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);
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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);
```
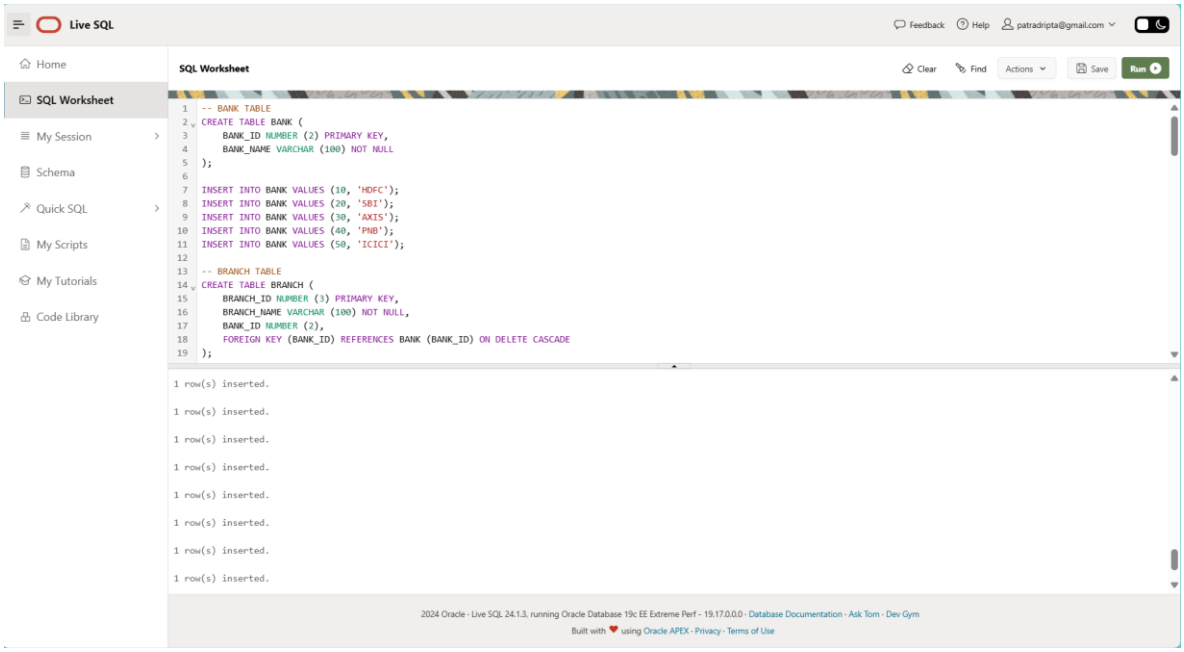

```
INSERT INTO ACCOUNT VALUES (45372949259, 7901.23, 30201, 301);
INSERT INTO ACCOUNT VALUES (12273579151, 69432.10, 40101, 401);
INSERT INTO ACCOUNT VALUES (43679662463, 4321.00, 40201, 402);
INSERT INTO ACCOUNT VALUES (90680460457, 2100.76, 40301, 403);
INSERT INTO ACCOUNT VALUES (18567978674, 34562.78, 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);

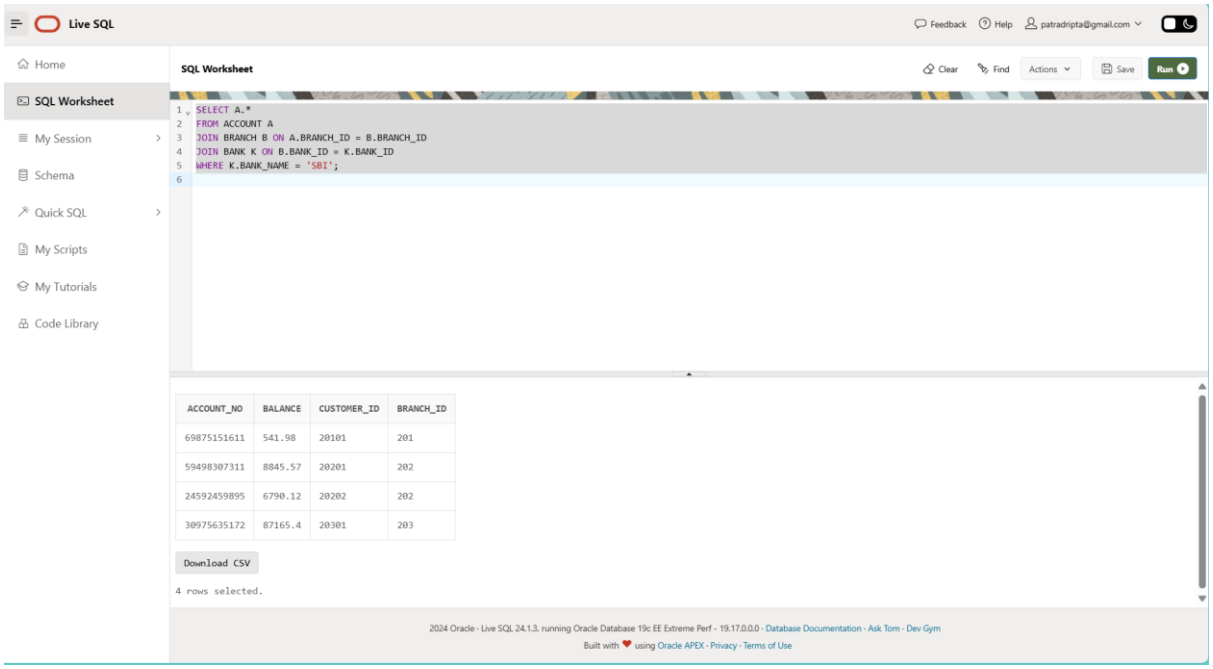


2.Every customer must have at least one account but is restricted to at most two loans at a time.

```
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;
```

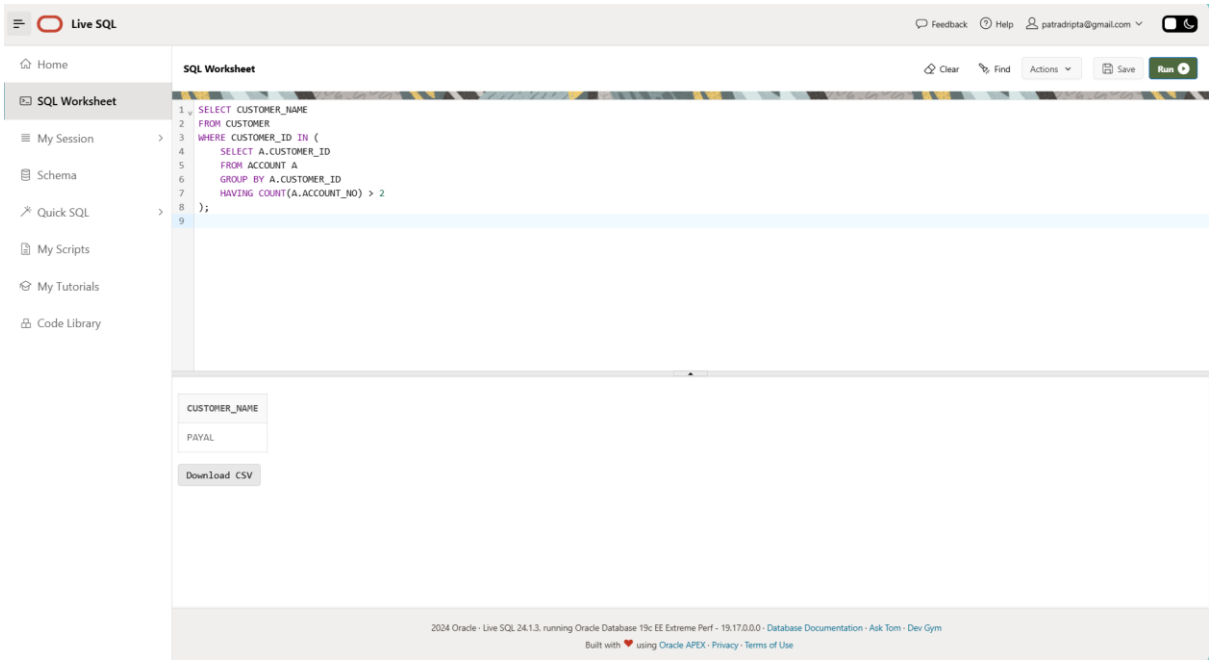
3.Give all the account details of a person who has accounts in SBI.

```
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';
```



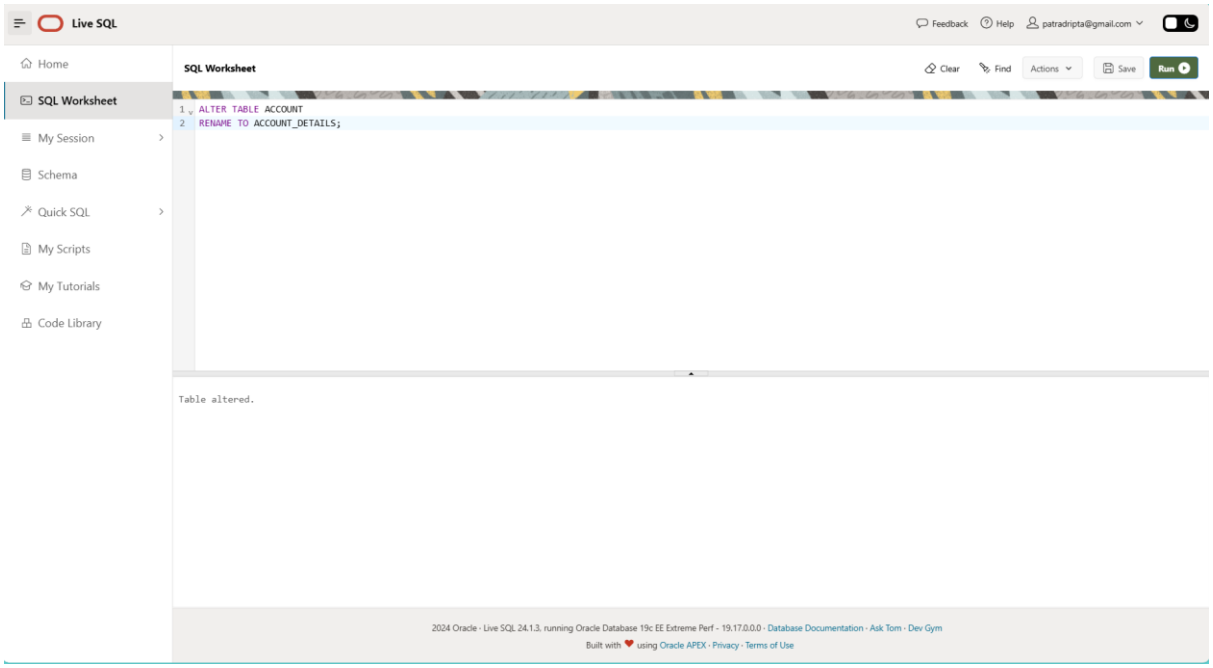
4.Find the account holder name who has more than 2 accounts.

```
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
);
```



5.Rename the accounts table as account details.

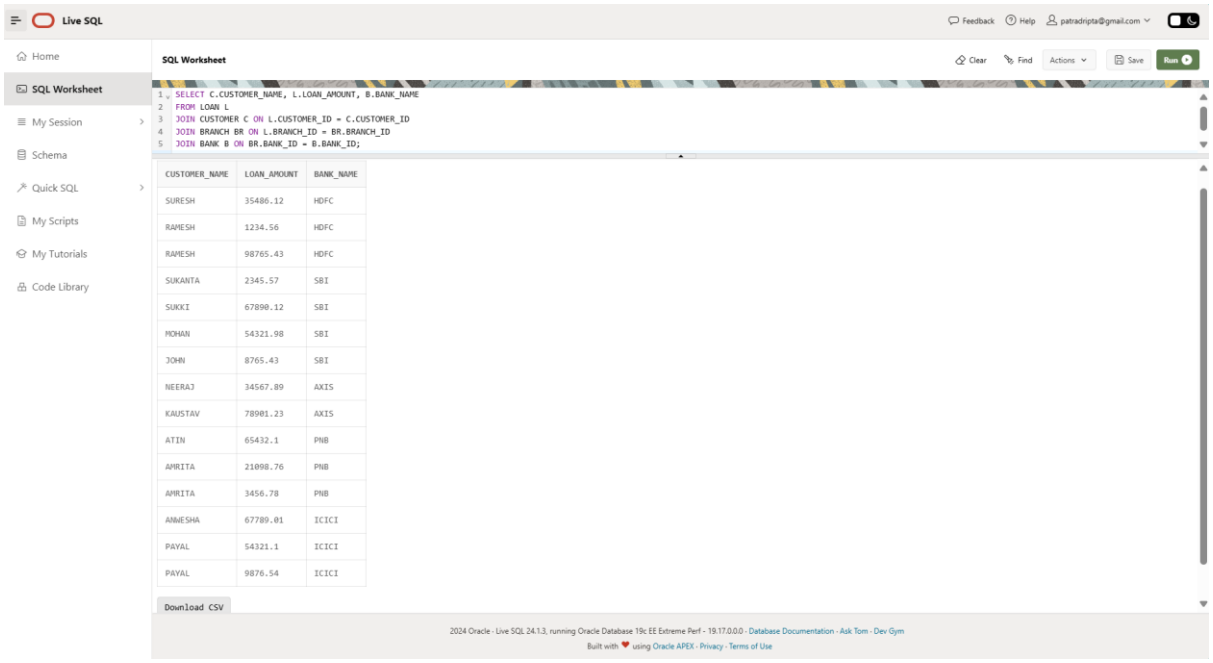
ALTER TABLE ACCOUNT RENAME TO ACCOUNT_DETAILS;



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

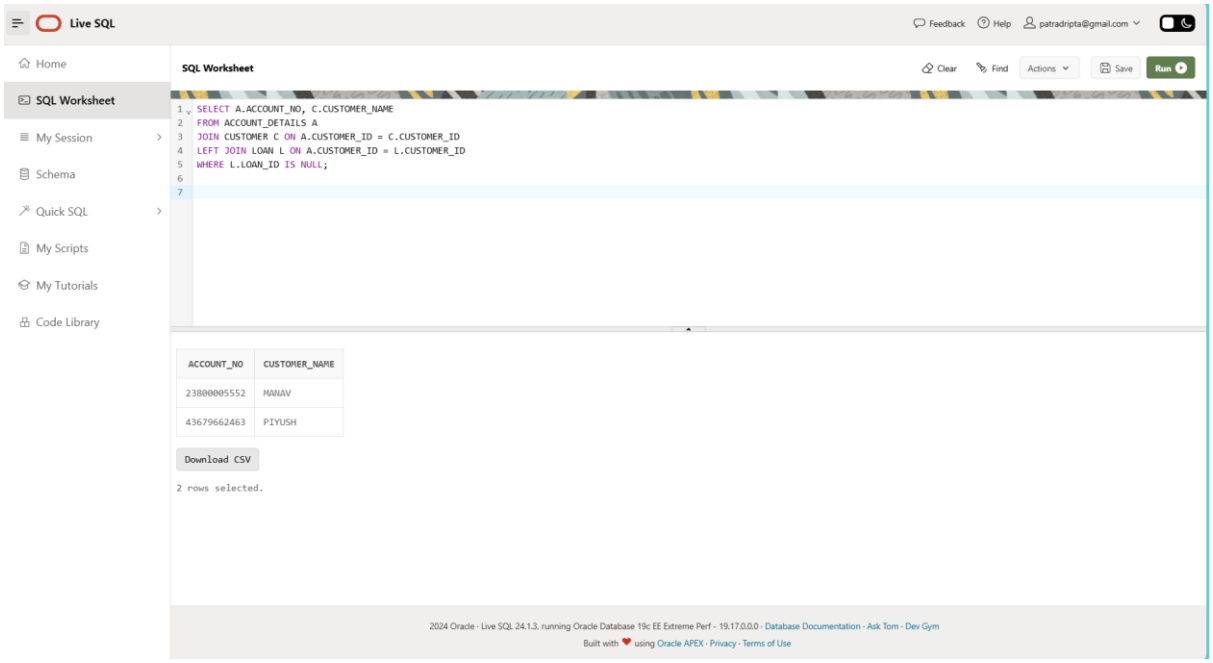
SELECT C.CUSTOMER_NAME, L.LOAN_AMOUNT, B.BANK_NAME
FROM LOAN L
JOIN CUSTOMER C ON L.CUSTOMER_ID = C.CUSTOMER_ID
JOIN BRANCH BR ON L.BRANCH_ID = BR.BRANCH_ID

JOIN BANK B ON BR.BANK_ID = B.BANK_ID;



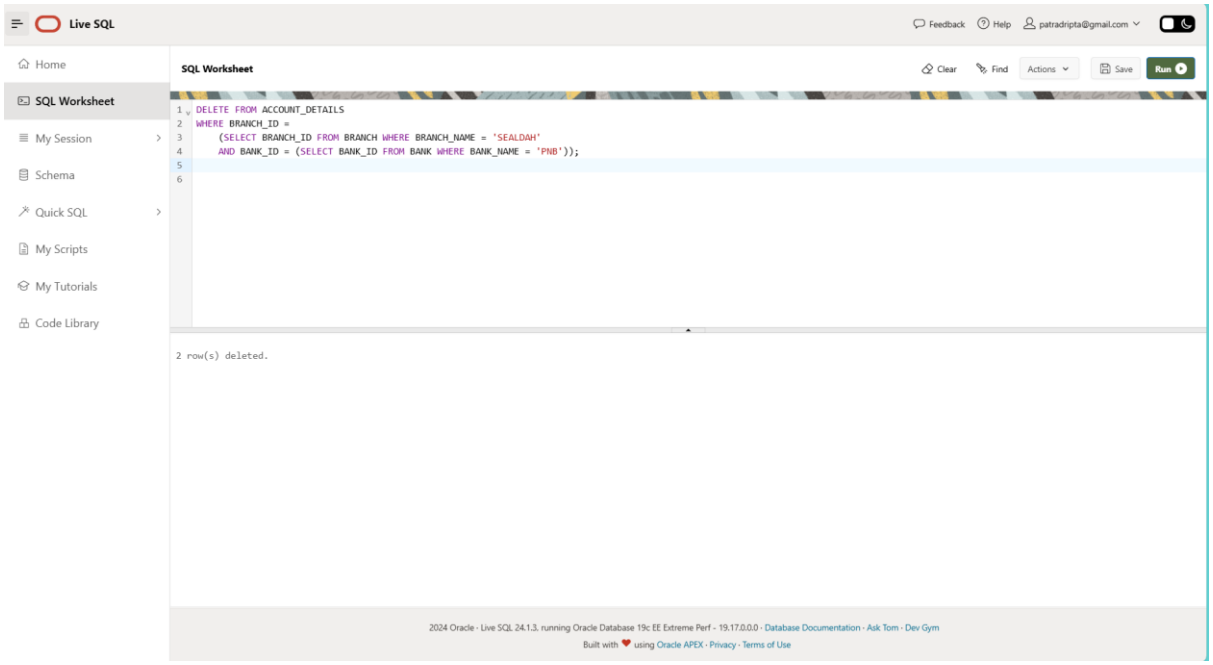
7.Find the account no. and account holder name who has not taken any loan.

```
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;
```



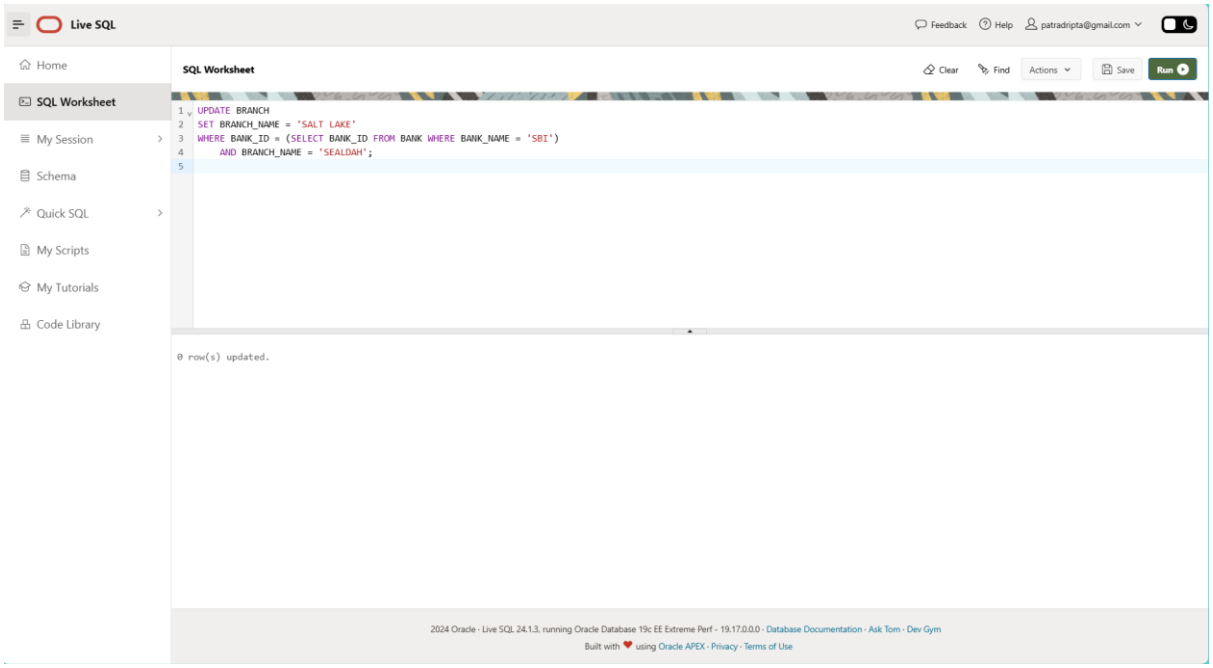
8.Delete the account of all the persons who had accounts in PNB, Sealdah branch.

```
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'));
```



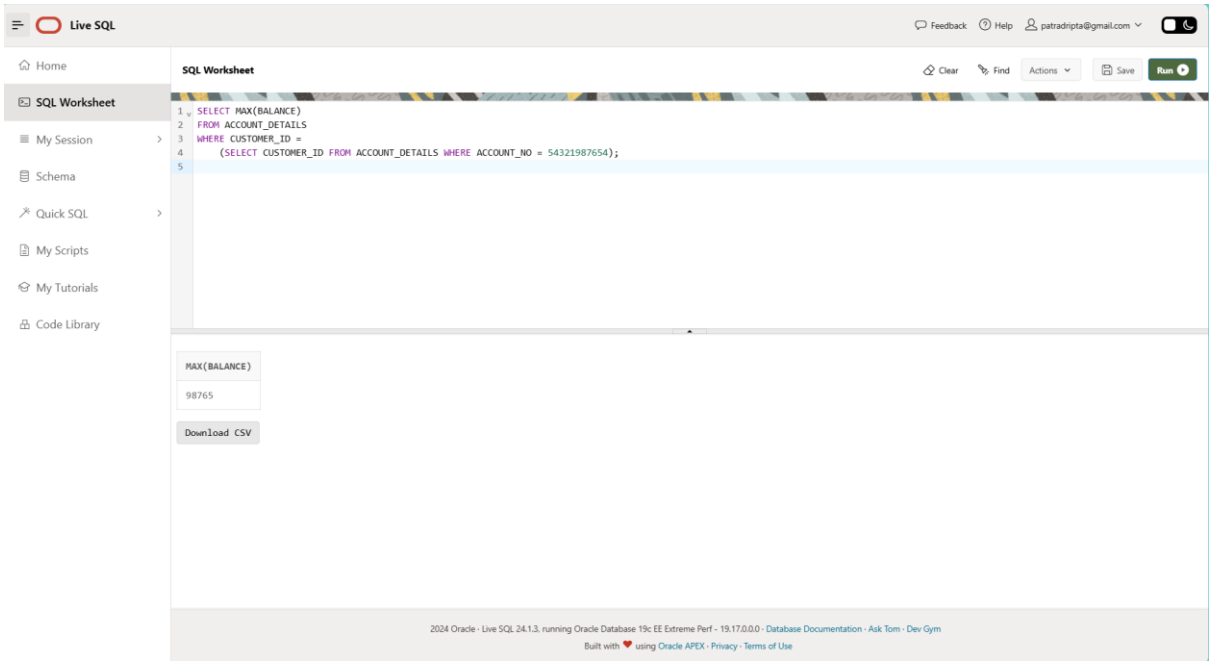
9.Update the branch to SBI, Salt Lake branch for all the persons who had a SBI account in Sealdah branch.

```
UPDATE BRANCH
SET BRANCH_NAME = 'SALT LAKE'
WHERE BANK_ID = (SELECT BANK_ID FROM BANK WHERE BANK_NAME = 'SBI')
   AND BRANCH_NAME = 'SEALDAH';
```

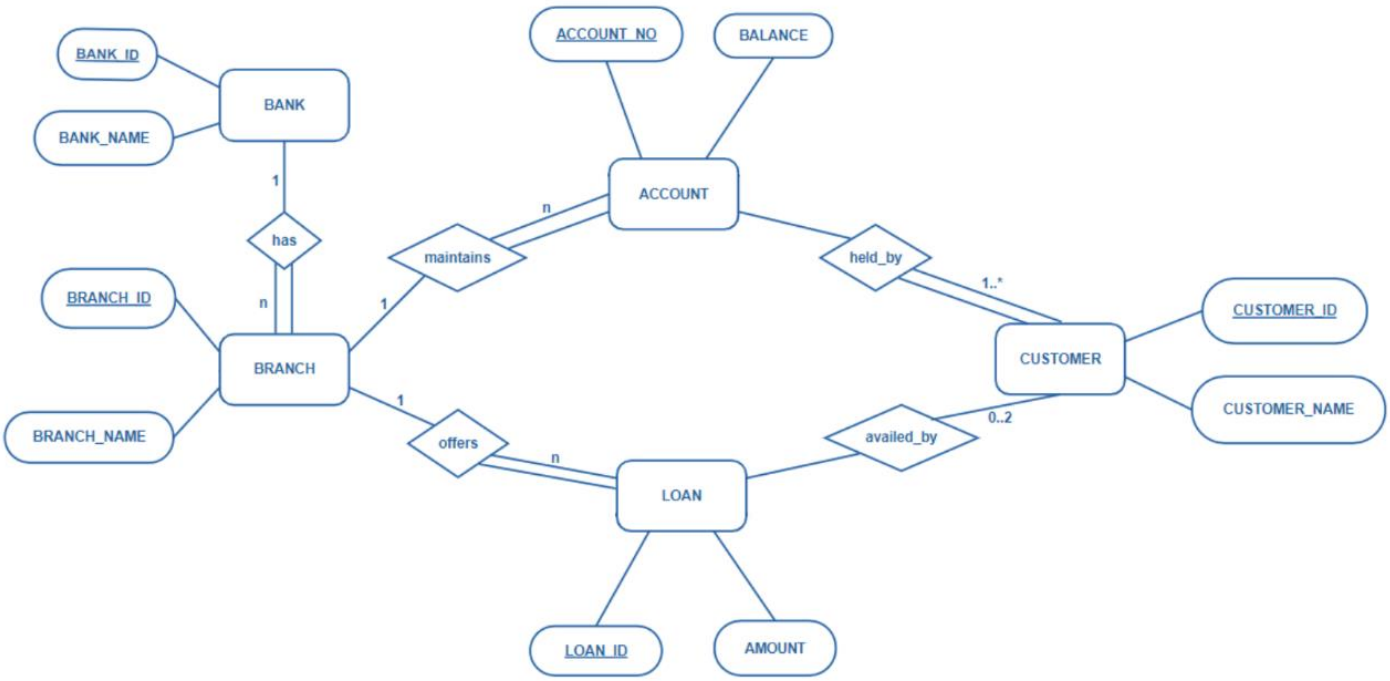


10.Find the maximum account balance of a person with account no 54321987654 among all of his accounts.

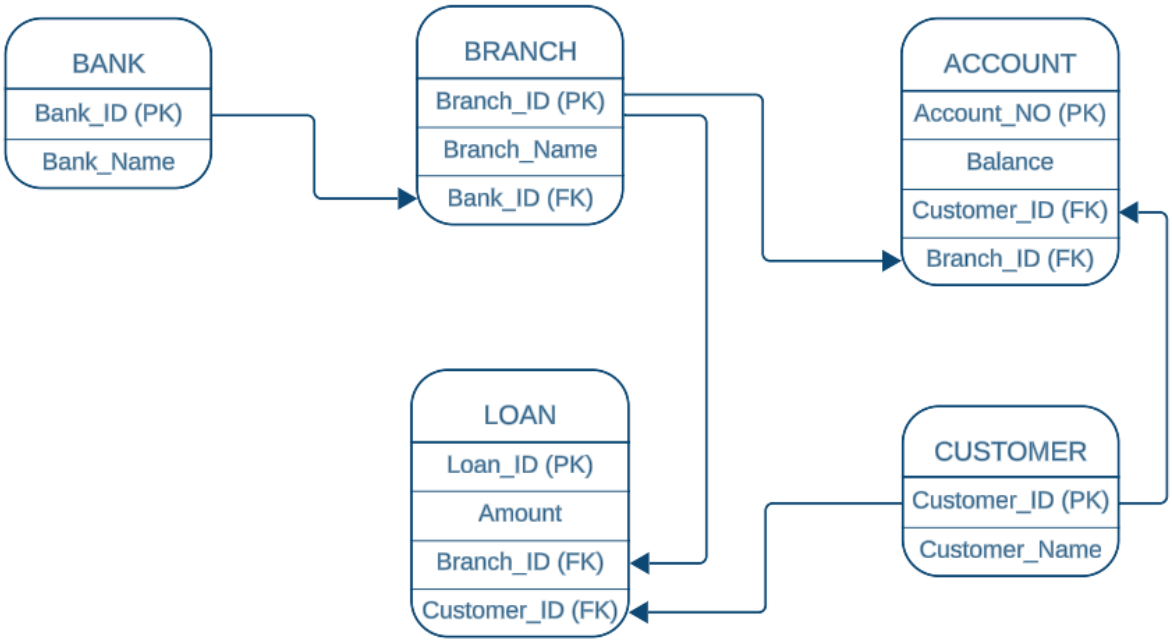
```
SELECT MAX(BALANCE)
FROM ACCOUNT_DETAILS
WHERE CUSTOMER_ID =
   (SELECT CUSTOMER_ID FROM ACCOUNT_DETAILS WHERE ACCOUNT_NO = 54321987654);
```



ER DIAGRAM:



DATABASE SCHEMA:


BANK
Bank_ID (PK)
Bank_Name
BRANCH
Branch_ID (PK)
Branch_Name
Bank_ID (FK)
ACCOUNT
Account_NO (PK)
Balance
Customer_ID (FK)
Branch_ID (FK)
LOAN
Loan_ID (PK)
Amount
Branch_ID (FK)
Customer_ID (FK)
CUSTOMER
Customer_ID (PK)
Customer_Name