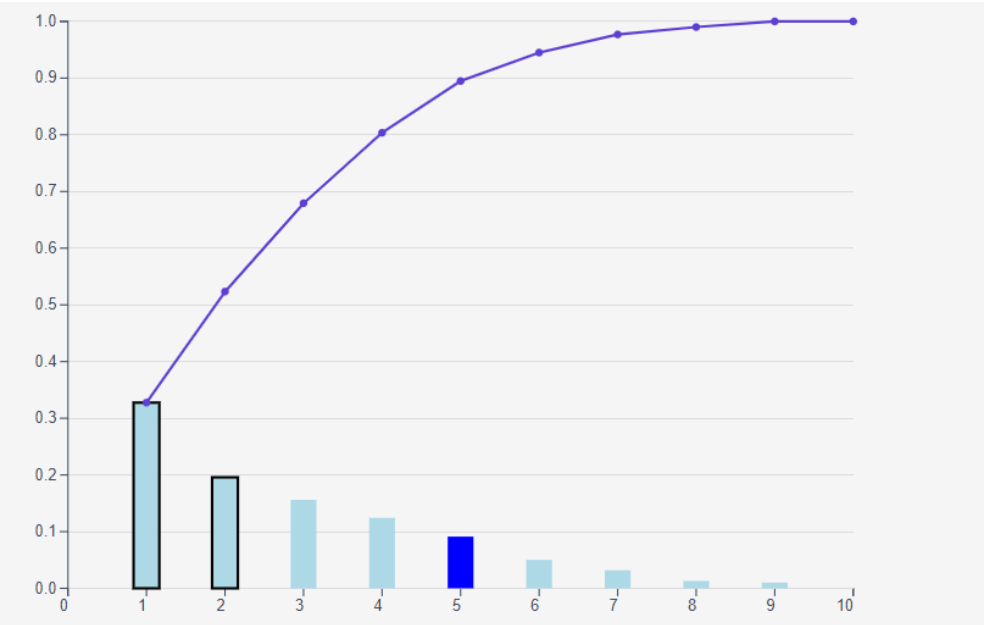
Lab Report 2a- CSE 564: Visualization

- Ananna Rahman

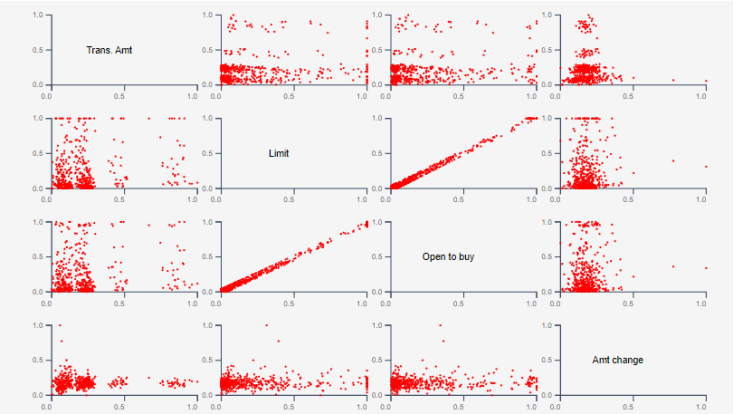
Dataset Link: https://www.kaggle.com/datasets/sakshigoyal7/credit-card-customers
Dataset Attribute:
Age: Represents the customer's age in years.
Dependents: Indicates the number of dependents each customer has. Although these are numerical values, they are treated as categorical due to their repetitive nature and limited range.
Months: Denotes the period of the customer's relationship with the bank.
Products: Refers to the total number of products held by the customer. Similar to dependents, this attribute is treated as categorical despite being numerical due to its limited and repetitive values.
Limit: Indicates the credit limit on the credit card.
Balance: Reflects the total revolving balance on the credit card.
Open-to-Buy : Represents the open-to-buy credit line for the last 12 months.
Change in Amount: Represents the total change in transaction amount (Q4 over Q1).
Transaction Amount: Denotes the total transaction amount for the last 12 months.
Utilisation Represents the average card utilisation ratio.

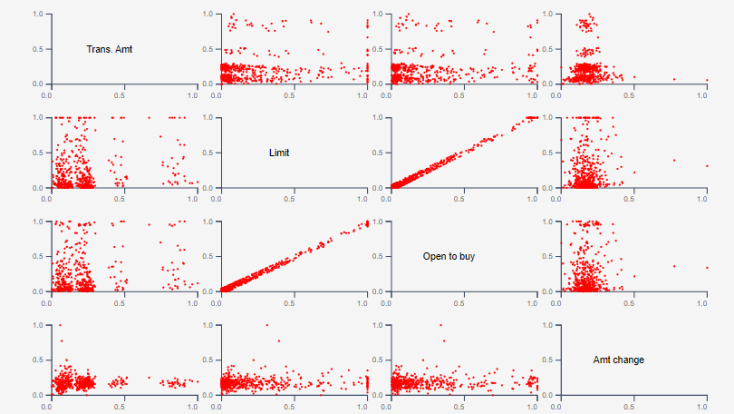
Observation 1:
We observed that the first principal component explains only 32% of the data, while the first two components together explain 52%. By choosing a total of five components, we can account for approximately 89% of the explained variance.

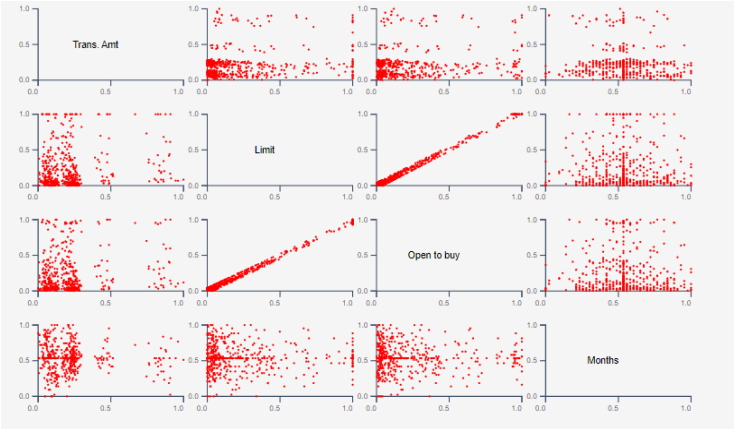


Observation 2:

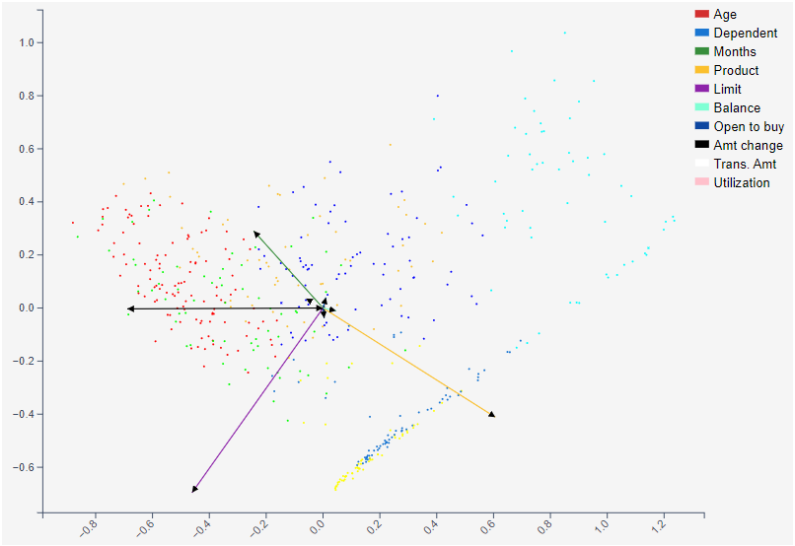
When considering five PCA components, the top four attributes are identified as Limit, Open to buy, Transaction Amount, and Balance. Through scatterplot analysis, we observe that Limit and Open to buy exhibit a proportional relationship. Moreover, regardless of changes in the intrinsic dimension, Limit, Open to buy, and Transaction Amount remain unaffected, while the fourth attribute varies. This suggests that Limit, Open to buy, and Transaction Amount are the most influential factors. The fourth attribute fluctuates between months, balance, age.







Observation 3: In the biplot, we initially plotted PC1 and PC2. PC1 exhibited high loading of Products, while PC2 showed high loading for factors related to months.



Running the application:

To run the Angular project with D3.js charts, follow these steps:

1. Ensure you have Node.js version 16.14.2 and Angular version 12.2.17 installed on your system.
2. Navigate to the project directory using the terminal/command prompt. Run the following command to install all dependencies listed in the project's package.json file:

    npm install

3. Once all dependencies are installed, start the development server by running the command:

    ng serve

4. After the server has started successfully, open any web browser and go to the following URL:

    http://localhost:4200/

This will load the Angular application with the D3.js charts.