

# Week-One (ERD)

## Exercise 1

Draw an ER diagram for the following scenario:

Although you always wanted to be an artist, you ended up being an expert on databases because

you love to cook data and you somehow confused database with database. Your old love is still there, however, so you set up a database company, ArtBase that builds a product for art galleries. The core of this product is a database with a schema that captures all the information that galleries need to maintain.

- Galleries keep information about artists, their names (which are unique), birthplaces, age, and style of art.
  - For each piece of artwork, the artist, the year it was made, its unique title, its type of art (e.g., painting, lithograph, sculpture, photograph), and its price must be stored.
  - Pieces of artwork are also classified into groups of various kinds, for example, portraits, still life's, works by Picasso, or works of the 19th century; a given piece may belong to more than one group.
  - Each group is identified by a name (like those just given) that describes the group.
  - Finally, galleries keep information about customers. For each customer, galleries keep that person's unique name, address, total amount of dollars spent in the gallery (very important!), and the artists and groups of art that the customer tends to like.
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## Exercise 2

Prepare an E-R diagram for a real estate firm that lists properties for sale. The following describes this organization:  
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- The firm has a number of sales offices in several states. Attributes of sales office include Office\_Number and Location.
- Each sales office is assigned one or more employees. Attributes of employee include Employee\_ID and Employee\_Name. An employee must be assigned to only one sales office.
- For each sales office, there is always one employee assigned to manage that office.
- The firm lists property for sale. Attributes of property include Property\_ID and Location. Components of Location include Address, City, State, and Zip\_Code.

- Each property must be listed with one (and only one) of the sales offices. A sales office may have any number of properties listed, or may have no properties listed.
  - Each property may have zero or more owners. Attributes of owners are Owner\_ID and Owner\_Name. An owner may own one or more properties. The system stores the percent owned by each owner in each property.
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### Problem 3

Major airlines companies that provide passenger services keep database with lots of information on all airlines.

1. Each airline has an identification number, name and address, name of the contact person and telephone numbers.
2. Each employee works in Airline Company has an employee identification number, name, address, birthday recorded as (day, month, year), gender, position with the company, and qualifications.
3. Each airline owns different aircraft models. For each aircraft an aircraft identification number, capacity, and model is recorded.
4. The aircrafts are assigned to different routes. An aircraft can work on more than one route and a route has many aircrafts going on it. Some information as number of passengers, price per passenger, departure date time, arrival date time and the time that aircraft spent in travelling the route are recorded.  
Each route has a route identification number, origin, destination, distance, classification (e.g. domestic or international route).
5. Each aircraft has its own crew (major pilot, assistant pilot and two hostesses), the aircraft crew not stored as employee. Each crew is assigned to one aircraft.
6. Each airline keeps information about their buy/sell transactions (for example selling an airplane ticket is a sell transaction, paying for maintenance is a buy transaction). Each transaction has a transaction identification number, date, description, and amount of money paid/received.

Draw an E-R diagram for the database presented above

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### Problem 4

- A General Hospital consists of a number of specialized wards. Each ward is described by ward\_id, Name
- The system records the following details about patients: Patient\_id, name, Date\_Of\_Birth

- Each ward may host zero or more patients and each patient is hosted by only one ward.
- Each patient is assigned to one leading consultant but may be examined by other consultants, if required.
- Each consultant may be assigned zero or more patients and may examine zero or more patients.
- Consultants are described by Consultant\_id, Name
- The system has to record all required data each time the Nurse gives a patient a certain drug with specified dosage at certain date and time.
- Each ward is under supervision of one nurse and a nurse may supervise only one ward.
- Each Nurse must serve in one ward
- Data about the nurse is recorded as her name and her number and her address.
- A drug has code number, recommended dosage and more than one brand name