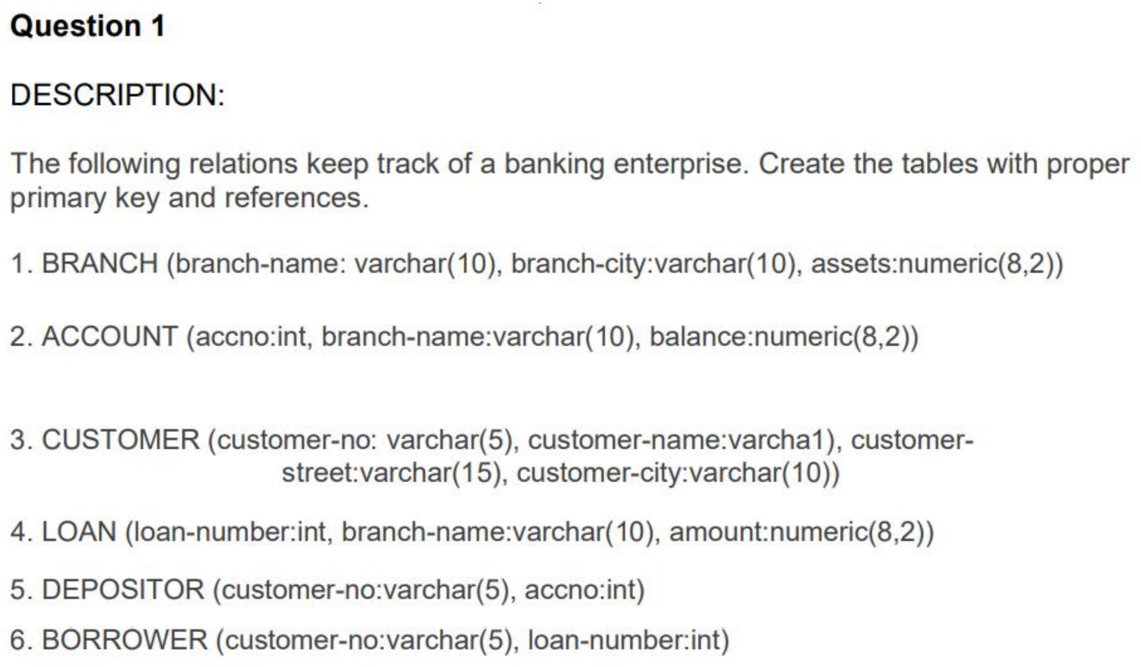
DATABASE MANAGEMENT SYSTEMS

Labsheet - 4



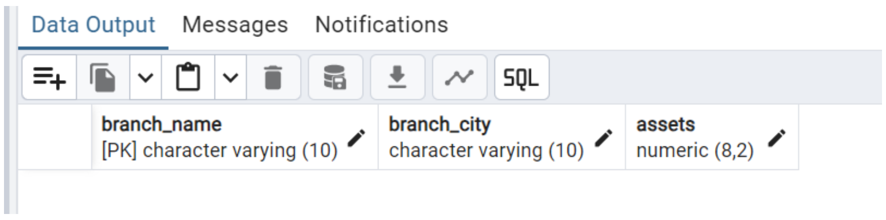
Question 1

DESCRIPTION:

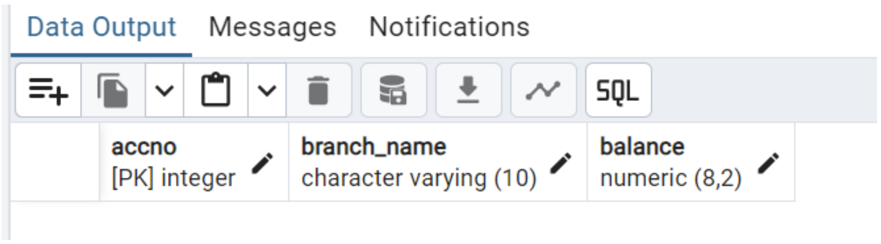
The following relations keep track of a banking enterprise. Create the tables with proper primary key and references.

1. BRANCH (branch-name: varchar(10), branch-city:varchar(10), assets:numeric(8,2))
2. ACCOUNT (accno:int, branch-name:varchar(10), balance:numeric(8,2))
3. CUSTOMER (customer-no: varchar(5), customer-name:varcha1), customer-street:varchar(15), customer-city:varchar(10))
4. LOAN (loan-number:int, branch-name:varchar(10), amount:numeric(8,2))
5. DEPOSITOR (customer-no:varchar(5), accno:int)
6. BORROWER (customer-no:varchar(5), loan-number:int)

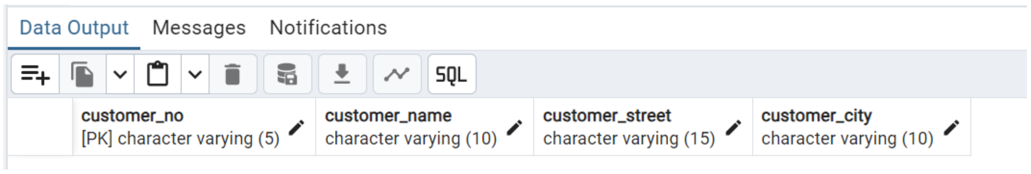
```
CREATE TABLE BRANCH (

    branch_name VARCHAR(10) PRIMARY KEY,

    branch_city VARCHAR(10),

    assets NUMERIC(8,2)

);


CREATE TABLE ACCOUNT (

    accno INT PRIMARY KEY,

    branch_name VARCHAR(10),

    balance NUMERIC(8,2),

    FOREIGN KEY (branch_name) REFERENCES BRANCH(branch_name)

);


CREATE TABLE CUSTOMER (
    customer_no VARCHAR(5) PRIMARY KEY,

    customer_name VARCHAR(10),

    customer_street VARCHAR(15),

    customer_city VARCHAR(10)

);


CREATE TABLE LOAN (

    loan_number INT PRIMARY KEY,

    branch_name VARCHAR(10),

    amount NUMERIC(8,2),

    FOREIGN KEY (branch_name) REFERENCES BRANCH(branch_name)

);


CREATE TABLE DEPOSITOR (

    customer_no VARCHAR(5),

    accno INT,

    PRIMARY KEY (customer_no, accno),

    FOREIGN KEY (customer_no) REFERENCES CUSTOMER(customer_no),

    FOREIGN KEY (accno) REFERENCES ACCOUNT(accno)

);


CREATE TABLE BORROWER (

    customer_no VARCHAR(5),

    loan_number INT,

    PRIMARY KEY (customer_no, loan_number),

    FOREIGN KEY (customer_no) REFERENCES CUSTOMER(customer_no),

    FOREIGN KEY (loan_number) REFERENCES LOAN(loan_number)

);
```


Data Output Messages Notifications

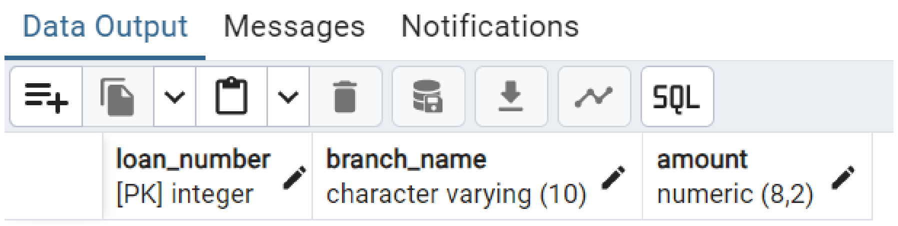
branch_name [PK] character varying (10)	branch_city character varying (10)	assets numeric (8,2)


Data Output Messages Notifications

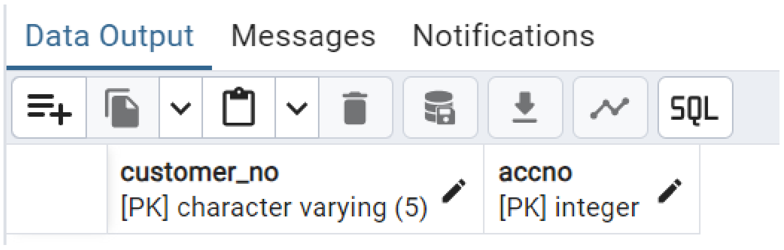
accno [PK] integer	branch_name character varying (10)	balance numeric (8,2)


Data Output Messages Notifications

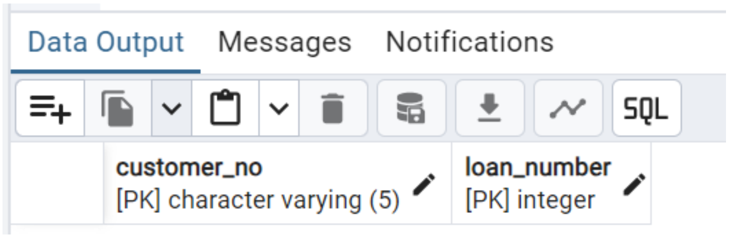
customer_no [PK] character varying (5)	customer_name character varying (10)	customer_street character varying (15)	customer_city character varying (10)


Data Output Messages Notifications

loan_number [PK] integer	branch_name character varying (10)	amount numeric (8,2)


Data Output Messages Notifications

customer_no [PK] character varying (5)	accno [PK] integer


Data Output Messages Notifications

customer_no [PK] character varying (5)	loan_number [PK] integer

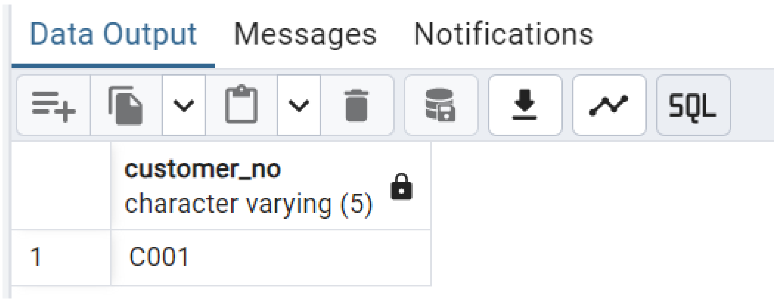
Queries:

Enter at least three tuples for each relation and write each of the following queries in SQL.

```
INSERT INTO BRANCH (branch_name, branch_city, assets)

VALUES

('Main', 'NewYork', 100000.00),

('West', 'LosAngeles', 75000.50),
('East', 'Boston', 50000.75),

('Kollam', 'Kerala', 80000.00);


INSERT INTO ACCOUNT (accno, branch_name, balance)

VALUES

(1001, 'Main', 2000.00),

(1002, 'Main', 3500.25),

(1003, 'West', 1500.75),

(1004, 'East', 4500.50),

(1005, 'Kollam', 12000.00),

(1006, 'Kollam', 18000.00);


INSERT INTO CUSTOMER (customer_no, customer_name, customer_street, customer_city)

VALUES

('C001', 'John Doe', '1st Ave', 'NewYork'),

('C002', 'Jane Smith', 'Sunset Blvd', 'LosAngeles'),

('C003', 'Sam Wilson', 'Park St', 'Boston'),

('C004', 'Alan Brown', 'MG Road', 'Kerala');


INSERT INTO LOAN (loan_number, branch_name, amount)

VALUES

(2001, 'Main', 5000.00),

(2002, 'West', 8000.50),

(2003, 'East', 3000.25),

(2004, 'Kollam', 15000.75);


INSERT INTO DEPOSITOR (customer_no, accno)

VALUES

('C001', 1001),

('C001', 1002),

('C002', 1003),
('C003', 1004),

('C004', 1005),

('C004', 1006);


INSERT INTO BORROWER (customer_no, loan_number)

VALUES

('C001', 2001),

('C002', 2002),

('C003', 2003),

('C004', 2004);
```

1. Find all the customers who have at least two accounts at the '*Main*' branch.

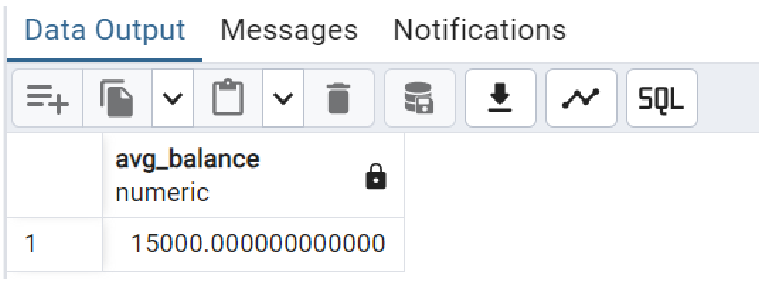
```
select customer_no from account where branch_name = 'Main' group by customer_no
having count(accno)>=2
```



	customer_no character varying (5)
1	C001

2. Find the average account balance at the '*Kollam*' branch.

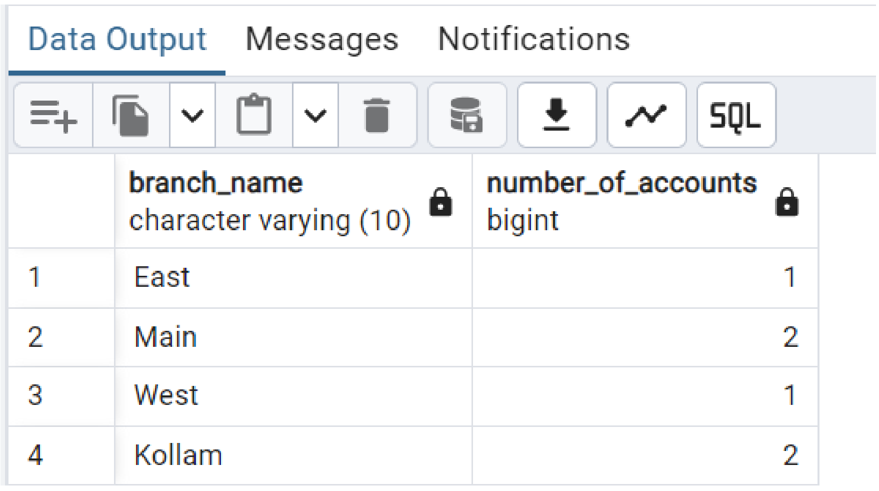
```
SELECT AVG(balance) AS avg_balance FROM ACCOUNT WHERE branch_name = 'Kollam';
```



	avg_balance numeric
1	15000.000000000000

3. Find the number of depositors for each branch.

```
SELECT branch_name, COUNT(accno) AS number_of_accounts FROM ACCOUNT GROUP BY
branch_name;
```

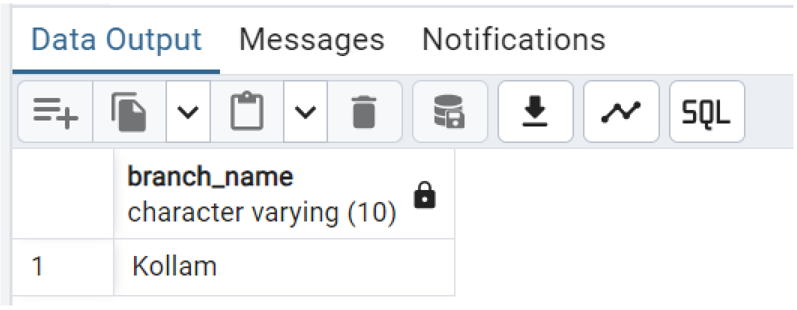


Data Output Messages Notifications

	branch_name character varying (10)	number_of_accounts bigint
1	East	1
2	Main	2
3	West	1
4	Kollam	2

4. Find the names of all branches where the average account balance is more than RS. 1,2000.

```
SELECT branch_name FROM ACCOUNT GROUP BY branch_name HAVING AVG(balance) > 12000;
```

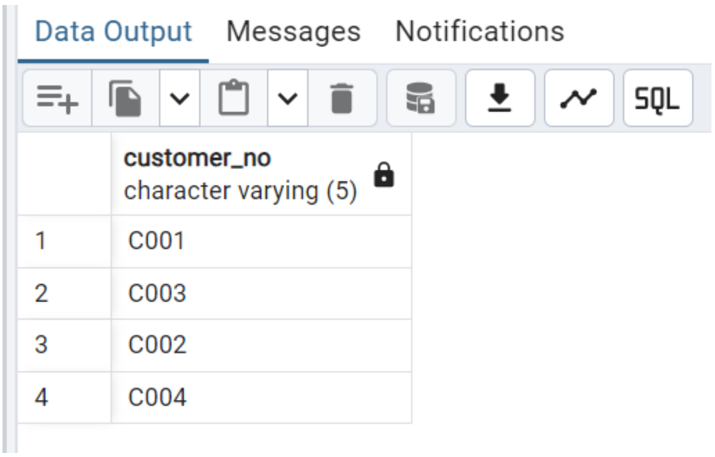


Data Output Messages Notifications

	branch_name character varying (10)
1	Kollam

5. Find all customers who have a loan, an account, or both.

```
SELECT DISTINCT customer_no FROM (SELECT customer_no FROM DEPOSITOR UNION SELECT
customer_no FROM BORROWER) AS customers;
```

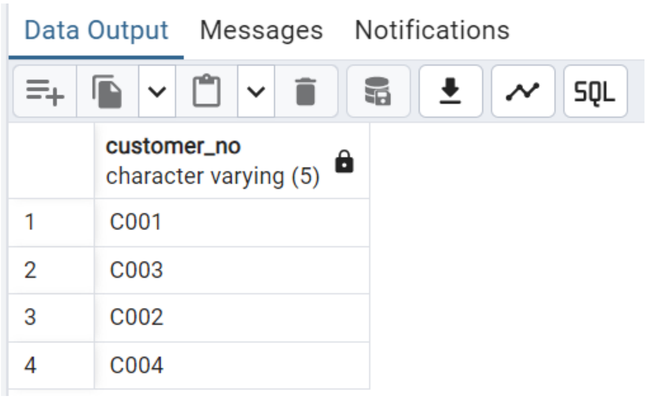


Data Output Messages Notifications

	customer_no character varying (5)
1	C001
2	C003
3	C002
4	C004

6. Find all customers who have both a loan and an account.

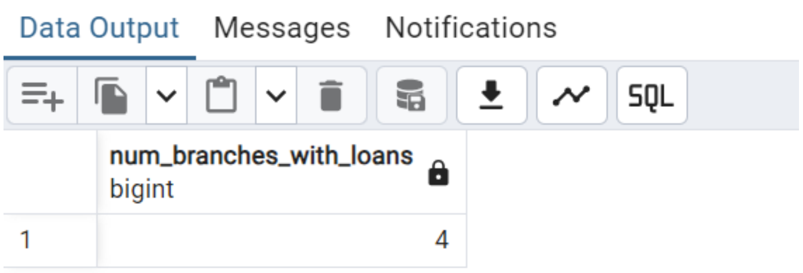
```
SELECT customer_no FROM DEPOSITOR INTERSECT SELECT customer_no FROM BORROWER;
```



	customer_no character varying (5)
1	C001
2	C003
3	C002
4	C004

7. Find the number of branches that currently have loans.

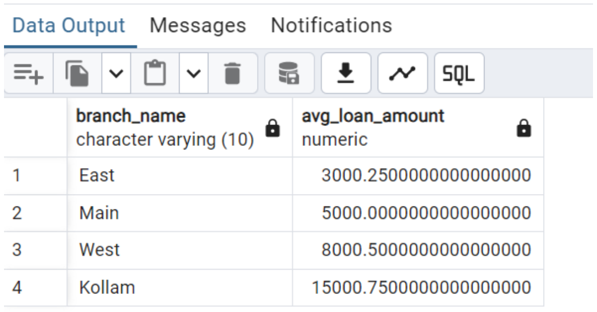
```
SELECT COUNT(DISTINCT branch_name) AS num_branches_with_loans FROM LOAN;
```



	num_branches_with_loans bigint
1	4

8. Find the average loan amount for each branch.

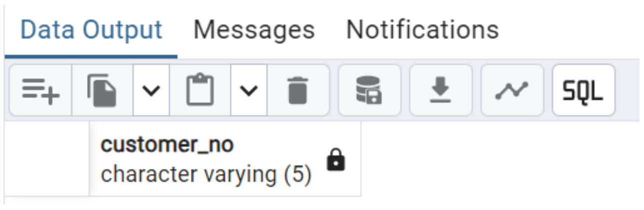
```
SELECT branch_name, AVG(amount) AS avg_loan_amount FROM LOAN GROUP BY branch_name;
```



	branch_name character varying (10)	avg_loan_amount numeric
1	East	3000.2500000000000000
2	Main	5000.0000000000000000
3	West	8000.5000000000000000
4	Kollam	15000.7500000000000000

9. Find all customers with more than one loan.

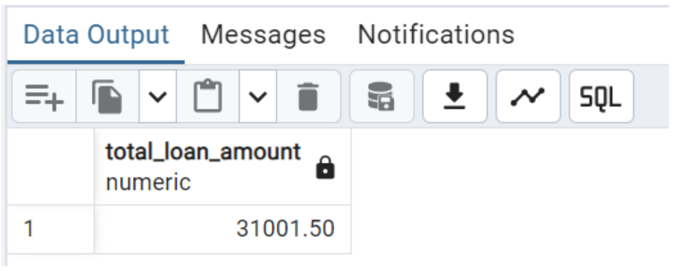
```
SELECT customer_no FROM BORROWER GROUP BY customer_no HAVING COUNT(loan_number) > 1;
```



	customer_no character varying (5)

10. Find the total of all loan amounts

```
SELECT SUM(amount) AS total_loan_amount FROM LOAN;
```



	total_loan_amount numeric
1	31001.50