Lab 5

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Task 1.

We only need to give a counter example:

Consider the following schema; a b c and c->b Clearly the above schema is in 3NF, because ab->c is a superkey dependency and ,from c->b we can see that b-c=b, which is a subset of the primary key (such dependency is also allowed in 3NF). But, the above schema is not in BCNF because c->b is neither super-key nor trivial dependency. So we decompose above schema , keeping it lossless. Only possible lossless decomposition is: ac and cb. (because,their intersection c is primary key for the 2nd table). But clearly the dependency ab->c is lost.

Hence, proved.

Task 2.

Unit_ID	**Tutor_ID**	**Topic**	**Room**	**Date**
U1	Tut1	GMT	629	23.02.03
U2	Tut3	Gln	631	18.11.02
U5	Tut3	PhF	632	05.05.03
U4	Tut5	AVQ	621	04.07.03

Student_ID	**Grade**	**Unit_ID**
St1	4.7	U1
St1	5.1	U2
St4	4.3	U1
St2	4.9	U5
St2	5.0	U4

Topic	**Book**
GMT	Deumlich
Gln	Zehnder
PhF	Dummlers
AVQ	SwissTopo

Tutor_ID	**TutEmail**
Tut1	tut1@fhbb.ch
Tut3	tut3@fhbb.ch
Tut5	Tut5@fhbb.ch

Task 3.

ProjectName	**Budget**	**TeamSize**	**ProjectManager**
Project1	1 kk $	15	Manager1
Project2	1.5 kk $	12	Manager2

ProjectManager	**Position**
Manager1	CTO
Manager2	CTO2

Task 4.

Group	**Speciality**
G1	S1
G2	S2

Speciality	**Faculty**
S1	F1
S2	F2

Task 5.

Project_ID	**Department**
P1	D1
P2	D2

Project_ID	**Curator**	**TeamSize**
P1	E1	100
P2	E2	120

TeamSize	**ProjectGroupsNumber**
100	5
120	6

Task 6.

The three design goals are lossless-join decompositions, dependency preserving decompositions, and minimization ofrepetition of information. They are desirable so we can maintain an accurate database, check correctness of updates quickly, and use the smallest amount of space possible.

Desirable decompositions: Lossless join, dependency preserving decompositions

Undesirable decompositions: A lossy decomposition