

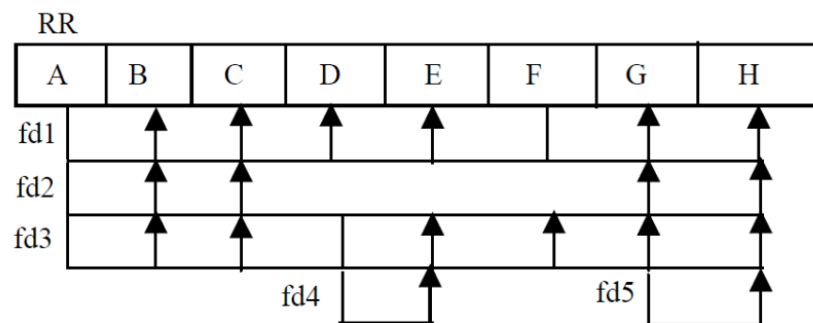
EBU5602 Database Tutorial 3

1. Examine the table shown below.

branchN	branchAddress	telNo	mgrStaffN	mgrName
B001	8 Jefferson Way, Portland, OR 97201	503-555-3618	S1500	Tom Daniels
B002	City Center Plaza, Seattle, WA 98122	206-555-6756	S0010	Mary Martinez
B003	14 - 8th Avenue, New York, NY 10012	212-371-3000	S0145	Art Peters
B003	14 - 8th Avenue, New York, NY 10012	212-371-3000	S0306	Jane Smith
B004	16 - 14th Avenue, Seattle, WA 98128	206-555-3131	S2250	Sally Stern

- Which normal form is this table in? Why?
- Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).
- Identify the primary and foreign keys in your 3NF relations.

2. Given the following relation schema and its functional dependencies:



- Specify candidate keys and state the primary key.
- Assuming that the relation is in first normal form (1NF), describe and illustrate the process of normalizing the relation schema to second (2NF) and third (3NF) normal forms. Identify the primary and foreign keys in your schemas.

3. Answer the following questions for the schedule of two transactions T1 and T2.

Time	T1	T2
t_1		begin_transaction
t_2		read(X)
t_3		$X = X + 100$
t_4	begin_transaction	write(X)
t_5	read(X)	...
t_6	$X = X * 10$	rollback
t_7	write(X)	
t_8	commit	

- What is the problem of updating X in the two transactions T1 and T2? Explain your answer.
- Rewrite T1 and T2 in Figure 1 using Two-Phase Locking (2PL).

4. The following figure illustrate a number of transactions being processed from t_0 until t_f when system had a power failure. At t_c a checkpoint was done. Explain how recovery is done for each transaction in the figure below.

