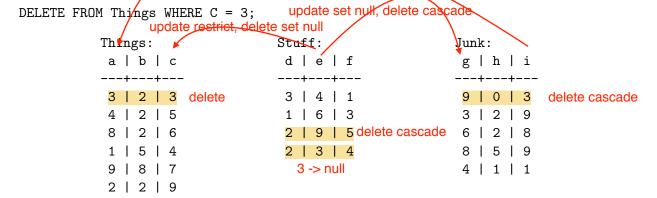
DETAIL: Key (c)=(6) is still referenced from table "stuff".

Page 13 of 29 CONT'D...

update cascade, delete cascade

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:



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 \mid e \mid 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)
```

Page 14 of 29 CONT'D...