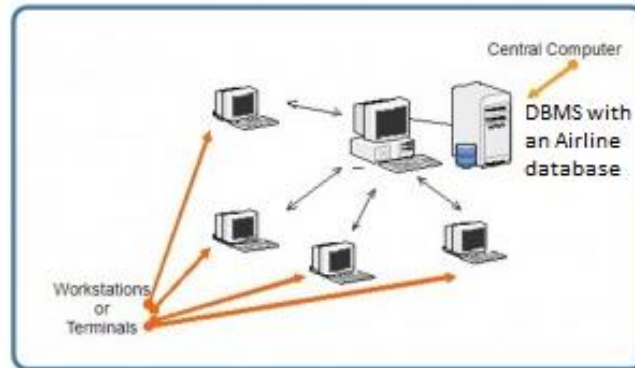# Homework #1 KEY

1. **Illustrate** with one complete example, the Centralized, 2-tier and 3-tier architectures.

   a. **Centralized DBMS**
      All DBMS functionality, application program execution, and user interface processing is carried out on one computer.

Airline Reservation System

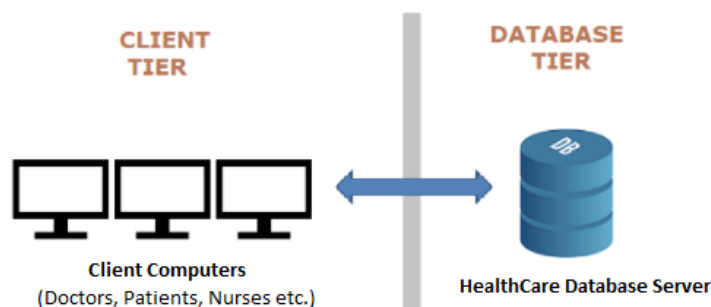*Example of a centralized database system.*

   b. **2-Tier Architecture**
      A 2-tier architecture includes
      - a server that handles query and transaction functionality related to SQL processing; and
      - a client that handles user interface programs and application programs and connects to the server database using tools like ODBC or JDBC

HealthCare System

   c. **3-Tier Architecture**
   A 3-tier architecture includes
      - a server that handles query and transaction functionality related to SQL processing;
      - an intermediate layer (Application server or Web server) between client and the database server that runs the application programs and stores business rules; and
      - a client that handles user interface programs and connects to the server database using tools like ODBC or JDBC

Student Information System

Three-tier client-server architecture
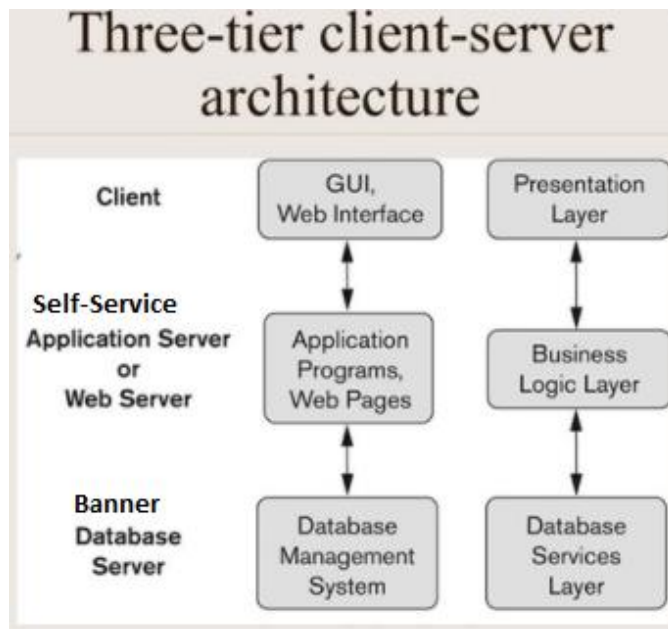
2. **Design** an ER model for the following:

A department store operates in several cities
In each city, there is one headquarter coordinating the local operations
A city may have several stores
Stores hold any amount of items
Customers place their orders for any number of items to a given store
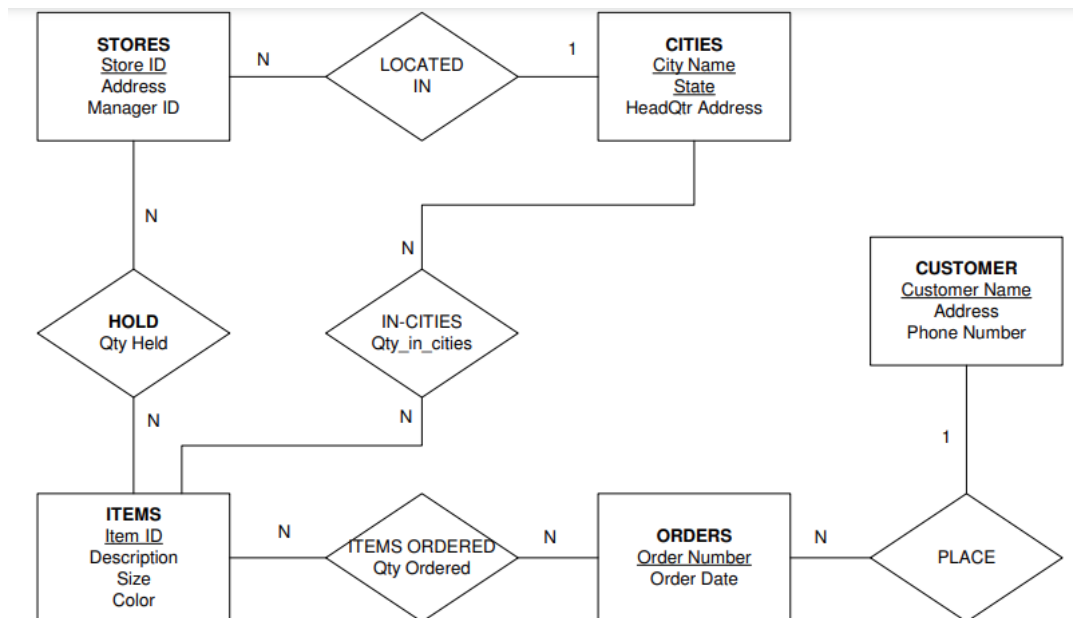
3. **Design** an ER diagram for the following database. Your diagram should have all the needed details. You may make any reasonable assumptions but you have to state them clearly.

A system is to be created to manage the calendar of campus events.

- Each event has a descriptive name and has a single start date and time (when the event begins) and ending date and time.

- Each event can be classified as sports, social, religious or academic. Depending on the classification, specific event information is stored.
- Each event takes place at a specific venue on campus. A venue is a sports area (such as an athletic field), a lecture hall, a conference hall, or a public space. The venue information differs depending on the type of venue.
- Each event is sponsored by an academic department. Each academic department has a person responsible for the event.

Note: Solution to this question will be provided with the graded homework

Homework # 2 KEY

4. **Convert** the ER diagram you have developed in Question 2 into a relational database schema diagram.

STORES

STORE ID	NAME	ADDRESS	MANAGER_ID	*CITY_NAME*

CITIES

CITY NAME	*STATE*	HQ_ADDRESS

ITEMS

ITEM ID	DESCRIPTION	COLOR	SIZE

ORDERS

ORDER NO	ORDER_DATE	*CUSTOMER_ID*

CUSTOMER

CUSTOMER ID	NAME	PHONE_NUMBER	*CITY_NAME*

STORE_ITEMS

STORE ID	*ITEM ID*	QUANTITY

ITEM_ORDER

ITEM ID	*ORDER NO*	QUANTITY_ORDERED

ITEMS_IN_CITY

CITY NAME	*ITEM ID*	QUANTITY_IN_CITY

Note: Foreign Key names match mapped Primary Key names in italics

5. **Convert** the ER diagram you have developed in Question 3 into a relational database schema diagram.

Note: Solution to this question will be provided with the graded homework

6. **Convert** the following ER model to a relational schema.
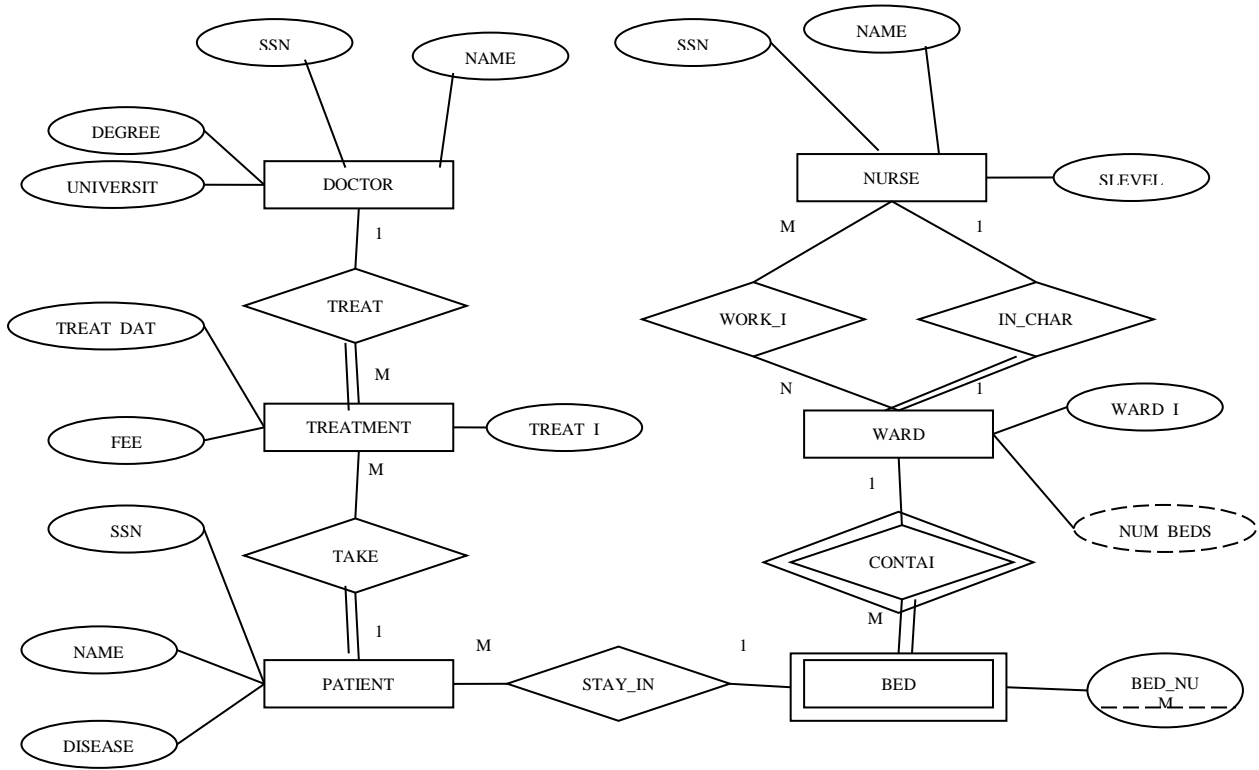
DOCTOR

DSSN	NAME	DEGREE	UNIVERSITY

TREATMENT

TREAT_ID	TREAT_DATE	FEE	DSSN	PSSN

PATIENT

PSSN	NAME	DISEASE	BEDNUM	WARD_ID

CONTACT

PSSN	NAME	PHONE

BED

BEDNUM	WARD_ID	PHONE

WARD

WARD_ID	PHONE	INCHARGE_NSSN

NURSE

NSSN	NAME	SLEVEL

WORK_IN

NSSN	WARD_ID

Note: Foreign Key names match mapped Primary Key names