

# CS2102 Database Systems

Semester 1 2019/2020

Midterm

## 4 Questions

### Question 1. Preliminary [1 marks]

Find all customers of PetER with a `uname` that starts with 'A' and consists of at least 5 characters. Answer the question by creating SQL view with the schema shown below:

```
CREATE VIEW qn1 (uname) AS ;
```

where `uname` is the `uname` of the customer.

### Question 2. [1 marks]

Find all pet of `atype` 'A' or 'B' that have a `diet` type 'D1'. Answer the question by creating SQL view with the schema shown below:

```
CREATE VIEW qn2 (uname, name) AS ;
```

where `uname` is the `uname` of the pet owner and `name` is the `name` of the pet.

### Question 3. [2 marks]

Find all customers that are not simultaneously both a pet owner and a care taker. Answer the question by creating SQL view with the schema shown below:

```
CREATE VIEW qn3 (uname) AS ;
```

where `uname` is the `uname` of the customer.

### Question 4. [2 marks]

Find all pet owner who has won at least one bid for an availability of the care taker but has not given any `rating` for that bid. Answer the question by creating SQL view with the schema shown below:

```
CREATE VIEW qn4 (uname) AS ;
```

where `uname` is the `uname` of the pet owner.

### Question 5. [2 marks]

Find all pairs of pet owners (P1, P2) that both have at least own one pet of the same `atype` and  $P1.name < P2.name$ . Exclude any pet owner that do not own any pet. Answer the question by creating SQL view with the schema shown below:

```
CREATE VIEW qn5 (p1uname, p2uname) AS ;
```

where `p1uname` is the `uname` of P1 and `p2uname` is the `uname` of P2.

### Question 6. [2 marks]

For each worker W, find the number of distinct workers besides W that work in at least one same office as W. In other words, if W is the only worker working in an office O, then the number should be 0. Answer the question by creating SQL view with the schema shown below:

```
CREATE VIEW qn6 (uname, num) AS ;
```

where `uname` is the `uname` of W and `num` is the number of workers besides W that work in the same office as W.

## Relational Algebra

### Question 7. [2 marks]

We say that a pet owner is *obsessed* with a care taker if the pet owner has bid for all the availability of the care taker. For each pet owner, find all the care taker the pet owner is obsessed with. Exclude pet owner without any associated care taker. Answer your question by creating SQL view with the schema shown below:

```
CREATE VIEW qn7 (pouname, ctuname) AS ;
```

where pouname is the uname of the pet owner and ctuname is the uname of the care taker.

### Question 8. [3 marks]

We say that a worker W is a *director* if the worker satisfies all of the following:

- W manages an office
- The office that W managed, has at least 3 workers that are also managers
- W does not work in any office that is managed by other workers besides W

Find all the director of PetER. Answer the question by creating SQL view with the schema shown below:

```
CREATE VIEW qn8 (uname, area) AS ;
```

where uname is the uname of the director and area is the area of the office the director manages.