

# Applied Databases

## Topic 6 Exercise Sheet

1. Get bus.sql from Moodle and import it into MySQL.

2. How are the tables in the database related?

The *busReg* column in *driver* is a Foreign Key referencing the *reg* column in *bus*.

3. Add the following drivers:

"Mary"

"Bob" – licence number "RN2423"

"Sean" – licence number "FF88345" who drives bus "191-G-123"

What happens and why?

Can't insert "Mary" as she doesn't have a licence.

```
INSERT INTO driver (licenceNo, name) values ("RN2423", "Bob");
```

```
INSERT INTO driver values ("FF88345", "Sean", "191-G-123");
```

4. Add the following buses:

"12-G-1323" that can hold up to 34 passengers and runs on "Diesel"

"171-G-885" that can hold up to 84 passengers and runs on "Petrol"

"191-D-45890" that can hold up to 120 passengers and runs on "Ethanol"

What happens and why?

Can't insert "12-G-1323" as reg is primary key and bus of that reg already exists.

```
INSERT INTO bus values ("171-G-885", 84, "Petrol");
```

Can't insert "191-D-45890" as fuel is an enum, and "Ethanol" is not one of the allowed values.

5. Update driver's licences that contain the letters "F" or "R" to have the letters "T-" before their current licence number.

```
update driver
```

```
set licenceNo = CONCAT("T-",licenceNo)
```

```
where licenceNo like "%F%"
```

```
or licenceNo like "%R%";
```

6. Delete driver "Alan". What happens and why?

```
delete from driver
```

```
where name = "Alan";
```

The driver is deleted because even though he is referencing foreign key, no other column from any other table is referencing anything in his row.

7. Delete bus "161-d-1323". What happens and why?

```
delete from bus where reg = "161-d-1323";
```

Bus reg "161-D-1323" is deleted from the bus table.

Driver "Tom" whose *busReg* attribute referenced bus "161-D-1323" is also deleted, this is because when defining the Foreign Key on the *busReg* attribute, it was defined as ON DELETE CASCADE, so anything in this table referencing an the value of an attribute to be deleted in the *bus* table would also be deleted.

8. Get bus2.sql from Moodle and import it into MySQL. To use this database type `use bus2;`

9. Delete bus "161-d-1323". What happens and why?

```
delete from bus where reg = "161-d-1323";
```

Bus reg "161-D-1323" is deleted from the bus table.

Driver "Tom" whose *busReg* attribute referenced bus "161-D-1323" is NOT deleted, but his *busReg* attribute which was referencing bus "161-D-1323" now says NULL instead.

This is because the Foreign Key on this table is set to ON DELETE CASCADE, meaning any attempt to delete a referenced foreign key will set the value to NULL in this table.

10. Get employees2.sql from Moodle and import it into MySQL. To use this database type `use employees2;`

11. Show the *emp\_no*, *first\_name* and *last\_name* of employees born in the *average* year.

The average year should be rounded down to the nearest whole number. For example,

- 1949.1 becomes 1949.
- 1949.9 becomes 1949.
- 1949.0 becomes 1949.

```
select emp_no, first_name, last_name from employees
where year(birth_date) = (
    select floor(avg(year(birth_date))) from employees
);
```

12. Show the *emp\_no*, *first\_name*, *last\_name* and name of the department each employee is in.

```
select distinct e.emp_no, e.first_name, e.last_name, d.name
from employees e
inner join salaries s
    on e.emp_no = s.emp_no
inner join dept d
    on s.dept_no = d.dept_no;
```