Assignment Solution SQL and Relational Algebra

- **Subject: Database Management System**

1) Given relation schema as below

Employee(emp_id, name, address, telephone, salary, age)
Works_on (emp_id, project_id, join_date)
Project(project_id, project_name, city,duration, budget)
Write the SQL commands for the following.

1. **Insert new record in project relation.**

```
INSERT INTO Project
VALUES (102, 'DBMS project', 'kathmandu', 2, 55000);
```

2. **Find the name of employees with the name of project they work on.**

```
SELECT Employee.name, Project.project_name
FROM Employee, Works_on, Project
WHERE Employee.emp_id = Works_on.emp_id
 AND Works_on.project_id = Project.project_id;
```

3. **Find the name and city of that project on which salary of employee is greater than or equal to 20000.**

```
SELECT Project.project_name, Project.city
FROM Employee, Works_on, Project
WHERE Employee.emp_id = Works_on.emp_id
AND Works_on.project_id = Project.project_id
AND Employee.salary >= 20000;
```

4. **List the name of employees whose name starts with “m” and ends with “a”**

```
SELECT name
FROM Employee
WHERE name LIKE 'm%a';
```

5. **Find the employee name and project name of those employees who living in address Pokhara.**

```
SELECT Employee.name, Project.project_name
FROM Employee, Works_on, Project
WHERE Employee.emp_id = Works_on.emp_id
 AND Works_on.project_id = Project.project_id
 AND Employee.address = 'Pokhara';
```

6. **List name of employee whose age is greater than average age of all employees.**

```
SELECT name
FROM Employee
WHERE age > (SELECT AVG(age) FROM Employee);
```

7. **List employee id of all employees whose age is greater than minimum budget of all projects.**

```
SELECT emp_id
FROM Employee
WHERE age > (SELECT MIN(budget) FROM Project);
```

8. **List employee id of all employees who joint project on "05/01/2015"**

```
SELECT emp_id
FROM Works_on
WHERE join_date = '2015-05-01';
```

9. **List the name of employees whose name starts with N or with K**

```
SELECT name
FROM Employee
WHERE name LIKE 'N%' OR name LIKE 'K%';
```

10. **Display the project id with maximum budget.**

```
SELECT project_id
FROM Project
WHERE budget = (SELECT MAX(budget) FROM Project);
```

2) Given Relational Schema as below.

Sailors (sid, sname, age,rating)
Boats(bid, bname,color)
Reserves(sid,bid,day)
Write the SQL for the following.

Note: For your convenience, rows in the above relation are inserted as needed, facilitating easier demonstration of the output. However, during exams, it is not mandatory to insert all rows unless prompted by specific questions.

The output is generated to verify whether the query conforms to the question's requirements, ensuring its relevance and accuracy. But it is not required in exam.

Sailors

sid	sname	age	rating
22	Dustin	45	7
29	Brutus	33	1
31	Lubber	55	8
32	Andy	25	8
58	Rusty	35	10
64	Horatio	35	7
71	Zorba	16	10
74	Horatio	40	9
85	Art	25	3
95	Bob	63	3

Boats

bid	bname	color
101	Interlake	blue
102	Interlake	red
103	Clipper	green
104	Marine	red

Reserves

sid	bid	day
22	101	1998-10-10
22	102	1998-10-10
22	103	1998-10-08
22	104	1998-10-07
31	102	1998-11-10
31	103	1998-11-06
31	104	1998-11-12
64	101	1998-09-05
64	102	1998-09-08
74	103	1998-09-08

1. **Find the sid of the sailor who have reserved red or green boat.**

```
SELECT distinct Sailors.sid
FROM Sailors, Boats, Reserves
WHERE Sailors.sid = Reserves.sid
AND Reserves.bid = Boats.bid
AND (Boats.color = 'red' OR Boats.color = 'green');
```

Output

sid
22
31
64
74

2. **Find sid's of sailors who've reserved a red and a green boat.**

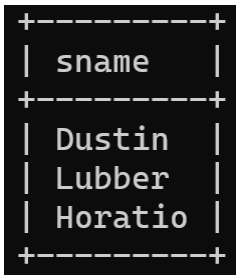
```
SELECT Sailors.sid
FROM Sailors, Boats, Reserves
WHERE Sailors.sid = Reserves.sid
AND Reserves.bid = Boats.bid
AND Boats.color = 'red'
INTERSECT
SELECT Sailors.sid
FROM Sailors, Boats, Reserves
WHERE Sailors.sid = Reserves.sid
AND Reserves.bid = Boats.bid
AND Boats.color = 'green';
```

Output

sid
22
31

3. **Find names of sailors who have reserved boat id 103:**

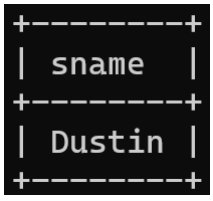
```
SELECT Sailors.sname
FROM Sailors, Reserves
WHERE Sailors.sid = Reserves.sid
AND Reserves.bid = 103;
```



sname
Dustin
Lubber
Horatio

4. **Find sailors who've reserved all boats**

```
SELECT Sailors. sname
FROM Sailors
WHERE NOT EXISTS
(SELECT Boats.bid FROM Boats
 WHERE NOT EXISTS
( SELECT Reserves.bid  FROM Reserves  WHERE Reserves.bid=Boats.bid AND
Reserves.sid=Sailors.sid));
```



sname
Dustin

This SQL query retrieves the names of sailors who have reserved all boats. Here's an explanation of each part of the query:

- ✓ **SELECT Sailors.sname:** This is the main query that selects the sailor names from the Sailors table.
- ✓ **FROM Sailors:** Specifies that the data is being selected from the Sailors table.
- ✓ **WHERE NOT EXISTS (SELECT Boats.bid FROM Boats WHERE NOT EXISTS (SELECT Reserves.bid FROM Reserves WHERE Reserves.bid=Boats.bid AND Reserves.sid=Sailors.sid)):** This is a subquery that filters the sailors who have reserved all boats.
- ✓ The innermost subquery **(SELECT Reserves.bid FROM Reserves WHERE Reserves.bid=Boats.bid AND Reserves.sid=Sailors.sid)** checks for each sailor (Sailors.sid) whether there exists a reservation for a boat (Reserves.bid) that matches both the sailor and the boat.
- ✓ The middle subquery **(SELECT Boats.bid FROM Boats WHERE NOT EXISTS (SELECT Reserves.bid FROM Reserves WHERE Reserves.bid=Boats.bid AND Reserves.sid=Sailors.sid))** checks for each boat (Boats.bid) whether there does not exist a reservation by the current sailor for that boat.
- ✓ The outer query **WHERE NOT EXISTS (SELECT Boats.bid FROM Boats WHERE NOT EXISTS ...)** checks if there are no boats for which a reservation does not exist for the current sailor.
- ✓ Finally, the outermost WHERE clause ensures that only sailors who do not meet the condition of not having reserved all boats are selected.

Overall, the query ensures that it selects sailors who have made reservations for all available boats.

5. **Find the name and age of youngest sailor**

```
SELECT Sailors.sname, Sailors.age
FROM Sailors
WHERE Sailors.age = (SELECT MIN(Sailors.age)
 FROM Sailors Sailors );
```

sname	age
Zorba	16

6. **Find name and age of the oldest sailor(s) with rating >7**

```
SELECT Sailors.sname, Sailors.age
FROM Sailors
WHERE Sailors.rating > 7
AND Sailors.age = (
   SELECT MAX(Sailors.age)
   FROM Sailors
   WHERE Sailors.rating > 7
);
```

sname	age
Lubber	55

7. **Find the age of the youngest sailor for each rating level**

```
SELECT rating, MIN(Age) as youngest_age
FROM Sailors
GROUP BY rating;
```

rating	youngest_age
1	33
3	25
7	35
8	25
9	40
10	16

8. **Find the age of the youngest sailor with age >= 18 for each rating level with at least 2 such sailors**

```
SELECT rating, MIN(Age)
FROM Sailors
WHERE age>= 18
GROUP BY rating
HAVING COUNT(*)>= 2;
```

rating	MIN(Age)
3	25
7	35
8	25

9. **Find the average age for each rating, and order results in ascending order on avg.**

```
SELECT rating, AVG(age) AS avg_age
FROM Sailors
GROUP BY rating
ORDER BY avg_age ASC;
```

rating	avg_age
10	25.5000
1	33.0000
9	40.0000
7	40.0000
8	40.0000
3	44.0000

3) Consider the relational database of figure given below, where primay keys are underlined. Given an expression in SQL for each of the following queries.

Employee(employee_name,street,city)
Works(employee_name,company_name,salary)
Company(company_name,ciy)
Manages(employee_name,manager_name)

Note: For your convenience, rows in the above relation are inserted as needed, facilitating easier demonstration of the output. However, during exams, it is not mandatory to insert all rows unless prompted by specific questions.

The output is generated to verify whether the query conforms to the question's requirements, ensuring its relevance and accuracy. But it is not required in exam.

Employee

employee_name	street	city
John	123 Main St	New York
Alice	456 Elm St	New York
Bob	123 Maple Avenue	Springfield
Mary	123 Main st	New York
David	222 Cedar St	Chicago

Works

employee_name	company_name	salary
John	First Bank Corporation	15000.00
Alice	First Bank Corporation	12000.00
Bob	Small Bank Corporation	10000.00
Mary	Small Bank Corporation	18000.00
David	Big Corporation	20000.00

company

company_name	city
First Bank Corporation	New York
Small Bank Corporation	Los Angeles
Big Corporation	Chicago

Manages

employee_name	manager_name
Alice	John
Bob	Alice
Mary	John
David	Mary

i. **Find the names of all employees who work for the First Bank Corporation.**

```
SELECT employee_name
FROM Works
WHERE company_name = 'First Bank Corporation';
```

Output

employee_name
John
Alice

ii. **Find the names of all employees who live in the same city and on the same street as do their managers.**

```
SELECT E1.employee_name
FROM Employee AS E1, Employee AS E2, Manages AS M
WHERE E1.employee_name = M.employee_name
  AND E2.employee_name = M.manager_name
  AND E1.street = E2.street
  AND E1.city = E2.city;
```

Output

employee_name
Mary

- ✓ **SELECT clause**: Finally, the SELECT clause specifies what data to retrieve. In this case, it selects the employee_name from E1, which represents the name of the employees who meet all the conditions specified in the WHERE clause.
- ✓ **FROM clause:** The query starts by selecting from three tables: Employee (twice, aliased as E1 and E2) and Manages (aliased as M). This is the source of data for the query.
- ✓ **WHERE clause:** The conditions specified in the WHERE clause filter the results. Here's what each condition does:
  - ➢ **E1.employee_name = M.employee_name:** This condition ensures that the employee in E1 is the same as the employee in the Manages table, meaning that E1 is an employee who is managed by someone.
  - ➢ **E2.employee_name = M.manager_name:** This condition ensures that E2 represents the manager of the employee in E1.
  - ➢ **E1.street = E2.street:** This condition checks if both the employee (E1) and their manager (E2) live on the same street.
  - ➢ **E1.city = E2.city:** This condition checks if both the employee (E1) and their manager (E2) live in the same city.

By combining these elements, the query retrieves the names of employees who live in the same city and on the same street as their managers. This is achieved by joining the Employee table with itself (via the E1 and E2 aliases) based on the relationships defined in the Manages table and filtering the results based on the specified conditions.

iii. Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000 per annum

```
SELECT Employee.employee_name, Employee.street, Employee.city
FROM Employee, Works
WHERE Employee.employee_name = Works.employee_name
AND Works.company_name = 'First Bank Corporation'
AND Works.salary > 10000;
```

Output

```
+---------------+-------------+----------+
| employee_name | street      | city     |
+---------------+-------------+----------+
| John          | 123 Main St | New York |
| Alice         | 456 Elm St  | New York |
+---------------+-------------+----------+
```

iv. Find the names of all employees who earn more than every employee of Small Bank Corporation

```
SELECT employee_name
FROM Works
WHERE salary > ALL
(
   SELECT salary
   FROM Works
   WHERE company_name = 'Small Bank Corporation'
);
```

Output

```
+---------------+
| employee_name |
+---------------+
| David         |
+---------------+
```

v. Find those companies whose employees earn a higher salary, on average, than the average salary at First Bank Corporation.

```
SELECT company_name
FROM Works
GROUP BY company_name
HAVING AVG(salary) > (
   SELECT AVG(salary)
   FROM Works
   WHERE company_name = 'First Bank Corporation'
);
```

Output

```
+----------------------+
| company_name         |
+----------------------+
| Big Corporation      |
| Small Bank Corporation |
+----------------------+
```

vi. Find the names of all employees in this database who live in the same city as the company for which they work

```
SELECT Employee.employee_name
FROM Employee, Works, Company
WHERE Employee.employee_name = Works.employee_name
AND Works.company_name = Company.company_name
AND Employee.city = Company.city;
```

employee_name
John
Alice
David

vii. modify the databases so that John now lives in Chicago

```
UPDATE Employee
SET city = 'Chicago'
WHERE employee_name = 'John';
```

Now ,Employee table becomes

employee_name	street	city
John	123 Main St	Chicago
Alice	456 Elm St	New York
Bob	123 Maple Avenue	Springfield
Mary	123 Main st	New York
David	222 Cedar St	Chicago

viii. Give all employees of First Bank Corporation a 10 percent raise

```
UPDATE Works
SET salary = salary * 1.1
WHERE company_name = 'First Bank Corporation';
```

Now works table looks like,

employee_name	company_name	salary
John	First Bank Corporation	16500.00
Alice	First Bank Corporation	13200.00
Bob	Small Bank Corporation	10000.00
Mary	Small Bank Corporation	18000.00
David	Big Corporation	20000.00

ix. **Give salary of all managers of First Bank Corporation a 10 percent raise.**

```
UPDATE Works
SET salary = salary * 1.1
WHERE employee_name IN (SELECT manager_name FROM Manages)
AND company_name = 'First Bank Corporation';
```

Note that John and Alice both are managers of First Bank corporation

employee_name	company_name	salary
John	First Bank Corporation	18150.00
Alice	First Bank Corporation	14520.00
Bob	Small Bank Corporation	10000.00
Mary	Small Bank Corporation	18000.00
David	Big Corporation	20000.00

x. Delete all in the work relation for employees of small bank corporation.

```
DELETE FROM Works
WHERE company_name = 'small bank corporation';
```

Now ,works relation becomes

employee_name	company_name	salary
John	First Bank Corporation	18150.00
Alice	First Bank Corporation	14520.00
David	Big Corporation	20000.00

xi. Find all employees who earn more than the average salary of all employees of their company

```
SELECT employee_name
FROM works a
WHERE salary > (SELECT AVG(salary)
FROM works b
WHERE a.company_name = b.company_name);
```

Output

employee_name
John

4) Consider the following schema

```
Branch(bname, bcity, assets)
Customer(cname, street, ccity)
Depositor (cname, account#)
Account(bname, account#, balance)
Loan(bname, loan#, amount)
Borrower(cname, loan#)
```

Write SQL statement for the following

1. **Find the name of all branch in account relation.**

   ```
   SELECT DISTINCT bname
   FROM Account;
   ```

2. **Finds the names of all branches that have assets greater than at least one branch located in Burnaby.**

   ```
   SELECT bname
   FROM Branch
   WHERE assets > some (SELECT assets FROM Branch WHERE bcity = 'Burnaby');
   ```

3. **Find all customers whose street includes the substring "Main".**

   ```
   SELECT cname
   FROM Customer
   WHERE street LIKE '%Main%';
   ```

4. **Finds all customers who have a loan and an account at the SFU branch.**

   ```
   SELECT DISTINCT Borrower.cname
   FROM Borrower, Loan
   WHERE Loan.`loan#` = Borrower.`loan#`
   AND Loan.bname = 'SFU'
   INTERSECT
   SELECT DISTINCT Depositor.cname
   FROM Depositor, Account
   WHERE Depositor.`account#` = Account.`account#`
   AND Account.bname = 'SFU';
   ```

5. **Find the name and loan number of all customers who have a loan at SFU branch.**

   ```
   SELECT DISTINCT Borrower.cname, Borrower.`loan#`
   FROM Borrower, Loan
   WHERE Borrower.`loan#` = Loan.`loan#`
   AND Loan.bname = 'SFU';
   ```

6. **Finding all customers who have a loan but not an account at the SFU branch**

```
SELECT DISTINCT Borrower.cname
FROM Borrower, Loan
WHERE Loan.`loan#` = Borrower.`loan#`
AND Loan.bname = 'SFU'
EXCEPT
SELECT DISTINCT Depositor.cname
FROM Depositor, Account
WHERE Depositor.`account#` = Account.`account#`
AND Account.bname = 'SFU';
```

7. **Find the branches whose assets are greater than some branch in Pokhara.**

```
SELECT bname
FROM Branch
WHERE assets > SOME(
   SELECT assets
   FROM branch
   WHERE bcity='Pokhara'
);
```

5) Consider the following relational schema

branch (branch-name, branch-city, assets)
customer (customer-name, customer-street, customer-city)
account (account-number, branch-name, balance)
loan (loan-number, branch-name, amount)
depositor (customer-name, account-number)
borrower (customer-name, loan-number)
Write relational algebraic expressions for the following

1. **Find all loans of over $1200**
   $(\sigma_{amount>1200}(loan))$

2. **Find the loan number for each loan of an amount greater than $1200**
   $\prod_{loan\text{-}number} (\sigma_{amount > 1200} (loan))$

3. **Find the names of all customers who have a loan, an account, or both, from the bank.**
   $\prod_{customer\text{-}name} (borrower) \cup \prod_{customer\text{-}name} (depositor)$

4. **Find the names of all customers who have a loan and an account at bank.**
   $\prod_{customer\text{-}name} (borrower) \cap \prod_{customer\text{-}name} (depositor)$

5. **Find the names of all customers who have a loan at the Perryridge branch.**
   $\Pi_{\text{customer-name}}$ ($\sigma_{\text{branch-name="Perryridge"}}$ (borrower $\bowtie$ loan))

6. **Find the names of all customers who have a loan at the Perryridge branch but do not have an account at any branch of the bank.**

   $\Pi_{\text{customer-name}}$ ($\sigma_{\text{branch-name="Perryridge"}}$ (borrower $\bowtie$ loan)) -$\Pi_{\textit{customer-name}}$ (depositor)

7. **Find the names of all customers who have a loan at the Perryridge branch.**
   $\Pi_{\text{customer-name}}$($\sigma_{\text{branch-name = "Perryridge"}}$ (borrower $\bowtie$ loan))
8. **Find the largest account balance.**

   $\mathcal{G}_{\text{max(balance)}}$ (account)

9. **Find all customers who have an account from at least the "Downtown" and the Uptown" branches.**

   $\Pi_{\text{customer-name}}$ ($\sigma_{\text{branch-name ="Downtown"}}$(depositor $\bowtie$ account)) $\cap$
   $\Pi_{\text{customer-name}}$ ($\sigma_{\text{branch-name ="Uptown"}}$(depositor$\bowtie$ account))

10. **Find all customers who have an account at all branches located in Brooklyn city.**
    $\Pi_{\textit{customer-name, branch-name}}$ (*depositor* $\bowtie$ *account*)
    $\div \Pi_{\textit{branch-name}}$ ($\sigma_{\textit{branch-city}}$ = "Brooklyn" (*branch*))

11. **Delete all account records in the Perryridge branch.**

    account $\leftarrow$ *account* – $\sigma_{\textit{branch-name = "Perryridge"}}$ *(account)*

12. **Delete all loan records with amount in the range of 0 to 50.**
    loan $\leftarrow$ *loan* – $\sigma_{\textit{amount} \geq 0 \textit{ and amount} \leq 50}$ (*loan*)

13. **Delete all accounts at branches located in Needham.**

    $r_1 \leftarrow \Pi_{\textit{branch-name, account-number, balance}}$ ($\sigma_{\textit{branch-city = "Needham"}}$ *(account* $\bowtie$ *branch)*)
    $r2 \leftarrow \Pi_{\textit{customer-name, account-number}}$ ($r_1 \bowtie$depositor)
    account $\leftarrow$ account – r_1
    depositor $\leftarrow$ depositor – r_2

14. **Insert information in the database specifying that Smith has $1200 in account A-973 at the Perryridge branch.**

    account $\leftarrow$ *account* $\cup$ {("Perryridge", A-973, 1200)}
    depositor $\leftarrow$ *depositor* $\cup$ {("Smith", A-973)}

15. Update interest payments by increasing all balances by 5 percent.

$$account \leftarrow \prod_{account\text{-}number,\ branch\text{-}name,\ balance * 1.05}(account)$$

16. Update all accounts with balances over $10,000 6 percent interest and pay all other 5 percent.

$$account \leftarrow \prod_{account\text{-}number,\ branch\text{-}name,\ balance * 1.06}(\sigma_{balance > 10000}(account)) \cup \prod_{account\text{-}number,\ branch\text{-}name,\ balance * 1.05}(\sigma_{balance \leq 10000}(account))$$

17. Create the view (named all-customer) consisting of branches and their customers.

create view all-customer **as**

$$\prod_{branch\text{-}name,\ customer\text{-}name}(depositor \bowtie account) \cup \prod_{branch\text{-}name,\ customer\text{-}name}(borrower \bowtie loan)$$

6) Consider the following relational database, where primary keys are underlined.

employee(person_name,street,city)

works(person_name,company_name,salary)

company(company_name,city)

manages(person_name,manager_name)

Given an expression in the relational algebra to express each of the following queries.

i) Find the name of all employees who work for first bank corporation.

$$\prod_{person\_name}(\sigma_{company\_name=\text{"first bank corporation"}}(works))$$

ii) Find the name and cities of residence of all employees who work for first bank corporation.

$$\prod_{person\_name,city}(\sigma_{company\_name=\text{"first bank corporation"}}(employee \bowtie works))$$

iii) Find the name, street address and city of residence of all employees who work for first bank corporation and earn more than $10000 per annum.

$$\prod_{person\_name,street,city}(\sigma_{company\_name=\text{"first bank corporation"} \wedge salary>10000}(employee \bowtie works))$$

(Here we assume attribute named salary represent Annual Salary)

iv) Find the name of all employees in this database who lives in same city as the company for which they work.

$$\prod_{person\_name}(employee \bowtie works \bowtie company)$$

v) Find the name of all employees who live in the same city and on the same street as do their managers.

$\Pi_{\text{person\_name}}((\text{employee} \bowtie \text{manages}) \bowtie_{(\text{manages.manager\_name=employee2.person\_name} \wedge \text{employee.street=employee2.street} \wedge \text{employee.city=employee2.city})} (\rho_{\text{employee2}}(\text{employee}))$

vi) Find the name of all employees in this database who do not work for first bank corporation.
$\Pi_{\text{person\_name}}(\sigma_{\text{company\_name} \neq \text{"first bank corporation"}}(\text{works})$

vii) Display the name of employee whose name begin from S.

viii) Find the average salary of employee.
$\mathcal{G}_{\text{avg(salary)}}(\text{works})$

ix) Find the average salary of employee company wise.
$\text{company\_name}\,\mathcal{G}_{\text{avg(salary)}}(\text{works})$

x) Find the name of all employees who earn more than their managers.

$\Pi_{\text{person\_name}}((\text{works} \bowtie \text{manages}) \bowtie_{\text{manages.manager\_name=e2.person\_name} \wedge \text{works.salary>e2.salary}} (\rho_{\text{e2}}(\text{works})))$

In SQL this will works

```
SELECT works.person_name
FROM works NATURAL JOIN manages
JOIN works AS e2 ON manages.manager_name = e2.person_name
AND works.salary > e2.salary;
```

xi) Find the name of employees who earn more than top earner at "NBL company" in the database.

$\text{topearner} \leftarrow \mathcal{G}_{\text{max(salary)}}(\sigma_{\text{company\_name=" NBL company"}}(\text{works}))$
$\text{result} \leftarrow \Pi_{\text{personname}}(\sigma_{\text{salary>topearner}}(\text{works}))$

xii) Find the name of all employee who live in "Lalitpur" and salary is less than 50000

$\Pi_{\text{person\_name}}(\sigma_{\text{city="Lalitpur"} \wedge \text{salary<50000}}(\text{Employee} \bowtie \text{Works}))$

xiii) **Assume that companies may located in several cities. Find all companies located in every city in which small bank corporation is located**.

$\Pi_{\text{company\_name,city}}(\text{company}) \div \Pi_{\text{city}}(\sigma_{\text{company\_name ="small bank corporation"}}(\text{company}))$

xiv)List the name and city of employee who work in "Pokhara" and have salary greater than Rs.50000

$\prod_{Employee.person\_name,Employee.city}$ ($\sigma_{Company.city="Pokhara"\wedge salary>50000}$ (Employee $\bowtie_{Employee.person\_name=works.person\_name}$ (works$\bowtie$company)))

xv) Delete all employee who come from "Chitwan".

Employee$\leftarrow$Employee-$\sigma_{city="Chitwan"}$(Employee)

xvi)Increase salary of all employee by 15%.

Works$\leftarrow\prod_{person_name,company_name,salary*1.15}$(Works)

xvii) Insert new records in employee relation.

employee$\leftarrow$employee U {"Ram","patan", "Lalitpur"}

xviii) Create view for which employee earns 20000$ or more

Create view high_earning_view

$\sigma_{salary>=20000}$ ($\prod_{person\_name,street,city,company\_name,salary}$(employee $\bowtie$ works))

xix)Modify the database so that Ramesh now lives in Kathmandu

employee$\leftarrow\prod_{person_name,street,"Kathmandu"}$ ($\sigma_{person\_name="Ramesh"}$(employee))
U (employee-$\sigma_{person\_name="Ramesh"}$(Employee))

xx) Give all salary of employee of "ABC company" 18.5% rise

works$\leftarrow\prod_{person_name,company_name,salary*1.185}$ ($\sigma_{company\_name="ABC\ company"}$(works))
U (works- $\sigma_{company\_name="ABC\ company"}$(works))