Tasks 1: Database Design

1. **Create the database named "HMBank"**

QUERY:

create database HMBank;

OUTPUT:

```
mysql> create database HMBank;
Query OK, 1 row affected (0.04 sec)
```

2. **Define the schema for the Customers, Accounts, and Transactions tables based on the provided schema.**

CUSTOMERS:

create table Customers(customer_id int primary key,
first_name varchar(20),last_name varchar(20),
DOB date, email varchar(30), phone_number bigint,
address varchar(300));

	Field	Type	Null	Key	Default	Extra
▶	customer_id	int	NO	PRI	NULL	
	first_name	varchar(20)	YES		NULL	
	last_name	varchar(20)	YES		NULL	
	DOB	date	YES		NULL	
	email	varchar(30)	YES		NULL	
	phone_number	bigint	YES		NULL	
	address	varchar(300)	YES		NULL	

ACCOUNTS:

```
CREATE TABLE Accounts (
   account_id INT PRIMARY KEY,
   customer_id INT,
   account_type ENUM('savings', 'current', 'zero_balance'),
   balance BIGINT,
   FOREIGN KEY (customer_id) REFERENCES customers(customer_id)
);
```

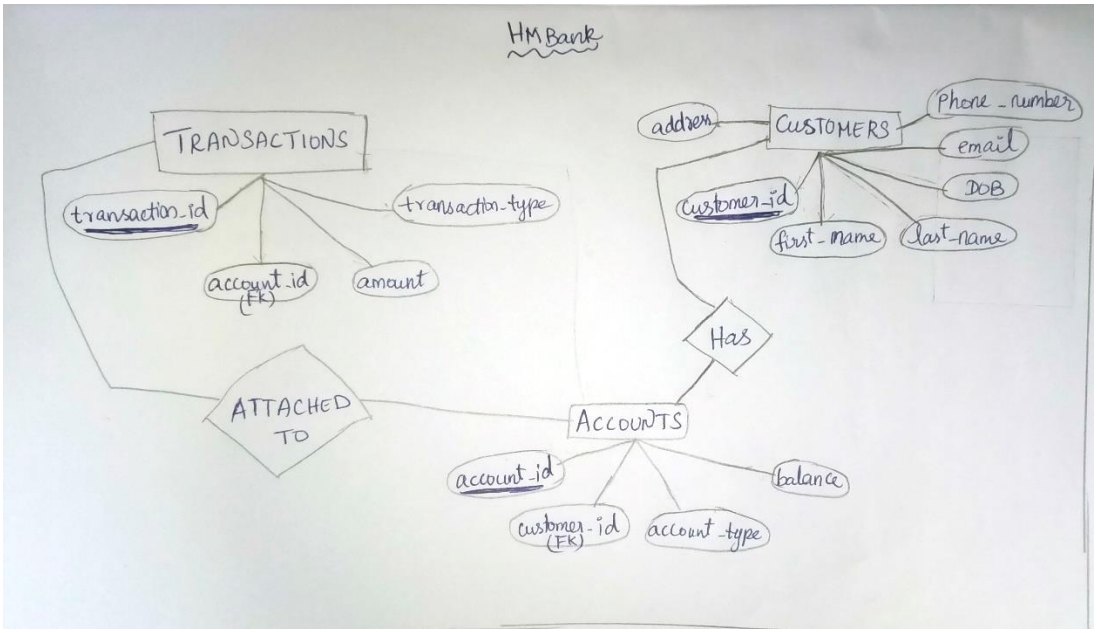
Field	Type	Null	Key	Default	Extra
account_id	int	NO	PRI	NULL	
customer_id	int	YES	MUL	NULL	
account_type	enum('savings','current','zero_balance')	YES		NULL	
balance	bigint	YES		NULL	

TRANSACTIONS:

```
CREATE TABLE Transactions(
transaction_id int primary key,
account_id int,
transaction_type enum('deposit','withdrawl','transfer'),
amount bigint,
transaction_date date,
foreign key (account_id) references Accounts(account_id)
);
```

Field	Type	Null	Key	Default	Extra
transaction_id	int	NO	PRI	NULL	
account_id	int	YES	MUL	NULL	
transaction_type	enum('deposit','withdrawl','transfer')	YES		NULL	
amount	bigint	YES		NULL	
transaction_date	date	YES		NULL	

3. **Create an ERD (Entity Relationship Diagram) for the database.**



TASK 2 : Select, Where, Between, AND, LIKE

1.Insert at least 10 sample records into each of the following tables.

- **Customers**
- **Accounts**
- **Transactions**

CUSTOMER:

INSERT INTO Customers (customer_id, first_name, last_name, DOB, email, phone_number, address)
VALUES
(1,'john','doe','1990-05-15','john.doe@example.com',1234567890,'123 Main St'),
(2,'swathi','guna''2001-05-03','swathig@gmail.com',2134658790,'236 annur coimbatore'),
(3, 'Sanjay', 'Patel', '1985-11-30', 'sanjay.patel@example.com', '7654321098', '34C, Mahatma Gandhi Street, Bangalore, Karnataka'),

(4, 'Aishwarya', 'Menon', '1990-05-03', 'aishwarya.menon@example.com', '6543210987', '45D, Malabar Hill, Mumbai, Maharashtra'),
(5, 'Naveen', 'Nair', '1987-09-12', 'naveen.nair@example.com', '5432109876', '56E, Rajaji Nagar, Kochi, Kerala'),
(6, 'Divya', 'Sharma', '1995-03-28', 'divya.sharma@example.com', '4321098765', '67F, Indira Nagar, Pune, Maharashtra'),
(7, 'Meera', 'Gupta', '1983-08-07', 'meera.gupta@example.com', '3210987654', '78G, Anna Salai, Chennai, Tamil Nadu'),
(8, 'Vishal', 'Rao', '1992-12-19', 'vishal.rao@example.com', '2109876543', '89H, Gokulam Road, Mysuru, Karnataka'),
(9, 'Shreya', 'Iyer', '1986-06-24', 'shreya.iyer@example.com', '1098765432', '90I, Jubilee Hills, Hyderabad, Telangana'),
(10, 'Karthik', 'Menon', '1997-01-10', 'karthik.menon@example.com', '0987654321', '91J, Brigade Road, Bengaluru, Karnataka')
(11,'ranji','priya','1990-04-03','ranji@gmail.com',1243637654,'abc coimbatore'),
(12,'shwetha','shree','1988-04-02','shwetha@gmail.com',1246712542,'salem'),
(13,'varun','lakshman','2002-06-01','laksh@gmail.com',5418564838,'ooty')
;

customer_id	first_name	last_name	DOB	email	phone_number	address
1	John	Doe	1990-05-15	john.doe@example.com	1234567890	123 Main St
2	swathi	guna	2001-05-03	swathig@gmail.com	2134657689	236 annur coimbatore
3	Sanjay	Patel	1985-11-30	sanjay.patel@example.com	7654321098	34C, Mahatma Gandhi Street, Bangalore,
4	Aishwarya	Menon	1990-05-03	aishwarya.menon@example.com	6543210987	45D, Malabar Hill, Mumbai, Maharashtra
5	Naveen	Nair	1987-09-12	naveen.nair@example.com	5432109876	56E, Rajaji Nagar, Kochi, Kerala
6	Divya	Sharma	1995-03-28	divya.sharma@example.com	4321098765	67F, Indira Nagar, Pune, Maharashtra
7	Meera	Gupta	1983-08-07	meera.gupta@example.com	3210987654	78G, Anna Salai, Chennai, Tamil Nadu
8	Vishal	Rao	1992-12-19	vishal.rao@example.com	2109876543	89H, Gokulam Road, Mysuru, Karnataka
9	Shreya	Iyer	1986-06-24	shreya.iyer@example.com	1098765432	90I, Jubilee Hills, Hyderabad, Telangana
10	Karthik	Menon	1997-01-10	karthik.menon@example.com	987654321	91J, Brigade Road, Bengaluru, Karnataka
11	ranji	priya	1990-04-03	ranji@gmail.com	1243637654	abc coimbatore
12	shwetha	shree	1988-04-02	shwetha@gmail.com	1246712542	salem
13	varun	lakshman	2002-06-01	laksh@gmail.com	5418564838	ooty

ACCOUNTS:

insert into Accounts(account_id,customer_id,account_type,balance)
values
(1,1,'savings',50000),(2,2,'current',75000),
(3,3,'savings',60000),(4,4,'savings',40000),
(5,5,'current',90000),(6,6,'savings',30000),
(7,7,'current',55000),(8,8,'savings',65000),
(9,9,'current',70000),(10,10,'savings',80000);

(11,11,'savings',0),(12,12,'current',23000),
(13,13,'savings',39999);

account_id	customer_id	account_type	balance
1	1	savings	50000
2	2	current	75000
3	3	savings	60000
4	4	savings	40000
5	5	current	90000
6	6	savings	30000
7	7	current	55000
8	8	savings	65000
9	9	current	70000
10	10	savings	100000
11	11	savings	0
12	12	current	23000
13	13	savings	39999

TRANSACTIONS:

insert into
Transactions(transaction_id,account_id,transaction_type,amount,transaction_date)
values
(20,1,'deposit',23000,'2024-03-23'),(21,2,'withdrawl',45000,'202405-30'),
(22,3,'transfer',4000,'2024-01-03'),(23,4,'deposit',65000,'2024-03-21'),
(24,5,'withdrawl',3000,'2024-04-02'),(25,6,'transfer',23000,'2024-05-03'),
(26,7,'deposit',24000,'2024-08-09'),(27,8,'withdrawl',65000,'2024-06-06'),
(28,9,'transfer',7000,'2024-07-24'),(29,10,'deposit',5000,'2024-08-28');
(30,11,'deposit',3000,'2023-03-23'),
(31,12,'withdrawl',56000,'2023-06-02'),
(32,13,'transfer',2300,'2024-11-21');

transaction_id	account_id	transaction_type	amount	transaction_date
20	1	deposit	23000	2024-03-23
21	2	withdrawl	45000	2024-05-30
22	3	transfer	4000	2024-01-03
23	4	deposit	65000	2024-03-21
24	5	withdrawl	3000	2024-04-02
25	6	transfer	23000	2024-05-03
26	7	deposit	24000	2024-08-09
27	8	withdrawl	65000	2024-06-06
28	9	transfer	7000	2024-07-24
29	10	deposit	5000	2024-08-28
30	11	deposit	3000	2023-03-23
31	12	withdrawl	56000	2023-06-02
32	13	transfer	2300	2024-11-21

1. Write SQL queries for the following tasks:

1. Write a SQL query to retrieve the name, account type and email of all customers.

```
select Customers.first_name,Customers.last_name,
Customers.email,
Accounts.account_type from Customers
inner join
Accounts on Customers.customer_id= Accounts.customer_id;
```

first_name	last_name	email	account_type
John	Doe	john.doe@example.com	savings
swathi	guna	swathig@gmail.com	current
Sanjay	Patel	sanjay.patel@example.com	savings
Aishwarya	Menon	aishwarya.menon@example.com	savings
Naveen	Nair	naveen.nair@example.com	current
Divya	Sharma	divya.sharma@example.com	savings
Meera	Gupta	meera.gupta@example.com	current
Vishal	Rao	vishal.rao@example.com	savings
Shreya	Iyer	shreya.iyer@example.com	current
Karthik	Menon	karthik.menon@example.com	savings

2.Write a SQL query to list all transaction corresponding customer.

```
select C.customer_id,C.first_name,C.last_name,C.email,
T.transaction_id,T.account_id,T.transaction_type,
```

```
T.amount,T.transaction_date
from transactions T
join Accounts A on
A.account_id=T.account_id
join customers C on
C.customer_id=A.customer_id;
```

customer_id	first_name	last_name	email	transaction_id	account_id	transaction_type	amount	transaction_date
1	John	Doe	john.doe@example.com	20	1	deposit	23000	2024-03-23
2	swathi	guna	swathig@gmail.com	21	2	withdrawl	45000	2024-05-30
3	Sanjay	Patel	sanjay.patel@example.com	22	3	transfer	4000	2024-01-03
4	Aishwarya	Menon	aishwarya.menon@example.com	23	4	deposit	65000	2024-03-21
5	Naveen	Nair	naveen.nair@example.com	24	5	withdrawl	3000	2024-04-02
6	Divya	Sharma	divya.sharma@example.com	25	6	transfer	23000	2024-05-03
7	Meera	Gupta	meera.gupta@example.com	26	7	deposit	24000	2024-08-09
8	Vishal	Rao	vishal.rao@example.com	27	8	withdrawl	65000	2024-06-06
9	Shreya	Iyer	shreya.iyer@example.com	28	9	transfer	7000	2024-07-24
10	Karthik	Menon	karthik.menon@example.com	29	10	deposit	5000	2024-08-28

3.Write a SQL query to increase the balance of a specific account by a certain amount.

```
update Accounts set balance=balance+20000
where account_id=10;
```

balance	customer_id
50000	1
75000	2
60000	3
40000	4
90000	5
30000	6
55000	7
65000	8
70000	9
100000	10

4. Write a SQL query to Combine first and last names of customers as a full_name.

```
select concat(first_name," ",last_name) as name from customers;
```

name
John Doe
swathi guna
Sanjay Patel
Aishwarya Menon
Naveen Nair
Divya Sharma
Meera Gupta
Vishal Rao
Shreya Iyer
Karthik Menon

5.Write a SQL query to remove accounts with a balance of zero where the account type is savings.

DELETE FROM Transactions

WHERE account_id IN (SELECT account_id FROM Accounts WHERE balance = 0 AND account_type = 'savings');

delete from Accounts where balance=0 and account_type='savings';

select * from Accounts;

account_id	customer_id	account_type	balance
1	1	savings	50000
2	2	current	75000
3	3	savings	60000
4	4	savings	40000
5	5	current	90000
6	6	savings	30000
7	7	current	55000
8	8	savings	65000
9	9	current	70000
10	10	savings	100000
12	12	current	23000
13	13	savings	39999
NULL	NULL	NULL	NULL

6.Write a SQL query to Find customers living in a specific city.

select * from customers where address like"%coimbatore%";

customer_id	first_name	last_name	DOB	email	phone_number	address
2	swathi	guna	2001-05-03	swathig@gmail.com	2134657689	236 annur coimbatore
11	ranji	priya	1990-04-03	ranji@gmail.com	1243637654	abc coimbatore
NULL	NULL	NULL	NULL	NULL	NULL	NULL

7. Write a SQL query to Get the account balance for a specific account.

select balance,account_id from accounts where account_id=3;

balance	account_id
60000	3
NULL	NULL

8. Write a SQL query to List all current accounts with a balance greater than $1,000.

select * from accounts where balance > 1000;

account_id	customer_id	account_type	balance
1	1	savings	50000
2	2	current	75000
3	3	savings	60000
4	4	savings	40000
5	5	current	90000
6	6	savings	30000
7	7	current	55000
8	8	savings	65000
9	9	current	70000
10	10	savings	100000
12	12	current	23000
13	13	savings	39999
NULL	NULL	NULL	NULL

9.Write a SQL query to Retrieve all transactions for a specific account.

select * from transactions where account_id = 3;

transaction_id	account_id	transaction_type	amount	transaction_date
22	3	transfer	4000	2024-01-03
NULL	NULL	NULL	NULL	NULL

10.Write a SQL query to Calculate the interest accrued on savings accounts based on a given interest rate.

```
select account_id,customer_id,balance*0.7 as interest_accured from
Accounts
where account_type='savings';
```

account_id	customer_id	interest_accured
1	1	35000.0
3	3	42000.0
4	4	28000.0
6	6	21000.0
8	8	45500.0
10	10	70000.0
13	13	27999.3

11. Write a SQL query to Identify accounts where the balance is less than a specified overdraft limit.

```
select account_id,customer_id,balance  from Accounts
where balance < 50000;
```

account_id	customer_id	balance
4	4	40000
6	6	30000
12	12	23000
13	13	39999
NULL	NULL	NULL

12.Write a SQL query to Find customers not living in a specific city.

select * from customers where address not like"%coimbatore%";

customer_id	first_name	last_name	DOB	email	phone_number	address
1	John	Doe	1990-05-15	john.doe@example.com	1234567890	123 Main St
3	Sanjay	Patel	1985-11-30	sanjay.patel@example.com	7654321098	34C, Mahatma Gandhi Street, Bangalore, Karna...
4	Aishwarya	Menon	1990-05-03	aishwarya.menon@example.com	6543210987	45D, Malabar Hill, Mumbai, Maharashtra
5	Naveen	Nair	1987-09-12	naveen.nair@example.com	5432109876	56E, Rajaji Nagar, Kochi, Kerala
6	Divya	Sharma	1995-03-28	divya.sharma@example.com	4321098765	67F, Indira Nagar, Pune, Maharashtra
7	Meera	Gupta	1983-08-07	meera.gupta@example.com	3210987654	78G, Anna Salai, Chennai, Tamil Nadu
8	Vishal	Rao	1992-12-19	vishal.rao@example.com	2109876543	89H, Gokulam Road, Mysuru, Karnataka
9	Shreya	Iyer	1986-06-24	shreya.iyer@example.com	1098765432	90I, Jubilee Hills, Hyderabad, Telangana
10	Karthik	Menon	1997-01-10	karthik.menon@example.com	987654321	91J, Brigade Road, Bengaluru, Karnataka
12	shwetha	shree	1988-04-02	shwetha@gmail.com	1246712542	salem
13	varun	lakshman	2002-06-01	laksh@gmail.com	5418564838	ooty
NULL	NULL	NULL	NULL	NULL	NULL	NULL

Tasks 3: Aggregate functions, Having, Order By, GroupBy and Joins:

1.Write a SQL query to Find the average account balance for all customers.

select avg(balance) from Accounts;

avg(balance)
58166.5833

2.Write a SQL query to Retrieve the top 10 highest account balances.

select balance from Accounts order by balance desc limit 10;

balance
100000
90000
75000
70000
65000
60000
55000
50000
40000
39999

3.Write a SQL query to Calculate Total Deposits for All Customers in specific date.

```
SELECT SUM(amount) AS total_deposit FROM Transactions WHERE
transaction_type='deposit' AND transaction_date='2024-03-23';
```

total_deposit
23000

4.Write a SQL query to Find the Oldest and Newest Customers.

```
SELECT *
FROM Customers
WHERE customer_id IN (
   SELECT MIN(customer_id) AS first_customer_id
   FROM Customers
   UNION
   SELECT MAX(customer_id) AS last_customer_id
   FROM Customers
);
```

customer_id	first_name	last_name	DOB	email	phone_number	address
1	John	Doe	1990-05-15	john.doe@example.com	1234567890	123 Main St
13	varun	lakshman	2002-06-01	laksh@gmail.com	5418564838	ooty
NULL	NULL	NULL	NULL	NULL	NULL	NULL

5.Write a SQL query to Retrieve transaction details along with the account type.

```
SELECT  Transactions.* ,accounts.account_type FROM Transactions
JOIN
```

Accounts ON Transactions.account_id=Accounts.account_id;

transaction_id	account_id	transaction_type	amount	transaction_date	account_type
20	1	deposit	23000	2024-03-23	savings
21	2	withdrawl	45000	2024-05-30	current
22	3	transfer	4000	2024-01-03	savings
23	4	deposit	65000	2024-03-21	savings
24	5	withdrawl	3000	2024-04-02	current
25	6	transfer	23000	2024-05-03	savings
26	7	deposit	24000	2024-08-09	current
27	8	withdrawl	65000	2024-06-06	savings
28	9	transfer	7000	2024-07-24	current
29	10	deposit	5000	2024-08-28	savings
31	12	withdrawl	56000	2023-06-02	current
32	13	transfer	2300	2024-11-21	savings

6.Write a SQL query to Get a list of customers along with their account details.

SELECT Customers.customer_id,concat(first_name, " " ,last_name) AS name,
Accounts.* FROM Accounts
JOIN
Customers ON Accounts.customer_id=Customers.customer_id;

customer_id	name	account_id	customer_id	account_type	balance
1	John Doe	1	1	savings	50000
2	swathi guna	2	2	current	75000
3	Sanjay Patel	3	3	savings	60000
4	Aishwarya Menon	4	4	savings	40000
5	Naveen Nair	5	5	current	90000
6	Divya Sharma	6	6	savings	30000
7	Meera Gupta	7	7	current	55000
8	Vishal Rao	8	8	savings	65000
9	Shreya Iyer	9	9	current	70000
10	Karthik Menon	10	10	savings	100000
12	shwetha shree	12	12	current	23000
13	varun lakshman	13	13	savings	39999

7.Write a SQL query to Retrieve transaction details along with customer information for a specific account.

SELECT Customers.*,Transactions.*
FROM Transactions
JOIN

```
Accounts ON Accounts.account_id=Transactions.account_id
JOIN
Customers ON Customers.customer_id=Accounts.account_id
WHERE Accounts.account_id=8;
```

customer_id	first_name	last_name	DOB	email	phone_number	address	transaction_id	account_id	transaction_type	amount	transaction_date
8	Vishal	Rao	1992-12-19	vishal.rao@example.com	2109876543	89H, Gokulam Road, Mysuru, Karnataka	27	8	withdrawl	65000	2024-06-06

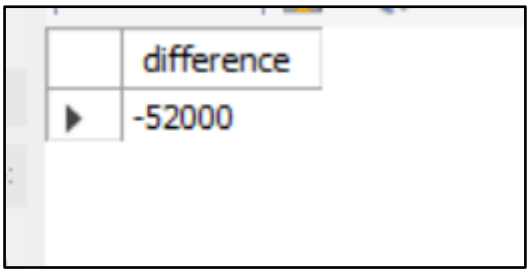
8.Write a SQL query to Identify customers who have more than one account.

```
select
Customers.customer_id,Customers.first_name,Customers.last_name,Accounts.accou
nt_id
from customers
join accounts
on customers.customer_id=Accounts.customer_id
group by customer_id
having count(account_id)>1;
```

customer_id	first_name	last_name	account_id

9.Write a SQL query to Calculate the difference in transaction amounts between deposits and withdrawals.

```
SELECT
   SUM(CASE WHEN transaction_type = 'deposit' THEN amount
         WHEN transaction_type = 'withdrawl' THEN -amount
         ELSE 0 END) AS difference
FROM
   Transactions;
```



	difference
▶	-52000

10.Write a SQL query to Calculate the average daily balance for each account over a specified period.

```
select account_id,avg(balance)
from Accounts as avg_balance
group by account_id;
```

	account_id	avg(balance)
▶	1	50000.0000
	2	75000.0000
	3	60000.0000
	4	40000.0000
	5	90000.0000
	6	30000.0000
	7	55000.0000
	8	65000.0000
	9	70000.0000
	10	100000.0000
	12	23000.0000
	13	39999.0000

11.Calculate the total balance for each account type.

```
select account_type, sum(balance) from accounts group by account_type;
```

	account_type	sum(balance)
▶	savings	384999
	current	313000

12.Identify accounts with the highest number of transactions order by descending order.

```
select account_id,count(account_id) as num
 from Transact
 group by account_id
 order by num desc;
```

	account_id	num
▶	3	4
	5	4
	1	3
	2	3
	4	3
	6	1

13.List customers with high aggregate account balances, along with their account types.

```
select concat(first_name," ",last_name) as full_name , Accounts.balance ,
Accounts.account_type
 from Customers
 join Accounts
 on Customers.customer_id=Accounts.customer_id
 group by full_name
 order by Accounts.balance desc;
```

full_name	total_balance	account_type
Karthik Menon	100000	savings
Naveen Nair	90000	current
swathi guna	75000	current
Shreya Iyer	70000	current
Vishal Rao	65000	savings
Sanjay Patel	60000	savings
Meera Gupta	55000	current
John Doe	50000	savings
Aishwarya Menon	40000	savings
varun lakshman	39999	savings
Divya Sharma	30000	savings
shwetha shree	23000	current

14.Identify and list duplicate transactions based on transaction amount, date, and account.

```
SELECT amount,transaction_date,account_id,COUNT(*) AS duplicate_count
FROM Transactions
GROUP BY amount,transaction_date,account_id
HAVING COUNT(*) > 1
ORDER BY amount,transaction_date,account_id;
```

amount	transaction_date	account_id	duplicate_count

Tasks 4: Subquery and its type:

1.Retrieve the customer(s) with the highest account balance.

```
select concat(first_name," ",last_name) as name
,Customers.customer_id,Accounts.balance
from Customers
join Accounts
on Accounts.customer_id=customers.customer_id
where balance= (select max(balance) from Accounts);
```

	name	customer_id	balance
▶	Karthik Menon	10	100000

3.Retrieve accounts with transactions whose amounts exceed the average transaction amount.

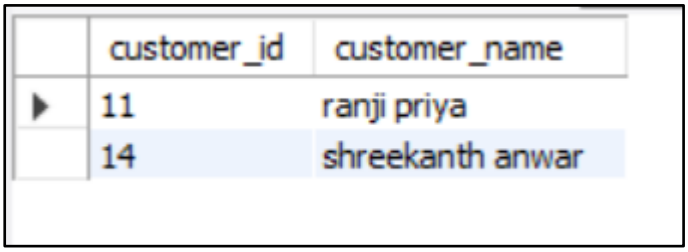
```
select account_id,amount from transactions
 where  amount >(select  avg(amount) from transactions);
```

	account_id	amount
▶	2	45000
	4	65000
	8	65000
	12	56000

4.Identify customers who have no recorded transactions.

```
SELECT c.customer_id,CONCAT(c.first_name, ' ', c.last_name) AS customer_name
FROM Customers c
```

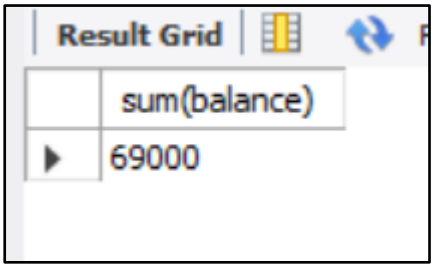
```
LEFT JOIN Accounts a ON c.customer_id = a.customer_id
LEFT JOIN Transactions t ON a.account_id = t.account_id
WHERE t.account_id IS NULL;
```



customer_id	customer_name
11	ranji priya
14	shreekanth anwar

5.Calculate the total balance of accounts with no recorded transactions.

```
select sum(balance) from accounts
where account_id not in (select account_id from transactions);
```

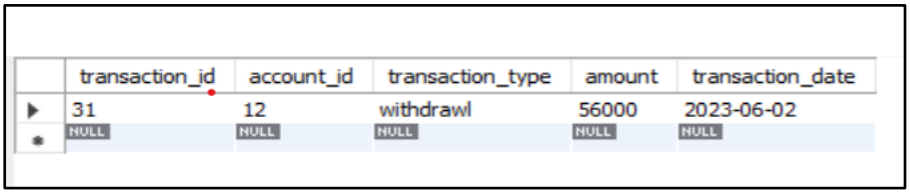


Result Grid

sum(balance)
69000

6.Retrieve transactions for accounts with the lowest balance.

```
SELECT *
FROM transactions
WHERE account_id
 IN (SELECT account_id FROM accounts WHERE balance = (SELECT MIN(balance)
FROM accounts));
```



transaction_id	account_id	transaction_type	amount	transaction_date
31	12	withdrawl	56000	2023-06-02
NULL	NULL	NULL	NULL	NULL

7.Identify customers who have accounts of multiple types.

```
SELECT customer_id,COUNT(DISTINCT account_type) AS num_account_types
FROM Accounts
GROUP BY customer_id
HAVING COUNT(DISTINCT account_type) > 1;
```

customer_id	num_account_types

8.Calculate the percentage of each account type out of the total number of accounts.

```
SELECT account_type,COUNT(*) AS num_accounts,
ROUND(COUNT(*) * 100.0 / (SELECT COUNT(*) FROM Accounts), 2) AS percentage
FROM Accounts
GROUP BY account_type;
```

account_type	num_accounts	percentage
savings	8	57.14
current	6	42.86

9.Retrieve all transactions for a customer with a given customer_id.

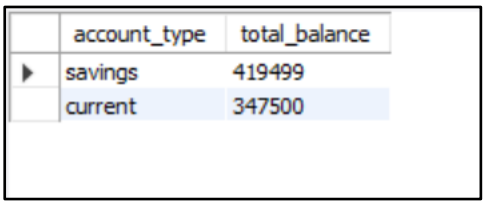
```
SELECT * FROM Transactions
WHERE
   account_id IN (SELECT account_id FROM Accounts WHERE customer_id = 3 );
```

transaction_id	account_id	transaction_type	amount	transaction_date
22	3	transfer	4000	2024-01-03

10.Calculate the total balance for each account type, including a subquery within the SELECT clause.

```
SELECT account_type,
```

(SELECT SUM(balance) FROM Accounts WHERE account_type = a.account_type) AS total_balance
FROM (SELECT DISTINCT account_type FROM Accounts) AS a;



account_type	total_balance
savings	419499
current	347500