Assignment 2

good! 8

QUESTION 1:-

∴ QUERY:-

```
Select dpt.DEPT_ID, dpt.DEPT_NAME, Min(emp.Salary) as LeastSalary
from Employee as emp
inner join Department as dpt on
emp.DEPT_ID = dpt.DEPT_ID
Group by dpt.DEPT_ID, dpt.DEPT_NAME
having Min(emp.Salary) > (
    Select Max(emp.salary) from Employee as emp
    where emp.DEPT_ID = 10
)
```

✓

∴ RA:-

$$R1 \leftarrow \sigma_{Dept\_ID \neq 10} (Employee)$$

$$R2 \leftarrow (R1 \bowtie_{R1.deptID = Department.deptID} Department)$$

✓

$$R3(DeptID, DeptName, MinS) \leftarrow DeptID, DeptName\ \mathcal{F}_{Min(R2.Salary)}\ (R2)$$

$R4(DeptID, DeptName, MaxS) \leftarrow DeptID, DeptName \mathcal{F}_{Max(Salary)} (\sigma_{DeptID=10} (Employee) \bowtie Employee.deptID = Departme...$ → C }

$R5 \leftarrow (R3 \bowtie_{R3.MinS > R4.MaxS} R4)$

$Result \leftarrow \pi_{R5.deptID, R5.deptName} (R5)$

QUESTION 2:-

∴ QUERY:-

```
Select ep.First_Name, ep.Last_name, ep.Salary, ep.Dept_ID from Employee as ep
where Salary in (
    Select emp.Salary from Employee as emp
    where emp.DeptID = 10
) AND ep.DeptID != 10.
```

∴ RA:-

$R1 \leftarrow \sigma_{DeptID=10} (Employee)$

$R2 \leftarrow \pi_{Salary} (R1)$

$R3 \leftarrow \pi_{FirstName, LastName, Salary} (\sigma_{Dept\_ID != 10} (Employee))$

$R4 \leftarrow (R3 \bowtie_{R3.Salary = R2.Salary} R2)$

$Result \leftarrow \pi_{R4.FirstName, R4.LastName, R4.Salary} (R4)$

QUESTION 3:-

∴ **QUERY:-**

```
Select First_Name, Last_Name, Salary, Dept_ID from Employee
where SALARY > (
    Select Min(emp.Salary) from Employee as emp
    where emp.DeptID = 10
) AND Employee.DeptID != 10
```

∴ **RA:-**

$$R1(\text{MinSalary}) \leftarrow \mathcal{F}_{\text{Min(Salary)}} \left(\sigma_{\text{DeptID}=10} (\text{Employee}) \right)$$

$$R2 \leftarrow \sigma_{\text{DeptID} \neq 10} (\text{Employee})$$

$$\text{Result} \leftarrow \pi_{\text{R2.FirstName, LastName, Salary}} \left(R2 \bowtie_{\text{R2.Salary} > \text{R1.Salary}} R1 \right)$$

QUESTION 4:-

∴ **QUERY:-**

```
Select FirstName, LastName, Salary from Employees
where Salary < (
    Select Min(emp.Salary) from Employees as emp
    join Department as dpt on
    dpt.DeptID = emp.DeptID
    where dpt.DeptID = 10 )
AND Employees.DeptID != 10
```

∴ **R**

3(DeptID;

Quiz

∴ **RA :-**

$$R1(Salary) \leftarrow \mathcal{F}_{Min(Salary)} \left(\sigma_{DeptID=10} (Employee) \right)$$

$$R2 \leftarrow \sigma_{DeptID!=10} (Employee)$$

$$Result \leftarrow \pi_{R2.FirstName, LastName, Salary} \left(R2 \bowtie_{R2.Salary < R1.Salary} R1 \right)$$

QUESTION 5 :-

∴ **QUERY :-**

```
Select FirstName, LastName from Employees
where MGR in (
    Select emp.MGR from Employees as emp where emp.EMP_ID=121 OR
    emp.EMP_ID=200) AND DEPT_ID in (
        Select EMP.DeptID from Employees as EMP
        where EMP.EMP_ID=121 or EMP.EMP_ID=200)
AND (Emp_ID!=121 AND EMP_ID!=200);
```

∴ **RA :-**

$$R1 \leftarrow \sigma_{EmpID=121 \text{ OR } EmpID=200} (Employee)$$

$$R2 \leftarrow \sigma_{EmpID!=121 \text{ OR } EmpID!=200} (Employee)$$

Result ← $\pi_{\text{FirstName, LastName}}(R_3)$

QUESTION 6:-

∴ QUERY:-

```
Select dpt.Dept_Name from Employees as emp
join Department as dpt
on emp.Dept_ID = dpt.Dept_ID
where emp.EMP_ID = 200.
```

∴ RA:-

$R1 \leftarrow \sigma_{\text{EmpID}=200}(\text{Employee})$

$R2 \leftarrow (R1 \bowtie \text{Department})_{R1.\text{DeptID}=\text{Department.DeptID}}$

$R3 \leftarrow \pi_{R2.\text{Dept\_Name}}(R2)$

QUESTION 7:-

∴ QUERY:-

```
Select emp.FirstName, emp.LastName from Employees as emp
where Salary = (
        Select MAX(emp.Salary) as HighestEarning from Employees as emp
        where emp.JOB = 'SA_REP'
)
```

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Decompose & Remove Redundant

n → C , AB → C , C → D , C → I , C → I , D → I

EC → B , EI → C

∴ **RA:-**

$$R1(Max\_Salary) \leftarrow \mathcal{F}_{Max(Salary)} \left(\sigma_{JOB='SA\_REP'} (Employee) \right)$$

$$R2 \leftarrow \sigma_{JOB='SA\_REP'} (Employee)$$

$$Result \leftarrow \pi_{R2.FirstName,\ R2.LastName} \left(R2 \bowtie_{R2.Salary = R1.MaxSalary} R1 \right)$$

QUESTION 8:-

∴ **QUERY:-**

```
Select emp.JOB from Employees as emp
Group by emp.JOB
having Count(*) > 0
```

∴ **RA:-**

$$R1(Job, No\_of\_Emp) \leftarrow Job\ \mathcal{F}_{Count(Employee.EMP\_ID)} (Employee)$$

$$R2 \leftarrow \sigma_{No.of.Emp > 1} (R1)$$

$$Result \leftarrow \pi_{Job} (R2)$$

QUESTION 9:-

∴ **QUERY:-**

```
Select emp.JOB from Employees as emp
Group by emp.JOB
having Count(*)=0
```

∴ **RA:-**

$R1(Job, No\_of\_EMP) \leftarrow Job\ \mathcal{F}_{Count(Employee.EMP\_ID)}\ (Employee)$

$R2 \leftarrow \sigma_{No\_of\_Emp=0}(R1)$

$Result \leftarrow \pi_{JOB}(R2)$

QUESTION 10:-

∴ **QUERY:-**

```
Select Top 1 T.Salary from (
    Select Distinct Top 3 (emp.Salary) from Employees as emp
    order by (SALARY) desc
) as T
order by T.Salary Asc
```

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Q.

$R1 \leftarrow \pi_{Salary}(Employee)$

$R2(Salary) \leftarrow \mathcal{F}_{Max(Salary)}(R1)$

$R3 \leftarrow R1 - R2$

$R4(Salary) \leftarrow \mathcal{F}_{Max(Salary)}(R3)$

$R5 \leftarrow R3 - R4$

$Result \leftarrow \mathcal{F}_{Max(Salary)}(R5)$