

Assignment

Programme : Bachelor of Information Technology (BIT)
Subject : Database Management System
Medium : English
Deadline : 15th November, 2023

Assignment Question

Chapter 01

1. What is a DBMS?
2. What are the advantages of a DBMS?
3. Compare and contrast the traditional File based system with Database approach.
4. What are the major components of Database Manager?
5. Explain the functions of the person who has the control of both data and programs accessing that data.
6. State whether the following are True or False.
 - The external schema defines how and where data are organised in physical data storage. (.....)
 - A schema separates the physical aspects of data storage from the logical aspects of data representation. (.....)
 - The conceptual schema defines a view or views of the database for particular users. (.....)
 - A collection of data designed to be used by different people is called a database. (.....)
 - In a database, the data are stored in such a fashion that they are independent of the programs of people using the data. (.....)
 - Using a database redundancy can be reduced. (.....)
 - The data in a database cannot be shared. (.....)
 - Security restrictions are impossible to apply in a database. (.....)
 - In a database data integrity can be maintained. (.....)
 - Independence means that the three levels in the schema (internal, conceptual and external) should be independent of each other so that the changes in the schema at one level should not affect the other levels. (.....)

Chapter 02

1. Consider the tables Suppliers, Parts, project and SPJ relation instances in the relations below. (Underline represents a key attribute. The SPJ relation have three Foreign keys: SNO, PNO and JNO.)

S		
<u>SNO</u>	SNAME	CITY
S1	Smita	Delhi
S2	Jim	Pune
S3	Ballav	Pune
S4	Sita	Delhi
S5	Anand	Agra

P			
<u>PNO</u>	PNAME	COLOUR	CITY
P1	Nut	Red	Delhi
P2	Bolt	Blue	Pune
P3	Screw	White	Bombay
P4	Screw	Blue	Delhi
P5	Camera	Brown	Pune
P6	Cog	Grey	Delhi

J			SPJ			
<u>JNO</u>	JNAME	CITY	<u>SNO</u>	<u>PNO</u>	<u>JNO</u>	QUANTITY
J1	Sorter	Pune	S1	P1	J1	200
J2	Display	Bombay	S1	P1	J4	700
J3	OCR	Agra	S2	P3	J2	400
J4	Console	Agra	S2	P2	J7	200
J5	RAID	Delhi	S2	P3	J3	500
J6	EDS	Udaipur	S3	P3	J5	400
J7	Tape	Delhi	S3	P4	J3	500
			S3	P5	J3	600
			S3	P6	J4	800
			S4	P6	J2	900
			S4	P6	J1	100
			S4	P5	J7	200
			S5	P5	J5	300
			S5	P4	J6	400

Using the sample data values in the relations above, draw the effect of each of the following operation:

- UPDATE Project J7 in J setting CITY to Nagpur.
 - UPDATE part P5 in P, setting PNO to P4.
 - UPDATE supplier S5 in S, setting SNO to S8, if the relevant update rule is RESTRICT.
 - DELETE supplier S3 in S, if the relevant rule is CASCADE.
 - DELETE part P2 in P, if the relevant delete rule is RESTRICT.
 - DELETE project J4 in J, if the relevant delete rule is CASCADE.
 - UPDATE shipment S1-P1-J1 in SPJ, setting SNO to S2. (shipment S1-P1-J1 means that in SPJ table the value for attributes SNO, PNO and JNO are S1, P1 and J1 respectively)
 - UPDATE shipment S5-P5-J5 in SPJ, setting JNO to J7.
 - UPDATE shipment S5-P5-J5 in SPJ, setting JNO to J8
 - INSERT shipment S5-P6-J7 in SPJ.
 - INSERT shipment S4-P7-J6 in SPJ
 - INSERT shipment S1-P2-jjj (where jjj stands for a default project number).
- A Company ABC develops applications for the clients and their own use. Thus, the company can work in “user mode” and “developer mode”. Find the possible entities and relationships among the entities. Give a step by step procedure to make an E-R diagram for the process of the company when they develop an application for the client and use the diagram to derive appropriate tables.
 - An employee works for a department. If the employee is a manager then s/he manages the department. As an employee the person works for the project, and the various departments of a company control those projects. An employee can have many dependents. Draw an E-R diagram for the above company. Try to find out all possible entities and relationships among them.
 - A supplier located in only one-city supplies various parts for the projects to different companies located in various cities. Let us name this database as “supplier-and-parts”. Draw the E-R diagram for the supplier and parts database.

Chapter 03

1. Consider supplier-part-project database

SUPPLIERS

S.NO	SNAME	CITY
S1	Smita	Delhi
S2	Jim	Pune
S3	Ballav	Pune
S4	Sita	Delhi
S5	Anand	Agra

PROJECTS

PROJNO	JNAME	CITY
PROJ1	Sorter	Pune
PROJ2	Display	Mumbai
PROJ3	OCR	Agra
PROJ4	Console	Agra
PROJ5	RAID	Delhi
PROJ6	EDS	Udaipur
PROJ7	Tape	Delhi

PARTS

P.NO	PNAME	COLOUR	CITY
P1	Nut	Red	Delhi
P2	Bolt	Blue	Pune
P3	Screw	White	Mumbai
P4	Screw	Blue	Delhi
P5	Cam	Brown	Pune
P6	Cog	Grey	Delhi

SUP_PAR_PROJ

SNO	PNO	PROJ NO	QUANTIT Y
S1	P1	PROJ1	200
S1	P1	PROJ4	700
S2	P3	PROJ2	400
S2	P2	PROJ7	200
S2	P3	PROJ3	500
S3	P3	PROJ5	400
S3	P4	PROJ3	500
S3	P5	PROJ3	600
S3	P6	PROJ4	800
S4	P6	PROJ2	900
S4	P6	PROJ1	100
S4	-	PROJ7	200
S5	P5	PROJ5	300
S6	P4	PROJ6	400

- What are the Candidate keys and PRIMARY key to the relations?
- What are the entity integrity constraints? Are there any domain constraints?
- What are the referential integrity constraints in these relations?
- What are referential actions you would suggest for these referential integrity constraints?

2. Consider the following relation

LIBRARY (member_id, member_name, book_code, book_name, issue_date, return_date)

The relation stores information about the issue and return of books in a Library to its members. A member can be issued many books. What are the anomalies in the relation above?

- What are the functional dependencies in the relation above? Are there any constraints, specially domain constraint, in the relation?
- Normalise the relation of problem 2.

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