Course Code: IS212
Course Name: Fundamentals of Database Concepts
Faculty of Computer and Information
Assiut University

Sheet 4

1. Design an ERD for an order processing system:

The data requirements for any retail store are as follows:

- The store has products where customers can buy them. The product has productID, name, unit price, units in stock, units on order, discount.
- Customers have customer ID, name, address, phone. They can buy products by making an order and any order has orderID, date, shipped date, ship address, and total price.
- Each order contains any number of products with their quantity and price for each item in the order.
- A shipment company ships order to customers. A shipper has ID, company name, phone. A shipper company ships many orders.
- An Employee has ID, name, title, address, phone. Each employee can work on many orders, but each order is worked on by one employee.
- Products may belong to one category that has ID, name, description. Each category has a number of products.
- Suppliers provide the retail with products. Each product is supplied by one supplier only. Suppliers have ID, company name, contact name, contact title, address, phone.

2. Design an ER diagram for a license issuing process of vehicles.

The data requirements are as follows:

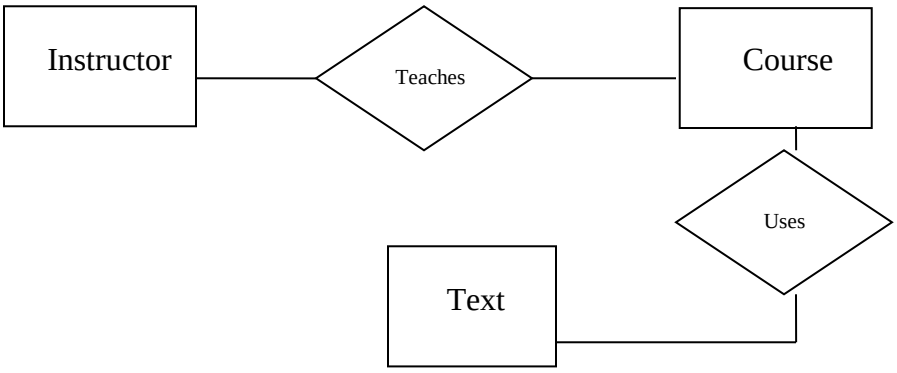
- The country is divided into departments (Cairo, Giza, Alex…etc). Each department is described by a code (unique), name (unique), and several service locations (e.g., for Cairo department, there are: Heliopolis, Nasr City, etc.).
- Each vehicle is described by a vehicle no, model (ex. Hyundai accent, Hyundai matrix, fiat 128, fiat punto), type (private, limousine, taxi, etc.), color, motor capacity, number of seats, manufacturing year, license issue date, license expiry date, owner, tax rate, and a set of fins. The owner, type and tax rate information are mandatory for each vehicle. Each vehicle model is identified by a code (unique), name (unique) and tax category. Each tax category has a specific tax rate and category_id. The tax category has one or more vehicle models.

- Each vehicle fin is described by a number (unique), type, date, and vehicle no. Each fin type has a specific value and description.
- Each owner is described by id (unique), name, type (individual, organization, government, etc.), address, and set of phone numbers.

3. Design and draw an ER diagram that captures the information about this system.

A Bus Company owns a number of buses. Each bus is allocated to a particular route, although some routes may have several buses. Each route passes through a number of towns. One or more drivers are allocated to each stage of a route, which corresponds to a journey through some or all of the towns on a route. Some of the towns have a garage where buses are kept and each of the buses are identified by the registration number and can carry different numbers of passengers, since the vehicles vary in size and can be single or double-decked. Each route is identified by a route number and information is available on the average number of passengers carried per day for each route. Drivers have an employee number, name, address, and sometimes a telephone number.

4. Consider the following ER diagram:



Assume that a course may or may not use a textbook, but that a text by definition is a book that is used in some course. A course may not use more than five books. Instructors teach from two to four courses. Supply(min,max) constraints on this diagram. State clearly any additional assumptions you make. If we add the relationship ADOPTS between INSTRUCTOR and TEXT what (min,max) constraints would you put on it? Why?