

PROBLEM STATEMENT:

CONSIDER THE FOLLOWING SCHEMA:

Customer (customer_id, customer_name, customer_street, customer_city)

Branch (branch_id, branch_name, branch_city, assets)

Account (account_number, branch_id, balance)

Depositor (customer_id, account_number)

Loan (loan_number, branch_id, amount)

Borrower (customer_id, loan_number)

Payment (loan_number, payment_number, payment_date, payment_amount)

1. Create the database in MySQL/ PostgreSQL/ Oracle/ DB2. Database name will be DB_CMSA.
2. Insert sufficient data, so that all queries can be satisfied. Use proper integrity constraints. Identify Foreign key.
3. Solve the queries below using SQL:
 - a. Find all customer having account balance greater than ₹500.
 - b. Find all customer does not have any loan.
 - c. Find all customer having account including loan.
 - d. Find all branch wise customer details.
 - e. Find the details of account and loan of a given customer.
 - f. Find the branch having maximum assets.
 - g. Find all the customers of a given branch name.

PROGRAM CODE AND OUTPUT:

Q1.>

```
mysql> CREATE DATABASE DB_CMSA;
```

Query OK, 1 row affected (0.16 sec)

```
mysql> USE DB_CMSA;
```

Database changed

```
mysql> CREATE TABLE Customer(
```

```
    -> customer_id varchar(10),
```

```
    -> customer_name varchar(20),
```

```
    -> customer_street varchar(20),
```

```
    -> customer_city varchar(20),
```

```
    -> PRIMARY KEY(customer_id)
```

```
    -> );
```

Query OK, 0 rows affected (0.86 sec)

```
mysql> DESC Customer;
```

Field	Type	Null	Key	Default	Extra
customer_id	varchar(10)	NO	PRI	NULL	
customer_name	varchar(20)	YES		NULL	
customer_street	varchar(20)	YES		NULL	
customer_city	varchar(20)	YES		NULL	

4 rows in set (0.00 sec)

```
mysql> CREATE TABLE Branch(  
    -> branch_id varchar(10),  
    -> branch_name varchar(20),  
    -> branch_city varchar(10),  
    -> assets numeric(10),  
    -> PRIMARY KEY(branch_id)  
    -> );
```

Query OK, 0 rows affected (0.97 sec)

```
mysql> DESC Branch;
```

Field	Type	Null	Key	Default	Extra
branch_id	varchar(10)	NO	PRI	NULL	
branch_name	varchar(20)	YES		NULL	
branch_city	varchar(10)	YES		NULL	
assets	decimal(10,0)	YES		NULL	

4 rows in set (0.00 sec)

```
mysql> CREATE TABLE Account(  
    -> account_number varchar(10),  
    -> branch_id varchar(10),  
    -> balance numeric(10),  
    -> PRIMARY KEY(account_number),  
    -> FOREIGN KEY(branch_id) REFERENCES Branch(branch_id)  
    -> );
```

Query OK, 0 rows affected (1.20 sec)

```
mysql> DESC Account;
```

```
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| account_number | varchar(10)   | NO   | PRI | NULL    |       |
| branch_id      | varchar(10)   | YES  | MUL | NULL    |       |
| balance        | decimal(10,0) | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE Depositor(
    -> customer_id varchar(10),
    -> account_number varchar(10),
    -> FOREIGN KEY(customer_id) REFERENCES Customer(customer_id),
    -> FOREIGN KEY(account_number) REFERENCES Account(account_number)
    -> );
```

```
Query OK, 0 rows affected (1.05 sec)
```

```
mysql> DESC Depositor;
```

```
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| customer_id    | varchar(10)   | YES  | MUL | NULL    |       |
| account_number | varchar(10)   | YES  | MUL | NULL    |       |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE Loan(
    -> loan_number varchar(10),
    -> branch_id varchar(10),
    -> amount numeric(10),
    -> PRIMARY KEY(loan_number),
    -> FOREIGN KEY(branch_id) REFERENCES Account(branch_id)
    -> );
```

Query OK, 0 rows affected (1.56 sec)

mysql> DESC Loan;

Field	Type	Null	Key	Default	Extra
loan_number	varchar(10)	NO	PRI	NULL	
branch_id	varchar(10)	YES	MUL	NULL	
amount	decimal(10,0)	YES		NULL	

3 rows in set (0.00 sec)

```
mysql> CREATE TABLE Borrower(  
    -> customer_id varchar(10),  
    -> loan_number varchar(10),  
    -> FOREIGN KEY(customer_id) REFERENCES Customer(customer_id),  
    -> FOREIGN KEY(loan_number) REFERENCES Loan(loan_number)  
    -> );
```

Query OK, 0 rows affected (1.44 sec)

mysql> DESC Borrower;

Field	Type	Null	Key	Default	Extra
customer_id	varchar(10)	YES	MUL	NULL	
loan_number	varchar(10)	YES	MUL	NULL	

2 rows in set (0.00 sec)

```
mysql> CREATE TABLE Payment(  
    -> loan_number varchar(10),  
    -> payment_number varchar(10),  
    -> payment_date date,  
    -> payment_amount numeric(10),
```

```
-> FOREIGN KEY(loan_number) REFERENCES Loan(loan_number)
-> );
```

Query OK, 0 rows affected (0.88 sec)

```
mysql> DESC Payment;
```

Field	Type	Null	Key	Default	Extra
loan_number	varchar(10)	YES	MUL	NULL	
payment_number	varchar(10)	YES		NULL	
payment_date	date	YES		NULL	
payment_amount	decimal(10,0)	YES		NULL	

4 rows in set (0.00 sec)

Q2.>

```
mysql> INSERT INTO Customer VALUES
```

```
-> ('C-01','ABHISEK MIDYA','JADAVPUR','KOLKATA'),
-> ('C-02','AHIN SUBHRA HALDER','GARIA','KOLKATA'),
-> ('C-03','ARNAB DEY','TOLLYGUNGE','KOLKATA'),
-> ('C-04','KRISHNENDU GANGULI','AC HOWRAH','HOWRAH'),
-> ('C-05','SUBHAJIT GARAI','DHAKURIA','KOLKATA'),
-> ('C-06','SAGNIK KUMAR GHOSH','BHOWANIPORE','KOLKATA'),
-> ('C-07','SUVAM PAL','SILIGURI','SILIGURI'),
-> ('C-08','RAKESH DAS','BEHALA','KOLKATA'),
-> ('C-09','SUPRIO SAHA','BEHALA','KOLKATA'),
-> ('C-10','BUDHADITTYA SARKAR','HAZRA','KOLKATA');
```

Query OK, 10 rows affected (0.23 sec)

Records: 10 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Branch VALUES
-> ('B-01','BHOWANIPORE','KOLKATA',90000),
-> ('B-02','JADAVPUR','KOLKATA',67000),
-> ('B-03','BEHALA','KOLKATA',298000),
-> ('B-04','GARIA','KOLKATA',30000),
-> ('B-05','SILIGURI','SILIGURI',35000);
```

Query OK, 5 rows affected (0.20 sec)

Records: 5 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Account VALUES
```

```
-> ('A-101','B-01',75000),
-> ('A-108','B-02',96400),
-> ('A-456','B-03',64000),
-> ('A-105','B-04',400),
-> ('A-111','B-02',4000),
-> ('A-767','B-03',9150),
-> ('A-451','B-03',310),
-> ('A-005','B-01',510),
-> ('A-002','B-04',11400),
-> ('A-009','B-04',5000),
-> ('A-052','B-05',15000);
```

Query OK, 11 rows affected (0.22 sec)

Records: 11 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Depositor VALUES
```

```
-> ('C-01','A-101'),
-> ('C-02','A-002'),
-> ('C-03','A-005'),
-> ('C-04','A-451'),
-> ('C-05','A-108'),
-> ('C-06','A-767'),
-> ('C-07','A-009'),
```

```
-> ('C-08','A-456'),  
-> ('C-09','A-108'),  
-> ('C-10','A-105');
```

Query OK, 10 rows affected (0.10 sec)

Records: 10 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Loan VALUES
```

```
-> ('L-01','B-01',9089),  
-> ('L-02','B-02',908),  
-> ('L-03','B-04',2000),  
-> ('L-04','B-04',9000),  
-> ('L-05','B-03',3500);
```

Query OK, 5 rows affected (0.16 sec)

Records: 5 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Borrower VALUES
```

```
-> ('C-01','L-01'),  
-> ('C-08','L-02'),  
-> ('C-05','L-03'),  
-> ('C-03','L-04'),  
-> ('C-09','L-05');
```

Query OK, 5 rows affected (0.12 sec)

Records: 5 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Payment VALUES
```

```
-> ('L-01','P-01','2021-11-30',2000),  
-> ('L-02','P-02','2019-07-19',9000),  
-> ('L-03','P-04','2018-08-12',8000),  
-> ('L-04','P-03','2020-06-21',100),  
-> ('L-05','P-05','2019-02-17',2050);
```

Query OK, 5 rows affected (0.15 sec)

Records: 5 Duplicates: 0 Warnings: 0

Q3.>

A.)

```
mysql> SELECT * FROM Customer WHERE customer_id IN (
    -> SELECT customer_id FROM Depositor WHERE account_number IN (
    -> SELECT account_number FROM Account WHERE balance > 500 )
    -> );
```

customer_id	customer_name	customer_street	customer_city
C-02	AHIN SUBHRA HALDER	GARIA	KOLKATA
C-03	ARNAB DEY	TOLLYGUNGE	KOLKATA
C-07	SUVAM PAL	SILIGURI	SILIGURI
C-01	ABHISEK MIDYA	JADAVPUR	KOLKATA
C-05	SUBHAJIT GARAI	DHAKURIA	KOLKATA
C-09	SUPRIO SAHA	BEHALA	KOLKATA
C-08	RAKESH DAS	BEHALA	KOLKATA
C-06	SAGNIK KUMAR GHOSH	BHOWANIPORE	KOLKATA

8 rows in set (0.00 sec)

B.)

```
mysql> SELECT * FROM Customer WHERE customer_id NOT IN (
    -> SELECT customer_id FROM Borrower);
```

customer_id	customer_name	customer_street	customer_city
C-02	AHIN SUBHRA HALDER	GARIA	KOLKATA
C-04	KRISHNENDU GANGULI	AC HOWRAH	HOWRAH
C-06	SAGNIK KUMAR GHOSH	BHOWANIPORE	KOLKATA
C-07	SUVAM PAL	SILIGURI	SILIGURI
C-10	BUDHADITTYA SARKAR	HAZRA	KOLKATA

5 rows in set (0.00 sec)

C.)

```
mysql> SELECT * FROM Customer WHERE customer_id IN (
    -> SELECT customer_id FROM Borrower);
```

```
+-----+-----+-----+-----+
| customer_id | customer_name | customer_street | customer_city |
+-----+-----+-----+-----+
| C-01        | ABHISEK MIDYA | JADAVPUR        | KOLKATA        |
| C-03        | ARNAB DEY     | TOLLYGUNGE      | KOLKATA        |
| C-05        | SUBHAJIT GARAI | DHAKURIA        | KOLKATA        |
| C-08        | RAKESH DAS    | BEHALA          | KOLKATA        |
| C-09        | SUPRIO SAHA   | BEHALA          | KOLKATA        |
+-----+-----+-----+-----+

5 rows in set (0.00 sec)
```

D.)

```
mysql> SELECT customer_id, customer_name, customer_city, customer_street,
branch_id, branch_name, account_number FROM Customer NATURAL JOIN Branch
NATURAL JOIN Account NATURAL JOIN Depositor;
```

```
+-----+-----+-----+-----+-----+-----+-----+
| customer_id | customer_name | customer_city | customer_street | branch_id | branch_name | account_number |
+-----+-----+-----+-----+-----+-----+-----+
| C-01        | ABHISEK MIDYA | KOLKATA      | JADAVPUR        | B-01      | BHOWANIPORE | A-101          |
| C-02        | AHIN SUBHRA HALDER | KOLKATA      | GARIA           | B-04      | GARIA       | A-002          |
| C-03        | ARNAB DEY     | KOLKATA      | TOLLYGUNGE      | B-01      | BHOWANIPORE | A-005          |
| C-04        | KRISHNENDU GANGULI | HOWRAH       | AC HOWRAH       | B-03      | BEHALA      | A-451          |
| C-05        | SUBHAJIT GARAI | KOLKATA      | DHAKURIA        | B-02      | JADAVPUR    | A-108          |
| C-06        | SAGNIK KUMAR GHOSH | KOLKATA      | BHOWANIPORE     | B-03      | BEHALA      | A-767          |
| C-07        | SUVAM PAL     | SILIGURI     | SILIGURI        | B-04      | GARIA       | A-009          |
| C-08        | RAKESH DAS    | KOLKATA      | BEHALA          | B-03      | BEHALA      | A-456          |
| C-09        | SUPRIO SAHA   | KOLKATA      | BEHALA          | B-02      | JADAVPUR    | A-108          |
| C-10        | BUDHADITTYA SARKAR | KOLKATA      | HAZRA           | B-04      | GARIA       | A-105          |
+-----+-----+-----+-----+-----+-----+-----+

10 rows in set (0.00 sec)
```

E.)

```
mysql> SELECT account_number as 'Account / Loan Number', branch_id, balance
FROM Account NATURAL JOIN Customer NATURAL JOIN Depositor WHERE
customer_id = 'C-01' UNION ( SELECT loan_number, branch_id, amount FROM
Loan NATURAL JOIN Borrower NATURAL JOIN Customer WHERE
customer_id = 'C-01');
```

```
+-----+-----+-----+
| Account / Loan Number | branch_id | balance |
+-----+-----+-----+
| A-101                | B-01      | 75000   |
| L-01                 | B-01      | 9089    |
+-----+-----+-----+
```

2 rows in set (0.00 sec)

F.)

```
mysql> SELECT branch_id,branch_name,branch_city,assets FROM Branch WHERE
assets = ( SELECT MAX(assets) FROM Branch );
```

```
+-----+-----+-----+-----+
| branch_id | branch_name | branch_city | assets |
+-----+-----+-----+-----+
| B-03      | BEHALA      | KOLKATA     | 298000 |
+-----+-----+-----+-----+
```

1 row in set (0.00 sec)

G.)

```
mysql> SELECT * FROM Customer WHERE customer_id IN (
-> SELECT customer_id FROM Depositor NATURAL JOIN Account NATURAL JOIN Branch
-> WHERE branch_name = 'BHOWANIPORE');
```

```
+-----+-----+-----+-----+
| customer_id | customer_name | customer_street | customer_city |
+-----+-----+-----+-----+
| C-01        | ABHISEK MIDYA | JADAVPUR        | KOLKATA       |
| C-03        | ARNAB DEY     | TOLLYGUNGE      | KOLKATA       |
+-----+-----+-----+-----+
```

2 rows in set (0.00 sec)