Exam 1

```
ANIMAL(id,species,gender,birthyear,habitat)
HABITAT(id,type)
REGION(number,description)
DISTRIBUTION(habitat,region,area)
OBSERVATION(id,animal,habitat,region,date,time,notes)
```

ANIMAL.habitat is that animal's preferred habitat. REGION.number is a number 1-9. DISTRIBUTION.area is
the total area (in acres) of that habitat in that region. DISTRIBUTION.area is non-zero – if there is no habitat
of some type in a particular region, there will not be an entry in DISTRIBUTION for that habitat and region.
OBSERVATION.date is in the form yyyy-mm-dd. OBSERVATION.time is in the form hh:mm.

Key attributes are underlined. Default values are NULL for all other attributes.

Foreign keys:

- ANIMAL.habitat → HABITAT.id
- DISTRIBUTION.habitat → HABITAT.id
- DISTRIBUTION.region → REGION.number   ~~REGION.id~~   ⇐
- OBSERVATION.animal → ANIMAL.id
- OBSERVATION.habitat → HABITAT.id
- OBSERVATION.region → REGION.number

• if you did something like

```
FROM HABITAT H JOIN DISTRIBUTION D ON H.id=D.habitat
                    JOIN REGION R ON D.region=R.id

WHERE R.number <= 5
```

it was noted as an unnecessary JOIN and an invalid column (`R.id`) but no points were taken off

---

Exam 1

• GROUP BY HABITAT.type
  – to group by distinct entities, group by the primary key
  – HABITAT's primary key is `id`

```
ANIMAL(id,species,gender,birthyear,habitat)
HABITAT(id,type)
REGION(number,description)
DISTRIBUTION(habitat,region,area)
OBSERVATION(id,animal,habitat,region,date,time,notes)
```