



# DATABASE DESIGN – ER MODEL EXAMPLE

---

CIS-673, LECTURE#12

BY RAJ PATIL



## 2 DESIGNING ER DIAGRAM - STEPS

---

Steps to follow while designing ER Model

1. Identifying entity sets
2. Primary key of entity sets, along with their attributes
3. Relationships between entity sets
  - a. Cardinality of entity sets in a relationship
  - b. Participation of entity sets in a relationship
  - c. Primary key of relationship sets
4. Identifying weak entity sets, and their primary keys

### 3 EXAMPLE - REQUIREMENTS

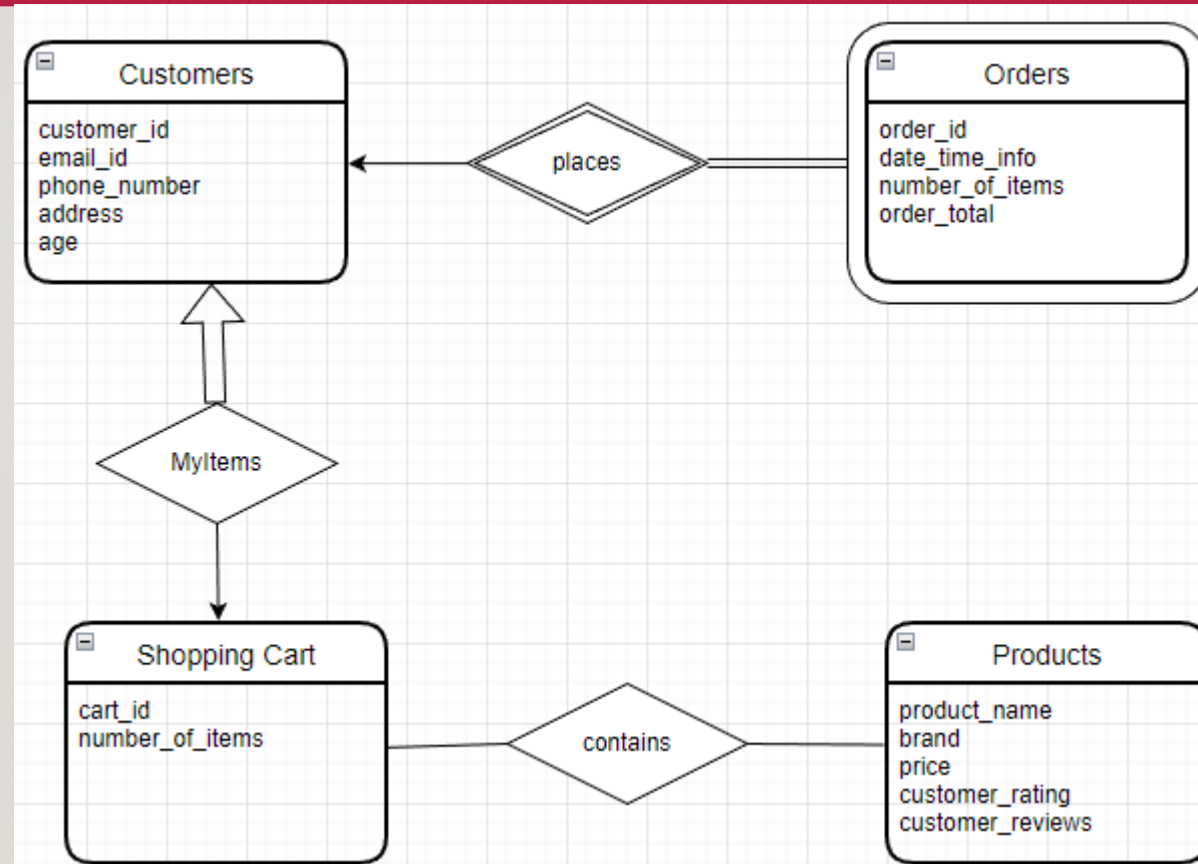
---

Requirements of an online store

- Customer can place zero or more orders, and an order has to belong to only one customer.
- Customers can use only one (electronic) shopping cart to add their items.
- A shopping cart consist of zero or many products, and the same product can be part of zero or many shopping carts.

## 4 ONLINE STORE EXAMPLE (DEFAULT NOTATION)

- <https://app.diagrams.net/>



## 5 MIN, MAX (LOW..HIGH) NOTATION

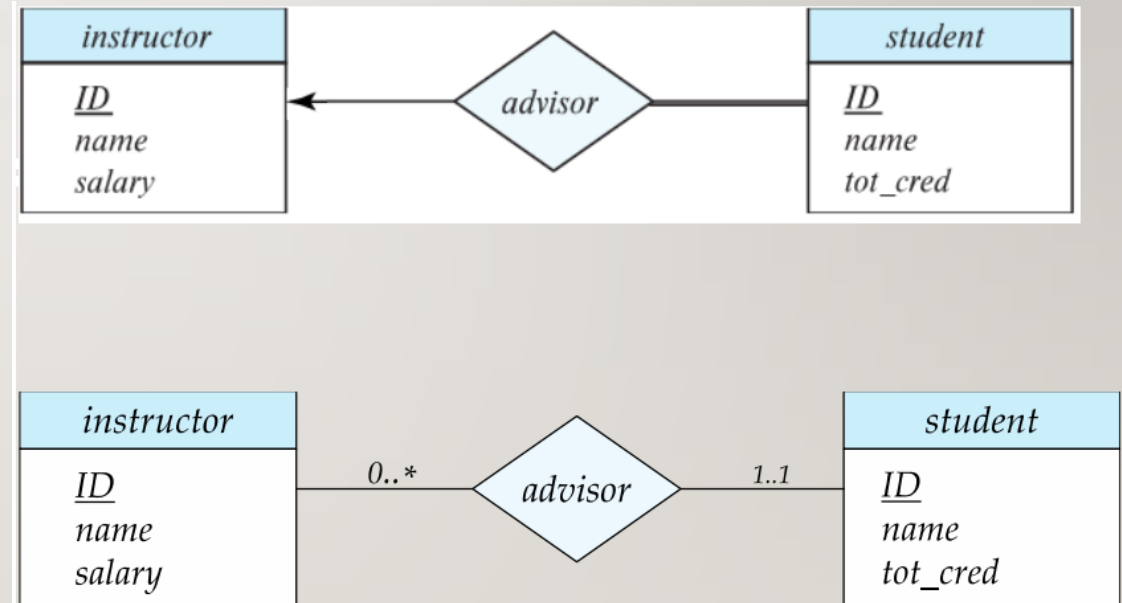
---

- A line may have an associated minimum (low) and maximum (high) cardinality, shown in the form l..h
  - A **minimum** value of 0 indicates partial participation.
  - A **minimum** value of 1 indicates total participation.
  - A **maximum** value of 1 indicates that the entity participates in at most one relationship
  - A **maximum** value of \* indicates no limit.
- For example:
  - 0..1 : entity **can** participate in at most one relationship
  - 0..\* : entity **can** participate in none or many relationship
  - 1..1 : entity **has to** participate with exactly one relationship
  - 1..\* : entity **has to** participate in at-least one relationship



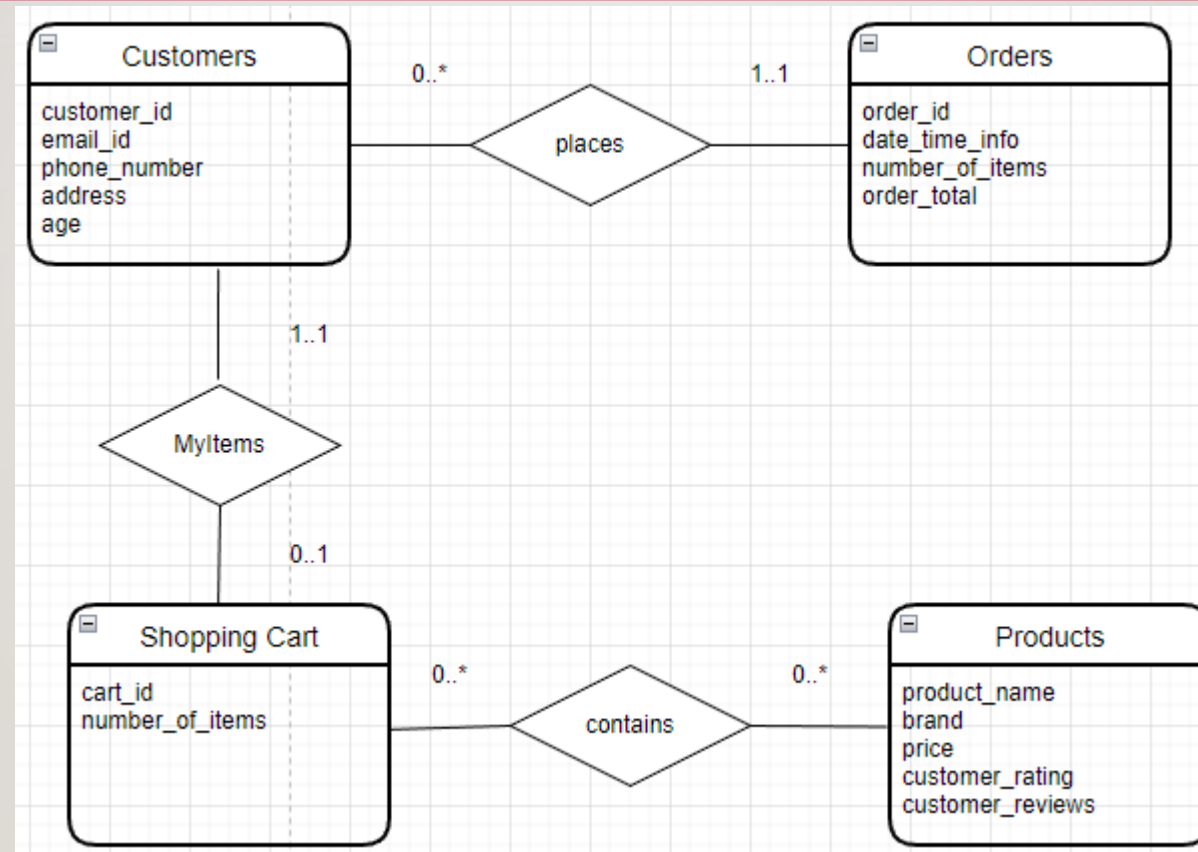
## 6 MIN, MAX (LOW..HIGH) NOTATION [CONT...]

- Min/low value indicates Participation
- Max/high value indicates Cardinality



- Instructor can advise 0 or more students. A student must (at-least) have 1 advisor; and cannot have multiple (more than 1) advisors

## 7 ONLINE STORE EXAMPLE (LOW..MIN NOTATION)



## 8 ONLINE STORE EXAMPLE (CROW-FOOT NOTATION)

