STUDENT:SHUAKBAEV.O.D

Task 1. Will the conversion to BCNF be dependency preserving in any case? Proofyour statement and give a reasoning for choosing BCNF design.

Answer: Yes , it will be be dependency. Other column will depend on PK. For Example

ID	Name
23984406	Olzhas
49585935	Kuanish

Name will depend to ID. If it won't we do not find the info.

Task 2. Given table in 1NF, convert to 3NF if PK is UnitID:

TASK TABLE

UnitID	StudentID	Date	TutorID	Topic	Room	Grade	Book	TutEmail
U1	St1	23.02.03	Tut1	GMT	629	4.7	Deumlich	tut1@fhbb.ch
U2	St1	18.11.02	Tut3	GIn	631	5.1	Zehnder	tut3@fhbb.ch
U1	St4	23.02.03	Tut1	GMT	629	4.3	Deumlich	tut1@fhbb.ch
U5	St2	05.05.03	Tut3	PhF	632	4.9	Dümmlers	tut3@fhbb.ch
U4	St2	04.07.03	Tut5	AVQ	621	5.0	SwissTopo	tut5@fhbb.ch

SOLUTION TABLES:

UnitID	**StudentID**	**Date**	**Topic**	**Room**	**Grade**	**Book**
U1	St1	23.02.03	GMT	629	4.7	Deumlich
U2	St1	18.11.02	GIn	631	5.1	Zehnder
U1	St4	23.02.03	GMT	629	4.3	Deumlich
U5	St2	05.05.03	PhF	632	4.9	Dümmlers
U4	St2	04.07.03	AVQ	621	5.0	SwissTopo

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

Task 3. Given table in 1NF, convert to 2NF if PK is {ProjectName, ProjectManager},use decomposition:

TASK:

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

ANSWER:
PROJECT_NAME:

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

PROJECT_MANAGER:

ProjectManager	TeamSize
Manager1	15
Manager2	12

Task 4. Given table, convert to 3NF if PK is Group, use decomposition:

Faculties have a number of specialities, each speciality consists of a set of particular groups.

Faculty-> speciality
Speciality -> group

Group	**Faculty**	**Speciality**
g1	**f1**	**s1**
g2	**f2**	**s2**

SPEC_PODRAZDEL

Speciality	**Group**
s1	**g1**
s2	**g2**

FAC_SPEC

Faculty	Speciality
f1	s1
f2	s2

Task 5. Given table, convert to BCNF if PK is {ProjectID, Department}, use decomposition:

Curator depends on projectID and related departments, teamSize directly relates to project and related departments, ProjectGroupsNumber depends on TeamSize.

projectID->curator
Teamsz->ProjGroNumb

TASK

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

PROJECT

ProjectID	Department	Curator
p1	d1	e1
p2	d2	e2

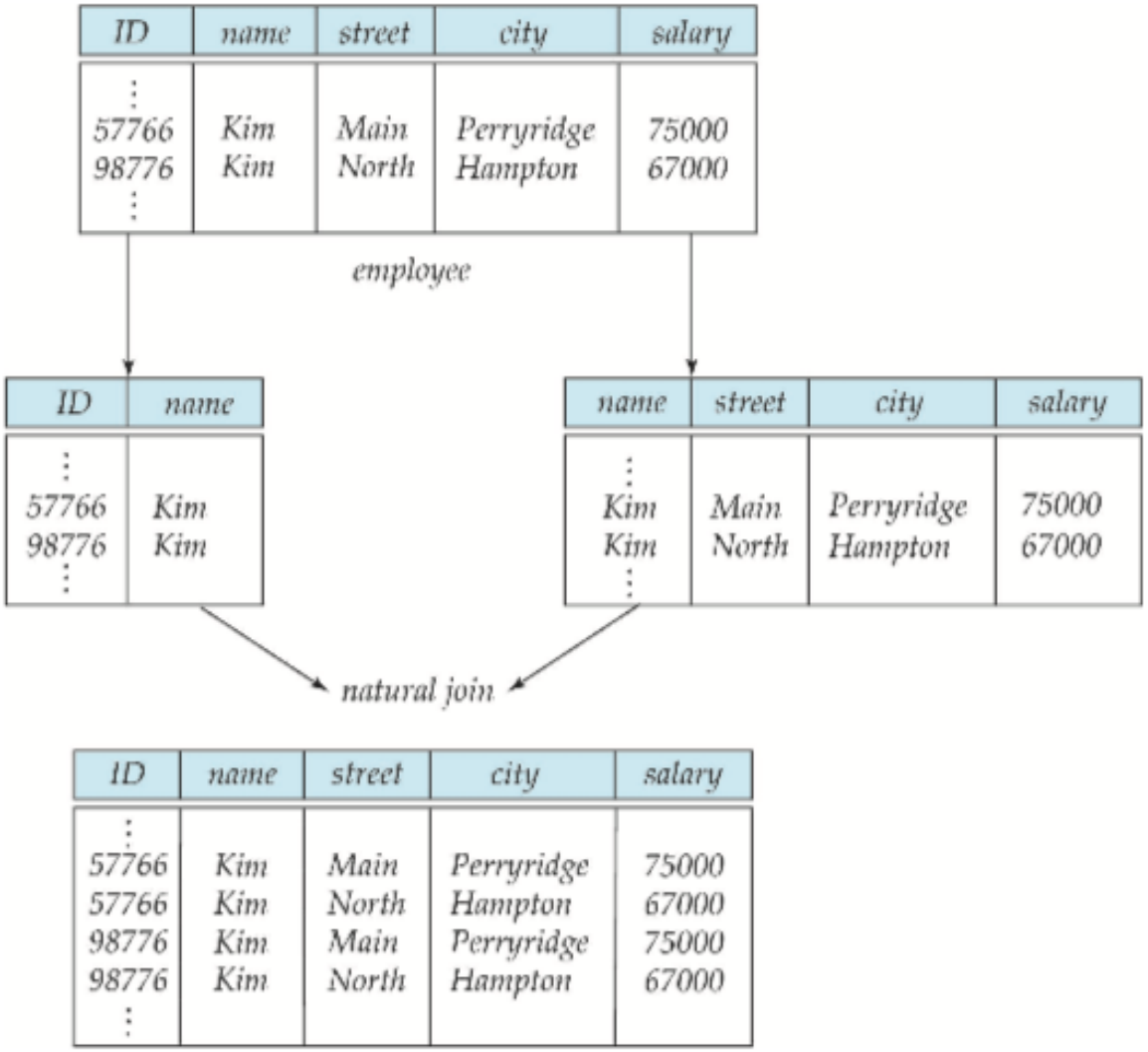
TEAM

Curator	TeamSize	ProjectGroupsNumber
e1	100	5
e2	120	6

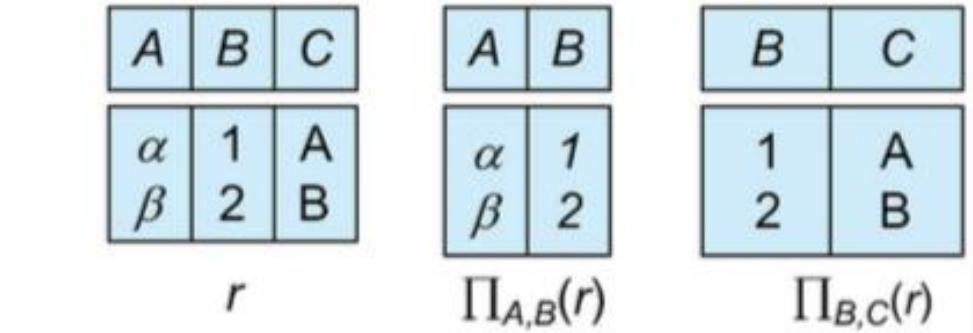
Task 6. List the three design goals for relational databases, and explain why each is desirable. Give an example of both desirable and undesirable types of decompositions.

1. **to generate a set of schemas that allow us to Store information without unnecessary redundancy**.
2. **Retrieve information easily and accurately**
3. **to provide an environment that is both convenient and efficient to use in retrieving and storing data base information.**

This example of Bad decomposition(below), it also named LOSSY DECOMPOSITION, it will provide redundancy.



This is Good decomposition(below), it also named LOSSLESS DECOMPOSITION:



A	B	C
α	1	A
β	2	B

r

A	B
α	1
β	2

$\Pi_{A,B}(r)$

B	C
1	A
2	B

$\Pi_{B,C}(r)$

$\Pi_A(r) \bowtie \Pi_B(r)$

A	B	C
α	1	A
β	2	B