

Exercise 1

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1 Entity Relationship Model

You are requested to design a database for an animal shelter association. An animal shelter is a place which keeps animals and where people work. For each animal shelter belonging to this association, its location is stored. All people visiting one of the association's animal shelter for the first time, have to be registered into the database and therefore their `person_no`, name, email, address and telephone number must be stored in it. Some of the registered people work in one or more animal shelters and hence, the schedule they follow must be stored. Also, you are asked to model the supervision relationship between people.

Lastly, you are requested to keep track of animals that are or have been in the animal shelter. Every animal has its `animal_no` and details, you are demanded to store the latter using a relationship called 'have' and knowing that there cannot exist details without an animal. The details that the association wants to keep track of are the age, race and sex. The association only takes care of dogs and cats, of the former the association also wants to know whether they are considered a dangerous race or not. When people adopt an animal, the date at which this happened should be stored. Assume once an animal is adopted, it will not be abandoned again.

1. Draw an ER diagram for the given database description. Make sure to include the **keys** and **multiplicities**. Group all the people that work and visit the animal shelter association under the entity *person*.
2. For each relationship type in the resulting ER diagram explain your choice of the multiplicity. Select sentences from the description to defend your choice if necessary and state all the assumptions you made.

2 Understanding ER Models

Consider the following ER model about vehicles and their owners.

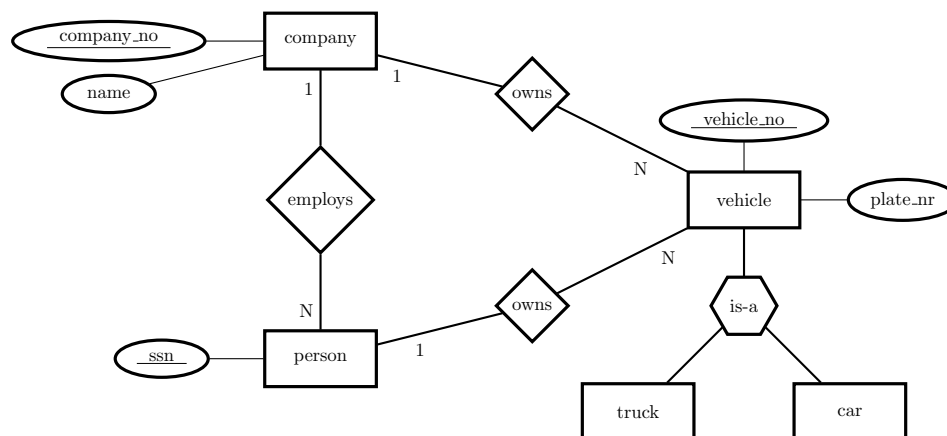


Figure 1: ER Model for a company

Tasks:

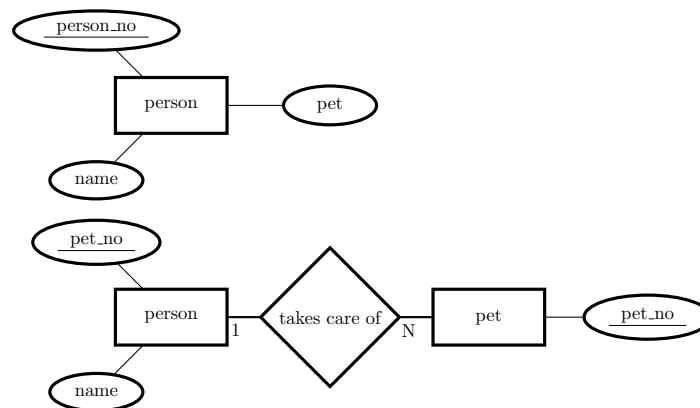
1. For each of the following statements decide whether they are true or false. Justify your answer.

- A company can be uniquely determined by its *company_no* and hence, *company_no* is a key of the entity *company*.
- Vehicle is an Entity with 2 attributes.
- A vehicle with a given *vehicle_no* can have two different *plate_nr*.
- A person can be working at two companies.
- A vehicle can be of type truck or type car.

2. Give an answer to the following problems

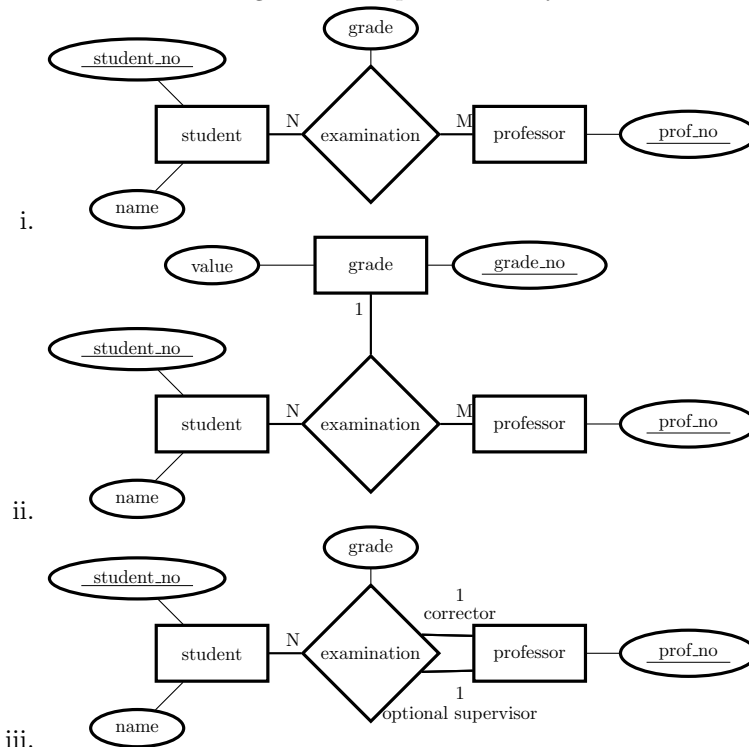
(a) Entities vs. Relationships

Which is the difference between the following models? State their pros and cons.



(b) Binary vs Ternary Relationships and Connection Traps

- Which of the following relationships are ternary and which binary?



- Is there a Connection Trap in the Figure 1?