

## Imanbay Amina Lab5

1.

BCNF can be used to obtain a lossless join decomposition into 3NF but does not ensure dependency preservation. Every conversion into BCNF may not be dependency preserving

The schema is in 3NF;

a b c and  $c \rightarrow b$

But, the above schema is not in BCNF because  $c \rightarrow b$  is neither super-key nor trivial dependency.

BCNF is a stronger form of normalization than 3NF because it eliminates the second condition for 3NF

2.

UnitID	TutorID	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

StudentID	Grade	UnitID
St1	4.7	U1
St1	5.1	U2
St2	4.9	U5
St2	5.0	U4
St4	4.3	U1

TutorID	TutEmail
Tut1	tut1@fhbb.ch
Tut3	tut3@fhbb.ch
Tut5	tut5@fhbb.ch

Topic	Book
GMT	Deumlich
Gln	Zehnder
PhF	Dummlers
AVQ	SwissTopo

3.

ProjectManager	Position
Manager1	CTO
Manager2	CTO2

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

4.

Group	Speciality
G1	S1
G2	S2

Speciality	Faculty
S1	F1
S2	F2

5.

ProjectID	Department	Curator
P1	D1	E1
P2	D2	E2

TeamSize	ProjectGroupsNumber
100	5
120	6

ProjectID	TeamSize
P1	100
P2	120

6.

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

The decomposition is a lossless decomposition if there is no loss of information by replacing R with the two relation schemas R1 and R2 (where  $R=R1+R2$ )

The decomposition is a dependency preserving decomposition if a relation R is decomposed into relation R1 and R2, then the dependencies of R either must be a part of R1 or R2 or must be derivable from the combination of functional dependencies of R1 and R2.

Repetition of information is dangerous because information can be changed in one place, not the other, thus causing inconsistencies.