

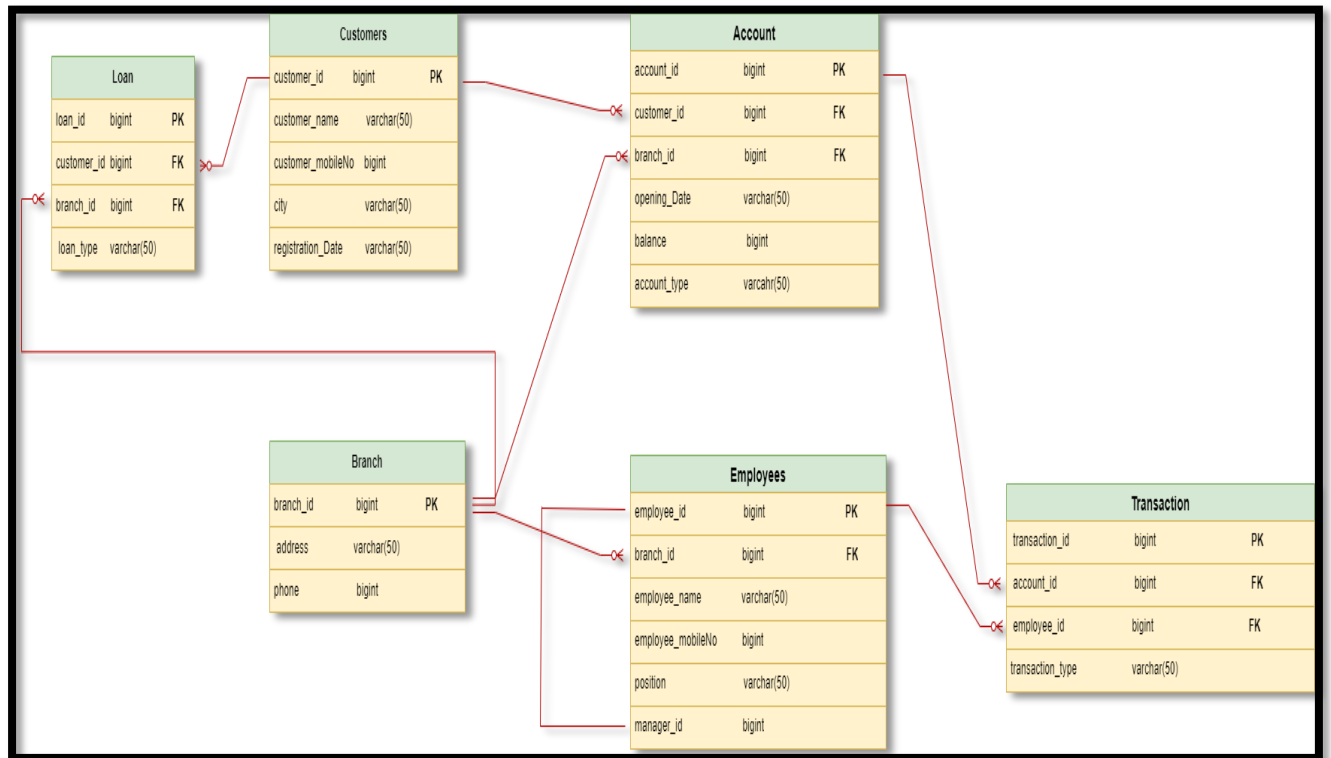


BANK OF MUMBAI

INTRODUCTION

Bank Of Mumbai project showcasing the structure and relationship between various tables. The tables include customers, branch, loan, account, employees and transaction each with their respective attributes and primary, foreign keys. The context also includes subqueries and joins to demonstrate how data can be retrieved from the tables using SQL queries.

ER DIAGRAM



STRUCTURE OF TABLES

1.CUSTOMERS

Customer table contains customer ID as primary key, customer name , customer mobile number , city and registration Date.

```
mysql> desc customers;
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| customer_id    | bigint        | NO   | PRI | NULL    |       |
| customer_name  | varchar(50)   | YES  |     | NULL    |       |
| customer_mobileNo | bigint        | YES  |     | NULL    |       |
| city           | varchar(50)   | YES  |     | NULL    |       |
| registration_Date | varchar(50)   | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

2.BRANCH

Branch table contains branch ID as primary key, branch address and branch phone number.

```
mysql> create table Branch(branch_id bigint primary key , address varchar(50) , phone bigint );
Query OK, 0 rows affected (0.03 sec)

mysql> desc branch;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| branch_id  | bigint        | NO   | PRI | NULL    |       |
| address    | varchar(50)   | YES  |     | NULL    |       |
| phone      | bigint        | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

3.LOAN

Loan table contains loan ID as primary key, customer ID as foreign key , branch ID as foreign key and loan type.

```
mysql> create table Loan(loan_id int primary key , customer_id bigint , branch_id bigint , loan_type varchar(50) , constraint ccn foreign key fcn (customer_id) references c
customers (customer_id) , constraint bcn foreign key bfn (branch_id) references branch (branch_id));
Query OK, 0 rows affected (0.03 sec)

mysql> desc loan;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| loan_id    | int           | NO   | PRI | NULL    |       |
| customer_id | bigint        | YES  | MUL | NULL    |       |
| branch_id  | bigint        | YES  | MUL | NULL    |       |
| loan_type  | varchar(50)   | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

4.ACCOUNT

Account table contains account ID as primary key , customer ID as foreign key , branch ID as foreign key , account opening date , account balance and account type.

```
mysql> create table account (account_id bigint primary key , customer_id bigint , branch_id bigint , opening_Date varchar(50) , balance bigint CHECK(balance > 1000) , account_type varchar(50) , constraint cn foreign key fn (customer_id) references customers (customer_id) , constraint bn foreign key bf (branch_id) references branch (branch_id) );
Query OK, 0 rows affected (0.05 sec)

mysql> desc account;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| account_id | bigint | NO | PRI | NULL |  |
| customer_id | bigint | YES | MUL | NULL |  |
| branch_id | bigint | YES | MUL | NULL |  |
| opening_Date | varchar(50) | YES |  | NULL |  |
| balance | bigint | YES |  | NULL |  |
| account_type | varchar(50) | YES |  | NULL |  |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

5.EMPLOYEES

Employees table contains employee ID as primary key , branch ID as foreign key , employee name , employee mobile number , employee position and manager ID .

```
mysql> create table employees (employee_id bigint primary key , branch_id bigint , employee_name varchar(50) , employee_mobileNo bigint , position varchar(50) , manager_id bigint , constraint bbn foreign key bbr (branch_id) references branch(branch_id));
Query OK, 0 rows affected (0.02 sec)

mysql> desc employees;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| employee_id | bigint | NO | PRI | NULL |  |
| branch_id | bigint | YES | MUL | NULL |  |
| employee_name | varchar(50) | YES |  | NULL |  |
| employee_mobileNo | bigint | YES |  | NULL |  |
| position | varchar(50) | YES |  | NULL |  |
| manager_id | bigint | YES |  | NULL |  |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

6.TRANSACTION

Transaction table contains transaction ID as primary key , account ID as foreign key , employee ID as foreign key and transaction type.

```
mysql> desc transaction;
```

Field	Type	Null	Key	Default	Extra
transaction_id	bigint	NO	PRI	NULL	
account_id	bigint	YES	MUL	NULL	
employee_id	bigint	YES	MUL	NULL	
transaction_type	varchar(50)	YES		NULL	

```
4 rows in set (0.00 sec)
```

CONTENTS OF TABLES

1.CUSTOMER

```
C:\Windows\System32\cmd.exe - mysql -uroot -proot123
20 rows in set (0.00 sec)

mysql> insert into customers values(121,'Siddhi',7865438965,'Dhule','27-05-2008'), (122,'Nidhi',3456543278,'Akola','11-04-2022'), (123,'Sammer',6349862341,'Nagpur','21-04-2002'), (124,'Simran',4532675432,'Thane','05-05-2003'), (125,'Raj',2343215674,'Kalyan','09-06-2005');
Query OK, 5 rows affected (0.00 sec)
Records: 5 Duplicates: 0 Warnings: 0

mysql> select * from customers;
```

customer_id	customer_name	customer_mobileNo	city	registration_Date
101	Riya	7654312343	Pune	11-04-2022
102	Amit	5656312383	Nagpur	17-06-2022
103	Suraj	9875934234	Thane	23-08-2021
104	Jai	7345673213	Kalyan	07-03-2020
105	Amar	9856345213	kurla	05-05-2003
106	Aditi	9876543212	Mumbra	06-08-2007
107	Varun	7543214678	Latur	21-04-2002
108	Mayur	9845678432	Dhule	09-06-2005
109	Tej	4567823452	Akola	03-03-2003
110	Neha	3456432134	Beed	05-05-2005
111	Pravin	6543215678	Vashi	08-02-2020
112	Akshay	4567834562	Airoli	09-02-2021
113	Devika	4567542115	Latur	06-06-2023
114	Neena	3456765432	Thane	27-05-2008
115	Pooja	4567543245	Dadar	07-03-2008
116	Deep	6543217895	Beed	06-08-2003
117	Nitin	2345432167	Dadar	23-08-2021
118	Deepali	9875678432	Pune	09-02-2021
119	Suyash	4567543216	Vashi	09-02-2021
120	Deepak	6785432167	Kalyan	17-06-2022
121	Siddhi	7865438965	Dhule	27-05-2008
122	Nidhi	3456543278	Akola	11-04-2022
123	Sammer	6349862341	Nagpur	21-04-2002
124	Simran	4532675432	Thane	05-05-2003
125	Raj	2343215674	Kalyan	09-06-2005

```
25 rows in set (0.00 sec)

mysql>
```

2.BRANCH

```
mysql> select * from branch;
```

branch_id	address	phone
11	Andheri	111111
12	Sion	121212
21	Colaba	212121
22	Bandra	222222
31	Fort	313131
33	Dadar	333333
41	Kala Ghoda	414141
44	Malad	444444
51	Byculla	515151
55	Powai	555555
66	Mulund	666666
77	Lower Parel	777777
88	Worli	888888
99	Lalbaug	999999

```
14 rows in set (0.00 sec)
```


3.LOAN

```
mysql> select * from loan;
```

loan_id	customer_id	branch_id	loan_type
1111	105	33	Home
1112	106	55	Gold
1113	106	55	Education
1114	110	41	Vehicle
1115	120	21	Business
1116	115	21	Gold
1117	115	21	Vehicle
1118	102	11	Gold
1119	123	66	Home
1120	118	77	Personal
1121	113	31	Business
1122	124	41	Home
1123	108	22	Vehicle
1124	108	22	Education
1125	125	44	Gold
1126	112	88	Home
1127	112	88	Personal
1128	107	99	Vehicle
1129	107	99	Gold
1130	122	12	Gold
1131	122	12	Education
1132	104	51	Home
1133	104	51	Vehicle
1134	119	77	Personal
1135	118	77	Home

```
25 rows in set (0.00 sec)
```

4.ACCOUNT

```
mysql> select * from account;
```

account_id	customer_id	branch_id	opening_Date	balance	account_type
1212	121	41	07-08-2020	2000	Saving
1213	117	77	23-12-2021	6000	Current
1214	109	12	14-09-2022	8000	Current
1215	114	77	09-02-2023	5000	Current
1216	101	41	23-04-2023	9000	Current
1217	111	12	26-07-2023	4000	Current
1218	116	44	09-02-2022	9000	Current
1219	103	22	15-07-2021	7600	Current
1220	106	31	29-06-2023	4400	Saving
1221	125	22	17-02-2019	7700	Saving
1222	105	31	24-11-2017	3300	Saving
1223	124	22	06-02-2015	5500	Saving
1224	119	51	16-01-2023	6600	Saving
1225	102	55	28-08-2018	2200	Current
1226	123	44	02-02-2020	3300	Saving
1227	122	51	14-07-2019	6060	Saving
1228	108	55	23-12-2020	7070	Saving
1229	120	11	16-06-2021	4400	Saving
1230	104	88	07-07-2023	7700	Saving
1231	118	99	29-04-2023	3000	Saving
1232	115	66	08-03-2021	6000	Saving
1233	113	21	24-02-2020	8800	Current
1234	112	33	04-04-2022	6200	Saving
1235	110	33	14-07-2017	8870	Saving
1236	107	99	07-07-2021	7720	Saving

```
25 rows in set (0.00 sec)
```

5.EMPLOYEES

```
C:\Windows\System32\cmd.exe - mysql -uroot -proot123
```

9920	51	Pushkar	8654321789	Banking Analyst	9912
9921	12	Anardeep	3478653456	Loan Officer	9916
9922	88	Sangeeta	9834674321	Clerk	9913
9923	22	Sajeev	4565436786	Banking Associate	9916
9924	51	Lau	3456543256	Personal Banker	9913

15 rows in set (0.00 sec)

```
mysql> insert into employees values (9925,44,'Avinash',3454367896,'Treasury Analyst',9921) , (9926,77,'Parth',5675432567,'Prbation Officer',9922) , (9927,66,'Meera',3245675432,'Equity Analyst',9918) , (9928,44,'Ranbir',6547896543,'Company Secretary',9924) , (9929,51,'Alia',4468985678,'Assistant Manager',9922) ;
```

Query OK, 5 rows affected (0.00 sec)
Records: 5 Duplicates: 0 Warnings: 0

```
mysql> select * from employees;
```

employee_id	branch_id	employee_name	employee_mobileNo	position	manager_id
9910	11	Niti	9867543245	Manager	NULL
9911	33	Reshma	4564321567	Banker	9910
9912	12	Sumit	3454321678	Credit Analyst	9914
9913	88	Neeraj	2345432189	Investment Banker	9910
9914	12	Rani	3456432167	Relationship Manager	9917
9915	51	Om	4565432987	Asset Manager	9910
9916	22	Ayush	2343567854	Underwriter	9914
9917	44	Surjeet	9856743215	Asset Manager	9914
9918	33	Damini	4567432567	Financial Analyst	9912
9919	11	Hardeep	3454321789	Internal Auditor	9915
9920	51	Pushkar	8654321789	Banking Analyst	9912
9921	12	Anardeep	3478653456	Loan Officer	9916
9922	88	Sangeeta	9834674321	Clerk	9913
9923	22	Sajeev	4565436786	Banking Associate	9916
9924	51	Lau	3456543256	Personal Banker	9913
9925	44	Avinash	3454367896	Treasury Analyst	9921
9926	77	Parth	5675432567	Prbation Officer	9922
9927	66	Meera	3245675432	Equity Analyst	9918
9928	44	Ranbir	6547896543	Company Secretary	9924
9929	51	Alia	4468985678	Assistant Manager	9922

20 rows in set (0.00 sec)

```
mysql>
```

6.TRANSACTION

```
C:\Windows\System32\cmd.exe - mysql -uroot -proot123
+-----+
28 rows in set (0.00 sec)

mysql> insert into transaction values(5571,1230,9929,'Internet Bank' ) , (5572,1231,9915,'AEPS') , (5573,1232,9919,'Card') , (5574,1233,9910,'NEFT') , (5575,1226,9920,'RTGS
');
Query OK, 5 rows affected (0.00 sec)
Records: 5 Duplicates: 0 Warnings: 0

mysql> select * from transaction;
+-----+
| transaction_id | account_id | employee_id | transaction_type |
+-----+
| 5551 | 1213 | 9911 | UPI |
| 5552 | 1226 | 9926 | Internet Bank |
| 5553 | 1215 | 9910 | Card |
| 5554 | 1222 | 9916 | NEFT |
| 5555 | 1212 | 9929 | RTGS |
| 5556 | 1214 | 9921 | IMPS |
| 5557 | 1230 | 9920 | AEPS |
| 5558 | 1216 | 9912 | RTGS |
| 5559 | 1217 | 9913 | UPI |
| 5560 | 1218 | 9915 | IMPS |
| 5561 | 1219 | 9917 | Internet Bank |
| 5562 | 1220 | 9918 | AEPS |
| 5563 | 1221 | 9919 | Card |
| 5564 | 1223 | 9922 | NEFT |
| 5565 | 1224 | 9923 | RTGS |
| 5566 | 1225 | 9924 | Internet Bank |
| 5567 | 1226 | 9925 | AEPS |
| 5568 | 1227 | 9926 | Card |
| 5569 | 1228 | 9927 | NEFT |
| 5570 | 1229 | 9928 | RTGS |
| 5571 | 1230 | 9929 | Internet Bank |
| 5572 | 1231 | 9915 | AEPS |
| 5573 | 1232 | 9919 | Card |
| 5574 | 1233 | 9910 | NEFT |
| 5575 | 1226 | 9920 | RTGS |
+-----+
25 rows in set (0.00 sec)

mysql>
```

SUBQUERY

1.show all details of customers who are taking loan whose branch address is lower parel.

```
mysql> select customer_id , customer_name , customer_mobileNo ,  
city , registration_Date from customers where customer_id in ( select  
customer_id from loan where branch_id in (select branch_id from  
branch where address='lower parel'));
```

```
mysql>  
mysql> select customer_id , customer_name , customer_mobileNo , city , registration_Date from customers where customer_id in ( select customer_id from loan where branch_id  
in (select branch_id from branch where address='lower parel'));
```

customer_id	customer_name	customer_mobileNo	city	registration_Date
118	Deepali	9875678432	Pune	09-02-2021
119	Suyash	4567543216	Vashi	09-02-2021

```
2 rows in set (0.00 sec)
```

2.Show all details of customers who have accounts in lalbaug branch.

```
mysql> select customer_name , customer_id from customers where customer_id in
```

```
(select customer_id from account where branch_id in
```

```
(select branch_id from branch where address='lalbaug'));
```

```
mysql>
mysql>
mysql> select customer_name , customer_id from customers where customer_id in
      -> (select customer_id from account where branch_id in
      -> (select branch_id from branch where address='lalbaug'));
+-----+-----+
| customer_name | customer_id |
+-----+-----+
| Deepali      |          118 |
| Varun        |          107 |
+-----+-----+
2 rows in set (0.00 sec)
```

3.Show details of account id , balance , customer id who open account in fort branch.

```
mysql> select account_id , balance , customer_id from account  
where customer_id in (select customer_id from customers where  
customer_id in ( select customer_id from account where branch_id  
=( select branch_id from branch where address='fort')));
```

```
mysql>  
mysql> select account_id , balance , customer_id from account where customer_id in (select customer_id from customers where customer_id in ( select customer_id from account  
where branch_id =( select branch_id from branch where address='fort')));  
+-----+-----+-----+  
| account_id | balance | customer_id |  
+-----+-----+-----+  
| 1220 | 4400 | 106 |  
| 1222 | 3300 | 105 |  
+-----+-----+-----+  
2 rows in set (0.00 sec)
```

4. calculate the number of accounts for each branch.

mysql> select branch_id, (select count(*) from account where account.branch_id = branch.branch_id) as no_of_accounts from branch;

```
mysql>
mysql> select branch_id, (select count(*) from account where account.branch_id = branch.branch_id) as no_of_accounts from branch;
```

branch_id	no_of_accounts
11	1
12	2
21	1
22	3
31	2
33	2
41	2
44	2
51	2
55	2
66	1
77	2
88	1
99	2

```
14 rows in set (0.00 sec)
```


5.Display name of customers who have taken count of loan.

```
mysql> SELECT customer_name, ( SELECT COUNT(*) FROM loan
WHERE loan.customer_id = customers.customer_id) AS loan_count
FROM customers;
```

```
C:\Windows\System32\cmd.exe - mysql -uroot -proot123
14 rows in set (0.01 sec)

mysql> SELECT customer_name, (
  -> SELECT COUNT(*)
  -> FROM loan
  -> WHERE loan.customer_id = customers.customer_id
  -> ) AS loan_count
  -> FROM customers;
+-----+-----+
| customer_name | loan_count |
+-----+-----+
| Riya          | 0          |
| Amit          | 1          |
| Suraj         | 0          |
| Jai           | 2          |
| Amar          | 1          |
| Aditi         | 2          |
| Varun         | 2          |
| Mayur         | 2          |
| Tej           | 0          |
| Neha          | 1          |
| Pravin        | 0          |
| Akshay        | 2          |
| Devika        | 1          |
| Neena         | 0          |
| Pooja         | 2          |
| Deep          | 0          |
| Nitin         | 0          |
| Deepali       | 2          |
| Suyash        | 1          |
| Deepak        | 1          |
| Siddhi        | 0          |
| Nidhi         | 2          |
| Sammer        | 1          |
| Simran        | 1          |
| Raj           | 1          |
+-----+-----+
25 rows in set (0.01 sec)

mysql>
```

JOINS

1.Display name of employees along with their manager name.

```
mysql> SELECT e1.employee_name AS employee_name,  
e2.employee_name AS manager_name FROM employees e1  
JOIN employees e2 ON e1.manager_id = e2.employee_id;
```

```
mysql> SELECT e1.employee_name AS employee_name, e2.employee_name AS manager_name  
-> FROM employees e1  
-> JOIN employees e2 ON e1.manager_id = e2.employee_id;
```

employee_name	manager_name
Reshma	Niti
Sumit	Rani
Neeraj	Niti
Rani	Sujeet
Om	Niti
Ayush	Rani
Sujeet	Rani
Damini	Sumit
Hardeep	Om
Pushkar	Sumit
Amardeep	Ayush
Sangeeta	Neeraj
Sajeev	Ayush
Lau	Neeraj
Avinash	Amardeep
Parth	Sangeeta
Meera	Damini
Ranbir	Lau
Alia	Sangeeta

```
19 rows in set (0.03 sec)
```

2.Display customer name along with their balance and branch address.

```
mysql> SELECT customers.customer_name, account.balance,  
branch.address FROM account INNER JOIN customers ON  
account.customer_id = customers.customer_id INNER JOIN branch  
ON account.branch_id = branch.branch_id;
```

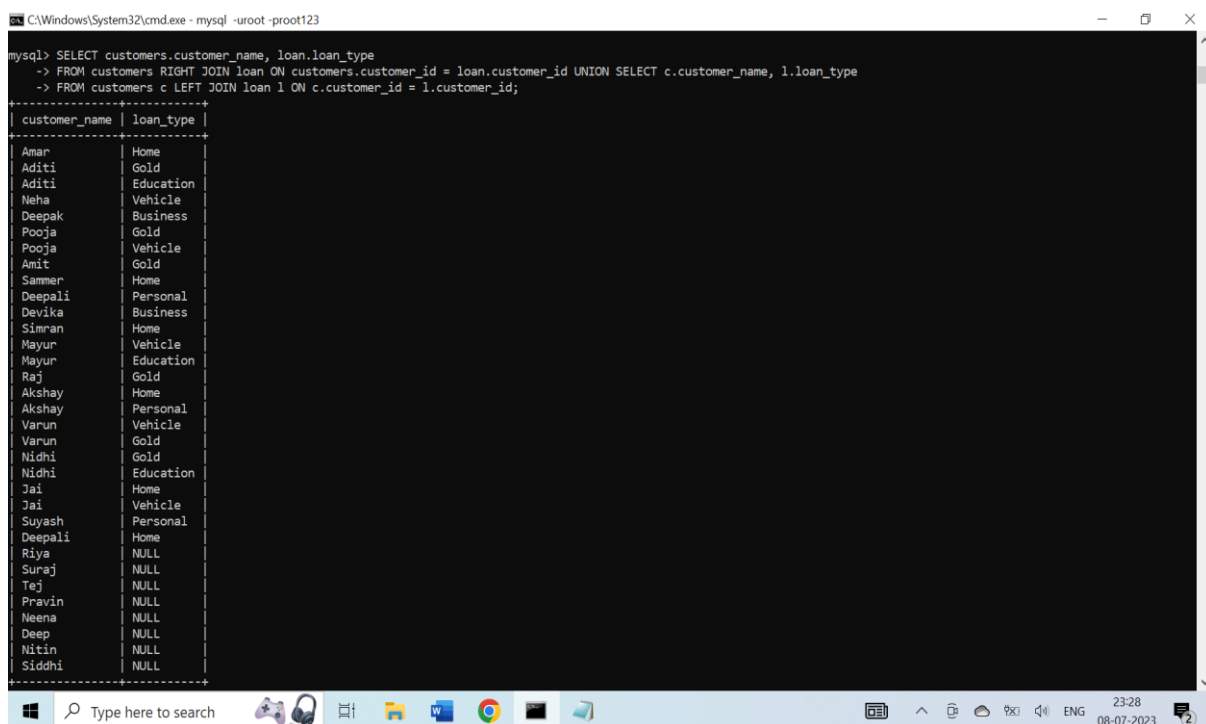
```
mysql>  
mysql> SELECT customers.customer_name, account.balance, branch.address  
-> FROM account  
-> INNER JOIN customers ON account.customer_id = customers.customer_id  
-> INNER JOIN branch ON account.branch_id = branch.branch_id;
```

customer_name	balance	address
Deepak	4400	Andheri
Tej	8000	Sion
Pravin	4000	Sion
Devika	8800	Colaba
Suraj	7600	Bandra
Raj	7700	Bandra
Simran	5500	Bandra
Aditi	4400	Fort
Amar	3300	Fort
Akshay	6200	Dadar
Neha	8870	Dadar
Siddhi	2000	Kala Ghoda
Riya	9000	Kala Ghoda
Deep	9000	Malad
Sammer	3300	Malad
Suyash	6600	Byculla
Nidhi	6060	Byculla
Amit	2200	Powai
Mayur	7070	Powai
Pooja	6000	Mulund
Nitin	6000	Lower Parel
Neena	5000	Lower Parel
Jai	7700	Worli
Deepali	3000	Lalbaug
Varun	7720	Lalbaug

```
25 rows in set (0.00 sec)
```

3.Display name of customer who have taken which type of loan.

```
SELECT customers.customer_name, loan.loan_type
FROM customers RIGHT JOIN loan ON customers.customer_id =
loan.customer_id UNION SELECT c.customer_name, l.loan_type
FROM customers c LEFT JOIN loan l ON c.customer_id =
l.customer_id;
```



The screenshot shows a Windows command prompt window titled "C:\Windows\System32\cmd.exe - mysql -uroot -proot123". The MySQL prompt is "mysql>". The user has entered a SQL query: "SELECT customers.customer_name, loan.loan_type -> FROM customers RIGHT JOIN loan ON customers.customer_id = loan.customer_id UNION SELECT c.customer_name, l.loan_type -> FROM customers c LEFT JOIN loan l ON c.customer_id = l.customer_id;". The query has been executed, and the results are displayed in a table with two columns: "customer_name" and "loan_type". The results list 28 customers and their corresponding loan types, with some customers having NULL values for loan_type.

customer_name	loan_type
Amar	Home
Aditi	Gold
Aditi	Education
Neha	Vehicle
Deepak	Business
Pooja	Gold
Pooja	Vehicle
Amit	Gold
Sammer	Home
Deepali	Personal
Devika	Business
Simran	Home
Mayur	Vehicle
Mayur	Education
Raj	Gold
Akshay	Home
Akshay	Personal
Varun	Vehicle
Varun	Gold
Nidhi	Gold
Nidhi	Education
Jai	Home
Jai	Vehicle
Suyash	Personal
Deepali	Home
Riya	NULL
Suraj	NULL
Tej	NULL
Pravin	NULL
Neena	NULL
Deep	NULL
Nitin	NULL
Siddhi	NULL

4. Which customers are included in the result set when performing a right join between the customers and loan tables on the customer_id column?

SELECT customers.customer_name, loan.loan_type FROM customers RIGHT JOIN loan ON customers.customer_id = loan.customer_id;

```
C:\Windows\System32\cmd.exe - mysql -uroot -proot123
mysql>
mysql>
mysql>
mysql>
mysql>
mysql> SELECT customers.customer_name, loan.loan_type
        -> FROM customers
        -> RIGHT JOIN loan ON customers.customer_id = loan.customer_id;
+-----+-----+
| customer_name | loan_type |
+-----+-----+
| Amar          | Home     |
| Aditi         | Gold     |
| Aditi         | Education|
| Neha          | Vehicle  |
| Deepak        | Business |
| Pooja         | Gold     |
| Pooja         | Vehicle  |
| Amit          | Gold     |
| Sammer        | Home     |
| Deepali       | Personal |
| Devika        | Business |
| Simran        | Home     |
| Mayur         | Vehicle  |
| Mayur         | Education|
| Raj           | Gold     |
| Akshay        | Home     |
| Akshay        | Personal |
| Varun         | Vehicle  |
| Varun         | Gold     |
| Nidhi         | Gold     |
| Nidhi         | Education|
| Jai           | Home     |
| Jai           | Vehicle  |
| Suyash        | Personal |
| Deepali       | Home     |
+-----+-----+
25 rows in set (0.00 sec)

mysql>
```