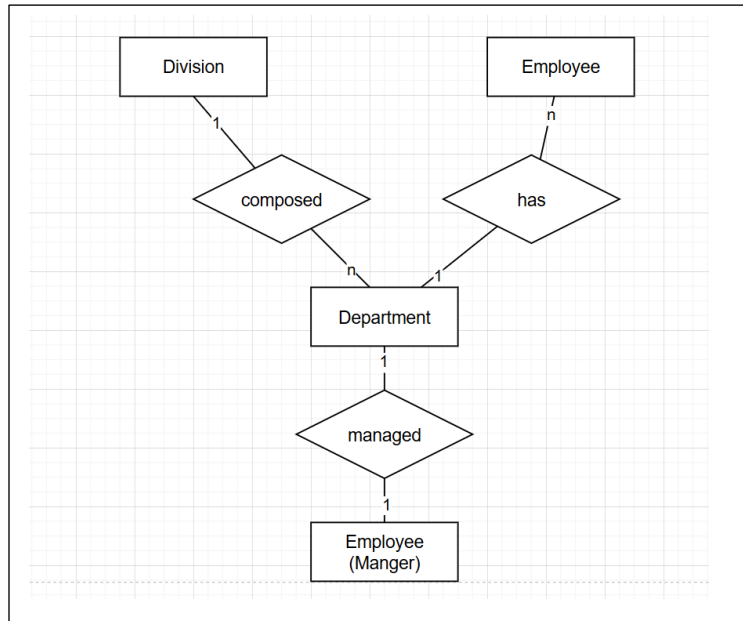


## DB W2 ASSIGNMENT

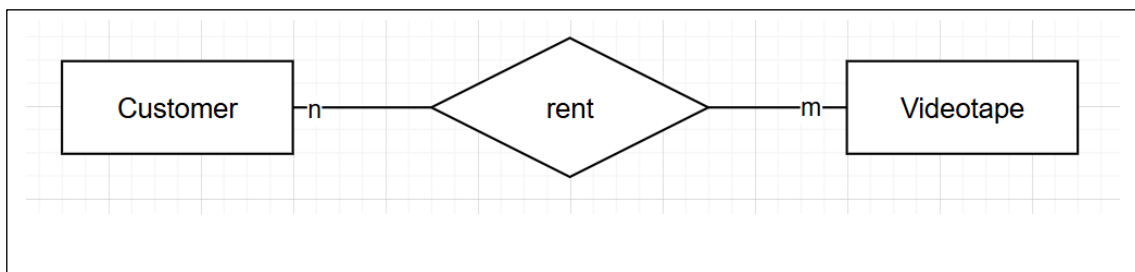
Name: Red Bora G2

### Exercise 1:

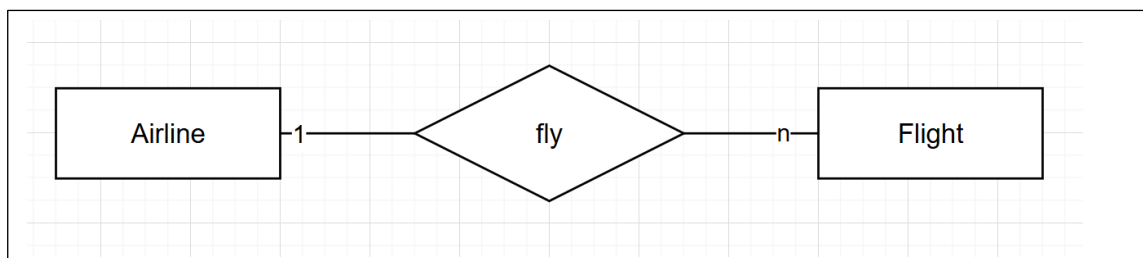
- A) Each of the MegaCo Corporation's divisions is composed of many departments. Each of the departments has many employees assigned to it. Each department is managed by one employee, and each of these managers can manage only one department at a time.



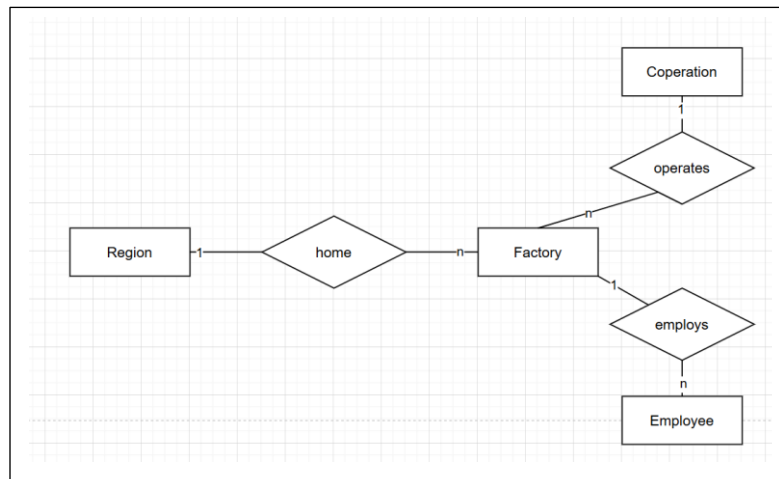
- B) During some period of time, a customer can rent many videotapes from the BigVidstore. Each of the BigVid's videotapes can be rented to many customers during that period of time



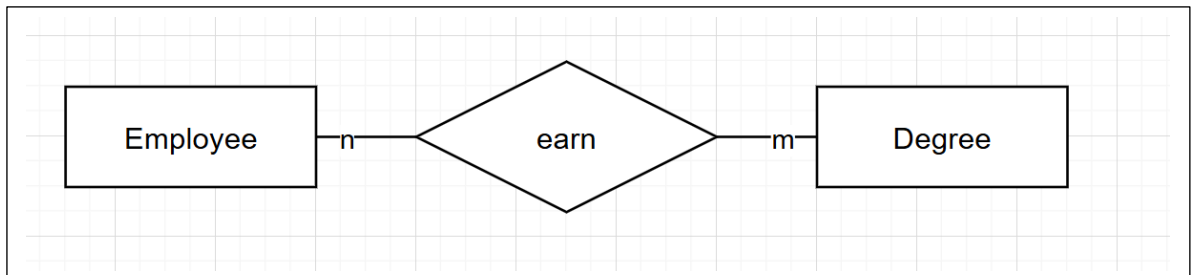
- C) An airline can be assigned to fly many flights, but each flight is flown by only one airline.



- D) The KwikTite Corporation operates many factories. Each factory is located in a region. Each region can be "home" to many of KwikTite's factories. Each factory employs many employees, but each of these employees is employed by only one factory



- E) An employee may have earned many degrees, and each degree may have been earned by many employees.



## Exercise 2:

Pick and Shovel Construction Company is a multi-state building contractor specializing in medium-priced townhomes. Assume that Pick and Shovel's main entities are its customers, employees, projects, and equipment. A customer can hire the company for more than one project, and employees sometimes work on more than one project at a time. Equipment, however, is assigned to only one project at a time.

## Question:

How many main entities are in Pick and Shovel Construction Company?

⇒ There are 4 main entities customers, employees, projects, and equipment.

What is the relationship (cardinality) between customer and project?

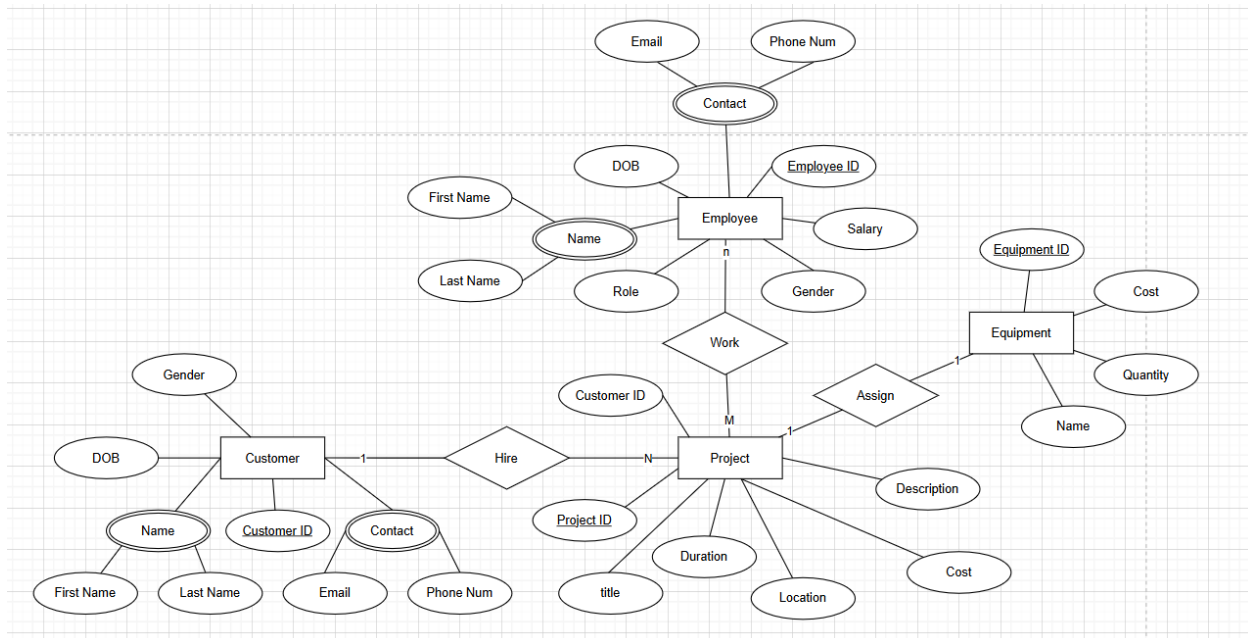
⇒ One to many.

What is the relationship (cardinality) between employee and project?

⇒ Many to many.

What is the relationship (cardinality) between equipment and project?

⇒ One to one.



### Optional Question & Answer

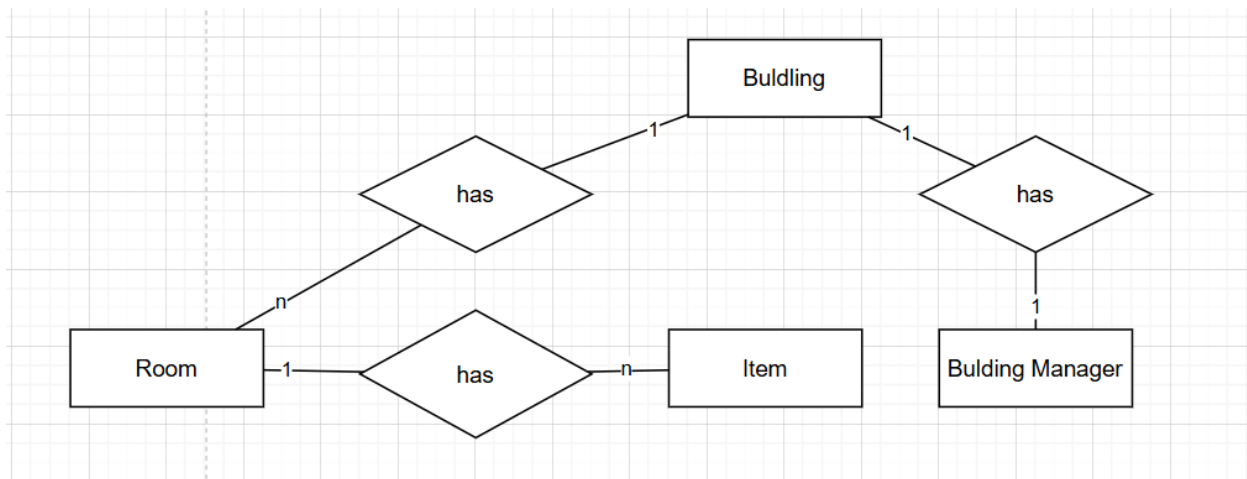
1. Can a project exist without a customer? Why or why not?  
=> No. A project is created because a customer hires the company. Without a customer, there is no reason for the project to exist.
2. Do employees need an associative (bridge) table to link them with projects?  
=> Yes, because employees can work on more than one project and projects can have many employees.
3. What attributes might belong to the Project entity?  
=> Project ID, Project title, description, cost, duration, location, customer ID.
4. If equipment can only be used by one project at a time, what happens when a project finishes?  
=> The equipment becomes available and can be reassigned to another project.
5. Which relationship would require a composite primary key in the database design?  
=> The employee and project relationship.

### Exercise 3:

To keep track of office furniture, computers, printers, and so on, the FOUNDIT company requires the creation of a simple database. Each piece of office furniture, computer, or printer is given an identification number. Each item is then placed in a room of one of three buildings. The building manager is responsible for the items in their building.

### Question and Answer:

1. How many main entities are involved?  
=> There are 4 main entities are involved: Building, item, Room and Building manager.
2. What is the relationship between building and room?  
=> one to many.
3. What is the relationship between Room and Item?  
=> one to many.
4. What is the relationship between the building and the building manager?  
=> one to one.

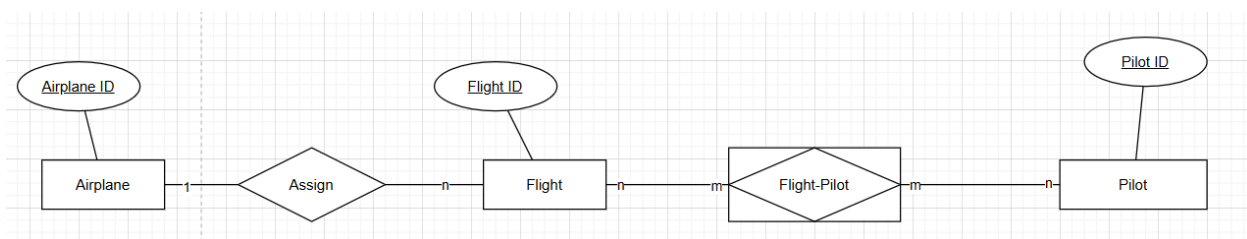


#### Exercise 4:

-An airplane (Tail-ID) is assigned to several flights (Flight-ID). A flight is assigned to only one airplane.  
 -A pilot (SocialSec-ID) can perform several flights. A flight is performed by several (normally at least two) pilots

#### Question and Answer:

1. How many main entities are involved?  
 => There are 3 main entities are involved: Airplane, flight and pilot.
2. What is the relationship between airplane and flight?  
 => one to many.
3. What is the relationship between pilot and flight?  
 => many to many.
4. Is an associative entity required?  
 => Yes, because Pilot-Flight is a many-to-many relationship.



#### Exercise 5:

A supplier (Supp-ID) processes many purchase orders (PO-ID) and sells a number of products (Prod-ID). A product is sold by only one supplier. Each of the purchase orders that a supplier may process includes several products. The relationship between order and product is defined as "Line Item". A customer (Cust-ID) may place one or more purchase orders. A purchase order may be placed by only one customer.

### Question and Answer:

1. What are the main entities?

=> Supplier, Product, Purchase order, Customer.

2. What is the relationship between Supplier and Product?

=> one to many.

3. What is the relationship between Supplier and Purchase Order?

=> one to many.

4. What is the relationship between Customer and Purchase Order?

=> one to many.

5. What is the relationship between Purchase Order and Product?

=> many to many.

6. How is the M:N relationship resolved?

=> The M:N relationship is resolved by creating an associative entity that linked together between Purchase Order and Product, called "Line Item". The Line Item will include foreign key from Purchase Order and Product, it will act as an associate entity between the 2 entities, it breaks the M:N relationship into 1:N relationship.

For example: One purchase order > many line items, one product > many line items.

