

department table

```
create table department (  
    dept_name varchar(100) PRIMARY KEY,  
  
    location varchar(100)  
);
```

Employee table

```
CREATE TABLE employee (  
    emp_id NUMBER PRIMARY KEY,  
    name VARCHAR2(50) NOT NULL,  
    dob DATE NOT NULL,  
    division VARCHAR2(20) NOT NULL  
        CHECK (division IN ('Dhaka', 'Chattogram', 'Khulna', 'Rajshahi', 'Barishal', 'Sylhet', 'Rangpur')),  
    cell_no VARCHAR2(11) UNIQUE NOT NULL  
        CHECK (  
            cell_no LIKE '017%' OR  
            cell_no LIKE '015%' OR  
            cell_no LIKE '016%' OR  
            cell_no LIKE '019%'  
        ),  
    marital_status VARCHAR2(20) NOT NULL  
        CHECK (marital_status IN('married','single', 'divorced')),  
    basic_salary NUMBER(10, 2) NOT NULL  
        CHECK (basic_salary BETWEEN 8250 AND 78000),  
    blood_group VARCHAR2(3)  
        CHECK (blood_group IN ('A+', 'A-', 'B+', 'B-', 'AB+', 'AB-', 'O+', 'O-')),  
    dept_name VARCHAR2(100),
```

```
CONSTRAINT fk_department FOREIGN KEY (dept_name)
    REFERENCES department(dept_name)
    ON DELETE SET NULL
);
```

Car table

```
CREATE TABLE car (
    car_id INT PRIMARY KEY,
    brand VARCHAR2(30) NOT NULL,
    model VARCHAR2(30) NOT NULL,
    reg_year NUMBER(4) NOT NULL,
    color VARCHAR2(20),
    owner_id INT NOT NULL,
    FOREIGN KEY (owner_id) REFERENCES employee(emp_id)
    ON DELETE CASCADE
);
```

Educational\_inst table

```
CREATE TABLE educational_inst (
    institution_id INT PRIMARY KEY,
    name VARCHAR2(100) NOT NULL,
    llevel VARCHAR2(20) NOT NULL
    CHECK (llevel IN ('School', 'College', 'University')),
    location VARCHAR2(100) NOT NULL
);
```

Child table

```

CREATE TABLE child (
    child_id INT PRIMARY KEY,
    name VARCHAR(50) NOT NULL,
    dob DATE NOT NULL,
    llevel VARCHAR2(20) NOT NULL
        CHECK (llevel IN ('Primary', 'Secondary', 'Higher Secondary', 'University')),
    institution_id INT,
    parent_id INT NOT NULL,
    FOREIGN KEY (institution_id) REFERENCES educational_inst(institution_id)
        ON DELETE SET NULL,
    FOREIGN KEY (parent_id) REFERENCES employee(emp_id)
        ON DELETE CASCADE
);

```

Insert necessary data in the corresponding tables.

```

INSERT INTO department (dept_name, location) VALUES
('CSE', 'Building A');

INSERT INTO department (dept_name, location) VALUES
('EEE', 'Building B');

INSERT INTO department (dept_name, location) VALUES
('FH Hall Office', 'Building C');

```

```

INSERT INTO employee (emp_id, name, dob, division, cell_no, marital_status, basic_salary, blood_group,
dept_name)
VALUES
(1, 'Helal', TO_DATE('1985-07-23', 'YYYY-MM-DD'), 'Dhaka', '01712345678', 'married', 50000, 'A+', 'CSE');

```

```
INSERT INTO employee (emp_id, name, dob, division, cell_no, marital_status, basic_salary, blood_group, dept_name)
```

```
VALUES
```

```
(2, 'Shafiq', TO_DATE('1990-05-15', 'YYYY-MM-DD'), 'Chattogram', '01698765432', 'single', 45000, 'B-', 'EEE');
```

```
INSERT INTO employee (emp_id, name, dob, division, cell_no, marital_status, basic_salary, blood_group, dept_name)
```

```
VALUES
```

```
(3, 'Abu Bakar', TO_DATE('1988-03-10', 'YYYY-MM-DD'), 'Sylhet', '01912543210', 'married', 78000, 'O-', 'FH Hall Office');
```

```
INSERT INTO employee (emp_id, name, dob, division, cell_no, marital_status, basic_salary, blood_group, dept_name)
```

```
VALUES
```

```
(4, 'Rafiqul', TO_DATE('1988-03-10', 'YYYY-MM-DD'), 'Sylhet', '01912549990', 'married', 78000, 'A+', 'FH Hall Office');
```

```
INSERT INTO employee (emp_id, name, dob, division, cell_no, marital_status, basic_salary, blood_group, dept_name)
```

```
VALUES
```

```
(5, 'Sajib Ahmad Sojib', TO_DATE('1988-03-10', 'YYYY-MM-DD'), 'Dhaka', '01912529990', 'single', 78000, 'A+', 'CSE');
```

```
INSERT INTO employee (emp_id, name, dob, division, cell_no, marital_status, basic_salary, blood_group, dept_name)
```

```
VALUES
```

```
(6, 'Salma Islam Bhuiyan', TO_DATE('1998-03-10', 'YYYY-MM-DD'), 'Rangpur', '01910529990', 'single', 78000, 'A+', 'EEE');
```

```
INSERT INTO employee (emp_id, name, dob, division, cell_no, marital_status, basic_salary, blood_group, dept_name)
```

VALUES

(7, 'Jonathan Alexander Doe', TO\_DATE('1985-07-23', 'YYYY-MM-DD'), 'Dhaka', '01712345678', 'married', 40000, 'A+', 'CSE'),

(8, 'Elizabeth Jane Smithson', TO\_DATE('1990-05-15', 'YYYY-MM-DD'), 'Chattogram', '01698765432', 'single', 45000, 'B-', 'CSE'),

(9, 'Michael Christopher Brown', TO\_DATE('1988-03-10', 'YYYY-MM-DD'), 'Sylhet', '01912543210', 'married', 50000, 'O-', 'EEE'),

(10, 'David Robert Johnson', TO\_DATE('1992-11-08', 'YYYY-MM-DD'), 'Khulna', '01512345678', 'married', 60000, 'A-', 'EEE'),

(11, 'Sophia Grace Wilson', TO\_DATE('1987-09-12', 'YYYY-MM-DD'), 'Rajshahi', '01798765432', 'single', 35000, 'O+', 'FH Hall Office'),

(12, 'Oliver Henry Carter', TO\_DATE('1995-03-15', 'YYYY-MM-DD'), 'Barishal', '01612345678', 'single', 37000, 'AB-', 'FH Hall Office');

INSERT INTO employee (emp\_id, name, dob, division, cell\_no, marital\_status, basic\_salary, blood\_group, dept\_name)

VALUES (13, 'Ahsan Hossain', TO\_DATE('1989-05-20', 'YYYY-MM-DD'), 'Dhaka', '01778912345', 'married', 60000, 'B+', 'CSE');

INSERT INTO employee (emp\_id, name, dob, division, cell\_no, marital\_status, basic\_salary, blood\_group, dept\_name)

VALUES (14, 'Fahima Nasreen', TO\_DATE('1993-08-15', 'YYYY-MM-DD'), 'Sylhet', '01689765432', 'single', 55000, 'AB+', 'EEE');

INSERT INTO employee (emp\_id, name, dob, division, cell\_no, marital\_status, basic\_salary, blood\_group, dept\_name)

VALUES (15, 'Shamsul Alam', TO\_DATE('1991-01-30', 'YYYY-MM-DD'), 'Rajshahi', '01999988877', 'married', 80000, 'O+', 'FH Hall Office');

INSERT INTO educational\_inst (institution\_id, name, llevel, location)

VALUES

```
(1, 'Dhaka University', 'University', 'Dhaka');
```

```
INSERT INTO educational_inst (institution_id, name, llevel, location)
```

```
VALUES
```

```
(2, 'ABC High School', 'School', 'Chattogram');
```

```
INSERT INTO child (child_id, name, dob, llevel, institution_id, parent_id)
```

```
VALUES
```

```
(1, 'Amina', TO_DATE('2010-06-15', 'YYYY-MM-DD'), 'University', 1, 1);
```

```
INSERT INTO child (child_id, name, dob, llevel, institution_id, parent_id)
```

```
VALUES
```

```
(2, 'Mariam', TO_DATE('2015-08-20', 'YYYY-MM-DD'), 'Secondary', 2, 2);
```

```
INSERT INTO residence (res_id, location, resident_id)
```

```
VALUES
```

```
(1, 'Shaheed Abul Khair Bhaban', 1);
```

```
INSERT INTO residence (res_id, location, resident_id)
```

```
VALUES
```

```
(2, 'CSE Hall', 2);
```

```
INSERT INTO residence (res_id, location, resident_id)
```

```
VALUES
```

```
(3, 'Greenview Apartments', 3);
```

```
INSERT INTO residence (res_id, location, resident_id)
```

VALUES

(4, 'Shaheed Abul Khair Bhaban', 4);

INSERT INTO car (car\_id, brand, model, reg\_year, color, owner\_id)

VALUES

(1, 'Toyota', 'Corolla', 2020, 'Black', 1);

INSERT INTO car (car\_id, brand, model, reg\_year, color, owner\_id)

VALUES

(2, 'Honda', 'Civic', 2019, 'White', 2);

INSERT INTO car (car\_id, brand, model, reg\_year, color, owner\_id)

VALUES

(3, 'Tesla', 'Model 3', 2022, 'Red', 3);

INSERT INTO car (car\_id, brand, model, reg\_year, color, owner\_id)

VALUES

(4, 'Tesla', 'Model 3', 2022, 'Red', 4);

5. Create a view 'emp\_car' to show the employee names, designation and their cars (name, brand, registration year etc) who reside in 'Shaheed Abul Khair Bhaban'.

Ans:

CREATE VIEW emp\_car AS

SELECT

```

e.name AS employee_name,
e.dept_name AS designation,
c.brand AS car_brand,
c.model AS car_model,
c.reg_year AS car_registration_year,
r.location AS residence_location
FROM
    employee e
JOIN
    residence r ON e.emp_id = r.resident_id
JOIN
    car c ON e.emp_id = c.owner_id
WHERE
    r.location = 'Shaheed Abul Khair Bhaban';

select* from emp_car

```

02 - select\* from emp\_car  
03

EMPLOYEE_NAME	DESIGNATION	CAR_BRAND	CAR_MODEL	CAR_REGISTRATION_YEAR	RESIDENCE_LOCATION
Helal	CSE	Toyota	Corolla	2020	Shaheed Abul Khair Bhaban
Rafiqul	FH Hall Office	Tesla	Model 3	2022	Shaheed Abul Khair Bhaban

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2 rows selected.

a.

```

SELECT name, division, dob
FROM employee
WHERE dept_name IN ('CSE', 'EEE', 'FH Hall Office')

```



AND LENGTH(name) >= 25;

```
211 ✓ select * from emp_cat
212
213
```

NAME			DIVISION	DOB
Sajib	Ahmad	Sojib	Dhaka	10-MAR-88
Salma	Islam	Bhuiyan	Rangpur	10-MAR-98

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2 rows selected.

b.

```
WITH AvgSalary AS (
  SELECT dept_name,
         COUNT(*) AS emp_count,
         SUM(basic_salary) AS total_salary,
         AVG(basic_salary) AS avg_salary
  FROM employee
  GROUP BY dept_name
)
SELECT dept_name, emp_count, total_salary
FROM AvgSalary
```

```
WHERE avg_salary > (SELECT MIN(total_salary) FROM AvgSalary);
```

c.

```
SELECT c.name AS child_name,
```

```
       c.llevel,
```

```
       e.name AS parent_name,
```

```
       ei.name AS institution_name
```

```
FROM child c
```

```
JOIN employee e ON c.parent_id = e.emp_id
```

```
LEFT JOIN educational_inst ei ON c.institution_id = ei.institution_id
```

```
WHERE ei.name = 'Dhaka University';
```

```
57         c.llevel,  
58         e.name AS parent_name,  
59         ei.name AS institution_name  
...
```

CHILD_NAME	LLEVEL	PARENT_NAME	INSTITUTION_NAME
Amina	University	Helal	Dhaka University

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d.

```
DELETE FROM residence
WHERE resident_id IN (
    SELECT emp_id
    FROM employee
    WHERE SUBSTR(cell_no, 4, 3) = '125'
);
```

```
263 WHERE ei.name = 'Dhaka University';
264
265
266
267 ✓ DELETE FROM residence
268 WHERE resident_id IN (
269     SELECT emp_id
270     FROM employee
271     WHERE SUBSTR(cell_no, 4, 3) = '125'
272 );
273
```

2 row(s) deleted.

7. a) using not exit

```
SELECT e.emp_id, e.name
FROM employee e
WHERE NOT EXISTS (
    SELECT 1
    FROM child c
    WHERE c.parent_id = e.emp_id
);
```

```

273
274
275 v SELECT e.emp_id, e.name
276 FROM employee e
277 WHERE NOT EXISTS (
278     SELECT 1
279     FROM dual

```

EMP_ID	NAME
6	Salma Islam Bhuiyan
14	Fahima Nasreen
4	Rafiqul
5	Sajib Ahmad Sojib
3	Abu Bakar
13	Ahsan Hossain

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6 rows selected.

a)using outer join

```
SELECT e.emp_id, e.name
```

```
FROM employee e
```

```
LEFT JOIN child c ON e.emp_id = c.parent_id
```

```
WHERE c.child_id IS NULL;
```

```
83
84
85 ✓ SELECT e.emp_id, e.name
86   FROM employee e
87  LEFT JOIN child c ON e.emp_id = c.parent_id
88  WHERE c.child_id IS NULL;
89
```

EMP_ID	NAME
6	Salma Islam Bhuiyan
14	Fahima Nasreen
4	Rafiqul
5	Sajib Ahmad Sojib
3	Abu Bakar
13	Ahsan Hossain

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