Credit Card Customer Segmentation

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Outline:

1. Objective & Stakeholder
2. Data Information
3. Visualization
4. Dandrogram
5. Kmean
6. Conclusion

1. Objective & Stakeholder

- Using Clustering algorithems to group similar customers into categories to develop a customer segmentation to define marketing strategy.

- The stakeholder: Customer Segmentation department of banks, pecifically Chase Bank (USA based).

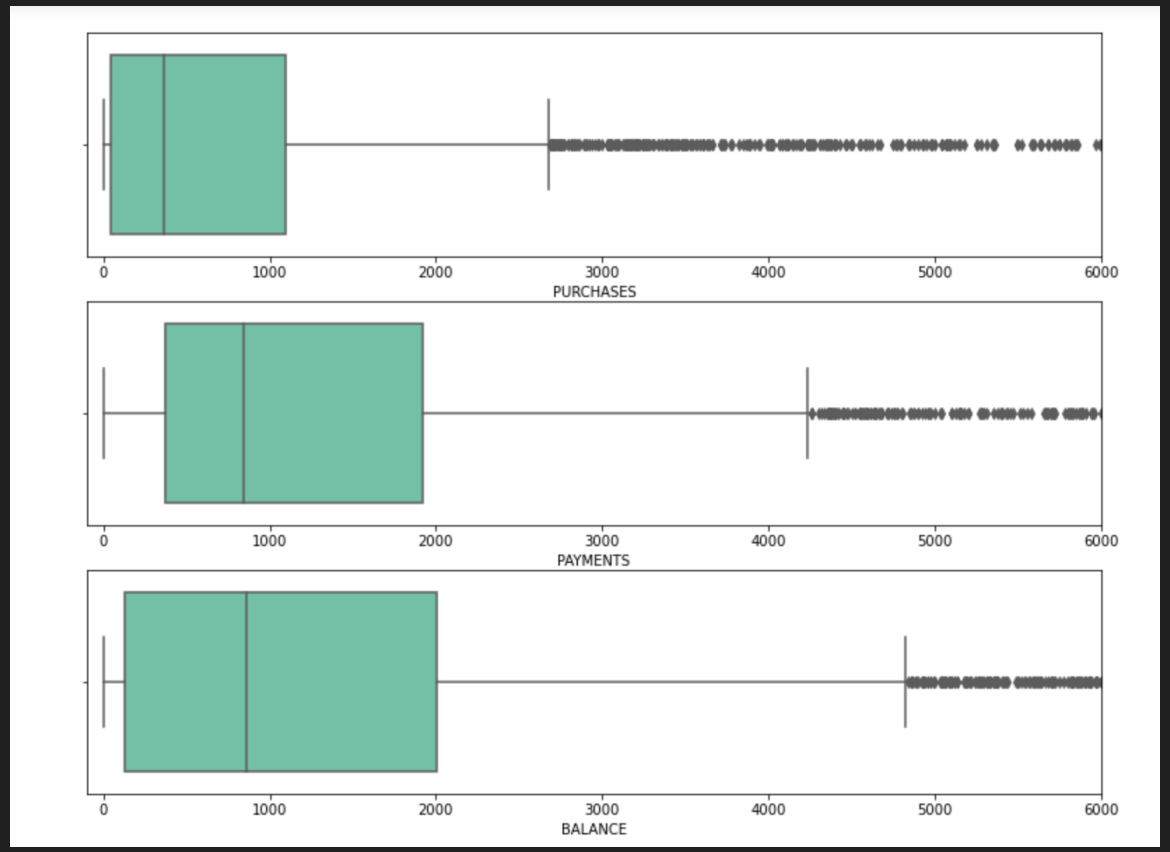
CHASE

2. Data Information

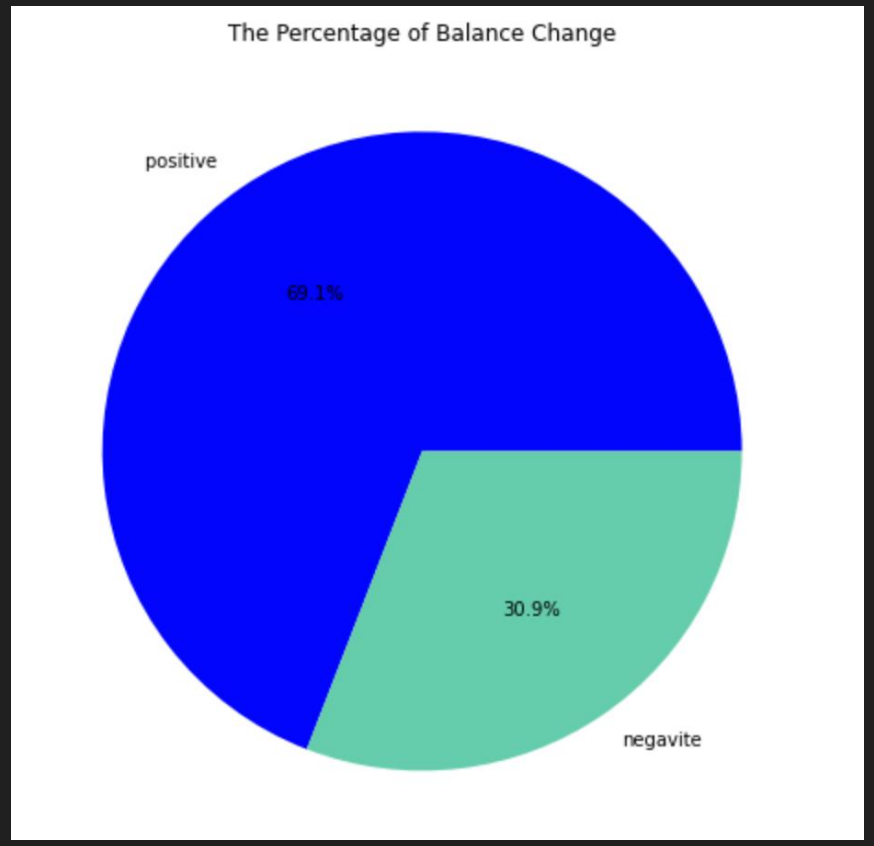
- Sample dataset:
  - 9000 active credit card holder during last 6 months
  - 18 behavioural variables
  - Source: https: https://www.kaggle.com/arjunbhasin2013/ccdata

CUST_ID	BALANCE	PURCHASES	CASH_ADVANCE	CREDIT_LIMIT	PAYMENTS	MINIMUM_PAYMENTS	INSTALLMENTS_PURCHASES	ONEOFF_PURCHASES
C17580	384.803407	549.00	0.000000	1000.0	569.597465	610.732047	258.00	291.00
C10289	1473.495809	414.00	0.000000	10500.0	5863.940340	570.250342	414.00	0.00
C14417	4988.093733	8581.29	225.473003	10500.0	1571.883000	1133.733957	3940.45	4640.84
C17426	3840.505780	0.00	5558.961557	5500.0	4608.621771	904.882748	0.00	0.00
C19097	227.220411	1387.60	107.660394	1000.0	1217.473837	136.283049	1099.06	288.54

3. Visualizations



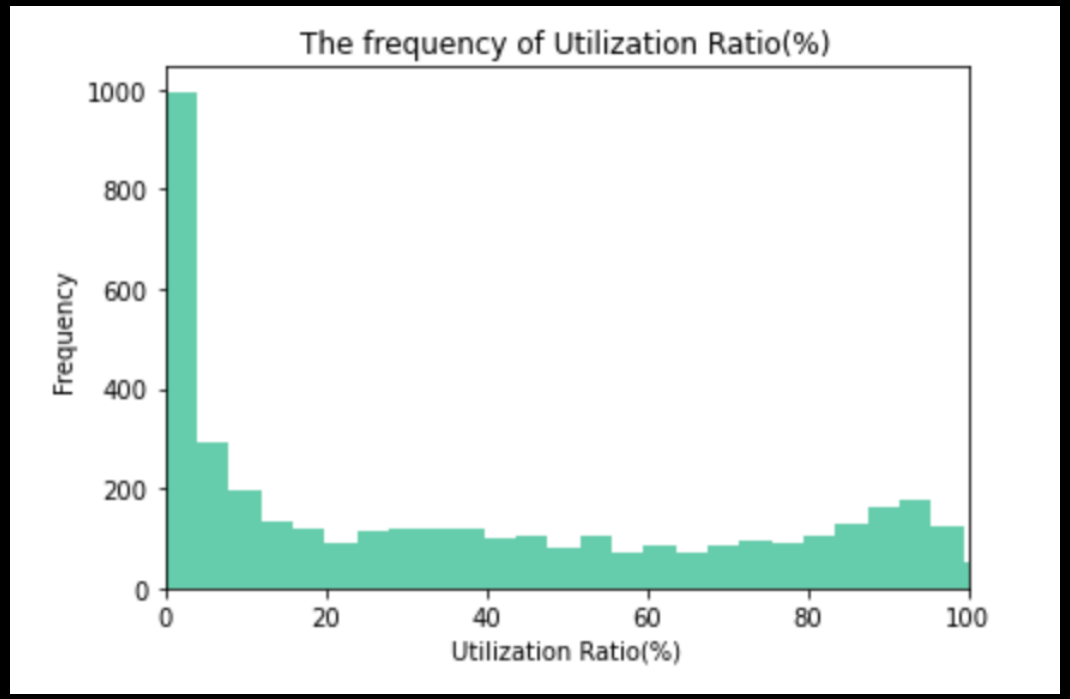
Plot1. Distribustion of Balance, Payment, Purchases of users.



Plot2. The percentage of Balance change

- 69.1% positive: **PURCHASES > PAYMENTS**
- **30.9% negative: PURCHASES < PAYMENTS**

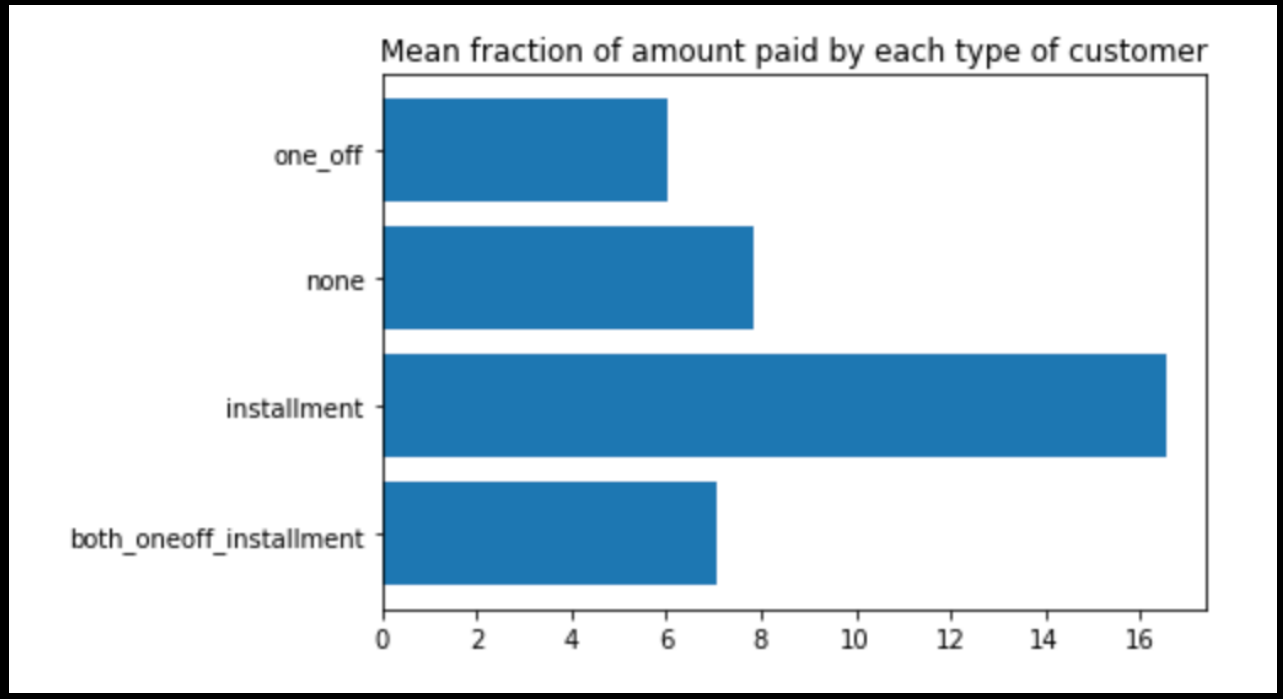
3. Visualizations



Plot3. The frequency of Utilization Ratio(%).

$$Ultilization.ratio = \frac{Balance}{Credit.Limit} \times 100$$

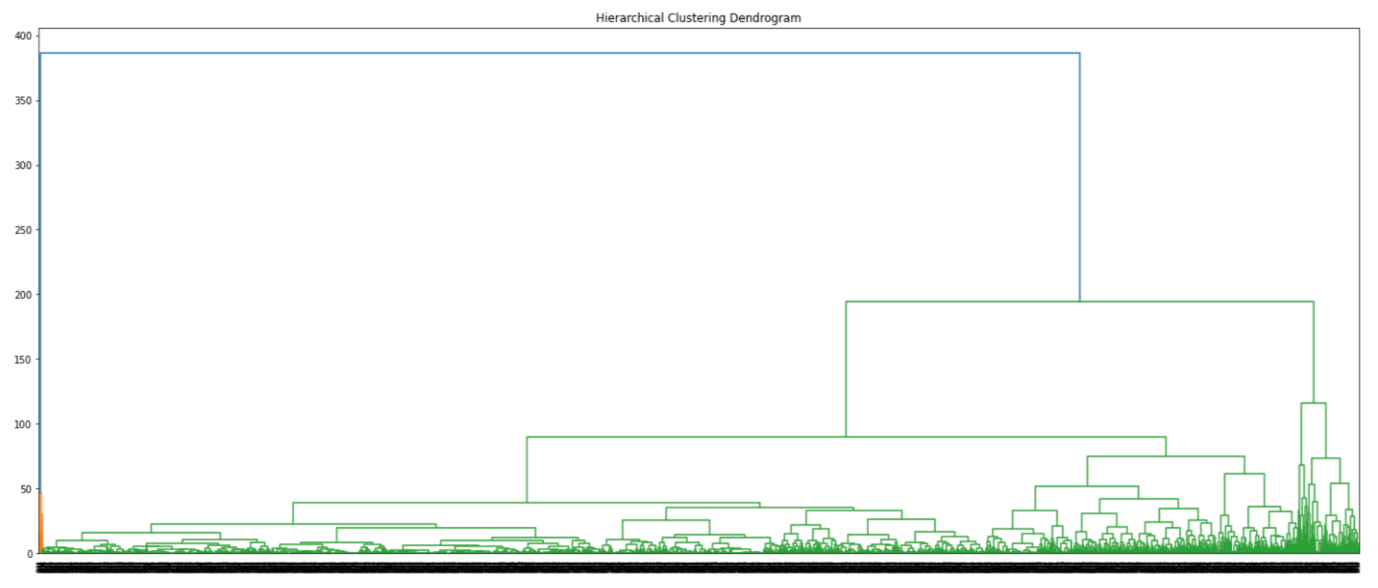
The majority of users has low Utilization Ratio -> Higher credit score!



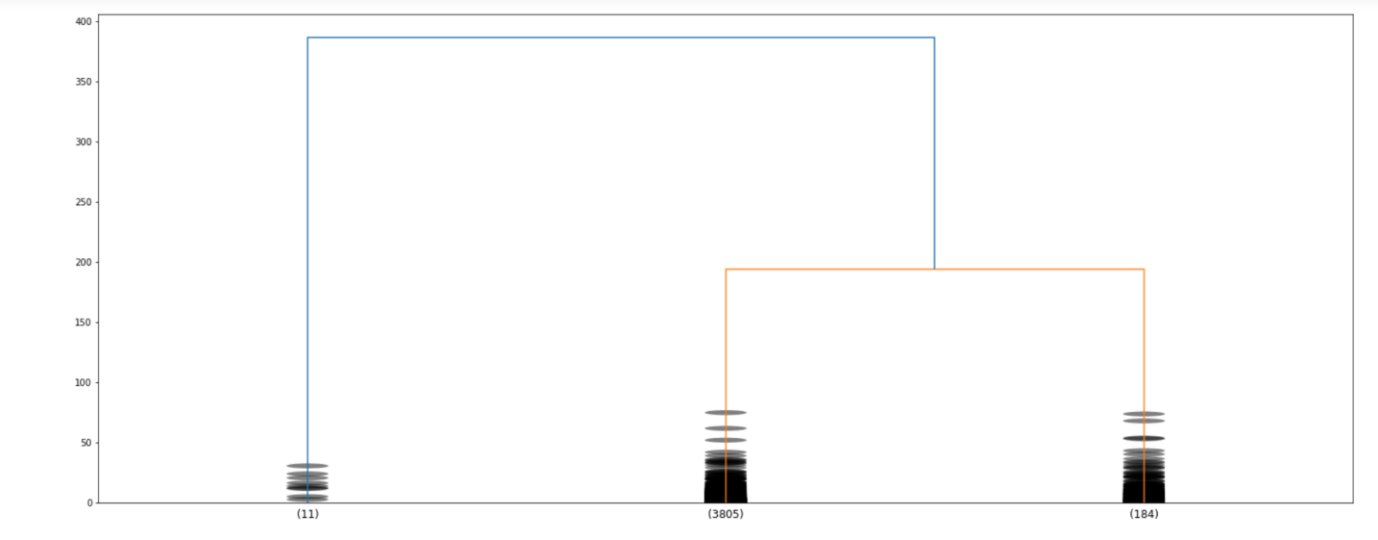
Plot4. The Mean Fraction of amount paid by each type of customer.

- customers purchasing in installments are paying dues timely

4. Dendrogram



Plot5. Dengrogram of Balance and credit-limit features.



Plot6. Dengrogram of Balance and credit-limit features with K=3.

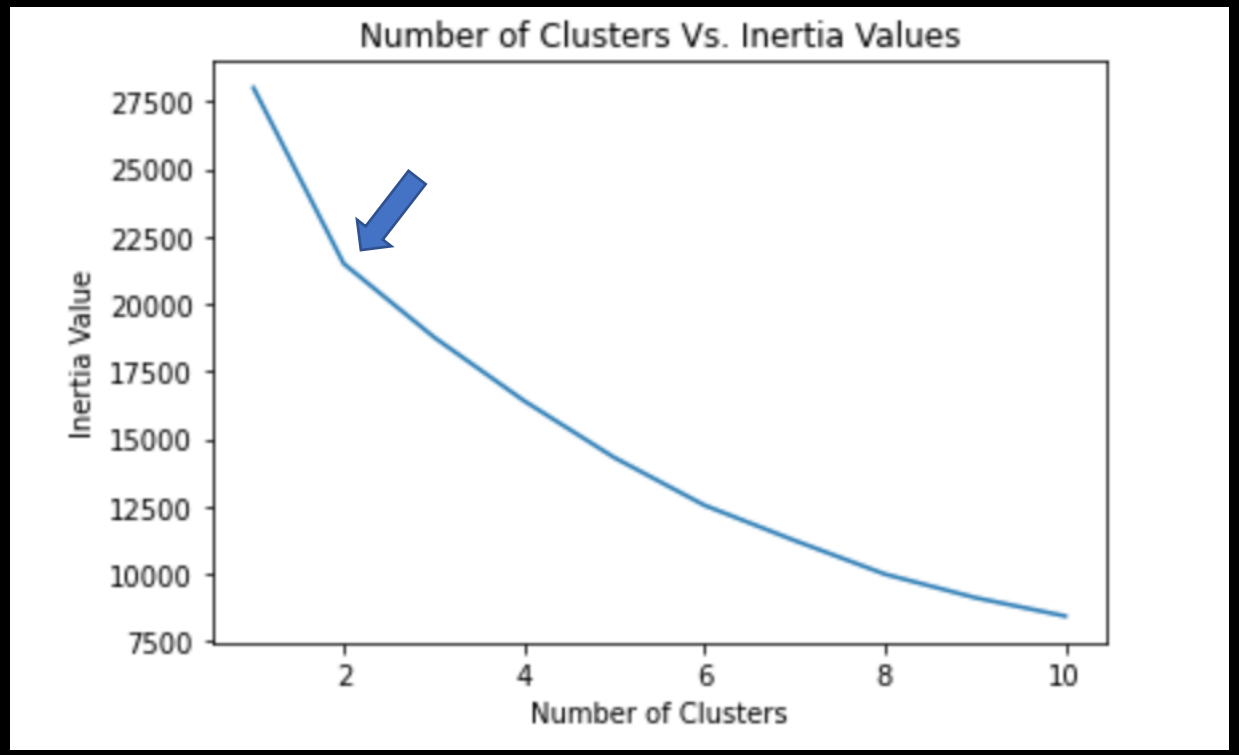
- Choose K = 3:
  - First cluster: 11 users
  - Sencond cluster: 3805 users
  - Third cluster: 184 users

- 2nd and 3rd have closer behavior comparing to the first one.

5. Kmean

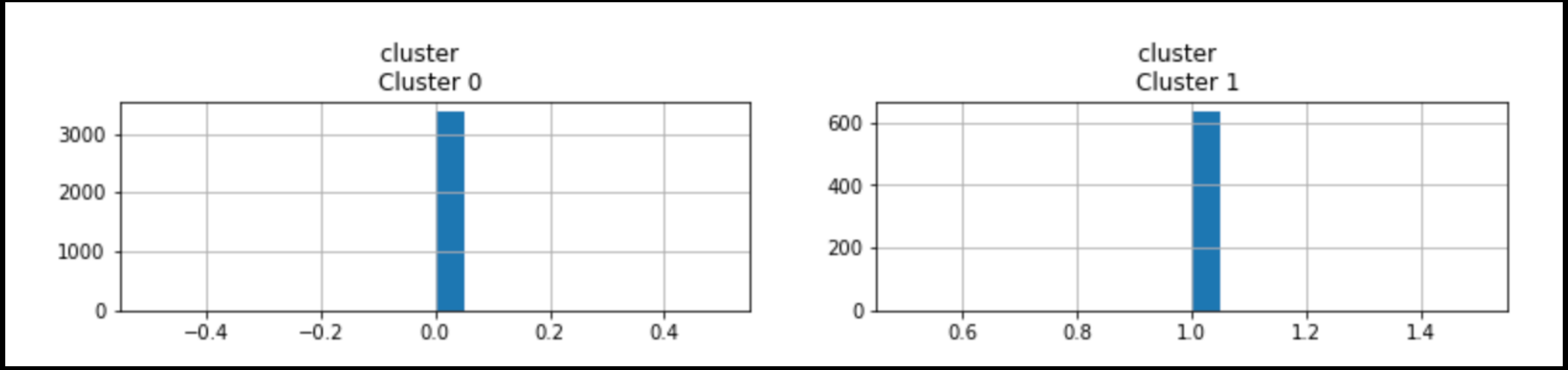
8 Features:

BALANCE, PURCHASES, CASH_ADVANCE, CREDIT_LIMIT, PAYMENTS, MINIMUM_PAYMENTS, Utilization.Ratio(%)



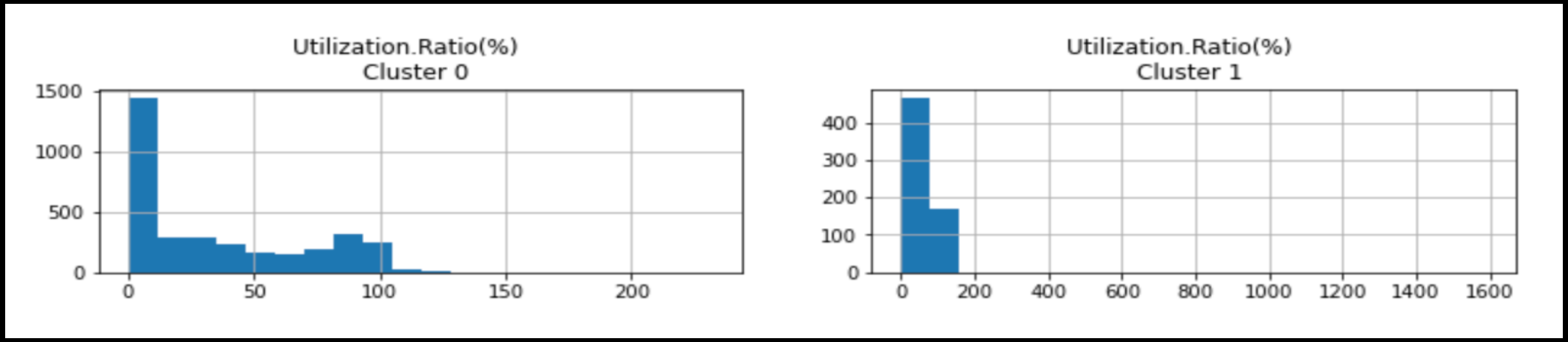
K = 2

5. Kmean

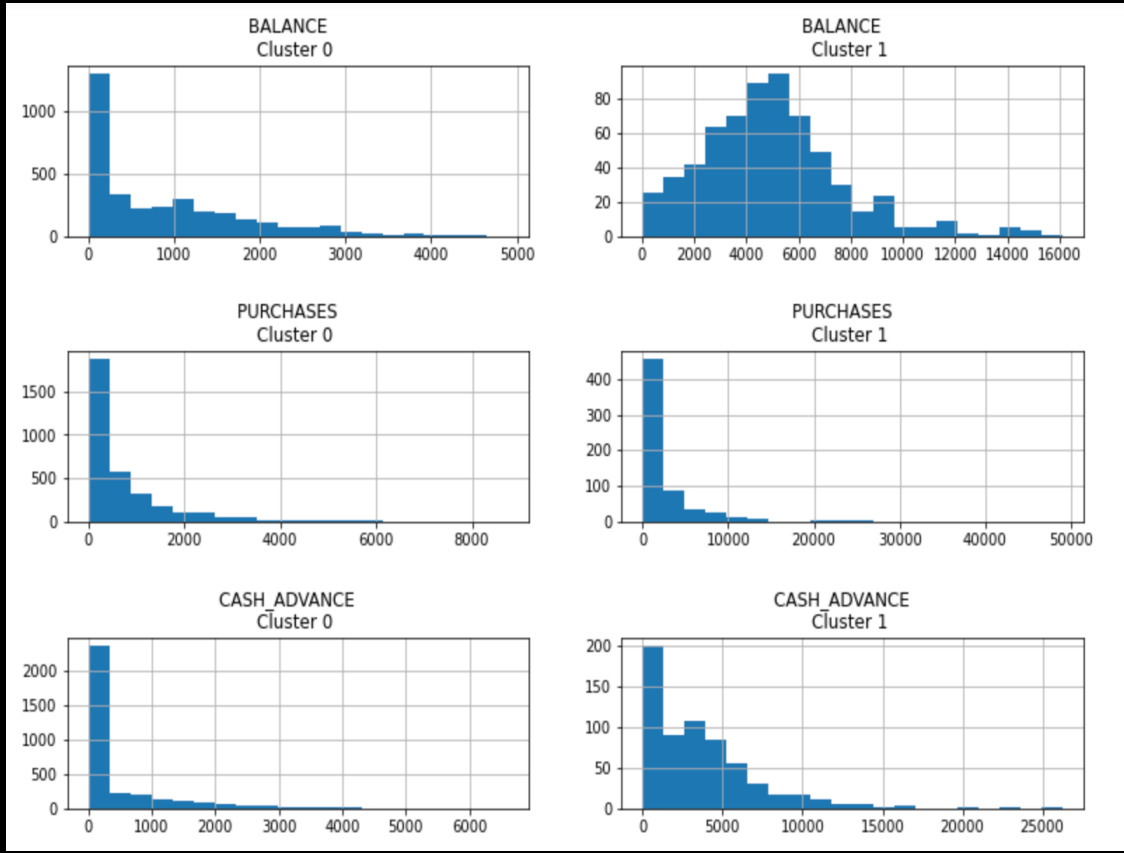


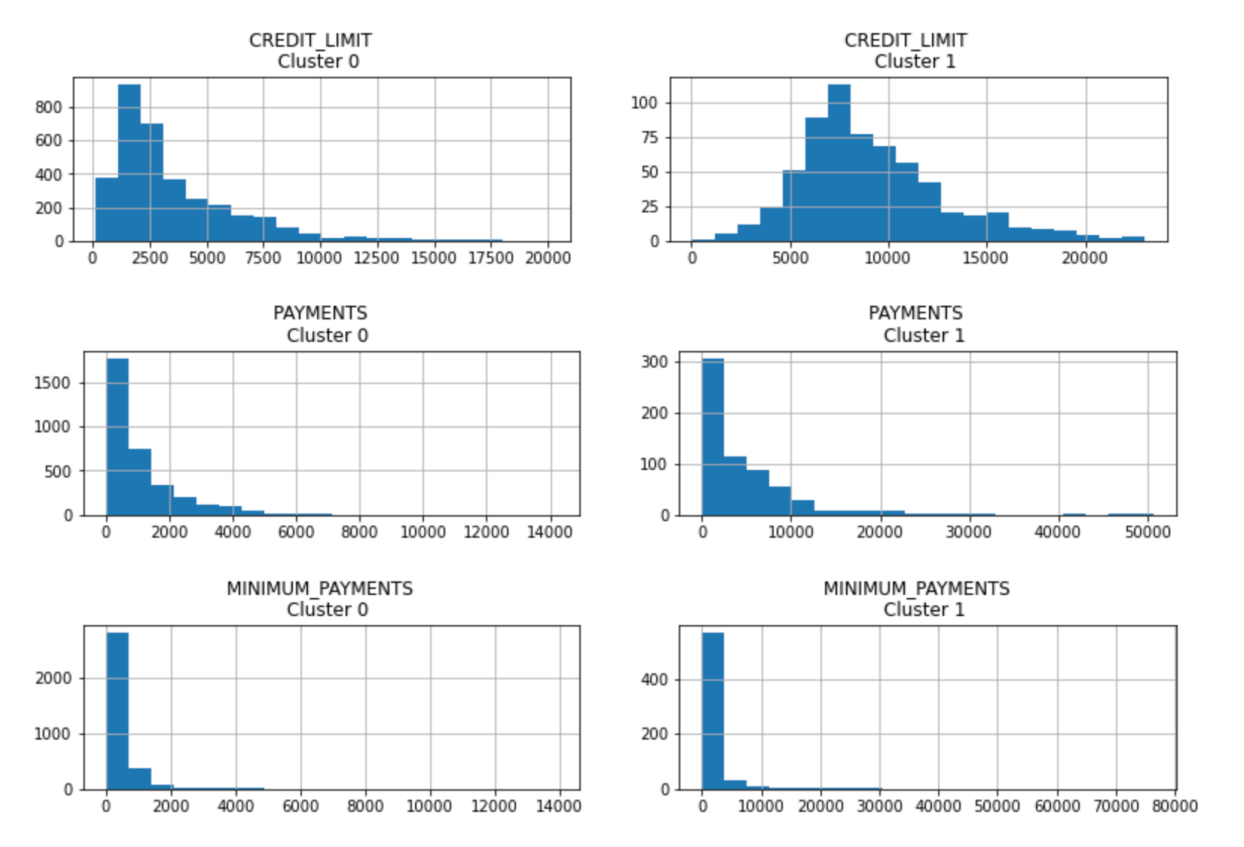
Cluster 0: the majority, around 3300 users

Cluster 1: around 700 users



5. Kmean


BALANCE
Cluster 0
BALANCE
Cluster 1
PURCHASES
Cluster 0
PURCHASES
Cluster 1
CASH_ADVANCE
Cluster 0
CASH_ADVANCE
Cluster 1


CREDIT_LIMIT
Cluster 0
CREDIT_LIMIT
Cluster 1
PAYMENTS
Cluster 0
PAYMENTS
Cluster 1
MINIMUM_PAYMENTS
Cluster 0
MINIMUM_PAYMENTS
Cluster 1

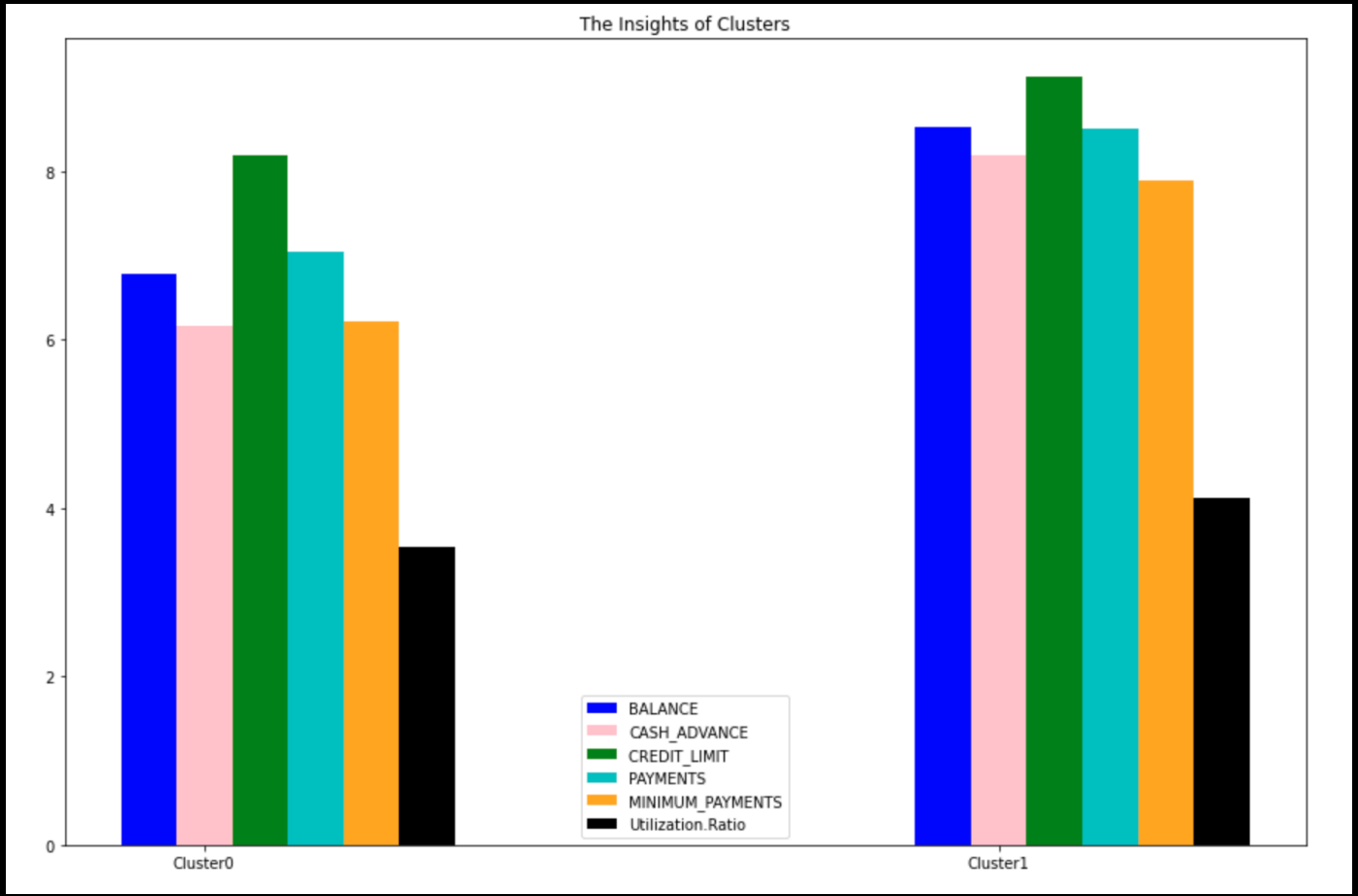
5. Kmean

The maximun and minimum amount of each feature are shown by following table:

Tables	Cluster 0	Cluster 1
Balance	0 - $4,5000	0 - $16,000
Purchase	0 - $6,000	0 - $27,000
Cash Advance	0 - $4,500	0 - $27,000
Credit limit	0 - $17,500	0 - $23,000
Payment	0 - $8,000	0 - $50,000
Minimim payment	0 - $5,000	0 - $30,000
Utilization	0 - 120	0 - 200

The cluster1’s amount > cluster0’s amount

The logarit mean values of features



- Cluster 1: high utilization ratio, high Cash_Advance, high balance.

-> low credit card score

- Cluster 0: lower balance, high credit limit and lower utilizaton rate.

-> Higher credit card score

6. Conclusion

- **Cluster 0-Financially Smart:**

Customers of this segment love to keep their finances in order and dislike having huge debt -> giving rewards point will make them make more payment.

- **Cluster 1-Financially Stressed:**

Customers in this segment carry heavy credit card debt. They often withdraw high amount of cash and make low minimum payment which results in higher debt.
-> target them make more payment or providing less interest rate on purchase transaction.

Thank You For Paying Attension ;)

"Credit cards aren't banking – they're information"

– Richard Fairbank, Founder of Capital One