

## ASSIGNMENT – 4

### Question:

Consider a BANK database. Each bank can have multiple branches, and each branch can have multiple accounts and loans. Assumptions also can be made. Design an ER diagram and database schema for the system. Specify the primary key, foreign key and other constraints for all required tables. Draw the ER diagram in MS Word.

### 1. Insert at least five tuples in each table.

```
-- BANK TABLE
CREATE TABLE BANK (
    BANK_ID NUMBER (2) PRIMARY KEY,
    BANK_NAME VARCHAR (100) NOT NULL
);

INSERT INTO BANK VALUES (10, 'HDFC');
INSERT INTO BANK VALUES (20, 'SBI');
INSERT INTO BANK VALUES (30, 'AXIS');
INSERT INTO BANK VALUES (40, 'PNB');
INSERT INTO BANK VALUES (50, 'ICICI');

-- BRANCH TABLE
CREATE TABLE BRANCH (
    BRANCH_ID NUMBER (3) PRIMARY KEY,
    BRANCH_NAME VARCHAR (100) NOT NULL,
    BANK_ID NUMBER (2),
    FOREIGN KEY (BANK_ID) REFERENCES BANK (BANK_ID) ON DELETE CASCADE
);

INSERT INTO BRANCH VALUES (101, 'RUBY', 10);
INSERT INTO BRANCH VALUES (102, 'SEALDAH', 10);
INSERT INTO BRANCH VALUES (103, 'BEHALA', 10);
INSERT INTO BRANCH VALUES (201, 'GARIA', 20);
INSERT INTO BRANCH VALUES (202, 'HOWRAH', 20);
INSERT INTO BRANCH VALUES (203, 'DUMDUM', 20);
INSERT INTO BRANCH VALUES (301, 'BELGACHIA', 30);
INSERT INTO BRANCH VALUES (302, 'PHOOLBAGAN', 30);
INSERT INTO BRANCH VALUES (303, 'RUBY', 30);
INSERT INTO BRANCH VALUES (401, 'HOWRAH', 40);
INSERT INTO BRANCH VALUES (402, 'BEHALA', 40);
```

```
INSERT INTO BRANCH VALUES (403, 'SEALDAH', 40);
INSERT INTO BRANCH VALUES (501, 'DOWNTOWN', 50);
INSERT INTO BRANCH VALUES (502, 'BEHALA', 50);
INSERT INTO BRANCH VALUES (503, 'NEWTOWN', 50);
```

-- CUSTOMER TABLE

```
CREATE TABLE CUSTOMER (
    CUSTOMER_ID NUMBER (5) PRIMARY KEY,
    CUSTOMER_NAME VARCHAR (100) NOT NULL
);
```

```
INSERT INTO CUSTOMER VALUES (10101, 'SURESH');
INSERT INTO CUSTOMER VALUES (10201, 'RAMESH');
INSERT INTO CUSTOMER VALUES (10301, 'MANAV');
INSERT INTO CUSTOMER VALUES (20201, 'SUKANTA');
INSERT INTO CUSTOMER VALUES (20202, 'SUKKI');
INSERT INTO CUSTOMER VALUES (20101, 'MOHAN');
INSERT INTO CUSTOMER VALUES (20301, 'JOHN');
INSERT INTO CUSTOMER VALUES (30201, 'NEERAJ');
INSERT INTO CUSTOMER VALUES (30101, 'KAUSTAV');
INSERT INTO CUSTOMER VALUES (40101, 'ATIN');
INSERT INTO CUSTOMER VALUES (40201, 'PIYUSH');
INSERT INTO CUSTOMER VALUES (40301, 'AMRITA');
INSERT INTO CUSTOMER VALUES (50101, 'ANWESHA');
INSERT INTO CUSTOMER VALUES (50301, 'PAYAL');
```

-- ACCOUNT TABLE

```
CREATE TABLE ACCOUNT (
    ACCOUNT_NO NUMBER (11) PRIMARY KEY,
    BALANCE DECIMAL (10, 2),
    CUSTOMER_ID NUMBER (5),
    BRANCH_ID NUMBER (3),
    FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMER (CUSTOMER_ID) ON DELETE CASCADE,
    FOREIGN KEY (BRANCH_ID) REFERENCES BRANCH (BRANCH_ID) ON DELETE CASCADE
);
```

```
INSERT INTO ACCOUNT VALUES (55690129329, 500.00, 10101, 101);
INSERT INTO ACCOUNT VALUES (22545237546, 1111.50, 10201, 101);
INSERT INTO ACCOUNT VALUES (54321987654, 98765.00, 10201, 102);
INSERT INTO ACCOUNT VALUES (23800005552, 4567.00, 10301, 103);
INSERT INTO ACCOUNT VALUES (59498307311, 8845.57, 20201, 202);
INSERT INTO ACCOUNT VALUES (24592459895, 6790.12, 20202, 202);
INSERT INTO ACCOUNT VALUES (69875151611, 541.98, 20101, 201);
INSERT INTO ACCOUNT VALUES (30975635172, 87165.40, 20301, 203);
INSERT INTO ACCOUNT VALUES (81531363466, 34567.20, 30101, 302);
```

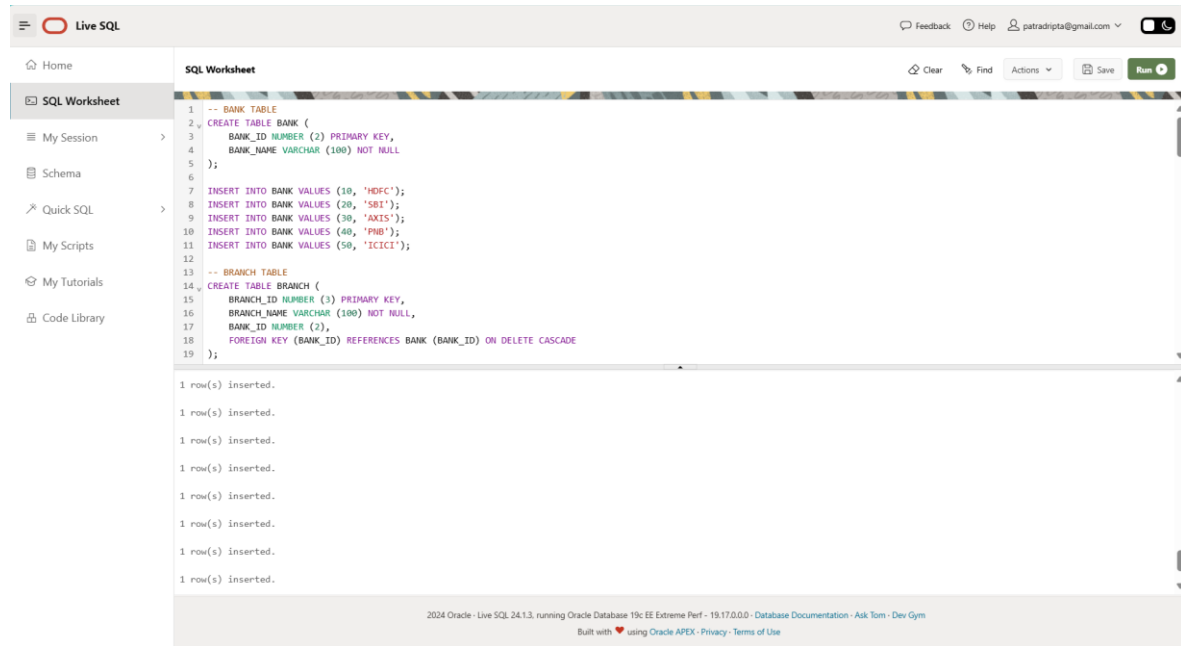
```
INSERT INTO ACCOUNT VALUES (45372949259, 7901.23, 30201, 301);
INSERT INTO ACCOUNT VALUES (12273579151, 69432.10, 40101, 401);
INSERT INTO ACCOUNT VALUES (43679662463, 4321.00, 40201, 402);
INSERT INTO ACCOUNT VALUES (90680460457, 2100.76, 40301, 403);
INSERT INTO ACCOUNT VALUES (18567978674, 34562.78, 40301, 403);
INSERT INTO ACCOUNT VALUES (97720840720, 677891.01, 50101, 501);
INSERT INTO ACCOUNT VALUES (10346725987, 5432.10, 50301, 503);
INSERT INTO ACCOUNT VALUES (31487204793, 987600.69, 50301, 503);
INSERT INTO ACCOUNT VALUES (29645816408, 123456.67, 50301, 503);
```

-- LOAN TABLE

```
CREATE TABLE LOAN (
    LOAN_ID NUMBER (6) PRIMARY KEY,
    LOAN_AMOUNT DECIMAL (12, 2),
    CUSTOMER_ID NUMBER (5),
    BRANCH_ID NUMBER (3),
    FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMER (CUSTOMER_ID) ON DELETE CASCADE,
    FOREIGN KEY (BRANCH_ID) REFERENCES BRANCH (BRANCH_ID) ON DELETE CASCADE
);
```

```
INSERT INTO LOAN VALUES (101011, 35486.12, 10101, 101);
INSERT INTO LOAN VALUES (102011, 12345.56, 10201, 101);
INSERT INTO LOAN VALUES (102012, 98765.00, 10201, 102);
INSERT INTO LOAN VALUES (202011, 23459.57, 20201, 202);
INSERT INTO LOAN VALUES (202021, 67890.62, 20202, 202);
INSERT INTO LOAN VALUES (201011, 5432.98, 20101, 201);
INSERT INTO LOAN VALUES (203011, 8765.00, 20301, 203);
INSERT INTO LOAN VALUES (302011, 34567.00, 30201, 302);
INSERT INTO LOAN VALUES (301011, 12901.23, 30101, 301);
INSERT INTO LOAN VALUES (401011, 65432.89, 40101, 401);
INSERT INTO LOAN VALUES (403011, 21091.76, 40301, 403);
INSERT INTO LOAN VALUES (403012, 34565.78, 40301, 403);
INSERT INTO LOAN VALUES (501011, 6778.01, 50101, 501);
INSERT INTO LOAN VALUES (503011, 543231.00, 50301, 503);
```

INSERT INTO LOAN VALUES (503012, 9800.54, 50301, 503);



## 2. Every customer must have at least one account but is restricted to at most two loans at a time.

ALTER TABLE CUSTOMER

ADD ACCOUNT\_NO NUMBER (11) NOT NULL,

ADD CONSTRAINT FK FOREIGN KEY (ACCOUNT\_NO) REFERENCES ACCOUNT (ACCOUNT\_NO);

CREATE TRIGGER MAXLOANSPERCUSTOMER

BEFORE INSERT ON LOAN

FOR EACH ROW

BEGIN

DECLARE LOAN\_COUNT INT;

SELECT COUNT(\*) INTO LOAN\_COUNT

FROM LOAN

WHERE CUSTOMER\_ID = NEW.CUSTOMER\_ID;

IF LOAN\_COUNT >= 2 THEN

SIGNAL SQLSTATE '45000'

SET MESSAGE\_TEXT = 'A CUSTOMER CAN HAVE A MAXIMUM OF 2 LOANS.';

END IF;

END;

## 3. Give all the account details of a person who has accounts in SBI.

```

SELECT A.*
FROM ACCOUNT A
JOIN BRANCH B ON A.BRANCH_ID = B.BRANCH_ID
JOIN BANK K ON B.BANK_ID = K.BANK_ID
WHERE K.BANK_NAME = 'SBI';

```

The screenshot shows the Live SQL web application interface. The SQL Worksheet area contains the query:
 

```

1 SELECT A.*
2 FROM ACCOUNT A
3 JOIN BRANCH B ON A.BRANCH_ID = B.BRANCH_ID
4 JOIN BANK K ON B.BANK_ID = K.BANK_ID
5 WHERE K.BANK_NAME = 'SBI';
6

```

 The Results area displays a table with 4 rows and 4 columns: ACCOUNT\_NO, BALANCE, CUSTOMER\_ID, and BRANCH\_ID.
 

| ACCOUNT_NO  | BALANCE | CUSTOMER_ID | BRANCH_ID |
|-------------|---------|-------------|-----------|
| 69875151611 | 541.98  | 20101       | 201       |
| 59498307311 | 8845.57 | 20201       | 202       |
| 24592459895 | 6790.12 | 20202       | 202       |
| 30975635172 | 87165.4 | 20301       | 203       |

 Below the table, it says 'Download CSV' and '4 rows selected.' The footer indicates '2024 Oracle - Live SQL 24.1.3, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym'.

#### 4.Find the account holder name who has more than 2 accounts.

```

SELECT CUSTOMER_NAME
FROM CUSTOMER
WHERE CUSTOMER_ID IN (
    SELECT A.CUSTOMER_ID
    FROM ACCOUNT A
    GROUP BY A.CUSTOMER_ID
    HAVING COUNT(A.ACCOUNT_NO) > 2
);

```

The screenshot shows the Oracle Live SQL interface. On the left is a sidebar with navigation links: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains the following SQL query:

```

1 SELECT CUSTOMER_NAME
2 FROM CUSTOMER
3 WHERE CUSTOMER_ID IN (
4   SELECT A.CUSTOMER_ID
5   FROM ACCOUNT A
6   GROUP BY A.CUSTOMER_ID
7   HAVING COUNT(A.ACCOUNT_NO) > 2
8 );
9

```

Below the query editor, there is a table with two columns: 'CUSTOMER\_NAME' and 'PAYAL'. A 'Download CSV' button is located below the table. At the bottom of the interface, a footer message reads: '2024 Oracle - Live SQL 24.1.3, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym'.

## 5. Rename the accounts table as account details.

ALTER TABLE ACCOUNT RENAME TO ACCOUNT\_DETAILS;

The screenshot shows the Oracle Live SQL interface with the 'SQL Worksheet' tab selected. The SQL query entered is:

```

1 ALTER TABLE ACCOUNT
2 RENAME TO ACCOUNT_DETAILS;

```

Below the query editor, the output area displays the message: 'Table altered.' At the bottom of the interface, the same footer message is present: '2024 Oracle - Live SQL 24.1.3, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym'.

## 6. Find the loan amount and loan taken from which bank for each account holder.

```

SELECT C.CUSTOMER_NAME, L.LOAN_AMOUNT, B.BANK_NAME
FROM LOAN L
JOIN CUSTOMER C ON L.CUSTOMER_ID = C.CUSTOMER_ID
JOIN BRANCH BR ON L.BRANCH_ID = BR.BRANCH_ID

```

JOIN BANK B ON BR.BANK\_ID = B.BANK\_ID;

The screenshot shows the 'Live SQL' web application interface. On the left is a sidebar with navigation links: Home, SQL Worksheet (active), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains a SQL query with five lines. Below the query is a table with three columns: CUSTOMER\_NAME, LOAN\_AMOUNT, and BANK\_NAME. The table lists 15 rows of data. At the bottom of the main area is a 'Download CSV' button. The footer contains version and copyright information.

```
1 SELECT C.CUSTOMER_NAME, L.LOAN_AMOUNT, B.BANK_NAME
2 FROM LOAN L
3 JOIN CUSTOMER C ON L.CUSTOMER_ID = C.CUSTOMER_ID
4 JOIN BRANCH BR ON L.BRANCH_ID = BR.BRANCH_ID
5 JOIN BANK B ON BR.BANK_ID = B.BANK_ID;
```

| CUSTOMER_NAME | LOAN_AMOUNT | BANK_NAME |
|---------------|-------------|-----------|
| SURESH        | 35486.12    | HDFC      |
| RAHESH        | 1234.56     | HDFC      |
| RAMESH        | 98765.43    | HDFC      |
| SUKANTA       | 2345.57     | SBI       |
| SUKKI         | 67890.12    | SBI       |
| HOMAN         | 54321.98    | SBI       |
| JOHN          | 8765.43     | SBI       |
| NEERAJ        | 34567.89    | AXIS      |
| KAUSTAV       | 78901.23    | AXIS      |
| ATIN          | 65432.1     | PNB       |
| AMRITA        | 21098.76    | PNB       |
| AMRITA        | 3456.78     | PNB       |
| ANMISHA       | 67789.01    | ICICI     |
| PAYAL         | 54321.1     | ICICI     |
| PAYAL         | 9876.54     | ICICI     |

Download CSV

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**7. Find the account no. and account holder name who has not taken any loan.**

```
SELECT A.ACCOUNT_NO, C.CUSTOMER_NAME
FROM ACCOUNT_DETAILS A
JOIN CUSTOMER C ON A.CUSTOMER_ID = C.CUSTOMER_ID
LEFT JOIN LOAN L ON A.CUSTOMER_ID = L.CUSTOMER_ID
WHERE L.LOAN_ID IS NULL;
```

The screenshot shows the Live SQL interface with a sidebar on the left containing links to Home, SQL Worksheet, My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains a SQL query:

```
1 SELECT A.ACCOUNT_NO, C.CUSTOMER_NAME
2 FROM ACCOUNT_DETAILS A
3 JOIN CUSTOMER C ON A.CUSTOMER_ID = C.CUSTOMER_ID
4 LEFT JOIN LOAN L ON A.CUSTOMER_ID = L.CUSTOMER_ID
5 WHERE L.LOAN_ID IS NULL;
```

Below the query, the results are displayed in a table:

| ACCOUNT_NO  | CUSTOMER_NAME |
|-------------|---------------|
| 23800005552 | MANAV         |
| 4367962463  | PEYUSH        |

A 'Download CSV' button is located below the table. The status bar at the bottom indicates '2 rows selected.' and provides version information: '2024 Oracle - Live SQL 24.1.3, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym'.

## 8.Delete the account of all the persons who had accounts in PNB, Sealdah branch.

```
DELETE FROM ACCOUNT_DETAILS
WHERE BRANCH_ID =
(SELECT BRANCH_ID FROM BRANCH WHERE BRANCH_NAME = 'SEALDAH'
AND BANK_ID = (SELECT BANK_ID FROM BANK WHERE BANK_NAME = 'PNB'));
```

The screenshot shows the Live SQL interface with the same sidebar. The main area is titled 'SQL Worksheet' and contains a SQL query:

```
1 DELETE FROM ACCOUNT_DETAILS
2 WHERE BRANCH_ID =
3 (SELECT BRANCH_ID FROM BRANCH WHERE BRANCH_NAME = 'SEALDAH'
4 AND BANK_ID = (SELECT BANK_ID FROM BANK WHERE BANK_NAME = 'PNB'));
```

Below the query, the results are displayed as '2 row(s) deleted.' The status bar at the bottom indicates '2024 Oracle - Live SQL 24.1.3, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym'.

## 9.Update the branch to SBI, Salt Lake branch for all the persons who had a SBI account in Sealdah branch.

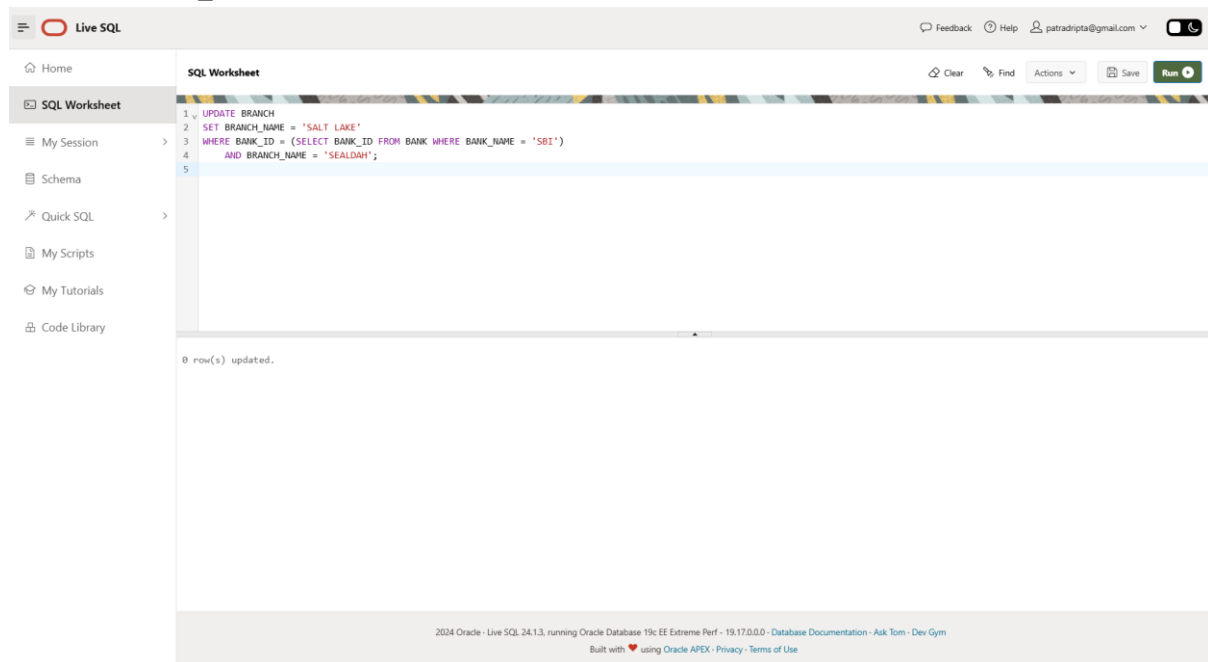


UPDATE BRANCH

SET BRANCH\_NAME = 'SALT LAKE'

WHERE BANK\_ID = (SELECT BANK\_ID FROM BANK WHERE BANK\_NAME = 'SBI')

AND BRANCH\_NAME = 'SEALDAH';



**10.Find the maximum account balance of a person with account no 54321987654 among all of his accounts.**

SELECT MAX(BALANCE)

FROM ACCOUNT\_DETAILS

WHERE CUSTOMER\_ID =

(SELECT CUSTOMER\_ID FROM ACCOUNT\_DETAILS WHERE ACCOUNT\_NO = 54321987654);

Live SQL

Feedback Help patradripta@gmail.com

Home

SQL Worksheet

My Session

Schema

Quick SQL

My Scripts

My Tutorials

Code Library

SQL Worksheet

1 SELECT MAX(BALANCE)

2 FROM ACCOUNT\_DETAILS

3 WHERE CUSTOMER\_ID =

4 (SELECT CUSTOMER\_ID FROM ACCOUNT\_DETAILS WHERE ACCOUNT\_NO = 54321987654);

5

MAX(BALANCE)

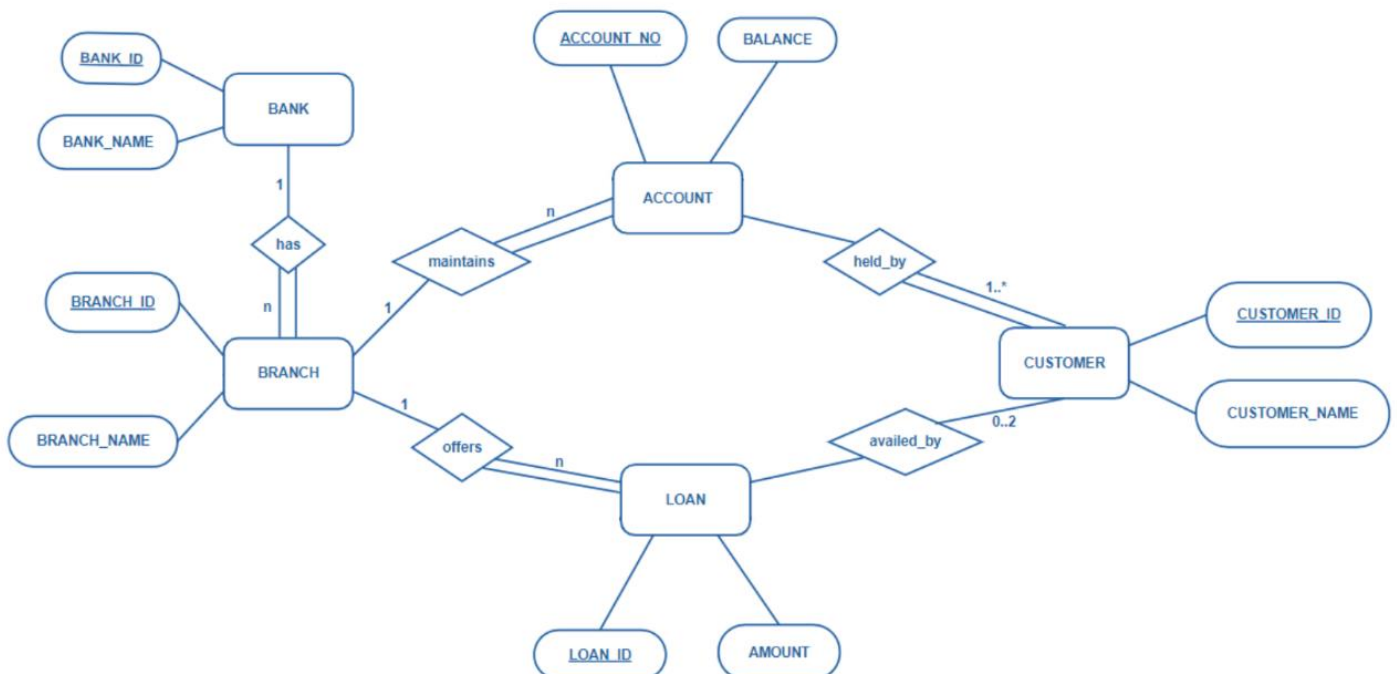
98765

Download CSV

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## ER DIAGRAM:



## DATABASE SCHEMA:

