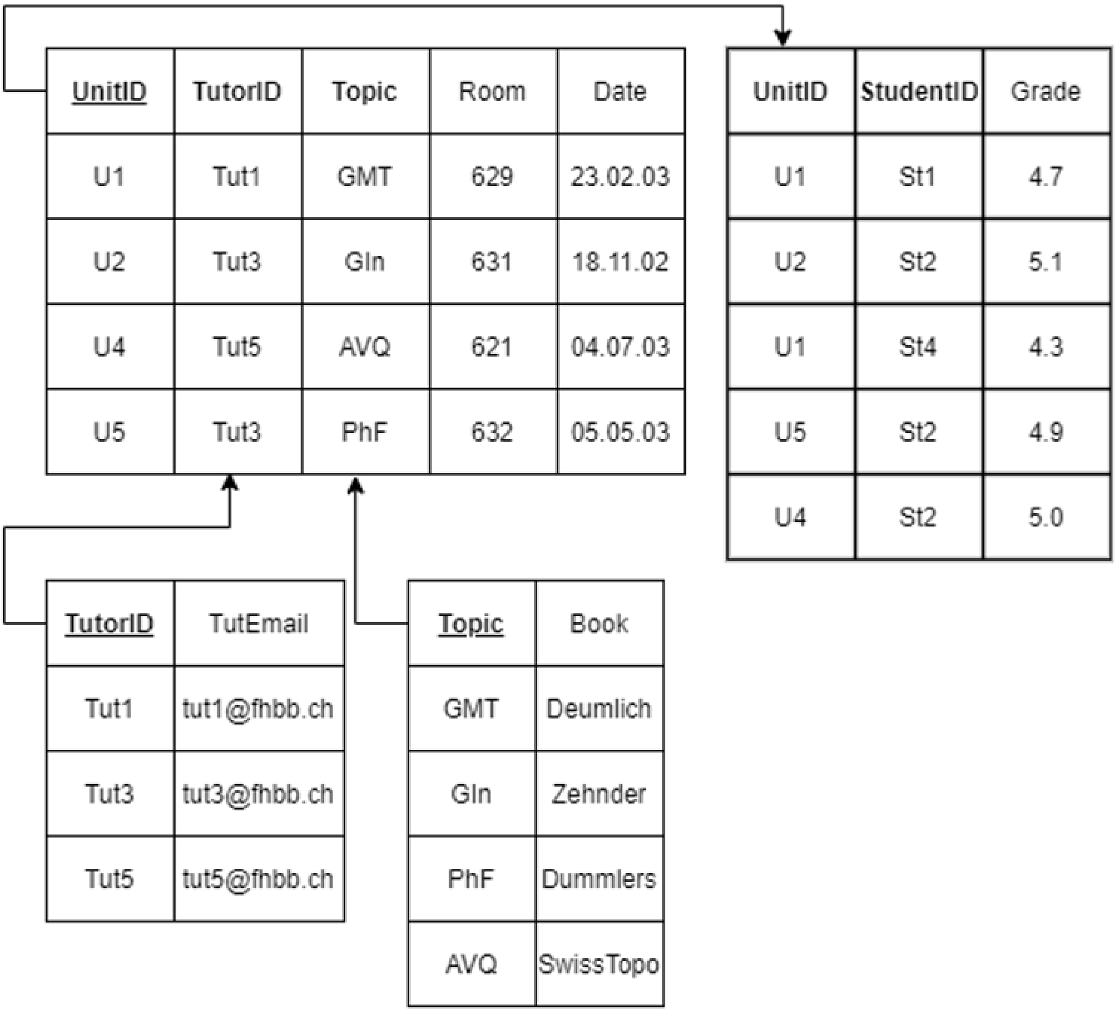
Turdalin Nurassyl
Saturday

TASK 1

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 → dept_name s_ID, dept_name → 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 → i_ID Thus, the composition is NOT be dependency preserving.

(From lecture)

TASK 2



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

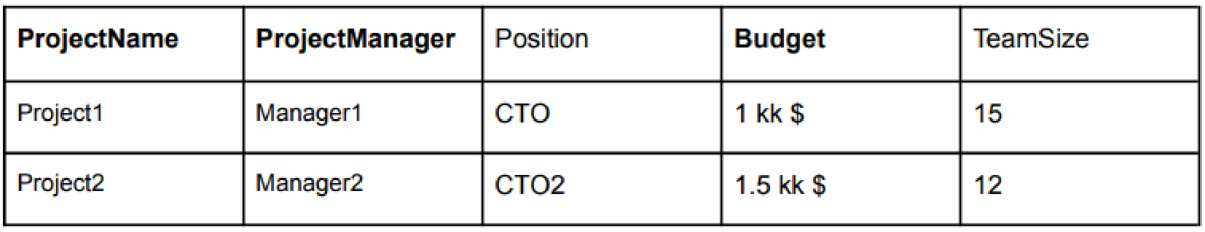
UnitID	StudentID	Grade
U1	St1	4.7
U2	St2	5.1
U1	St4	4.3
U5	St2	4.9
U4	St2	5.0

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

Topic	Book
GMT	Deumlich
GIn	Zehnder
PhF	Dummlers
AVQ	SwissTopo

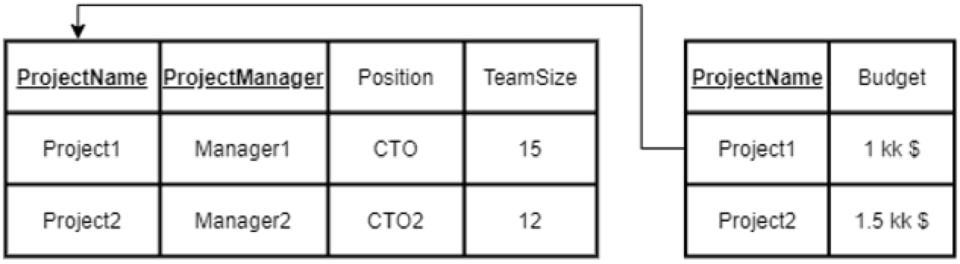
TASK 3

1NF



ProjectName	**ProjectManager**	Position	**Budget**	TeamSize
Project1	Manager1	CTO	1 kk $	15
Project2	Manager2	CTO2	1.5 kk $	12

2NF - Budget directly depends on Project



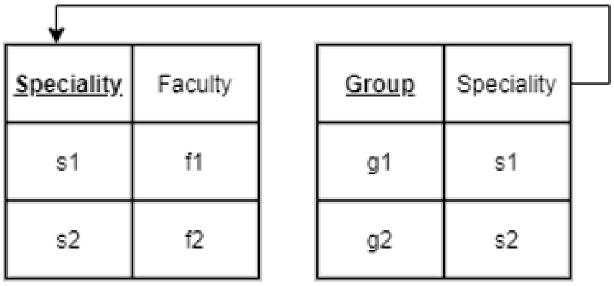
ProjectName	ProjectManager	Position	TeamSize
Project1	Manager1	CTO	15
Project2	Manager2	CTO2	12

ProjectName	Budget
Project1	1 kk $
Project2	1.5 kk $

TASK 4

Group	Faculty	Speciality
g1	f1	s1
g2	f2	s2

3NF – Each speciality relates to faculties. Several specialities also can relate to one faculty. And the same with groups. Each group relates to some specialities. Also, several groups can relate to one speciality.



Speciality	Faculty
s1	f1
s2	f2

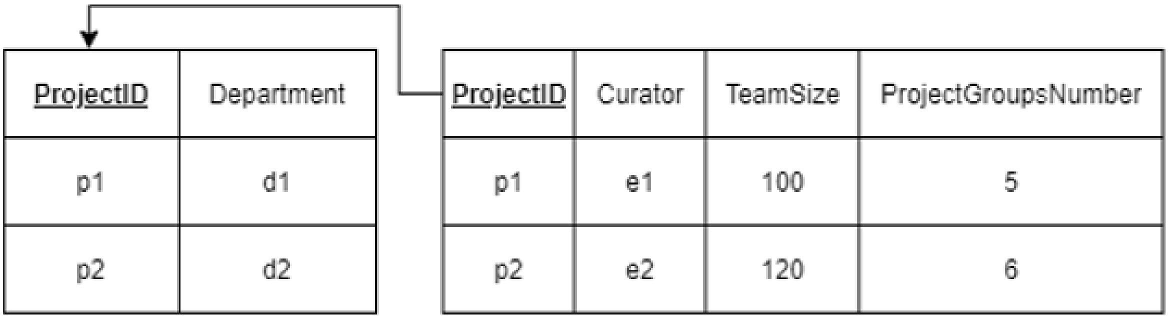
Group	Speciality
g1	s1
g2	s2

TASK 5

ProjectID	Department	Curator	TeamSize	ProjectGroupsNumber
p1	d1	e1	100	5
p2	d2	e2	120	6

Curator and TeamSize relate to Project that has relation with Department. ProjectGroupsNumber relates to TeamSize. Using this information we can easily decompose table.

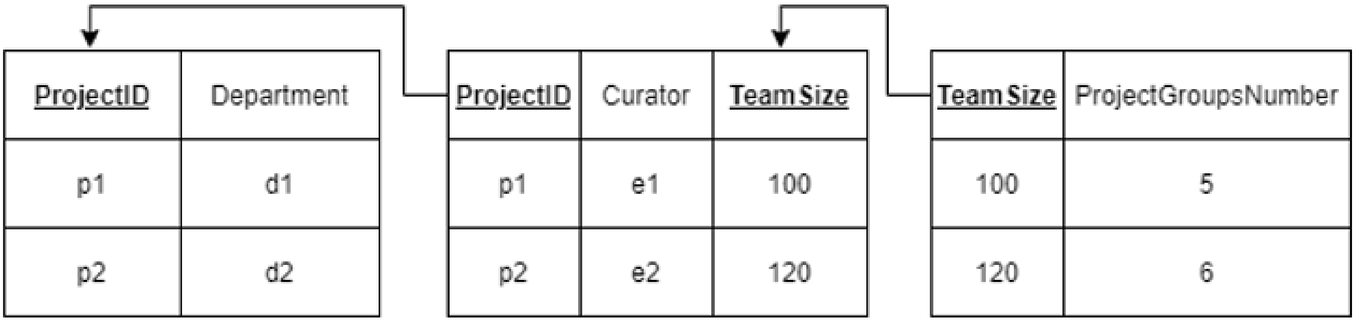
2NF:



ProjectID	Department
p1	d1
p2	d2

ProjectID	Curator	TeamSize	ProjectGroupsNumber
p1	e1	100	5
p2	e2	120	6

3NF:



ProjectID	Department
p1	d1
p2	d2

ProjectID	Curator	Team Size
p1	e1	100
p2	e2	120

Team Size	ProjectGroupsNumber
100	5
120	6

There is no more desirable decompositions.

TASK 6

Let R be a relation scheme with a set F of functional dependencies. Decide whether a relation scheme R is in “good” form. In the case that a relation scheme R is not in “good” form, decompose it into a set of relation scheme {R1, R2, ..., Rn} such that • Each relation scheme is in good form • The decomposition is a lossless decomposition • Preferably, the decomposition should be dependency preserving.

(Also from lecture)