Assignment 6

Name: Sayantani Karmakar

Roll No: 20CS8024

Question:

Suppose you have two tables named "Accounts" and "Transactions":

- "Accounts" table, which contains the following columns:
  - account_number (integer)
  - account_holder (text)
  - balance (float)
- "Transactions" table, which contains the following columns:
  - transaction_id (integer)
  - from_account (integer)
  - to_account (integer)
  - amount (float)
  - transaction_date (date)

1. Write an SQL transaction that transfers $100 from account number 1234 to account number 5678, and records the transaction in the "Transactions" table. The transaction should only occur if the balance of account number 1234 is greater than or equal to $100. If the transaction occurs successfully, the balance of account number 1234 should be reduced by $100, and the balance of account number 5678 should be increased by $100.
2. Write an SQL transaction that transfers $500 from account "A" to account "B", and inserts a new row into the "Transactions" table to record the transfer. However, the transaction should only be committed if both updates (i.e. transferring the money and inserting the transaction record) occur successfully.
3. Write an SQL transaction that transfers $1000 from account number 1234 to account number 5678, and inserts a new row into the "Transactions" table to record the transfer. However, the transaction should only be committed if all of the following conditions are met:
   - The balance of account 1234 is greater than or equal to $1000.
   - The balance of account 5678 is less than or equal to $5000.
   - The transaction date is on or after the current date.

Solution

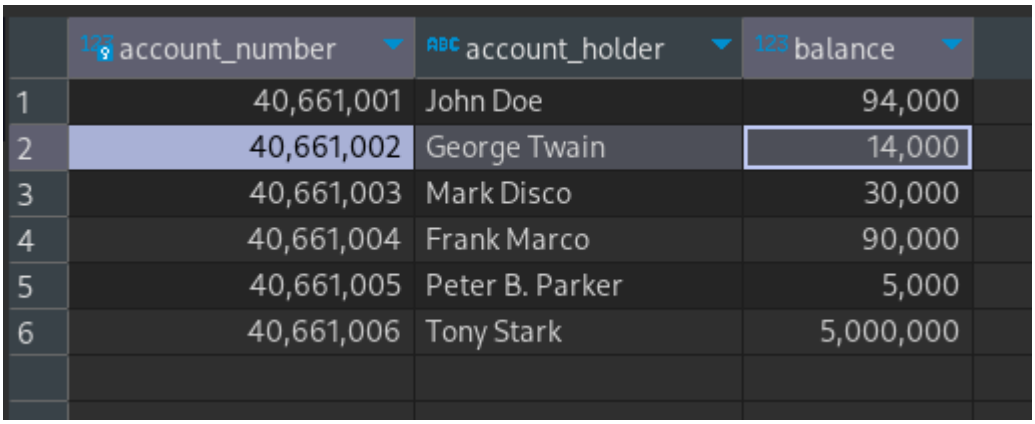
Creating tables

```
CREATE TABLE `Accounts` (
  `account_number` int(10) NOT NULL,
  `account_holder` text DEFAULT NULL,
  `balance` float DEFAULT NULL,
  PRIMARY KEY (`account_number`)
```

```
)

CREATE TABLE `Transactions` (
  `transaction_id` int(10) NOT NULL,
  `from_account` int(10) DEFAULT NULL,
  `to_account` int(10) DEFAULT NULL,
  `amount` float DEFAULT NULL,
  `transaction_date` date DEFAULT NULL,
  PRIMARY KEY (`transaction_id`),
  FOREIGN KEY (`from_account`) REFERENCES `Accounts` (`account_number`),
  FOREIGN KEY (`to_account`) REFERENCES `Accounts` (`account_number`)
)
```

Current Table with data:



	account_number	account_holder	balance
1	40,661,001	John Doe	94,000
2	40,661,002	George Twain	14,000
3	40,661,003	Mark Disco	30,000
4	40,661,004	Frank Marco	90,000
5	40,661,005	Peter B. Parker	5,000
6	40,661,006	Tony Stark	5,000,000

Transaction code inside a procedure:

```
CREATE DEFINER=`hobbist`@`localhost` PROCEDURE `Assignment_6`.`Transfer`(
    IN v_from_account INT(10),
    IN v_to_account INT(10),
    IN v_amount FLOAT(10),
    IN v_id INT(10))
BEGIN
    DECLARE senderBal, recvBal, id int;

    SELECT balance into senderBal FROM Accounts WHERE
account_number=v_from_account;

    IF senderBal >= v_amount THEN
        START TRANSACTION;
            SELECT balance INTO recvBal FROM Accounts WHERE
account_number=v_to_account;
            UPDATE Accounts
                SET balance=senderBal-v_amount WHERE
account_number=v_from_account;
            UPDATE Accounts
                SET balance=recvBal+v_amount WHERE
account_number=v_to_account;

            INSERT INTO Transactions VALUES
```

```
            (v_id, v_from_account, v_to_account, v_amount, NOW());
        COMMIT;
        SELECT 'Database Committed';
    ELSE
        SELECT 'Not Enough Balance';
        ROLLBACK;
    END IF;
END
```

1. Transaction for Q1.

```
CALL Transfer(40661001, 40661002, 100, 1);
```

```
MariaDB [Assignment_6]> CALL Transfer(40661001, 40661002, 100, 1);
+--------------------+
| Database Committed |
+--------------------+
| Database Committed |
+--------------------+
1 row in set (0.010 sec)

Query OK, 5 rows affected, 1 warning (0.010 sec)

MariaDB [Assignment_6]> select * from Accounts;
+----------------+-----------------+---------+
| account_number | account_holder  | balance |
+----------------+-----------------+---------+
|       40661001 | John Doe        |   93900 |
|       40661002 | George Twain    |   14100 |
|       40661003 | Mark Disco      |   30000 |
|       40661004 | Frank Marco     |   90000 |
|       40661005 | Peter B. Parker |    5000 |
|       40661006 | Tony Stark      | 5000000 |
+----------------+-----------------+---------+
6 rows in set (0.001 sec)

MariaDB [Assignment_6]> select * from Transactions;
+----------------+--------------+------------+--------+------------------+
| transaction_id | from_account | to_account | amount | transaction_date |
+----------------+--------------+------------+--------+------------------+
|              1 |     40661001 |   40661002 |    100 | 2023-04-05       |
+----------------+--------------+------------+--------+------------------+
1 row in set (0.001 sec)
```

2. Transaction for Q2.

```
CALL Transfer(40661003, 40661004, 500, 2);
```

```
MariaDB [Assignment_6]> CALL Transfer(40661003, 40661004, 500, 2);
+--------------------+
| Database Committed |
+--------------------+
| Database Committed |
+--------------------+
1 row in set (0.009 sec)

Query OK, 5 rows affected, 1 warning (0.009 sec)

MariaDB [Assignment_6]> select * from Accounts;
+----------------+----------------+---------+
| account_number | account_holder  | balance |
+----------------+----------------+---------+
|       40661001 | John Doe       |   93900 |
|       40661002 | George Twain   |   14100 |
|       40661003 | Mark Disco     |   29500 |
|       40661004 | Frank Marco    |   90500 |
|       40661005 | Peter B. Parker |    5000 |
|       40661006 | Tony Stark     | 5000000 |
+----------------+----------------+---------+
6 rows in set (0.001 sec)

MariaDB [Assignment_6]> select * from Transactions;
+----------------+--------------+------------+--------+------------------+
| transaction_id | from_account | to_account | amount | transaction_date |
+----------------+--------------+------------+--------+------------------+
|              1 |     40661001 |   40661002 |    100 | 2023-04-05       |
|              2 |     40661003 |   40661004 |    500 | 2023-04-05       |
+----------------+--------------+------------+--------+------------------+
2 rows in set (0.000 sec)
```

3. Transaction for Q3.

```
CALL Transfer(40661001, 40661002, 5000, 3);
```

```
MariaDB [Assignment_6]> CALL Transfer(40661001, 40661002, 5000, 3);
+--------------------+
| Database Committed |
+--------------------+
| Database Committed |
+--------------------+
1 row in set (0.010 sec)

Query OK, 5 rows affected, 1 warning (0.010 sec)

MariaDB [Assignment_6]> select * from Accounts;
+----------------+-----------------+---------+
| account_number | account_holder  | balance |
+----------------+-----------------+---------+
|       40661001 | John Doe        |   88900 |
|       40661002 | George Twain    |   19100 |
|       40661003 | Mark Disco      |   29500 |
|       40661004 | Frank Marco     |   90500 |
|       40661005 | Peter B. Parker |    5000 |
|       40661006 | Tony Stark      | 5000000 |
+----------------+-----------------+---------+
6 rows in set (0.001 sec)

MariaDB [Assignment_6]> select * from Transactions;
+----------------+--------------+------------+--------+------------------+
| transaction_id | from_account | to_account | amount | transaction_date |
+----------------+--------------+------------+--------+------------------+
|              1 |     40661001 |   40661002 |    100 | 2023-04-05       |
|              2 |     40661003 |   40661004 |    500 | 2023-04-05       |
|              3 |     40661001 |   40661002 |   5000 | 2023-04-05       |
+----------------+--------------+------------+--------+------------------+
3 rows in set (0.001 sec)
```