Laboratory work 1- Bazarbai Aruzhan

Employee(id, person_name, street, city)

Works(person_name, company_name, salary)

Company(company_name, city)

Task 1.

1) $\prod_{id,person\_name}(\sigma_{company\_name=\text{"BigBank"}}(employee \bowtie_{\text{employee.person\_name=works.person\_name}} works))$

2)
$\prod_{id,person\_name,city}(\sigma_{company\_name=\text{"BigBank"}}(employee \bowtie_{\text{employee.person\_name=works.person\_name}} works))$

3) $\prod_{id,person\_name,street,city}(\sigma_{company\_name=\text{"BigBank"} \wedge salary>10000\$}($

$employee \bowtie_{\text{employee.person\_name=works.person\_name}} works))$

4) $\prod_{id,person\_name}($

$\sigma_{employee.person\_name=works.person\_name \wedge}$ works.company_name=company.company_name $\wedge$ employee.city=company.city(

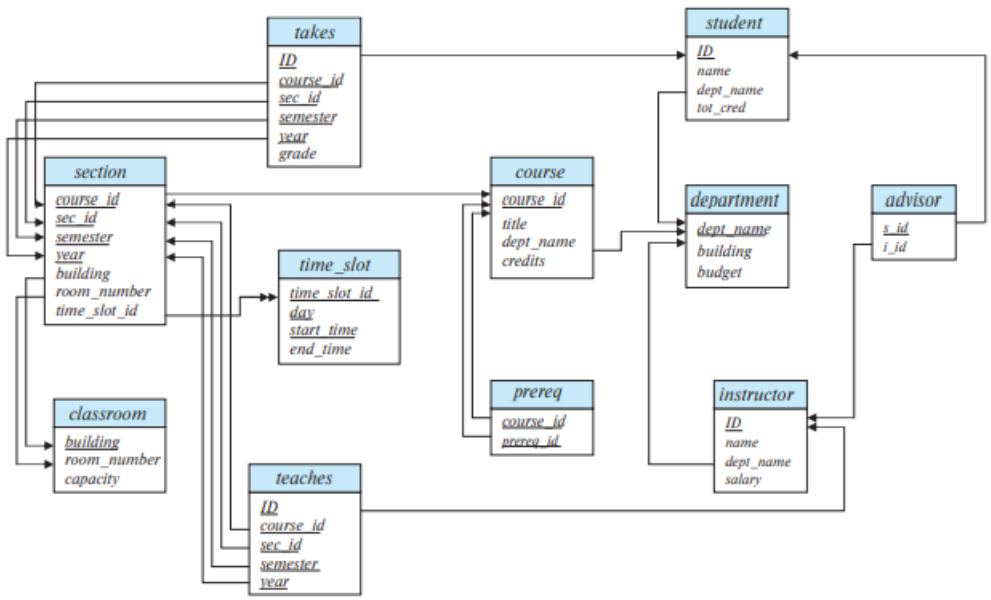
$employee \times works \times company))$

Task 2.

1) $\prod_{id,person\_name}(\sigma_{company\_name\neq\text{"BigBank"}}(employee \bowtie_{\text{employee.person\_name=works.person\_name}} works))$

2)
$\prod_{id,person\_name}(\sigma_{salary\geq average(salary)}(employee \bowtie_{\text{employee.person\_name=works.person\_name}} works))$

Task 3



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dept_name	building	budget
Biology	Watson	90000
Comp. Sci.	Taylor	100000
Elec. Eng.	Taylor	85000
Finance	Painter	120000
History	Painter	50000
Music	Packard	80000
Physics	Watson	70000

Figure 2.5 The *department* relation.

ID	name	dept_name	salary
10101	Srinivasan	Comp. Sci.	65000
12121	Wu	Finance	90000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
32343	El Said	History	60000
33456	Gold	Physics	87000
45565	Katz	Comp. Sci.	75000
58583	Califieri	History	62000
76543	Singh	Finance	80000
76766	Crick	Biology	72000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000

Figure 2.1 The *instructor* relation.

As we see,the instructor relation is referenced to the department relation(The dept_name is foreign key). So if I insert a tuple, for example, (10110, Jack, Mathematics, 90000) to a instructor table, the foreign key constrait will violate, because the department relation has no dept_name Mathematics, and these cannot reference to relation department. And if I delete, for example, a tuple (Physics,Watson,70000) from the relation departments, it will also destroy the forerign key costraint. Because two instructor has dept_name Physics.

Task 4.

In database “employee” we have three relations: “employee”,”works”,” company”.

The relation “employee” has primary key-“person_name”.

The relation “works” has a primary key called-“company_name”, and foreign key “person_name”.

And the last relation has no primary key, only foreign key- “company_name”.