Tutorial 3

CSN-351/AID-523 Database Management Systems

1. Consider the following Relation table representing data about purchases made at a supermarket. Find possible redundancies among the values across different attributes. Also decompose the given table to overcome the founded redundancies if any.

Customer ID	Product ID	Customer Name	Product Name	Time
15	ABC-131	Raj	Amul Ice-cream	09:31
15	ABC-13	Raj	Amul Milk (500ml)	09:32
19	ABC-13	Samay	Amul Milk (500ml)	13:11
2	PQR-54	Zakir	Iphone 15	21:19

2. a. What are the properties of decomposition ?

   b. What is the principled and systematic approach to decomposition called ?

   c. Name some anomalies we overcome by performing decomposition.

3. Consider the following Relation table R(ABC). Decompose the table into R1(AB) and R2(BC) and identify whether the decomposition is lossless or lossy. If lossy then suggest a lossless decomposition method and show the decomposed tables.

A	B	C
1	2	1
2	2	2
3	1	2

4. Consider R(ABCD) with functional dependency set

F = {A—>B, B—>C, C—>D}. Determine whether following decomposition scheme are lossless or lossy.

       a. R1(ABC) , R2(CD)

       b. R1(AB), R2(CD)

       c. R1(AB), R2(BC)

       d. R1(AB), R2(BC), R3(CD)

5. Given R(ABCDEG) with F = {AB—>C, AC—>B, AD—>E,

B—>D, BC—>A, E—>G}. Give a valid lossless decomposition scheme. If there are multiple answers, write any one of them.

6. Given R(ABCDEFGHIJ) with F = {AB—>C, A—>DE, B—>F, F—>GH, D—>IJ}. We decompose R into R1(ABC), R2(ADE), R3(BF), R4(FGH), R5(DIJ). Determine whether this decomposition is dependency preserving decomposition or not. If not then show the functional dependencies in F that cannot be recovered after this decomposition.

7. Given R(ABCDEF) with F = {AB—>CD, C—>D, D—>E, E—>F}. We decompose R into R1(AB), R2(CDE), R3(EF). Determine whether this decomposition is dependency preserving decomposition or not.