--1. **How many unique nodes are there on the Data Bank system?**

```
SELECT
COUNT (DISTINCT node_id)
FROM data_bank.customer_nodes;
```

Results

Query #1 **Execution time: 2ms**

count
5

--2**. What is the number of nodes per region?**

```
SELECT   r.region_id, r.region_name,
COUNT(node_id)  AS  node_per_region
FROM data_bank.regions r
JOIN data_bank.customer_nodes n
  ON r.region_id = n.region_id
GROUP BY r.region_id, r.region_name
ORDER BY region_id;
```

Results

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region_id	region_name	node_per_region
1	Australia	770
2	America	735
3	Africa	714
4	Asia	665
5	Europe	616

--3. **How many customers are allocated to each region?**

```
SELECT region_id, COUNT(customer_id) AS Total_customer
FROM data_bank.customer_nodes
GROUP BY region_id
ORDER BY region_id;
```

region_id	total_customer
1	770
2	735
3	714
4	665
5	616

--4 **How many days on average are customers reallocated to a different node?**

```
WITH node_diff AS (
SELECT  customer_id, node_id, start_date, end_date,
(end_date - start_date) AS diff
FROM data_bank.customer_nodes
WHERE end_date != '9999-12-31'
GROUP BY customer_id, node_id, start_date, end_date
),
sum_diff_cte AS (
SELECT customer_id, node_id, SUM(diff) AS sum_diff
from node_diff
group by customer_id, node_id
)

SELECT  ROUND(AVG(sum_diff),0) AS avg_reallocation_days
FROM sum_diff_cte;
```

Query #1 **Execution time: 4ms**

avg_reallocation_days
24

Customer txn analysis:-

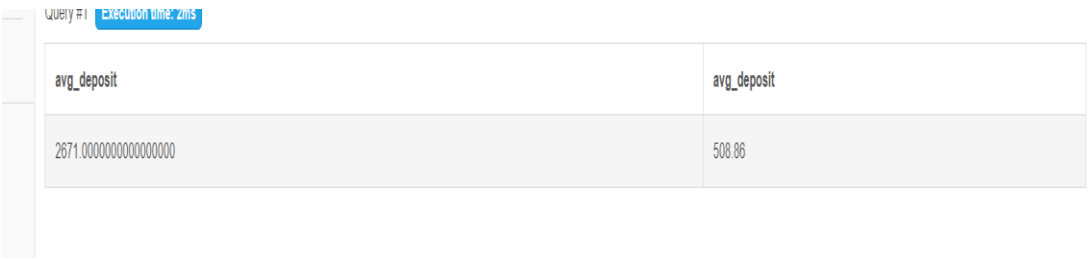
--1. **What is the unique count and total amount for each transaction type?**

```
SELECT
 txn_type, COUNT(*) as total_number_txn,
SUM(txn_amount)  as  total_amount
from data_bank.customer_transactions
group by txn_type;
```

txn_type	total_number_txn	total_amount
purchase	1617	806537
deposit	2671	1359168
withdrawal	1580	793003

--2. **What is the average total historical deposit counts and amounts for all customers?**

```
with cte1 as (
SELECT
txn_type,
 count(*) AS  total_number_deposit ,
 avg(txn_amount) AS avg_deposit_amount
from data_bank.customer_transactions
group by txn_type
 )
Select
 avg(total_number_deposit) as avg_deposit,
 round(avg(avg_deposit_amount),2) as avg_deposit
from cte1
where  txn_type ='deposit'
```



avg_deposit	avg_deposit
2671.0000000000000000	508.86

--3 **For each month - how many Data Bank customers make more than 1 deposit and either 1 purchase or 1 withdrawal in a single month?**

```
with cte1 as
(SELECT
 customer_id, count(*) as tt, date_part('month',txn_date)     as month_number,
 sum(case when txn_type = 'withdrawal' then 1 else 0 end ) as total_withdrawal,
 sum(case when txn_type = 'deposit'       then 1 else 0 end )  as total_deposite,
 sum(case when txn_type  = 'purchase'   then 1 else 0 end )  as total_purchase
from  data_bank.customer_transactions
group by customer_id, month_number   )
```

```
select month_number, count(distinct(customer_id))   from cte1
where
total_deposite > 1 and  (total_purchase =1 or total_withdrawal =1)
group by month_number;
```

month_number	count
1	115
2	108
3	113
4	50

--4 **What is the closing balance for each customer at the end of the month?**

```
with cte1 as
(
SELECT
customer_id,date_part('month', txn_date) as month_number,
sum (case when txn_type= 'deposit' then (txn_amount)   else 0 end) as deposite,
sum (case when txn_type= 'withdrawal' then -txn_amount else 0 end) as withdrawal,
sum (case when txn_type= 'purchase' then -txn_amount   else 0 end) as purchase
FROM data_bank.customer_transactions
group by customer_id,month_number
order by customer_id,month_number )
select  customer_id,month_number,
deposite+withdrawal+purchase  as month_end_closing_balance
from cte1
```

customer_id	month_number	month_end_closing_balance
1	1	312
1	3	-952
2	1	549
2	3	61
3	1	144
3	2	-965
3	3	-401
3	4	493
4	1	848
4	3	-193
5	1	954
5	3	-2877

--5 **What is the percentage of customers who increase their closing balance by more than 5%?**

```
with cte1 as
(
SELECT
customer_id,date_part('month', txn_date) as month_number,
sum (case when txn_type= 'deposit' then (txn_amount)   else 0 end) as deposite,
sum (case when txn_type= 'withdrawal' then -txn_amount else 0 end) as withdrawal,
sum (case when txn_type= 'purchase' then -txn_amount   else 0 end) as purchase
from data_bank.customer_transactions
group by customer_id,month_number
order by customer_id,month_number ),
--cte1 to find each month what is the total amount has been depostie ,withdrawal,purchase for each
customer

cte2 as (
select  customer_id,month_number,
deposite+withdrawal+purchase  as eachmonth_end_closing_balance
from cte1 ),
-- to find each month end balance after adding deposite amount and deducting withdrawal and
purchase amount

cte3 as (
select *,
sum(eachmonth_end_closing_balance)over(partition by customer_id order by month_number) as
cummulative_balance
from cte2 ),
 -- to find   cummlative total amount that has been present after each month for each customer

cte4 as (
select *,
first_value( cummulative_balance) over (partition by   customer_id order by month_number)  as
start_balance,
last_value( cummulative_balance) over(partition by customer_id order by  month_number rows
between unbounded preceding and unbounded following) as end_balance
from cte3 ),
-- to find intial value and and final value present in the account for each customer

cte5 as ( select *,
((end_balance-start_balance)*100/start_balance) as per
from cte4
where    ((end_balance-start_balance)*100/start_balance) > 5
 and end_balance >start_balance)
-- find those customer whose final balnce is more then 5 percent as compared to their intial bank
balance

select count(distinct(customer_id)) *100 / (select count(distinct(customer_id))
  from data_bank.customer_transactions)
from cte5
-- divide total number of those customers whose closing balnace is more than 5 % of their intial
balance with total number of customer present in the bank to find percentage .
```

```
23
```