

# Assignment 1 of CSCI 3170

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Deadline: October 11, 2020, 23:5

In this assignment, you will have 3 problems related to ER-Model. You will have 2 weeks to finish this assignment. Please submit your answer to blackboard before 11 October 2020, 23:59.

## 1 Problem 1 (10 marks)

Construct appropriate relational schemes for each of the E-R diagrams below. (5 marks each)

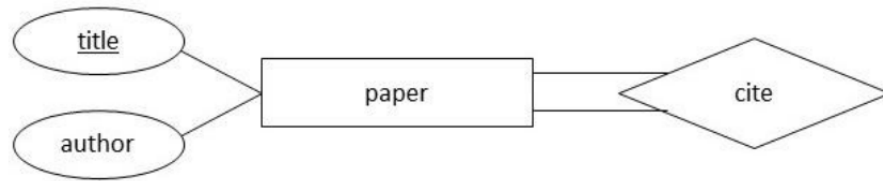


Figure 1: Paper citing

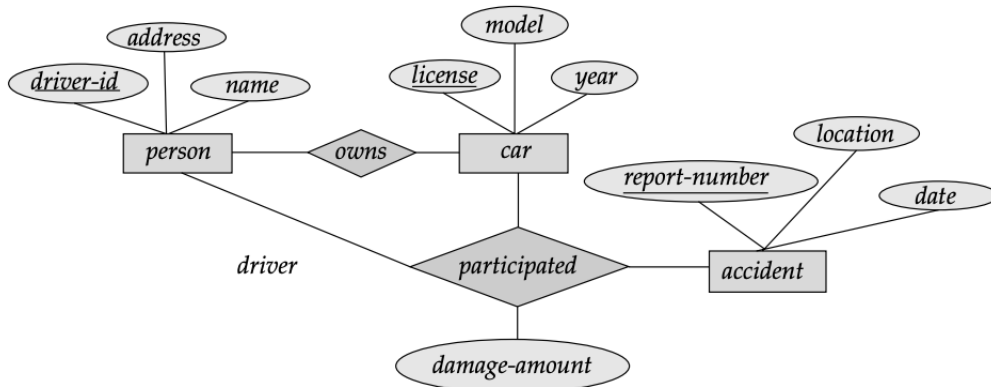


Figure 2: Car-insurance company

## 2 Problem 2 (10 marks)

Draw an ER-diagram for the following relational schemes. (Hint: bed and wardrobe are both furniture.)

Customer (customer\_id, name)

buy (customer\_id, product\_id)

Furniture (product\_id, stuff\_type, price)

Bed (product\_id, size)

Wardrobe (product\_id, height)

### 3 Problem 3 (25 marks)

Consider the following ER-diagram and assumptions for a university.

1. Every department has a unique dname.
2. Every department can be uniquely identified by its dhead and location.
3. Every advisor has a unique aid.
4. Every student has a unique sid.
5. Every project has a unique pid.
6. Every project can be uniquely identified by its pname and funding.
7. A advisor works in exactly one department.
8. A department has at least one advisor working in it.
9. A student can be assigned any number of projects.

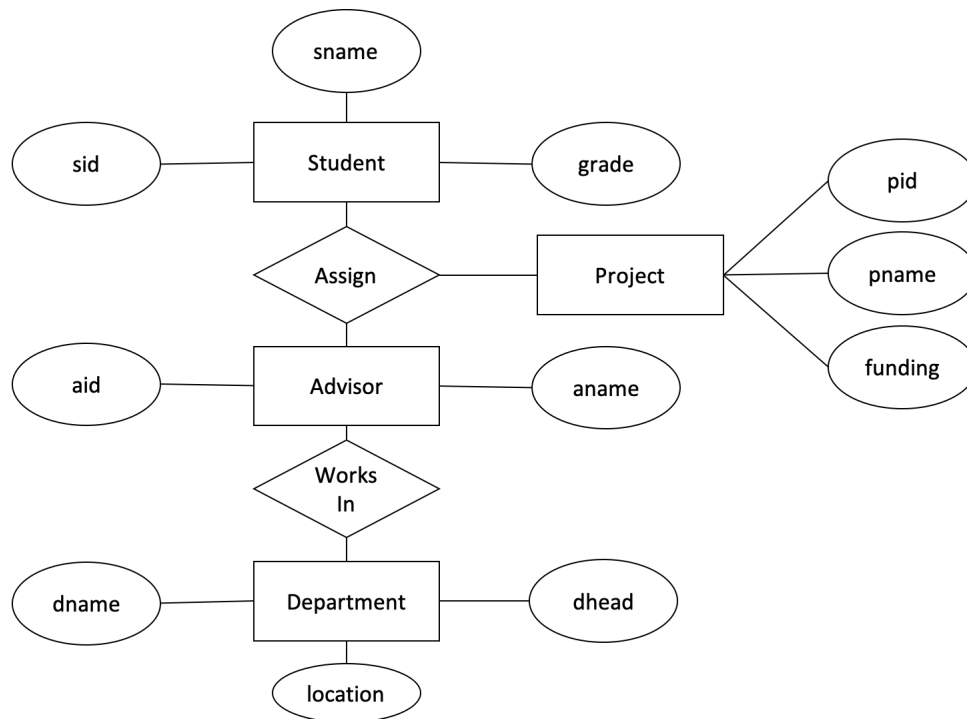


Figure 3: Problem3

- a) (5 marks) List all the superkey(s) of “Project”.
- b) (4 marks) List all the candidate key(s) of “Department”

- c) (6 marks) Assume that pid is a primary key, complete the ER-diagram by adding all missing constraints (weak entity, key constraints, participation constraints and relationship constraints).
- d) (10 marks) This ER model does not allow a advisor to assign one project to the same student twice. Please briefly state why this is happening and try to modify the diagram to make it work.