DEPARTMENT OF MATHEMATICAL AND COMPUTATIONAL SCIENCES

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

MA611 – 2nd Semester MCA, 2024-2025

DATABASE MANAGEMENT SYSTEMS

LAB Assignment-5

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1. Create the following tables with the following attributes and constraints on them.

a. Bank (bk_code, bk_name, bk_address)

b. Branch (br_id, br_name, br_address, bk_code)

c. Customer (cust_ID, cust_name, phone_no, address)

d. Account (acc_no, acc_type, balance, br_id)

e. Customer_Account (cust_ID, acc_no)

f. Loan (loan_ID, loan_type, amount, br_id)

g. Customer_Loan (cust_ID, loan_ID)

--a. Bank table

```
CREATE TABLE Bank (
    bk_code VARCHAR(10) PRIMARY KEY,
    bk_name VARCHAR(50) NOT NULL,
    bk_address VARCHAR(100)
);
```

```
-- b. Branch table
CREATE TABLE Branch (
    br_id VARCHAR(10) PRIMARY KEY,
    br_name VARCHAR(50) NOT NULL,
    br_address VARCHAR(100),
    bk_code VARCHAR(10),
    FOREIGN KEY (bk_code) REFERENCES Bank(bk_code)
);

-- c. Customer table
CREATE TABLE Customer (
    cust_ID INT PRIMARY KEY,
    cust_name VARCHAR(50) NOT NULL,
    phone_no VARCHAR(15) UNIQUE,
    address VARCHAR(100)
);

-- d.  Account table
CREATE TABLE Account (
    acc_no INT PRIMARY KEY,
    acc_type VARCHAR(20) CHECK (acc_type IN ('savings', 'current')),
    balance DECIMAL(10,2),
    br_id VARCHAR(10),
    FOREIGN KEY (br_id) REFERENCES Branch(br_id) ON DELETE CASCADE
);

-- e.  Customer_Account table
CREATE TABLE Customer_Account (
    cust_ID INT,
    acc_no INT,
    PRIMARY KEY (cust_ID, acc_no),
```

```
    FOREIGN KEY (cust_ID) REFERENCES Customer(cust_ID) ON DELETE CASCADE,
    FOREIGN KEY (acc_no) REFERENCES Account(acc_no)  ON DELETE CASCADE
);
```

```
-- f.  Loan table
CREATE TABLE Loan (
    loan_ID INT PRIMARY KEY,
    loan_type VARCHAR(50),
    amount DECIMAL(10,2),
    br_id VARCHAR(10),
    FOREIGN KEY (br_id) REFERENCES Branch(br_id) ON DELETE CASCADE
);
```

```
-- g.  Customer_Loan table
CREATE TABLE Customer_Loan (
    cust_ID INT,
    loan_ID INT,
    PRIMARY KEY (cust_ID, loan_ID),
    FOREIGN KEY (cust_ID) REFERENCES Customer(cust_ID) ON DELETE CASCADE,
    FOREIGN KEY (loan_ID) REFERENCES Loan(loan_ID)  ON DELETE CASCADE
);
```

2. Insert at least five records in each table

INSERT INTO Bank VALUES

```
SQL> insert into Bank values ('B001', 'SBI', 'MG Road');

1 row created.

SQL> insert into Bank values ('B002', 'HDFC', 'Surathkal');

1 row created.

SQL> insert into Bank values ('B003', 'ICICI', 'NITK');

1 row created.

SQL> insert into Bank values ('B004', 'Axis', 'Mumbai');

1 row created.

SQL> insert into Bank values ('B005', 'Canara', 'Delhi');

1 row created.
```

INSERT INTO Branch VALUES

```
SQL> insert into Branch values ('BR01', 'SBI Main', 'MG Road', 'B001');

1 row created.

SQL> insert into Branch values ('BR02', 'HDFC Town', 'Surathkal', 'B002');

1 row created.

SQL> insert into Branch values ('BR03', 'ICICI Campus', 'NITK', 'B003');

1 row created.

SQL> insert into Branch values ('BR04', 'Axis South', 'Mumbai', 'B004');

1 row created.

SQL> insert into Branch values ('BR05', 'Canara Metro', 'Delhi', 'B005');

1 row created.
```

INSERT INTO Customer

```
SQL> insert into Customer values (101, 'Ravi', '9876543210', 'Bangalore');

1 row created.

SQL> insert into Customer values (102, 'Amit', '9876543211', 'Delhi');

1 row created.

SQL> insert into Customer values (103, 'Suman', '9876543212', 'Mumbai');

1 row created.

SQL> insert into Customer values (104, 'Rahul', '9876543213', 'Surathkal');

1 row created.

SQL> insert into Customer values (105, 'Priya', '9876543214', 'NITK');

1 row created.
```

INSERT INTO Account VALUES

```
SQL> insert into Account values (1001, 'savings', 20000, 'BR01');

1 row created.

SQL> insert into Account values (1002, 'current', 15000, 'BR02');

1 row created.

SQL> insert into Account values (1003, 'savings', 8000, 'BR03');

1 row created.

SQL> insert into Account values (1004, 'current', 500, 'BR04');

1 row created.

SQL> insert into Account values (1005, 'savings', 3000, 'BR05');

1 row created.
```

INSERT INTO Customer_Account VALUES

```
SQL> insert into Customer_Account values (101, 1001);

1 row created.

SQL> insert into Customer_Account values (102, 1002);

1 row created.

SQL> insert into Customer_Account values (103, 1003);

1 row created.

SQL> insert into Customer_Account values (104, 1004);

1 row created.

SQL> insert into Customer_Account values (105, 1005);

1 row created.
```

INSERT INTO Loan VALUES

```
SQL> insert into Loan values (2001, 'home', 500000, 'BR01');

1 row created.

SQL> insert into Loan values (2002, 'vehicle', 200000, 'BR02');

1 row created.

SQL> insert into Loan values (2003, 'personal', 100000, 'BR03');

1 row created.

SQL> insert into Loan values (2004, 'education', 150000, 'BR04');

1 row created.

SQL> insert into Loan values (2005, 'home', 600000, 'BR05');

1 row created.
```

INSERT INTO Customer_Loan VALUES

```
SQL> insert into Customer_Loan values (101, 2001);

1 row created.

Commit complete.
SQL> insert into Customer_Loan values (102, 2002);

1 row created.

Commit complete.
SQL> insert into Customer_Loan values (103, 2003);

1 row created.

Commit complete.
SQL> insert into Customer_Loan values (104, 2004);

1 row created.

Commit complete.
SQL> insert into Customer_Loan values (105, 2005);

1 row created.
```

3. List the details of all customers.

```
   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ---------------
ADDRESS
--------------------------------------------------------------------------------
       101 Ravi                                               9876543210
Bangalore

       102 Amit                                               9876543211
Delhi

       103 Suman                                              9876543212
Mumbai


   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ---------------
ADDRESS
--------------------------------------------------------------------------------
       104 Rahul                                              9876543213
Surathkal

       105 Priya                                              9876543214
NITK
```

4.Find the cust_ID and phone number of customer ‘Ravi’

```
SQL> SELECT cust_ID, phone_no FROM Customer WHERE cust_name = 'Ravi';

   CUST_ID PHONE_NO
---------- ---------------
       101 9876543210
```

5. Find the Address of all branches of br_01

```
       101 9876543210

SQL> SELECT br_address FROM Branch WHERE br_id = 'BR01';

BR_ADDRESS
--------------------------------------------------------------------------------
MG Road
```

6. Find the details of Customer having ID 103

```
SQL> SELECT * FROM Customer WHERE cust_ID = 103;

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ---------------
ADDRESS
--------------------------------------------------------------------------------
       103 Suman                                              9876543212
Mumbai
```

7. List the account details having balance more than 10000

```
SQL> SELECT * FROM Account WHERE balance > 10000;

    ACC_NO ACC_TYPE                BALANCE BR_ID
---------- -------------------- ---------- ----------
      1001 savings                   20000 BR01
      1002 current                   15000 BR02
```

8. List the account details of branch br_02

```
SQL> SELECT * FROM Account WHERE br_id = 'BR02';

    ACC_NO ACC_TYPE                BALANCE BR_ID
---------- -------------------- ---------- ----------
      1002 current                   15000 BR02

SQL>
```

9. List the loan details of branch br_01

```
SQL> SELECT * FROM Loan WHERE br_id = 'BR01';

   LOAN_ID LOAN_TYPE                                                AMOUNT
---------- ---------------------------------------------------- ----------
BR_ID
----------
      2001 home                                                    500000
BR01
```

10. List the account details with their branch address

```
SQL> SELECT Account.*, Branch.br_address FROM Account JOIN Branch ON Account.br_id = Branch.br_id;

    ACC_NO ACC_TYPE              BALANCE BR_ID
---------- -------------------- ---------- ----------
BR_ADDRESS
--------------------------------------------------------------------------------
      1001 savings                  20000 BR01
MG Road

      1002 current                  15000 BR02
Surathkal

      1003 savings                   8000 BR03
NITK


    ACC_NO ACC_TYPE              BALANCE BR_ID
---------- -------------------- ---------- ----------
BR_ADDRESS
--------------------------------------------------------------------------------
      1004 current                    500 BR04
Mumbai

      1005 savings                   3000 BR05
Delhi
```

11. List the customer details with their account details

```
SELECT Customer.*, Account.* FROM Customer
JOIN Customer_Account ON Customer.cust_ID = Customer_Account.cust_ID
  3  JOIN Account ON Customer_Account.acc_no = Account.acc_no;

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ----------
ADDRESS
--------------------------------------------------------------------------------
    ACC_NO ACC_TYPE               BALANCE BR_ID
---------- -------------------- ---------- ----------
       101 Ravi                                           9876543210
Bangalore
      1001 savings                   20000 BR01

       102 Amit                                           9876543211
Delhi
      1002 current                   15000 BR02

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ----------
ADDRESS
--------------------------------------------------------------------------------
    ACC_NO ACC_TYPE               BALANCE BR_ID
---------- -------------------- ---------- ----------

       103 Suman                                          9876543212
Mumbai
      1003 savings                    8000 BR03

       104 Rahul                                          9876543213
Surathkal

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ----------
ADDRESS
--------------------------------------------------------------------------------
    ACC_NO ACC_TYPE               BALANCE BR_ID
---------- -------------------- ---------- ----------
      1004 current                     500 BR04

       105 Priya                                          9876543214
NITK
      1005 savings                    3000 BR05
```

12. List the customer details having account type ‘savings’

```
SELECT Customer.* FROM Customer
JOIN Customer_Account ON Customer.cust_ID = Customer_Account.cust_ID
  3  JOIN Account ON Customer_Account.acc_no = Account.acc_no WHERE acc_type = 'savings';

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ----------
ADDRESS
--------------------------------------------------------------------------------
       101 Ravi                                           9876543210
Bangalore

       103 Suman                                          9876543212
Mumbai

       105 Priya                                          9876543214
NITK
```

13. List the customer details having vehicle loan

```
SELECT Customer.* FROM Customer
JOIN Customer_Loan ON Customer.cust_ID = Customer_Loan.cust_ID
JOIN Loan ON Customer_Loan.loan_ID = Loan.loan_ID
  4  WHERE loan_type = 'vehicle';

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ---------------
ADDRESS
--------------------------------------------------------------------------------
       102 Amit                                               9876543211
Delhi
```

14. List the branch names of all accounts

```
SQL> SELECT DISTINCT Branch.br_name FROM Account JOIN Branch ON Account.br_id = Branch.br_id;

BR_NAME
--------------------------------------------------
Canara Metro
ICICI Campus
HDFC Town
Axis South
SBI Main
```

15. List the customer details going to ‘Surathkal’ branch

```
SELECT Customer.* FROM Customer
JOIN Customer_Account ON Customer.cust_ID = Customer_Account.cust_ID
JOIN Account ON Customer_Account.acc_no = Account.acc_no
JOIN Branch ON Account.br_id = Branch.br_id
  5  WHERE br_address = 'Surathkal';

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ---------------
ADDRESS
--------------------------------------------------------------------------------
       102 Amit                                               9876543211
Delhi
```

16. List the customers having loan account in ‘MG Road’ branch

```
SQL> SELECT Customer.* FROM Customer
  2  JOIN Customer_Loan ON Customer.cust_ID = Customer_Loan.cust_ID
  3  JOIN Loan ON Customer_Loan.loan_ID = Loan.loan_ID
  4  JOIN Branch ON Loan.br_id = Branch.br_id
  5  WHERE br_address = 'MG Road';

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ---------------
ADDRESS
--------------------------------------------------------------------------------
       101 Ravi                                               9876543210
Bangalore
```

17. Find the customers having balance between 1000 to 10000

```
SQL> SELECT Customer.* FROM Customer
  2  JOIN Customer_Account ON Customer.cust_ID = Customer_Account.cust_ID
  3  JOIN Account ON Customer_Account.acc_no = Account.acc_no
  4  WHERE balance BETWEEN 1000 AND 10000;

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ---------------
ADDRESS
--------------------------------------------------------------------------------
       103 Suman                                              9876543212
Mumbai

       105 Priya                                              9876543214
NITK
```

18. Give a bonus of rupees 100 to customers having more than 10000 balance

```
SQL> UPDATE Account SET balance = balance + 100 WHERE balance > 10000;

2 rows updated.
```

19. Deduct 50 rupees from customers having less than 500 balance

```
SQL> UPDATE Account SET balance = balance - 50 WHERE balance < 500;

0 rows updated.
```

20. Give the customer details having home loan

```
SQL> SELECT Customer.* FROM Customer
  2  JOIN Customer_Loan ON Customer.cust_ID = Customer_Loan.cust_ID
  3  JOIN Loan ON Customer_Loan.loan_ID = Loan.loan_ID
  4  WHERE loan_type = 'home';

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ----------
ADDRESS
--------------------------------------------------------------------------------
       101 Ravi                                               9876543210
Bangalore

       105 Priya                                              9876543214
NITK
```

21. Give the customer details having home loan in ‘NITK’ branch

```
SQL> SELECT Customer.* FROM Customer
  2  JOIN Customer_Loan ON Customer.cust_ID = Customer_Loan.cust_ID
  3  JOIN Loan ON Customer_Loan.loan_ID = Loan.loan_ID
  4  JOIN Branch ON Loan.br_id = Branch.br_id
  5  WHERE loan_type = 'home' AND br_address = 'NITK';

no rows selected
```

22. Add a column NOMINEE to the customer table

```
SQL> ALTER TABLE Customer ADD  nominee VARCHAR(50);

Table altered.
```

23. List all the account numbers in ascending order of their balance

```
SQL> SELECT acc_no FROM Account ORDER BY balance ASC;

    ACC_NO
----------
      1004
      1005
      1003
      1002
      1001
```

24. Count the number of customers having account type savings

```
SQL> SELECT COUNT(*) FROM Customer_Account
  2  JOIN Account ON Customer_Account.acc_no = Account.acc_no
  3  WHERE acc_type = 'savings';

  COUNT(*)
----------
         3
```

25. Count the number of customers for each account type

```
SQL> SELECT acc_type, COUNT(*) FROM Account GROUP BY acc_type;

ACC_TYPE             COUNT(*)
-------------------- ----------
savings                       3
current                       2
```

26. Find the total balance in Savings account

```
SQL> SELECT SUM(balance) FROM Account
  2  WHERE acc_type = 'savings';

SUM(BALANCE)
------------
       31100
```

27. Find the average balance of Current account

```
SQL> SELECT AVG(balance) FROM Account
  2  WHERE acc_type = 'current';

AVG(BALANCE)
------------
        7800
```

28. Find the average balance for each account type

```
SQL> SELECT acc_type, AVG(balance) FROM Account
  2  GROUP BY acc_type;

ACC_TYPE             AVG(BALANCE)
-------------------- ------------
savings                 10366.6667
current                       7800
```

29. Find the customer details having maximum balance

```
SQL> SELECT c.* FROM Customer c
  2  JOIN Customer_Account ca  ON c.cust_ID = ca.cust_ID
  3  JOIN Account a ON ca.acc_no = a.acc_no
  4  WHERE rownum < 2
  5  ORDER BY balance DESC ;

   CUST_ID CUST_NAME                                          PHONE_NO
---------- -------------------------------------------------- ---------------
ADDRESS
--------------------------------------------------------------------------------
NOMINEE
--------------------------------------------------
       101 Ravi                                               9876543210
Bangalore
```

30. Find the average amount for vehicle loan

```
SQL> SELECT AVG(amount) FROM Loan
  2  WHERE loan_type ='vehicle';

AVG(AMOUNT)
-----------
     200000
```

31. Find the average balance in each branch

```
SQL> SELECT br_id, AVG(balance) FROM Account GROUP BY br_id;

BR_ID      AVG(BALANCE)
---------- ------------
BR01              20100
BR02              15100
BR04                500
BR03               8000
BR05               3000
```