

Homework2-CS460

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1. List all attributes of the employees from department 5.

Query:

```
display(project(select(employee)(dno='5'))(fname,minit,lname,ssn,bdate,address,sex,salary, superssn,dno))
```

Answer:

fname	minit	lname	ssn	bdate	address	sex	salary	superssn	dno
John	B	Smith	123456789	09-JAN-1955	731_Fondren_Houston_TX	M	30000	333445555	5
Franklin	T	Wong	333445555	08-DEC-1945	638_Voss_Houston_TX	M	40000	888665555	5
Ramesh	K	Narayan	666884444	15-SEP-1952	975_Fire_Oak_Humble_TX	M	38000	333445555	5
Joyce	A	English	453453453	31-JUL-1962	5631_Rice_Houston_TX	F	25000	333445555	5

2. What are the SSNs of the employees working on proposal #10?

Query:

```
display(project(join(employee)(project(select(works_on)(pno='10'))(empssn))(empssn=employee.ssn))(ssn))
```

Answer:

```
ssn
-----
333445555
999887777
987987987
```

3. What is the Cartesian Product of the employees' first names and the dependents' names?

Query:

```
display((project(employee)(fname))product(project(dependent)(dependent_name)))
```

Answer:

fname	dependent_name
John	Alice
John	Theodore
John	Joy
John	Abner
John	Michael
John	Elizabeth
Franklin	Alice
Franklin	Theodore
Franklin	Joy
Franklin	Abner
Franklin	Michael
Franklin	Elizabeth
Alicia	Alice
Alicia	Theodore
Alicia	Joy
Alicia	Abner
Alicia	Michael
Alicia	Elizabeth
Jennifer	Alice
Jennifer	Theodore
Jennifer	Joy
Jennifer	Abner
Jennifer	Michael
Jennifer	Elizabeth
Ramesh	Alice
Ramesh	Theodore
Ramesh	Joy
Ramesh	Abner
Ramesh	Michael
Ramesh	Elizabeth
Joyce	Alice
Joyce	Theodore
Joyce	Joy
Joyce	Abner
Joyce	Michael
Joyce	Elizabeth
Ahmed	Alice
Ahmed	Theodore
Ahmed	Joy
Ahmed	Abner
Ahmed	Michael
Ahmed	Elizabeth
James	Alice
James	Theodore
James	Joy
James	Abner
James	Michael
James	Elizabeth

4. (You must not use JOIN for this query) At which locations is the research department located?

Query:

```
display(project(select(select((department)product(dept_locations))(dname='Research'))(dnumber=d#))(dlocation))
```

Answer:

```
dlocation
-----
Bellaire
Sugarland
Houston
```

5. (You must use JOIN for this query) At which locations is the research department located?

Query:

```
display(project(join(dept_locations)(project(select(department)(dname='Research'))(dnumber)))(dnumber=dept_locations.d#))(dlocation))
```

Answer:

```
dlocation
-----
Bellaire
Sugarland
Houston
```

6. What are the names of the departments with employees who have a dependent named Alice?

Query:

```
display(project(join(project(select(dependent)(dependent_name='Alice'))(essn))(department)(department.mgrssn=essn))(dname))
```

Answer:

```
dname
-----
Research
```

7. Retrieve the SSNs of the employees who work in department 5 or who directly supervise an employee in department 5.

Query:

```
display((project(join(project(select(employee)(dno='5'))(superssn))(employee)(employee.ssn=superssn))(ssn))union(project(select(employee)(dno='5'))(ssn)))
```

Answer:

```
ssn
-----
333445555
888665555
123456789
666884444
453453453
```

8. What are the birthdates of the managers of the proposals from Stafford?

Query:

```
display(project(join(employee)(project(join(department)(project(select(proposal)(plocation='Stafford'))(dnum))(department.dnumber=dnum))(mgrssn))(mgrssn=employee.ssn))(bdate))
```

Answer:

```
bdate
-----
20-JUN-1931
```

9. What are the names of the departments managed by people who have dependent female spouses?

Query:

```
display(project(join(department)(project(select(select(dependent)(relationship='Spouse'))(sex='F'))(essn))(department.mgrssn=essn))(dname))
```

Answer:

```
dname
-----
Research
```

10. What are the names of the male dependents who are also dependent on a male employee? (Use \cap)

Query:

```
display(project(select(join(project((project(select(employee))(sex='M'))(ssn))intersect(project(select(dependent)(sex='M'))(essn)))(essn))(dependent)(dependent.essn=essn))(sex='M'))(dependent_name))
```

Answer:

```
dependent_name
-----
Theodore
Michael
```

11. What are the salaries of the employees from department 5 who are NOT working on ProductY?

Query:

```
display(project(select(join(employee)((project(works_on)(empssn))difference(project(join(works_on)(project(select(proposal)(pname='ProductY'))(pnumber))(pnumber=works_on.pno))(empssn)))(empssn=employee.ssn))(dno='5'))(salary))
```

Answer:

```
salary
-----
38000
```

12. What are the names of the departments which employ all genders? (In other words, the departments that have at least one woman and at least one man.) (Yup, this is the \div query.)

Query:

```
a=project(employee)(sex,dno)
b=project(employee)(sex)
dn=project(a)(dno)
pro=(b)product(dn)
dif=(pro)difference(a)
se=project(dif)(dno)
```

```
c=(dn)difference(se)
jo=join(c)(department)(c.dno=department.dnumber)
display(project(jo)(dname))
```

Answer:

```
dname
-----
Research
Administration
```