CREATE TABLE EmployeesTable (

EMP\_ID TINYINT NOT NULL PRIMARY KEY,

FIRST\_NAME VARCHAR(10) NOT NULL,

LAST\_NAME VARCHAR(10) NOT NULL,

SALARY INT NOT NULL,

JOINING\_DATE DATETIME ,

DEPARTMENT VARCHAR(10) NOT NULL )

INSERT INTO EmployeesTable ( EMP\_ID, FIRST\_NAME, LAST\_NAME, SALARY, JOINING\_DATE, DEPARTMENT)

VALUES ( 001, 'Manish','Agarwal', 700000, '2019-04-20 09:00:00', 'HR'),

( 002, 'Niranjan', 'Bose', 20000, '2019-02-11 09:00:00', 'DA'),

( 003, 'Vivek', 'Singh', 100000, '2019-01-20 09:00:00', 'DA'),

( 004, 'Asutosh', 'Kapoor', 700000, '2019-03-20 09:00:00', 'HR'),

( 005, 'Vihaan', 'Banerjee', 300000, '2019-06-11 09:00:00', 'DA'),

( 006, 'Atul', 'Diwedi', 400000, '2019-05-11 09:00:00', 'Account'),

( 007, 'Satyendra', 'Tripathi', 95000, '2019-03-20 09:00:00', 'Account'),

( 008, 'Pritika', 'Bhatt', 80000, '2019-02-11 09:00:00', 'DA')

CREATE TABLE VariablesDetails (

EMP\_REF\_ID TINYINT NOT NULL PRIMARY KEY REFERENCES EmployeesTable (EMP\_ID),

VARIABLES\_DATE DATETIME ,

VARIABLES\_AMOUNT INT NOT NULL )

INSERT INTO VariablesDetails ( EMP\_REF\_ID, VARIABLES\_DATE, VARIABLES\_AMOUNT)

VALUES ( 1, '2019-02-20 00:00:00', 15000),

( 2, '2019-06-11 00:00:00', 30000),

( 3, '2019-02-20 00:00:00', 42000),

( 4, '2019-02-20 00:00:00', 14500),

( 5, '2019-06-11 00:00:00', 23500)

CREATE TABLE DesignationTable (

EMP\_REF\_ID TINYINT NOT NULL PRIMARY KEY REFERENCES EmployeesTable (EMP\_ID),

EMP\_TITLE VARCHAR(15) NOT NULL,

AFFECTED\_FROM DATETIME )

INSERT INTO DesignationTable ( EMP\_REF\_ID, EMP\_TITLE, AFFECTED\_FROM )

VALUES (1, 'Asst. Manager', '2019-02-20 00:00:00'),

(2, 'Senior Analyst', '2019-01-11 00:00:00'),

(8, 'Senior Analyst', '2019-04-06 00:00:00'),

(5, 'Manager', '2019-10-06 00:00:00'),

(4, 'Asst. Manager', '2019-12-06 00:00:00'),

(7, 'Team Lead', '2019-06-06 00:00:00'),

(6, 'Team Lead', '2019-09-06 00:00:00'),

(3, 'Senior Analyst', '2019-08-06 00:00:00')

/\*\*\*\*\*\*\*\*\*\* Ques 2 \*\*\*\*\*\*\*\*\*/

Types of Joins in SQL

1. Inner Join
2. Left Join
3. Right Join
4. Full Join

**1.Inner Join: -**

**Select** EmployeesTable.\*, DesignationTable.\*

From EmployeesTable

inner join EmployeesTable on EMP\_ID = DesignationTable.EMP\_REF\_ID

**2.Left Join**: -

**Select** EmployeesTable.\*, DesignationTable.\*

From EmployeesTable

left join EmployeesTable on EMP\_ID = DesignationTable.EMP\_REF\_ID

**3.Right Join**: -

**Select** EmployeesTable.\*, DesignationTable.\*

From EmployeesTable

right join EmployeesTable on EMP\_ID = DesignationTable.EMP\_REF\_ID

**4.Full Join**: -

**Select** EmployeesTable.\*, DesignationTable.\*

From EmployeesTable

full join EmployeesTable on EMP\_ID = DesignationTable.EMP\_REF\_ID

/\*\*\*\*\*\*\*\*\*\* Ques 2.a \*\*\*\*\*\*\*\*\*\*\*\*/

Select FIRST\_NAME + ' ' + LAST\_NAME as "Full name"

,DEPARTMENT

from EmployeesTable

WHERE EMP\_ID = (Select top 1 EMP\_REF\_ID

from VariablesDetails

order by VARIABLES\_AMOUNT DESC)

OR

EMP\_ID = (Select top 1 EMP\_REF\_ID

from VariablesDetails

order by VARIABLES\_AMOUNT ASC)

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\* Ques 2.b \*\*\*\*\*\*\*\*\*\*\*\*/\*

SELECT P.\* FROM

(Select TOP 1

DesignationTable.EMP\_TITLE,

coalesce(SALARY + VARIABLES\_AMOUNT,SALARY,VARIABLES\_AMOUNT) AS TOTAL\_SALARY

from EmployeesTable

left join DesignationTable on EMP\_ID = DesignationTable.EMP\_REF\_ID

left join VariablesDetails on EMP\_ID = VariablesDetails.EMP\_REF\_ID

where YEAR(AFFECTED\_FROM) = 2019

order by TOTAL\_SALARY DESC) AS P

union

SELECT Q.\* FROM

(Select

DesignationTable.EMP\_TITLE,

coalesce(SALARY + VARIABLES\_AMOUNT,SALARY,VARIABLES\_AMOUNT) AS TOTAL\_SALARY

from EmployeesTable

left join DesignationTable on EMP\_ID = DesignationTable.EMP\_REF\_ID

left join VariablesDetails on EMP\_ID = VariablesDetails.EMP\_REF\_ID

where YEAR(AFFECTED\_FROM) = 2019

order by TOTAL\_SALARY ASC

OFFSET 1 ROW

FETCH NEXT 1 ROW ONLY) AS Q

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\* Ques 3.a \*\*\*\*\*\*\*\*\*\*\*\*/

Select EmployeesTable.\*,

VariablesDetails.VARIABLES\_AMOUNT

from EmployeesTable

left join DesignationTable on EMP\_ID = DesignationTable.EMP\_REF\_ID

left join VariablesDetails on EMP\_ID = VariablesDetails.EMP\_REF\_ID

where month(AFFECTED\_FROM) between 7 and 12

order by VARIABLES\_AMOUNT DESC

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\* Ques 3.b \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* Creating a stored procedure to call the query \*/

CREATE PROCEDURE p\_emplopyeesdetails

AS

SELECT EmployeesTable.\*,

VariablesDetails.VARIABLES\_AMOUNT

FROM EmployeesTable

left join DesignationTable on EMP\_ID = DesignationTable.EMP\_REF\_ID

left join VariablesDetails on EMP\_ID = VariablesDetails.EMP\_REF\_ID

where month(AFFECTED\_FROM) between 7 and 12

order by VARIABLES\_AMOUNT DESC

GO

/\* Calling the procedure as following \*/

EXEC p\_emplopyeesdetails

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\* Ques 2.c \*\*\*\*\*\*\*\*\*\*/

SELECT EmployeesTable.\*,

DesignationTable.\*

FROM EmployeesTable

CROSS JOIN DesignationTable

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\* Ques 2.d \*\*\*\*\*\*\*\*\*\*/

/\*

Clauses used with Select statements are following

1. SELECT

2. FROM

3. WHERE

4. GROUP BY

5. HAVING

6. ORDER BY

7. OFFSET

8. FETCH FIRST

9. UNION

10. INTERSECT

11. EXCEPT

12. WITH

The preference orders of clause is following

1. FROM

2. WHERE

3. GROUP BY

4. HAVING

5. SELECT

6. ORDER BY

7. LIMIT

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

Q1. Using Euclidean distance,

Using the function euclidean\_classifier

x=[0.1 0.5 0.1];

m1=[0 0 0];

m2=[0.5 0.5 0.5];

m=[m1 m2];

z=euclidean\_classifier(m,x)

The answer is z = 1; that is, the point is classified to the C1 class

Q1. Using Mahalanobis distance,

Using the function mahalanobis classifier.

x=[0.1 0.5 0.1];

m1=[0 0 0]; m2=[0.5 0.5 0.5];

m=[m1 m2];

S=[0.8 0.01 0.01;0.01 0.2 0.01; 0.01 0.01 0.2];

z=mahalanobis\_classifier(m,S,x);

This time, the answer is, z = 2, meaning the point is classified to the C2 class.