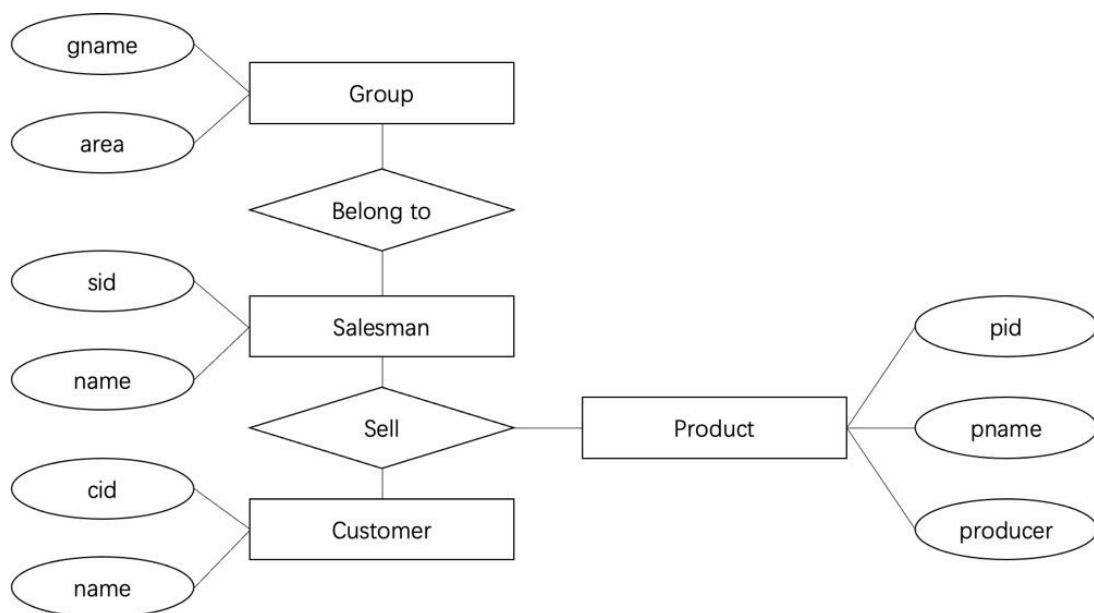


Assignment One (Fall 2021)

Please answer all the questions below and submit your solution in PDF format to the blackboard system before 19 Oct, 2021 23:59.

1. (25 marks) Consider the following ER-diagram and assumptions for a selling system.

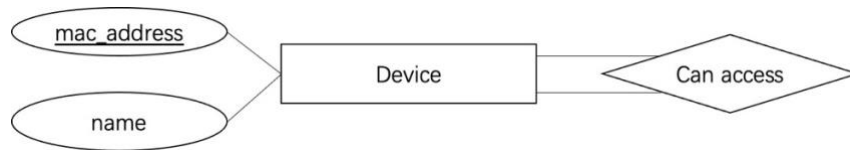


- Every group has a unique gname.
- Every salesman has a unique sid.
- Every customer has a unique cid.
- Every product has a unique pid.
- Every product can be uniquely identified by its pname and producer.
- A salesman belongs to exactly one group.
- A group contains at least one salesmen.
- A salesman can sell any number of products to a customer.

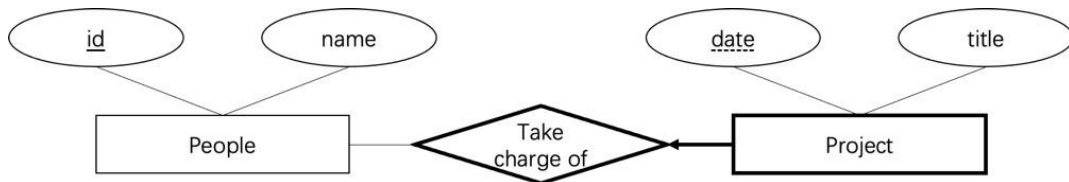
- (9 marks) List all the superkey(s) and candidate key(s) of "Product".
- (6 marks) Assume that pid is a primary key, complete the ER-diagram by adding all missing constraints (weak entity, key constraints, participation constraints and relationship constraints).
- (10 marks) Does this ER model allow a salesman to sell one product to the same customer twice? Please briefly explain your answer. Try to modify the diagram to satisfy the opposite condition.

2. (10 marks) Translate the following ER-diagrams into relational schemas.

a) (5 marks)



b) (5 marks)



3. (10 marks) Draw an ER-diagram for the following relational schemas.

Hint: desktops and laptops are both computers.

Customer (customer_id, name)

buy (customer_id, product_id)

Computer (product_id, storage, price)

Desktop (product_id, monitor_type)

Laptop (product_id, battery_capacity)