1)

BCNF and Dependency Preservation

- It is not always possible to achieve both BCNF and dependency preservation
- Consider a schema:

  dept_advisor(s_ID, i_ID, department_name)
- With function dependencies:

  $i\_ID \rightarrow dept\_name$

  $s\_ID, dept\_name \rightarrow i\_ID$
- *dept_advisor* is not in BCNF
  - *i_ID* is not a superkey.
- Any decomposition of *dept_advisor* will not include all the attributes in

  $s\_ID, dept\_name \rightarrow i\_ID$
- Thus, the composition is NOT be dependency preserving

2)

UnitID	Date	Topic	Room	Tutor ID
U1	23.02.03	GMT	629	Tut1
U2	18.11.02	Gln	631	Tut3
U1	23.02.03	GMT	629	Tut1
U5	05.05.03	PhF	632	Tut3
U4	04.07.03	AVQ	621	Tut5

Tutor ID	TutEmail	Book
Tut1	tut1@fhbb.ch	Deumlich
Tut3	tut3@fhbb.ch	Zehnder
Tut1	tut1@fhbb.ch	Deumlich
Tut3	tut3@fhbb.ch	Dümmlers
Tut5	tut5@fhbb.ch	SwissTopo

UnitID	StudentID
U1	St1
U2	St1
U1	St4
U5	St2
U4	St2

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

3)

ProjectName	ProjectManager
Project1	Manager1
Project2	Manager2

ProjectName	Position	Budget
Project1	CTO	1 kk $
Project2	CTO2	1.5 kk $

ProjectManager	TeamSize
Manager1	15
Manager2	12

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4)

Faculty	Speciality
f1	s1
f2	s2

Group	Speciality
g1	s1
g2	s2