CREATE TABLE EMPLOYEE

( Fname VARCHAR(10) NOT NULL,

Minit CHAR,

Lname VARCHAR(20) NOT NULL,

Ssn CHAR(9) NOT NULL,

Bdate DATE,

Address VARCHAR(30),

Sex CHAR(1),

Salary DECIMAL(5),

Super\_ssn CHAR(9),

Dno INT NOT NULL, PRIMARY KEY(Ssn));

CREATE TABLE DEPARTMENT

( Dname VARCHAR(15) NOT NULL,

Dnumber INT NOT NULL,

Mgr\_ssn CHAR(9) NOT NULL,

Mgr\_start\_date DATE, PRIMARY KEY (Dnumber), UNIQUE (Dname),

FOREIGN KEY (Mgr\_ssn) REFERENCES EMPLOYEE(Ssn) );

CREATE TABLE DEPT\_LOCATIONS

( Dnumber INT NOT NULL, Dlocation VARCHAR(15) NOT NULL,

PRIMARY KEY (Dnumber, Dlocation),

FOREIGN KEY (Dnumber) REFERENCES DEPARTMENT(Dnumber) );

Create table PROJECT

( pname varchar(25) not nullunique, pnumber int not null primary key, plocation varchar(15),

dnum int not null,

foreign key(dnum) references DEPARTMENT(Dnumber));

CREATE TABLE WORKS\_ON

( Essn CHAR(9) NOT NULL,

Pno INT NOT NULL,

Hours DECIMAL(3,1) NOT NULL, PRIMARY KEY (Essn, Pno),

FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn), FOREIGN KEY (Pno) REFERENCES PROJECT(Pnumber) );

CREATE TABLE DEPENDENT

|  |  |  |
| --- | --- | --- |
| ( Essn | CHAR(9) | NOT NULL, |
| Dependent\_name | VARCHAR(15) | NOT NULL, |
| Sex | CHAR, |  |

Bdate DATE,

Relationship VARCHAR(8), PRIMARY KEY (Essn, Dependent\_name),

FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn) );

INSERT INTO EMPLOYEE

VALUES ('Franklin','T','Wong',333445555,'1965-12-08','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,,1);

INSERT INTO DEPARTMENT

VALUES ('Research',5,333445555,'1988-05-22'), ('Administration',4,987654321,'1995-01-01'), ('Headquarters',1,888665555,'1981-06-19');

INSERT INTO PROJECT

VALUES ('ProductX',1,'Bellaire',5), ('ProductY',2,'Sugarland',5),

('ProductZ',3,'Houston',5), ('Computerization',10,'Stafford',4), ('Reorganization',20,'Houston',1), ('Newbenefits',30,'Stafford',4);

INSERT INTO WORKS\_ON

VALUES (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);

INSERT INTO DEPENDENT

VALUES (333445555,'Alice','F','1986-04-04','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');

INSERT INTO DEPT\_LOCATIONS VALUES (1,'Houston'),

(4,'Stafford'),

(5,'Bellaire'),

(5,'Sugarland'),

(5,'Houston');

select \* from EMPLOYEE;

+ + + + + +

+ + + + +

| Fname | Minit | Lname | Ssn | Bdate | Address

| Sex | Salary | Super\_ssn | Dno |

+ + + + + +

+ + + + +

| John | B | Smith | 123456789 | 1965-01-09 | 731 Houston,TX

| M | 30000 | | 5 |

| Franklin | T | Wong | 333445555 | 1965-12-08 Houston TX | M | 40000 | 888665555 | 5 |

|  |  |  |
| --- | --- | --- |
| | | 638 Voss, | |
| | | 5631 Rice, | |
| | | 975 | Fire Oak, |
| | | 450 | Stone, |
| | | 291 | Berry, |
| | | 980 | Dallas, |
| | | 3321 Castle, | |

| Joyce | A | English | 453453453 | 1972-07-31 Houston TX | F | 25000 | 333445555 | 5 |

| Ramesh | K | Narayan | 666884444 | 1962-09-15 Humble TX | M | 38000 | 333445555 | 5 |

| James | E | Borg | 888665555 | 1937-11-10 Houston TX | M | 55000 | NULL | 1 |

| Jennifer | S | Wallace | 987654321 | 1941-06-20 Bellaire TX | F | 43000 | 888665555 | 4 |

| Ahmad | V | Jabbar | 987987987 | 1969-03-29 Houston TX | M | 25000 | 987654321 | 4 |

| Alicia | J | Zelaya | 999887777 | 1968-01-19 Spring TX | F | 25000 | 987654321 | 4 |

+ + + + + +

+ + + + +

8 rows in set (0.00 sec)

select \* from DEPARTMENT;

+ + + + +

| Dname | Dnumber | Mgr\_ssn | Mgr\_start\_date |

+ + + + +

| Headquarters | 1 | 888665555 | 1981-06-19 |

| Administration | 4 | 987654321 | 1995-01-01 |

| Research | 5 | 333445555 | 1988-05-22 |

+ + + + +

3 rows in set (0.00 sec)

select \* from 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 |

+ + + + +

6 rows in set (0.00 sec)

select \* from DEPENDENT;

+ + + + + +

| Essn | Dependent\_name | Sex | Bdate | Relationship |

+ + + + + +

| 123456789 | Alice | F | 1988-12-30 | Daughter |

| 123456789 | Elizabeth | F | 1967-05-05 | Spouse |

| 123456789 | John | M | 1973-04-04 | Brother |

| 123456789 | Michael | M | 1988-01-04 | Son |

| 333445555 | Alice | F | 1986-04-04 | Daughter |

| 333445555 | Joy | F | 1958-05-03 | Spouse |

| 333445555 | Theodore | M | 1983-10-25 | Son |

| 987654321 | Abner | M | 1942-02-28 | Spouse |

+ + + + + +

8 rows in set (0.00 sec)

select \* from WORKS\_ON;

+ + + +

| Essn | Pno | Hours |

+ + + +

| 123456789 | 1 | 32.5 |

| 123456789 | 2 | 7.5 |

| 333445555 | 2 | 10.0 |

| 333445555 | 3 | 10.0 |

| 333445555 | 10 | 10.0 |

| 333445555 | 20 | 10.0 |

| 453453453 | 1 | 20.0 |

| 453453453 | 2 | 20.0 |

| 666884444 | 3 | 40.0 |

| 999887777 | 30 | 30.0 |

+ + + +

10 rows in set (0.00 sec)

select \* from DEPT\_LOCATIONS;

+ + +

| Dnumber | Dlocation |

+ + +

| 1 | Houston |

| 4 | Stafford |

| 5 | Bellaire |

| 5 | Houston |

| 5 | Sugarland |

+ + +

5 rows in set (0.00 sec)

# 3a. Retrieve the name and address of all employees who work for the ‘Research’ department.

select Fname, Minit, Lname, Address from EMPLOYEE e, DEPARTMENT d where e.Dno=d.Dnumber

and d.Dname="Research";

+ + + + +

| Fname | Minit | Lname | Address |

+ + + + +

| John | B | Smith | 731 Houston,TX |

| Franklin | T | Wong | 638 Voss, Houston TX |

| Joyce | A | English | 5631 Rice, Houston TX |

| Ramesh | K | Narayan | 975 Fire Oak, Humble TX |

+ + + + +

# 3b. For every project located in ‘Stafford’, list the project number, the controlling department number, and the department manager’s last name, address, and birth date.

select e.Lname, e.Bdate, e.Address, p.pnumber, p.dnum from EMPLOYEE e, PROJECT p, DEPARTMENT d

where p.plocation="Stafford" and p.dnum=d.Dnumber and d.Mgr\_ssn=e.Ssn;

+ + + + + +

| Lname | Bdate | Address | pnumber | dnum |

+ + + + + +

| Wallace | 1941-06-20 | 291 Berry, Bellaire TX | 10 | 4 |

| Wallace | 1941-06-20 | 291 Berry, Bellaire TX | 30 | 4 |

+ + + + + +

# 3c. For each employee, retrieve the employee’s first and last name and the first and last name

of his or her immediate supervisor.

select e1.Fname, e1.Lname, e2.Fname as manager\_Fname, e2.Lname as manager\_Lname

from EMPLOYEE as e1, EMPLOYEE as e2 where e2.Ssn=e1.Super\_ssn;

+ + + + +

| Fname | Lname | manager\_Fname | manager\_Lname |

+ + + + +

| Franklin | Wong | James | Borg |

| Joyce | English | Franklin | Wong |

| Ramesh | Narayan | Franklin | Wong |

| Jennifer | Wallace | James | Borg |

| Ahmad | Jabbar | Jennifer | Wallace |

| Alicia | Zelaya | Jennifer | Wallace |

+ + + + +

6 rows in set (0.00 sec)

# 3d. Make a list of all project numbers for projects that involve an employee whose last name is ‘Smith’, either as a worker or as a manager of the department that controls the project.

(select distinct pnumber

From PROJECT,DEPARTMENT,EMPLOYEE

where Dnum=Dnumber AND Mgr\_ssn=Ssn AND Lname="Smith") UNION

(Select distinct pnumber

From PROJECT,WORKS\_ON,EMPLOYEE

where pnumber=Pno AND Essn=Ssn AND Lname="Smith");

+ +

| pnumber |

+ +

| 1 |

| 2 |

+ +

2 rows in set (0.00 sec)

# 3e. Retrieve all employees whose address is in Houston, Texas.

select Fname, Minit, Lname from EMPLOYEE

where Address like "%Houston%TX%";

+ + + +

| Fname | Minit | Lname |

+ + + +

| John | B | Smith |

| Franklin | T | Wong |

| Joyce | A | English |

| James | E | Borg |

| Ahmad | V | Jabbar |

+ + + +

5 rows in set (0.00 sec)

# 3f. Retrieve all employees in department 5 whose salary is between $30,000 and $40,000.

select \*

from EMPLOYEE e, DEPARTMENT d

where e.Dno=d.Dnumber and d.Dnumber=5 and e.Salary between 30000 and 40000;

+ + + + + +

+ + + + + + +

+ +

| Fname | Minit | Lname | Ssn | Bdate | Address

| Sex | Salary | Super\_ssn | Dno | Dname | Dnumber | Mgr\_ssn | Mgr\_start\_date |

+ + + + + +

+ + + + + + +

+ +

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | John  | M | | | | B 30000 | | | | | Smith | |  | | 123456789 | 1965-01-09 | 731 Houston,TX  5 | Research | 5 | 333445555 | |
| 1988-05-22  | Franklin | T | | | | | | | Wong | | | 333445555 | 1965-12-08 | 638 Voss, |

Houston TX | M | 40000 | 888665555 | 5 | Research | 5 | 333445555 | 1988-05-22 |

| Ramesh | K | Narayan | 666884444 | 1962-09-15 | 975 Fire Oak, Humble TX | M | 38000 | 333445555 | 5 | Research | 5 | 333445555 | 1988-05-22 |

+ + + + + +

+ + + + + + +

+ +

3 rows in set (0.00 sec)

# 4a. Retrieve the names of all employees who do not have supervisors.

select Fname, Minit, Lname from EMPLOYEE e

where

not exists(select \* from EMPLOYEE as s where e.Super\_ssn=s.Ssn);

+ + + +

| Fname | Minit | Lname |

+ + + +

| John | B | Smith |

| James | E | Borg |

+ + + +

2 rows in set (0.00 sec)

# 4b. Retrieve the name of each employee who has a dependent with the same first name and is the same gender as the employee

select Fname, Minit, Lname

from EMPLOYEE e, DEPENDENT d where e.Fname=d.Dependent\_name

and e.Sex=d.Sex;

+ + + +

| Fname | Minit | Lname |

+ + + +

| John | B | Smith |

+ + + +

1 row in set (0.00 sec)

# 4c. Retrieve the names of employees who have no dependents.

select Fname, Minit, Lname from EMPLOYEE where

not exists(select \* from DEPENDENT where Ssn=Essn);

+ + + +

| Fname | Minit | Lname |

+ + + +

| Joyce | A | English |

| Ramesh | K | Narayan |

| James | E | Borg |

| Ahmad | V | Jabbar |

| Alicia | J | Zelaya |

+ + + +

5 rows in set (0.00 sec)

# 4d. List the names of managers who have at least one dependent.

select Fname, Minit, Lname from EMPLOYEE where

exists(select \* from DEPARTMENT where Ssn=Mgr\_ssn and Dno=Dnumber) and

exists(select \* from DEPENDENT where Ssn=Essn);

+ + + +

| Fname | Minit | Lname |

+ + + +

| Franklin | T | Wong |

| Jennifer | S | Wallace |

+ + + +

2 rows in set (0.00 sec)

# 4e. Retrieve the Social Security numbers of all employees who work on project numbers 1, 2, or 3.

select distinct Essn from WORKS\_ON where Pno in (1,2,3);

+ +

| Essn |

+ +

| 123456789 |

| 453453453 |

| 333445555 |

| 666884444 |

+ +

4 rows in set (0.00 sec)

# 4f. Find the sum of the salaries of all employees of the ‘Research’ department, as well as the maximum salary, the minimum salary, and the average salary in this department.

select sum(Salary), max(Salary), min(Salary), avg(salary) from EMPLOYEE, DEPARTMENT

where Dno=Dnumber and Dname="Research";

+ + + + +

| sum(Salary) | max(Salary) | min(Salary) | avg(salary) |

+ + + + +

| 133000 | 40000 | 25000 | 33250.0000 |

+ + + + +

1 row in set (0.00 sec)

# 4g. For each department, retrieve the department number, the number of employees in the department, and their average salary.

select Dno, count(\*), avg(Salary) from EMPLOYEE

group by Dno;

+ + + +

| Dno | count(\*) | avg(Salary) |

+ + + +

| 1 | 1 | 55000.0000 |

| 4 | 3 | 31000.0000 |

| 5 | 4 | 33250.0000 |

+ + + +

3 rows in set (0.00 sec)

BANK DATABASE:

create table branch( branch\_name varchar(25), branch\_city varchar(25), assets int,

primary key(branch\_name));

create table account( accno int,

branch\_name varchar(25), balance int,

primary key(accno));

create table customer( customer\_name varchar(25), customer\_street varchar(25), customer\_city varchar(25), primary key(customer\_name));

create table depositor( customer\_name varchar(25), accno int,

primary key(customer\_name,accno),

foreign key(customer\_name) references customer(customer\_name), foreign key(accno) references account(accno) on delete cascade);

create table loan(

loan\_number int, branch\_name varchar(25), amount int,

primary key(loan\_number),

foreign key(branch\_name) references branch(branch\_name));

insert into branch values('jaynagar','bangalore',15000000),

('basavanagudi','bangalore',25000000), ('noida','delhi',50000000),

('marine drive','mumbai',40000000), ('green park','delhi',30000000);

insert into account values(123,'jaynagar',25000); insert into account values(156,'jaynagar',30000); insert into account values(456,'basavanagudi',15000); insert into account values(789,'noida',25000);

insert into account values(478,'marine drive',48000); insert into account values(778,'green park',60000); insert into account values(189,'basavanagudi',50000);

insert into customer values('ramu','jaynagar','bangalore'); insert into customer values('kumar','basavanagudi','bangalore');

insert into customer values('john','noida','delhi');

insert into customer values('mike','marine drive','mumbai'); insert into customer values('sachin','green park','delhi');

insert into depositor values('ramu',123); insert into depositor values('ramu',156); insert into depositor values('ramu',189); insert into depositor values('kumar',456); insert into depositor values('john',789); insert into depositor values('mike','478'); insert into depositor values('sachin','778');

insert into loan values(1111,'jaynagar',250000); insert into loan values(2222,'basavanagudi',350000); insert into loan values(3333,'noida',150000);

insert into loan values(4444,'marine drive',1500000); insert into loan values(5555,'green park',7500000);

mysql> select \* from branch;

+ + + +

| branch\_name | branch\_city | assets |

+ + + +

| basavanagudi | bangalore | 25000000 |

| green park | delhi | 30000000 |

| jaynagar | bangalore | 15000000 |

| marine drive | mumbai | 40000000 |

| noida | delhi | 50000000 |

+ + + +

5 rows in set (0.00 sec)

mysql> select \* from account;

+ + + +

| accno | branch\_name | balance |

+ + + +

| 123 | jaynagar | 25000 |

| 156 | jaynagar | 30000 |

| 189 | basavanagudi | 50000 |

| 456 | basavanagudi | 15000 |

| 478 | marine drive | 48000 |

| 778 | green park | 60000 |

| 789 | noida | 25000 |

+ + + +

7 rows in set (0.00 sec)

mysql> select \* from depositor;

+ + +

| customer\_name | accno |

+ + +

| ramu | 123 |

7 rows in set (0.00 sec) mysql> select \* from customer;

|  |  |
| --- | --- |
| | ramu | | 156 | |
| | ramu | | 189 | |
| | kumar | | 456 | |
| | mike | | 478 | |
| | sachin | | 778 | |
| | john | | 789 | |
| + | + + |

+ + + +

| customer\_name | customer\_street | customer\_city |

+ + + +

| john | noida | delhi |

| kumar | basavanagudi | bangalore |

| mike | marine drive | mumbai |

| ramu | jaynagar | bangalore |

| sachin | green park | delhi |

+ + + +

5 rows in set (0.00 sec)

mysql> select \* from loan;

+ + + +

| loan\_number | branch\_name | amount |

+ + + +

| 1111 | jaynagar | 250000 |

| 2222 | basavanagudi | 350000 |

| 3333 | noida | 150000 |

| 4444 | marine drive | 1500000 |

| 5555 | green park | 7500000 |

+ + + +

5 rows in set (0.00 sec)

# 5a. Find all the customers who have atleast two accounts at the main branch

select distinct(customer\_name), count(\*) from account a, depositor d

where a.accno=d.accno and

d.accno in (select accno from account where branch\_name='jaynagar') group by d.customer\_name having count(\*)>=2;

+ + +

| customer\_name | count(\*) |

+ + +

| ramu | 2 |

+ + +

1 row in set (0.00 sec)

# 5b. Find all the customers who have an account at all the branches located in a specified city.

select d.customer\_name from

account a, depositor d, branch b where b.branch\_name=a.branch\_name

and a.accno=d.accno and

b.branch\_city='bangalore' group by customer\_name having

count(distinct b.branch\_name) = (select count(branch\_name) from branch where branch\_city='bangalore');

or

# 5b. Find all the customers who have an account at all the branches located in a specified city

SELECT d.customer\_name FROM account a

JOIN depositor d ON a.accno = d.accno

JOIN branch b ON a.branch\_name = b.branch\_name WHERE b.branch\_city = 'bangalore'

GROUP BY d.customer\_name

HAVING COUNT(DISTINCT b.branch\_name) = (SELECT COUNT(branch\_name) FROM branch WHERE branch\_city = 'bangalore');

+ +

| customer\_name |

+ +

| ramu |

+ +

1 row in set (0.00 sec)

# 5c. Demonstrate how you delete all account tuples at every branch located in a specified city

delete from account where branch\_name

in (select branch\_name from branch where branch\_city='delhi' and accno

<> 0);

after executing the delete query output will "delete from account Query OK, 2 rows affected (0.03 sec)"

## Before deletion account table

select \* from branch;

+ + + +

| branch\_name | branch\_city | assets |

+ + + +

| basavanagudi | bangalore | 25000000 |

| green park | delhi | 30000000 |

| jaynagar | bangalore | 15000000 |

| marine drive | mumbai | 40000000 |

| noida | delhi | 50000000 |

+ + + +

5 rows in set (0.00 sec) select \* from account;

+ + + +

| accno | branch\_name | balance |

+ + + +

| 123 | jaynagar | 25000 |

| 156 | jaynagar | 30000 |

| 189 | basavanagudi | 50000 |

| 333 | basavanagudi | 25000 |

| 456 | basavanagudi | 15000 |

| 478 | marine drive | 48000 |

| 778 | green park | 60000 |

| 789 | noida | 25000 |

+ + + +

8 rows in set (0.00 sec)

## After deletion account table

select \* from account;

+ + + +

| accno | branch\_name | balance |

+ + + +

| 123 | jaynagar | 25000 |

| 156 | jaynagar | 30000 |

| 189 | basavanagudi | 50000 |

| 333 | basavanagudi | 25000 |

| 456 | basavanagudi | 15000 |

| 478 | marine drive | 48000 |

+ + + +

6 rows in set (0.00 sec)