IT667 - Database Management Systems

Lab Assignment 7 - Database Design

1. Construct an ER Diagram for the following system description:
Note - Illustrate the cardinality as well

a. A music database stores relationships between artists, albums, and tracks. The following requirements must be satisfied:

- The collection consists of several albums.
- An album is composed by exactly one artist.
- An artist makes one or multiple albums.
- An album can contain more than one tracks
- Artists, albums, and tracks each have a name.
- Each track is on one album only.
- Each track has a time length, measured in seconds.
- When a track is played, the date and time the playback began should be recorded.

b. A flight database stores details about an airline's data including flight and bookings. The following requirements must be satisfied:

- The airline can have more than airplanes.
- An airplane has a model_number, an unique registration_number, and the capacity to take passengers.
- An airplane flight has a unique flight_number, a departure_airport, a destination_airport, a departure_date and departure_time, and an arrival_date and arrival_time.
- Each flight is carried out by a single airplane.
- A passenger has given names, a contact_number, and a unique email_address.
- A passenger can book a seat on a flight.

c. A company has the following scenario:

- There are several salespersons.
- Some of the salespersons manage other salespersons.
- A salesperson cannot have more than one manager.
- A salesperson can be an agent for multiple customers.
- A customer is managed by exactly one salesperson.
- A customer can place multiple orders.
- An order can be placed by exactly one customer.
- Each order contains one or more products.
- A product may be listed in many orders.
- A product is assembled from different parts and parts can be common for many products.
- One or more employees assemble a product from parts.
- A supplier can supply different parts in certain quantities.
- A part can be supplied by different suppliers.

2. For the table given below, using the concept of Normalization, Normalize the table to 1NF and then 2NF. With the help of the table, state the conditions for 1NF and 2NF as well. Further, if possible, normalize it to 3NF, stating the conditions as well.

ORDER_ID	ORDER_DATE	C_ID	C_NAME	C_STATE	P_ID	P_NAME	P_PRICE	P_QUANTITY
101	1/10/22	1	ALICE	LA	3,7,6	PEN, PAPER, PENCIL	50, 100, 20	1,2,1
102	9/10/22	2	BOB	CA	5,6	SCALE, PENCIL	10, 20	4,5