

Specify the following views in SQL on the COMPANY database schema

shown in Figure 1

a) A view that has the department name, manager name, and manager salary for every department.

```
main.sql
-- View: Department_Managers
CREATE VIEW Department_Managers AS
SELECT D.Dname AS Department_Name,
       E.Fname || ' ' || E.Lname AS Manager_Name,
       E.Salary AS Manager_Salary
FROM DEPARTMENT D
JOIN EMPLOYEE E ON D.Mgr_ssn = E.Ssn;
Select *from department_managers;
```

```
-- Loading resources from main.sql
Research|Franklin Wong|40000
Administration|Jennifer Wallace|43000
Headquarters|James Borg|55000
SQLite version 3.39.4 2022-09-29 15:55:41
Enter ".help" for usage hints.
> 
```

b) A view that has the employee name, supervisor name, and employee salary for each employee who works in the 'Research' department.

```
in.sql
-- View: Research_Employees
CREATE VIEW Research_Employees AS
SELECT E.Fname || ' ' || E.Lname AS Employee_Name,
       (SELECT Fname || ' ' || Lname FROM EMPLOYEE WHERE
        Ssn = E.Super_ssn) AS Supervisor_Name,
       E.Salary AS Employee_Salary
FROM EMPLOYEE E
WHERE E.Dno = (SELECT Dnumber FROM DEPARTMENT WHERE
Dname = 'Research');
Select * from research_employees;
```

```
-- Loading resources from main.sql
John Smith||30000
Franklin Wong|James Borg|40000
Ramesh Narayan|Franklin Wong|38000
Joyce English|Franklin Wong|25000
SQLite version 3.39.4 2022-09-29 15:55:41
Enter ".help" for usage hints.
> 
```

c) A view that has the project name, controlling department name, number of employees, and total hours worked per week on the project for each project.

```
proj.sql
-- View: Project_Summary
CREATE VIEW Project_Summary AS
SELECT P.Pname AS Project_Name,
       D.Dname AS Controlling_Department_Name,
       COUNT(W.Essn) AS Number_of_Employees,
       SUM(W.Hours) AS Total_Hours_Worked_Per_Week
FROM PROJECT P
JOIN DEPARTMENT D ON P.Dnum = D.Dnumber
LEFT JOIN WORKS_ON W ON P.Pnumber = W.Pno
GROUP BY P.Pname, D.Dname;
Select *from project_summary;
```

```
-- Loading resources from main.sql
Computerization|Administration|3|55
Newbenefits|Administration|3|55
ProductX|Research|2|52.5
ProductY|Research|3|37.5
ProductZ|Research|2|50
Reorganization|Headquarters|3|25
SQLite version 3.39.4 2022-09-29 15:55:41
Enter ".help" for usage hints.
> 
```

d) A view that has the project name, controlling department name, number of employees, and total hours worked per week on the project for each project with more than one employee working on it.

```

-- View: Project_More_Than_One_Employee
CREATE VIEW Project_More_Than_One_Employee AS
SELECT P.Pname AS Project_Name,
       D.Dname AS Controlling_Department_Name,
       COUNT(W.Essn) AS Number_of_Employees,
       SUM(W.Hours) AS Total_Hours_Worked_Per_Week
FROM PROJECT P
JOIN DEPARTMENT D ON P.Dnum = D.Dnumber
JOIN WORKS_ON W ON P.Pnumber = W.Pno
GROUP BY P.Pname, D.Dname
HAVING COUNT(W.Essn) > 1;
Select *from Project_More_Than_One_Employee;

```

```

-- Loading resources from main.sql
Computerization|Administration|3|55
Newbenefits|Administration|3|55
ProductX|Research|2|52.5
ProductY|Research|3|37.5
ProductZ|Research|2|50
Reorganization|Headquarters|3|25
SQLite version 3.39.4 2022-09-29 15:55:41
Enter ".help" for usage hints.
> 

```

2.State and justify which of the following queries and updates would be allowed on the view. If a query or update would be allowed, show what the corresponding query or update on the base relations would look like (screen shots) , and give its result (screen shots) when applied to the database in Figure 3.6.

i. SELECT *

FROM DEPT_SUMMARY;

```

main.sql
172 SELECT *
173 FROM DEPT_SUMMARY;
174

```

```

-- Loading resources from main.sql
1|1|55000|55000.0
4|3|93000|31000.0
5|4|133000|33250.0
SQLite version 3.39.4 2022-09-29 15:55:41
Enter ".help" for usage hints.
> 

```

This query is allowed and will retrieve all the data from the DEPT_SUMMARY view, showing the columns D, C, Total_s, and Average_s for each department.

ii. SELECT D, C

FROM DEPT_SUMMARY

WHERE TOTAL_S > 100000;

```

main.sql
SELECT D, C FROM DEPT_SUMMARY
WHERE TOTAL_S > 100000;

```

```

-- Loading resources from main.sql
5|4
SQLite version 3.39.4 2022-09-29 15:55:41
Enter ".help" for usage hints.
> 

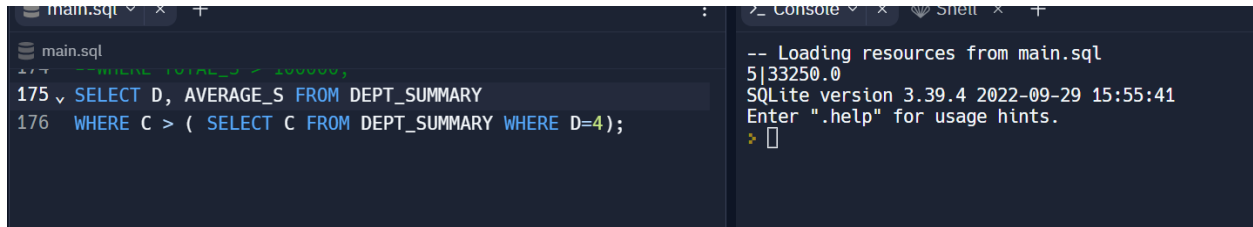
```

This query is allowed and will retrieve the columns D and C from the DEPT_SUMMARY view where the Total_s is greater than 100000.

iii. **SELECT D, AVERAGE_S**

FROM DEPT_SUMMARY

WHERE C > (SELECT C FROM DEPT_SUMMARY WHERE D=4);



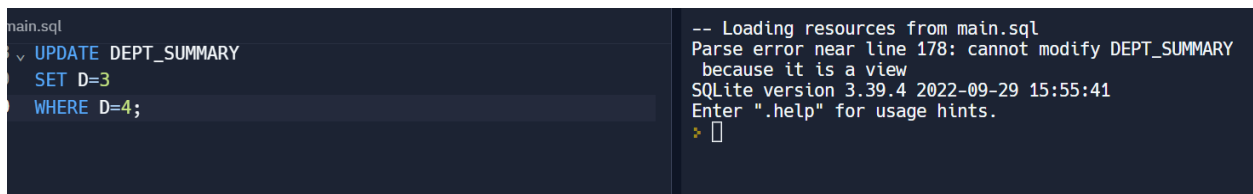
The screenshot shows a SQLite IDE with a dark theme. On the left, a file named 'main.sql' is open, containing the following SQL query:
175 SELECT D, AVERAGE_S FROM DEPT_SUMMARY
176 WHERE C > (SELECT C FROM DEPT_SUMMARY WHERE D=4);
On the right, the console output shows:
-- Loading resources from main.sql
5|33250.0
SQLite version 3.39.4 2022-09-29 15:55:41
Enter ".help" for usage hints.
The cursor is at the end of the first line of the query.

This query is allowed and will retrieve the columns D and Average_s from the DEPT_SUMMARY view where the count of employees (C) is greater than the count of employees in department 4.

iv. **UPDATE DEPT_SUMMARY**

SET D=3

WHERE D=4;

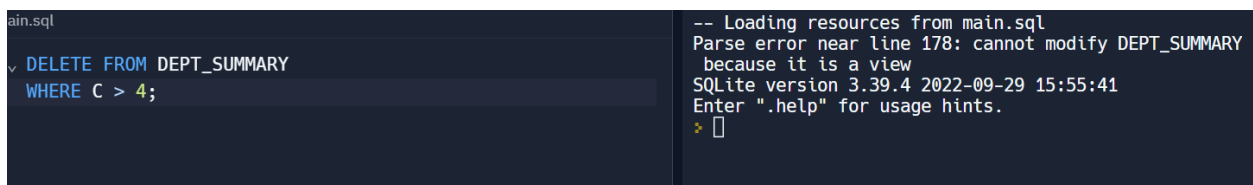


The screenshot shows a SQLite IDE with a dark theme. On the left, a file named 'main.sql' is open, containing the following SQL query:
UPDATE DEPT_SUMMARY
SET D=3
WHERE D=4;
On the right, the console output shows:
-- Loading resources from main.sql
Parse error near line 178: cannot modify DEPT_SUMMARY
because it is a view
SQLite version 3.39.4 2022-09-29 15:55:41
Enter ".help" for usage hints.
The cursor is at the end of the first line of the query.

This update operation is not allowed on the view because it affects the underlying base table EMPLOYEE through the view. Since the view contains an aggregate function (AVG(Salary)), updates are not possible on it.

v. **DELETE FROM DEPT_SUMMARY**

WHERE C > 4;



The screenshot shows a SQLite IDE with a dark theme. On the left, a file named 'main.sql' is open, containing the following SQL query:
DELETE FROM DEPT_SUMMARY
WHERE C > 4;
On the right, the console output shows:
-- Loading resources from main.sql
Parse error near line 178: cannot modify DEPT_SUMMARY
because it is a view
SQLite version 3.39.4 2022-09-29 15:55:41
Enter ".help" for usage hints.
The cursor is at the end of the first line of the query.

This delete operation is not allowed on the view for the same reason as the update. The view contains an aggregate function, and deletions are not possible on it.