

# Bài tập 1.a:

## EMPLOYEE

Fname	Minit	Lname	<u>Ssn</u>	Bdate	Address	Sex	Salary	Super_ssn	Dno
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## DEPARTMENT

Dname	<u>Dnumber</u>	Mgr_ssn	Mgr_start_date
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## DEPT\_LOCATIONS

<u>Dnumber</u>	<u>Dlocation</u>
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## PROJECT

Pname	<u>Pnumber</u>	Plocation	Dnum
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## WORKS\_ON

<u>Essn</u>	<u>Pno</u>	Hours
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## DEPENDENT

<u>Essn</u>	<u>Dependent_name</u>	Sex	Bdate	Relationship
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### Solve all below queries using Relational Algebra:

1. Find numbers and names of projects which employee (SSN='123456789') did not involve
2. Find numbers and names of projects which employee (SSN='123456789') has participated
3. For each employee, show SSN, name and his supervisor name
4. Show (SSN, Fname, Lname) of all employees who have the highest salary
5. Show employee's SSN, name and his/her department name of all employees who did not participate into any projects.
6. Find the highest salary in 'Female' employees
7. Show the SSN, name and the salary of all department managers.
8. Show the SSN, name and the salary of employees who are the manager or supervisors.
9. Show numbers and names of departments which have more than 2 employees
10. Show SSN and names of supervisors who supervise more than 2 employees.
11. Find name of departments which all employees are females.
12. Find employees who participate in projects most.
13. Find name of employees whose all child are son.
14. Find employee who has participated in all projects which are controlled by department 'Research'

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

DEPT\_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

WORKS\_ON

Essn	Pno	Hours
123456789	1	32.5
123456789	2	7.5
666884444	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0
987654321	20	15.0

PROJECT

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

# Bài tập 1.b:

## CUSTOMER

ID	NAME	City	O_ID	DATE	CUSTOMER_ID	Amount
1	Brian	Chicago	001	May 30	2	200
2	Jane	Houston	002	June 8	3	500
3	Katie	Houston	003	June 12	2	100
4	John	Houston	004	May 30	4	300
5	Leo	San Jose	005	June 14	2	400
			006	May 30	3	300

## ORDER

## PRODUCT

PID	Pname	Type
P1	Cinderella	Books
P2	Dell XYZ	Computers
P3	Aladdin	Books
P4	HP 123	Computers

## DETAILS

O_ID	P_ID
001	P1
001	P3
002	P2
003	P2
004	P2
005	P2
006	P1

Solve all below queries using **Relation Calculus**

1. Find all customers in Chicago.
2. Find all customers who purchased in May 30
3. Find name of customers who don't make any order
4. Find id, date and amount of all orders of "Brian"
5. Find name of customers whom every amounts of their orders  $\geq 300$
6. Find name of products which have never been sold.
7. Find name of customers who have bought all items
8. Find name of customers who have bought all books.
9. Find name of customers who bought 'Dell XYZ'
10. Find name of computers which has been sold in May 30.

11. For each customer, show id, name and the number of their orders
12. Show id and name of customers who had paid the most for their orders.
13. Show the date and the sales for each date.
14. Show the dates which had the most sales.
15. Which city has the most sales?
16. Find ID and Name of customer who don't make any order
17. For each customer, show id, name and the number orders (0 if they don't make any order)
18. Find name of customers whom every amounts of their orders must be  $\geq 300$