**A. Customer Nodes Exploration**

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

|  |
| --- |
| **Total Unique Nodes** |
| 25 |

2. What is the number of nodes per region?

|  |  |
| --- | --- |
| **Regions** | **Nodes per Region** |
| Africa | 5 |
| America | 5 |
| Asia | 5 |
| Australia | 5 |
| Europe | 5 |

3. How many customers are allocated to each region?

|  |  |
| --- | --- |
| **Regions** | **Customers per Region** |
| Australia | 110 |
| America | 105 |
| Africa | 102 |
| Asia | 95 |
| Europe | 88 |

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

|  |
| --- |
| **Avg days per Node** |
| 14.63 |

5. What is the median, 80th and 95th percentile for this same reallocation days metric for each region?

|  |  |  |  |
| --- | --- | --- | --- |
| Region | Avg days per node | | |
| Median | 80th percentile | 95th percentile |
| **Australia** | 15 | 23 | 28 |
| **America** | 15 | 23 | 28 |
| **Africa** | 15 | 24 | 28 |
| **Asia** | 15 | 23 | 28 |
| **Europe** | 15 | 24 | 28 |

**B. Customer Transactions**

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

|  |  |  |
| --- | --- | --- |
| **Transaction categories** | **Type of transactions** | **Number of each transaction** |
| deposit | 1 | 2671 |
| purchase | 1 | 1617 |
| withdrawal | 1 | 1580 |

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

|  |  |
| --- | --- |
| **Average number of deposits per customer** | **Average total deposits per customer** |
| 5.34 | 2718.34 |

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?

Following is the total number of customers in ‘customer\_transaction’ table.

|  |
| --- |
| **Number of customers** |
| 500 |

|  |  |
| --- | --- |
| **Month** | **Number of customers with deposits/month >1 & purchase/month or withdrawal/month = 1** |
| January | 53 |
| March | 38 |
| February | 36 |
| April | 22 |

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

Table

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

|  |
| --- |
| **Proportion of customers with 5 percent increase in monthly balance** |
| 36.38% |

**C. Data Allocation Challenge**

**How much data would have been required for each of the following option on a monthly basis?**

* **Option 1: data is allocated based off the amount of money at the end of the previous month.**
* **Option 2: data is allocated on the average amount of money kept in the account in the previous 30 days.**
* **Option 3: data is updated real-time.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Month** | **option\_1** | **option\_2** | **option\_3** |
| **January** | NULL | NULL | 390315 |
| **February** | 412632 | 625745.8 | 23341 |
| **March** | -389781 | 210218.2 | -904668 |
| **April** | -370545 | -2706.02 | -491691 |
| **Total** | **-347694** | **833258** | **-982703** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Month** | **Average Deposit** | **Average Withdrawal** | **Average Purchase** |
| 1 | January | 505.65 | 513.04 | 475.89 |
| 2 | February | 505.01 | 494.17 | 491.67 |
| 3 | March | 510.61 | 510.92 | 504.4 |
| 4 | April | 521.35 | 480.71 | 532.63 |

**D. Extra Challenge**

If the annual interest rate is set at 6% and the Data Bank team wants to reward its customers by increasing their data allocation based off the interest calculated daily basis at the end of each day, how much data would be required for this option monthly basis?

|  |  |
| --- | --- |
| **Month** | **Data required based on interest calculated on a daily basis** |
| January | 1561.79 |
| February | 2012.81 |
| March | -3091.99 |
| April | -1516.74 |