TUTORIAL 8

1) **Given a relation R(A1,A2,A3,A4,A5) with functional dependencies A1->A2A4 and A4->A5, Check if the decomposition R1(A1,A2,A3), R2(A1,A4), R3(A2,A4,A5) is lossless.**

Answer

Initial Matrix

	A1	A2	A3	A4	A5
R1	a1	a2	a3	b14	b15
R2	a1	b22	b23	a4	b25
R3	b31	a2	b33	a4	a5

Table 13.1

After applying A1→A2A4

	A1	A2	A3	A4	A5
R1	a1	a2	a3	a4	b15
R2	a1	a2	b23	a4	b25
R3	b31	a2	b33	a4	a5

Table 13.2

After applying A4→A5

	A1	A2	A3	A4	A5
R1	a1	a2	a3	a4	a5
R2	a1	a2	b23	a4	a5
R3	b31	a2	b33	a4	a5

Table 13.3

Since the first row has all 'a' the decomposition is lossless.

2. Assume that the relation R(P,Q,S,T,U) with FDs P->S, Q->S,S->T,TU->S,SU->P is decomposed into 5 relations :

R1(P,T)

R2(P,Q)

R2(Q,U)

R4(S,T,U)

R5(P,U)

Apply the standard algorithm to test if the decomposition is a lossless-join decomposition.