

Worksheet No:1

Part01:

<ol style="list-style-type: none"> 1. What is database? 2. What is DBMS and RDBMS? 3. Give three popular DBMS software. 4. What is a Database system? 5. Give main advantages of DBMS? 6. Give main Disadvantage in File Processing System? 7. Describe the three levels of data abstraction? 8. What is DDL (Data Definition Language)? 9. What is DQL (Data query Language)? 10. What is SQL? 11. Define the "integrity rules" 12. What is extension and intension? 13. What is Data Independence? 14. What is Data Model? 15. What is E-R model? 16. What is an Entity? 17. What is an Entity type? 	<ol style="list-style-type: none"> 18. What is an Entity set? 19. What is an Extension of entity type? 20. What is an attribute? 21. What is a Relation Schema and a Relation? 22. What is degree of a Relation? 23. What is Relationship? 24. What is Relationship set? 25. What is Relationship type? 26. What is degree of Relationship type? 27. Explain the difference between a weak and a strong entity set. 28. We can convert any weak entity set to a strong entity set by simply adding appropriate attributes. Why, then, do we have weak entity sets?
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Part02:

Exercise 01:

Consider a relation R(A,B,C) with the following extension:

A	B	C
a1	b1	c1
a2	b1	c2
a2	b2	c3
a1	b2	c2
a2	b3	c3
a1	b3	c3

- Define the primary key of this relation

Exercise 02:

Given the following relational schema

Product (Product-id, Product-name, price, Quantity-stock)

Customer (Customer-id, Customer-name, City, Country)

Order-detail (Product-id, Customer-id, Quantity)

When using the database, errors prevented the execution of the following operations:

Insert tuple <1, ACER, 50000, 1000 > into Product table

Insert tuple <1, 2, 5,50 > into Order-detail table

Delete tuple <1, amina laidani, AADL, Algeria > from Customer table.

- Explain the probable causes of each error.

Exercise 03:

- Design an E-R diagram for keeping track of the exploits of your favourite sports team. You should store the matches played, the scores in each match, the players in each match and individual player statistics for each match. Summary statistics should be modeled as derived attributes.
- Extend the E-R diagram of the previous question to track the same information for all teams in a league.

For the exercises(4 to 6), design an E-R diagram and give the relational schema

Exercise 04:

A salesperson may manage many other salespeople. A salesperson is managed by only one salesperson. A salesperson can be an agent for many customers. A customer is managed by one salesperson. A customer can place many orders. An order can be placed by one customer. An order lists many inventory items. An inventory item may be listed on many orders. An inventory item is assembled from many parts. A part may be assembled into many inventory items. Many employees assemble an inventory item from many parts. A supplier supplies many parts. A part may be supplied by many suppliers.

Exercise 5:

Consider the database of an online bookstore

- Every book has a title, isbn, year and price. The store also keeps the author and publisher for any book.
- For authors, the database keeps the name, address and the url of their homepage.
- For publishers, the database keeps the name, address, phone number and the url of their website.
- The store has several warehouses, each of which has a code, address and phone number.
- The warehouse stocks several books. A book may be stocked at multiple warehouses. (In previous sentence, we are not referring to a particular copy of the book. Consider for example “the complete book” for our course. This book may be stocked at multiple warehouses.)
- The database records the number of copies of a book stocked at various warehouses.
- The bookstore keeps the name, address, email-id, and phone number of its customers.
- A customer owns several shopping basket. A shopping basket is identified by a basketID and contains several books. Some shopping baskets may contain more than one copy of same book. The database records the number of copies of each book in any shopping basket.

Exercise 06:

The company is organized into departments. Each department has a unique name, a unique number, and a particular employee who manages the department.

We keep track of the start date when that employee began managing the department. A department may have several locations.

- A department controls a number of projects, each of which has a unique name, a unique number, and a single location.
- The database will store each employee's name, Social Security number, address, salary, sex (gender), and birth date. An employee is assigned to one department, but may work on several projects, which are not necessarily controlled by the same department. It is required to keep track of the current number of hours per week that an employee works on each project, as well as the direct supervisor of each employee (who is another employee).
- The database will keep track of the dependents of each employee for insurance purposes, including each dependent's first name, sex, birth date, and relationship to the employee.

Exercise 7:

Consider a university database for the scheduling of classrooms for final exams. This database could be modeled as the single entity set exam, with attributes course-name, section-number, room-number, and time. Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the exam entity set, as

- course with attributes name, department, and c-number
- section with attributes s-number and enrollment, and dependent as a weak entity set on course
- room with attributes r-number, capacity, and building

- a. Show an E-R diagram illustrating the use of all three additional entity sets listed.
- b. Explain what application characteristics would influence a decision to include or not to include each of the additional entity sets.