Task 1.

It is not possible to achieve both BCNF and dependency preservation.

Consider a schema:

dept_advisor(student_id, advisor_ID, dept_name)

With function dependencies:

advisor_ID—>t_name

student_ID, dept_name —> advisor_ID

dept_advisor is not in BCNF

advisor_ID is not a superkey.

Any decomposition of dept_advisor will not include all the attributes in

student_ID, dept_name—>advisor_ID

Thus, the composition is NOT be dependency preserving

Task 2.

UnitID	StudentID	Date	Tutor ID	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

Partial dependency:

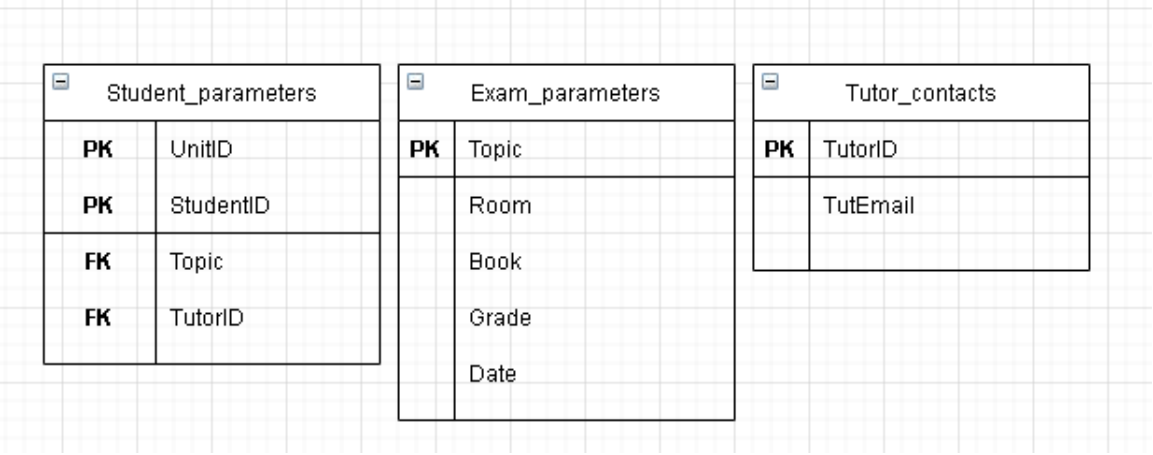
TutorID —> TutEmail;

Topic —> Room;

Topic —> Book;

Topic —> Grade;

Topic --—> Date;

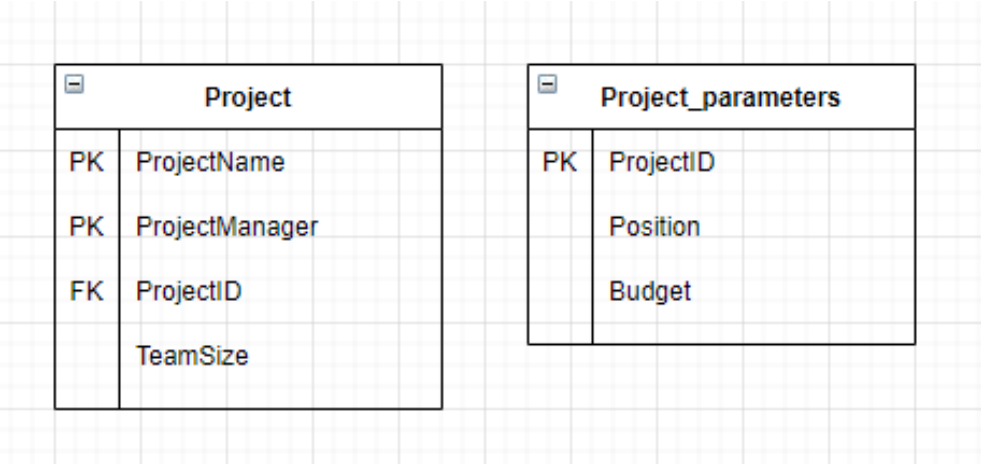


Task 3.

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

ProjectName —> Position;

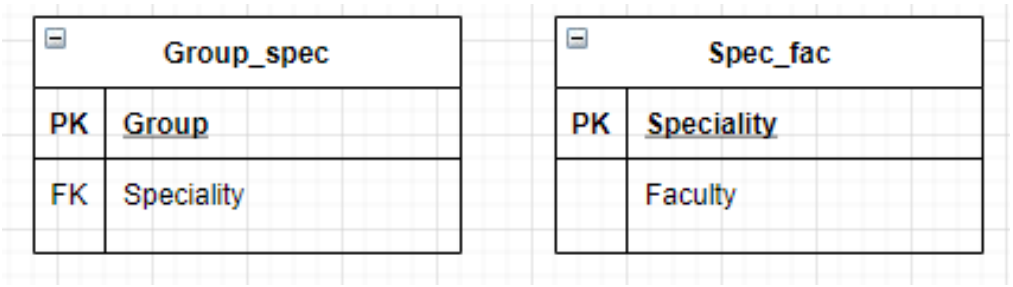
ProjectName —> Budget;



Task 4.

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

Group	Faculty	Speciality
g1	f1	s1
g2	f2	s2



Task 5.

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

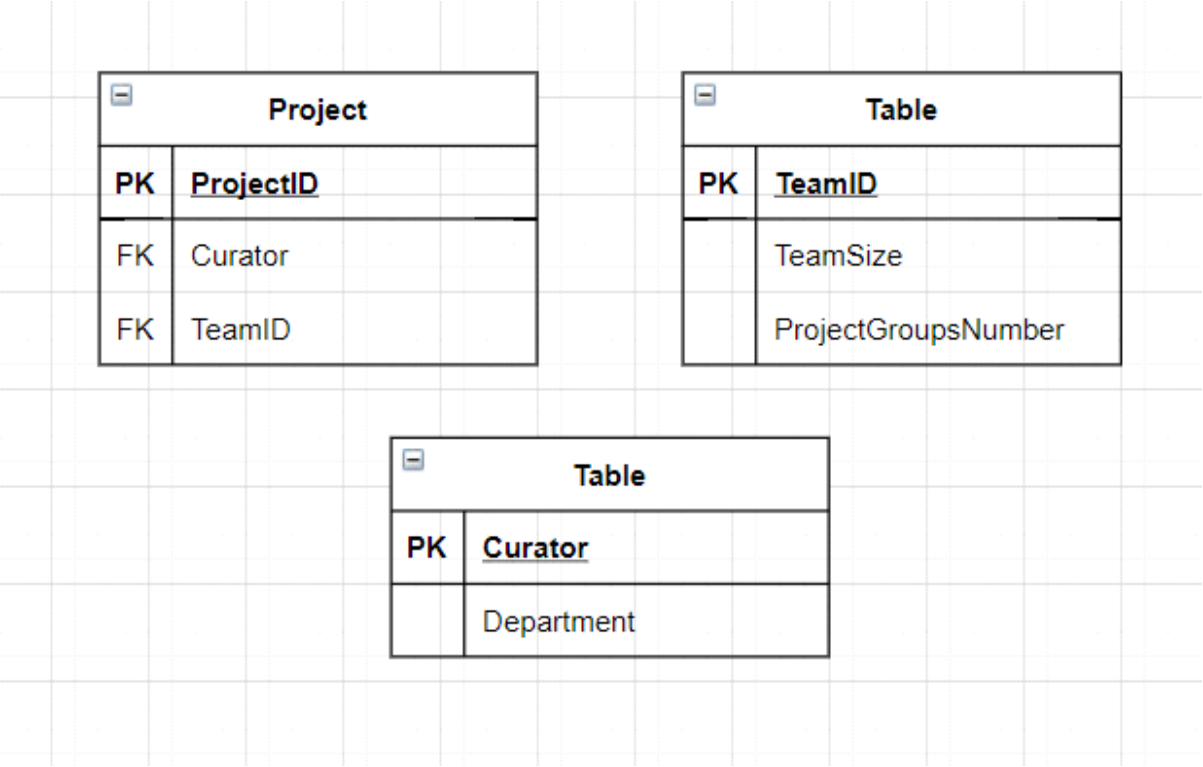
ProjectID	Department	Curator	TeamSize	ProjectGroupsNumber
p1	d1	e1	100	5
p2	d2	e2	120	6

ProjectID -> Curator;

Department -> Curator;

ProjectID -> TeamSize;

TeamSize -> ProjectGroupsNumber;


Project
PK
ProjectID
FK
Curator
FK
TeamID
Table
PK
TeamID
TeamSize
ProjectGroupsNumber
Table
PK
Curator
Department