



# MILESTONE 1

# PYTHON

Ivan Sudibyo

# BUSINESS OBJECTIONS

- The writer have trusted to handle the user segmentation for the upcoming govt bond feature. Then the writer should be understanding the data and coming up with clean, useful data for segmentation.
- The writer should do analysis and give insight to business team

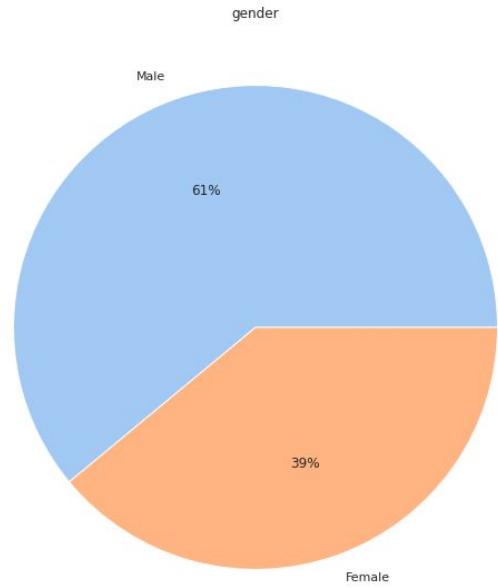


# LINK SCRIPT

- [link colab](#)



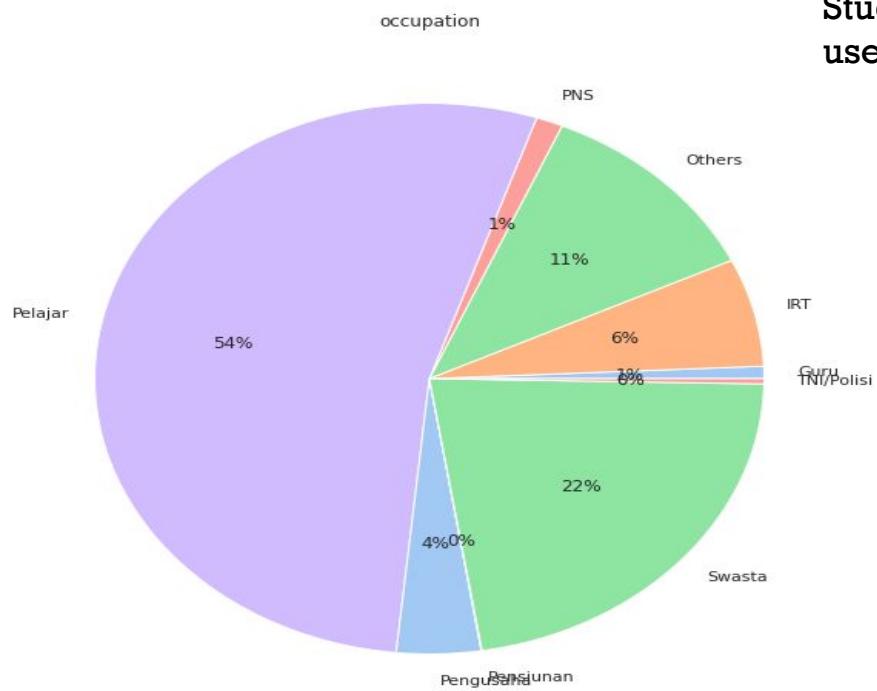
# USER'S PROFILING



Male is dominant in proportions users



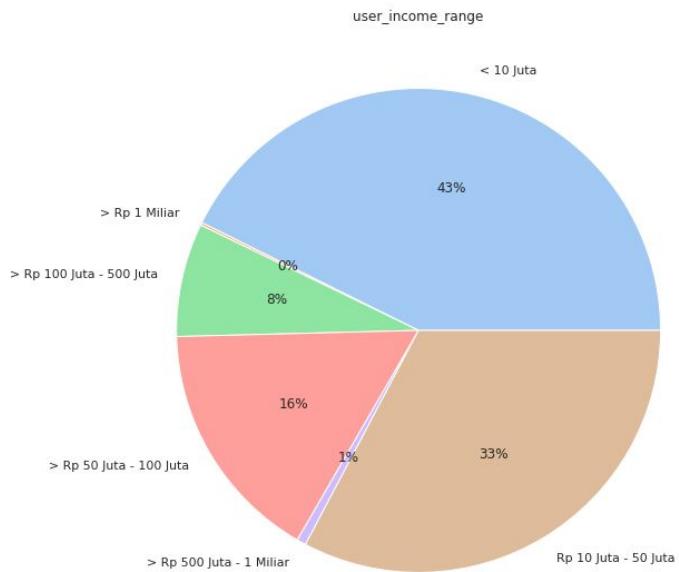
# USER'S PROFILING



Students & swasta has dominant in proportions of users



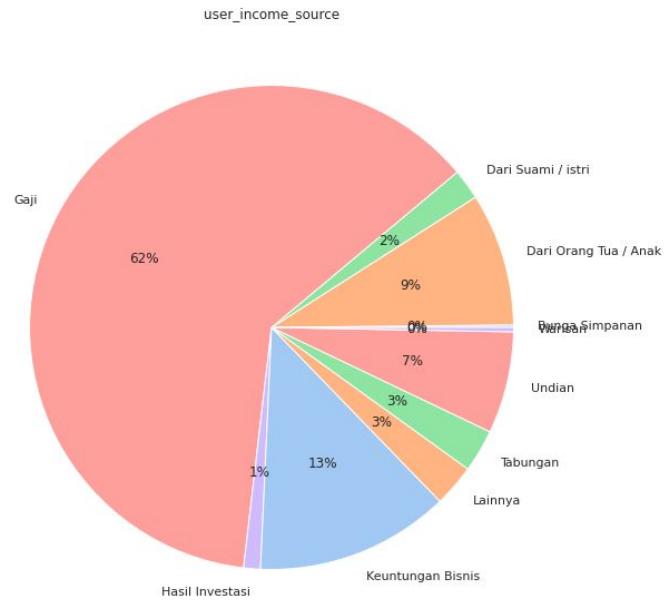
# USER'S PROFILING



<10 juta, 10-50 jt, >50-100 jt, >100-500 jt has dominant in user's proportions



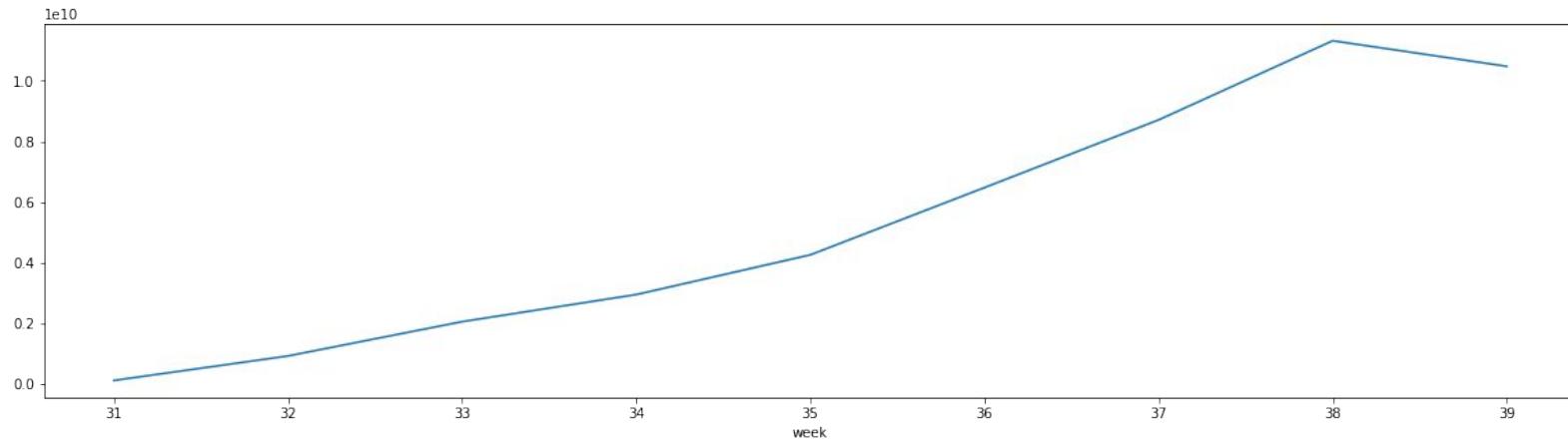
# USER'S PROFILING



Gaji, keuntungan bisnis, dari orang tua/wali, undian has dominant in user's proportions



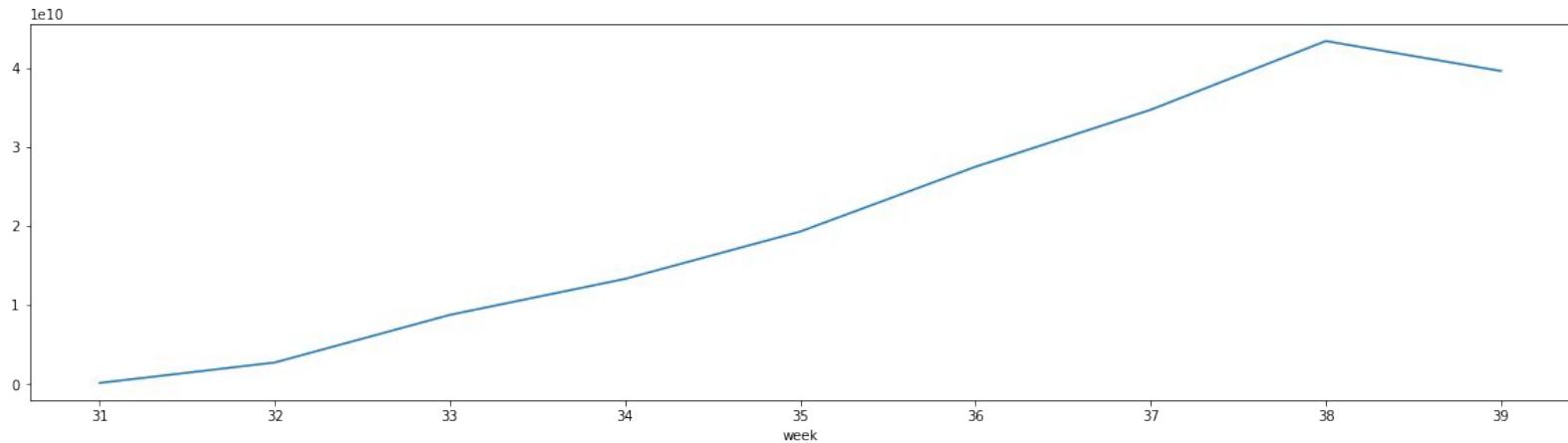
## GROUPBY 'WEEK' - 'SAHAM\_TRANSACTION AMOUNT'



the 'saham transaction amount' trend line is increasing, though in the last week has decreased slightly



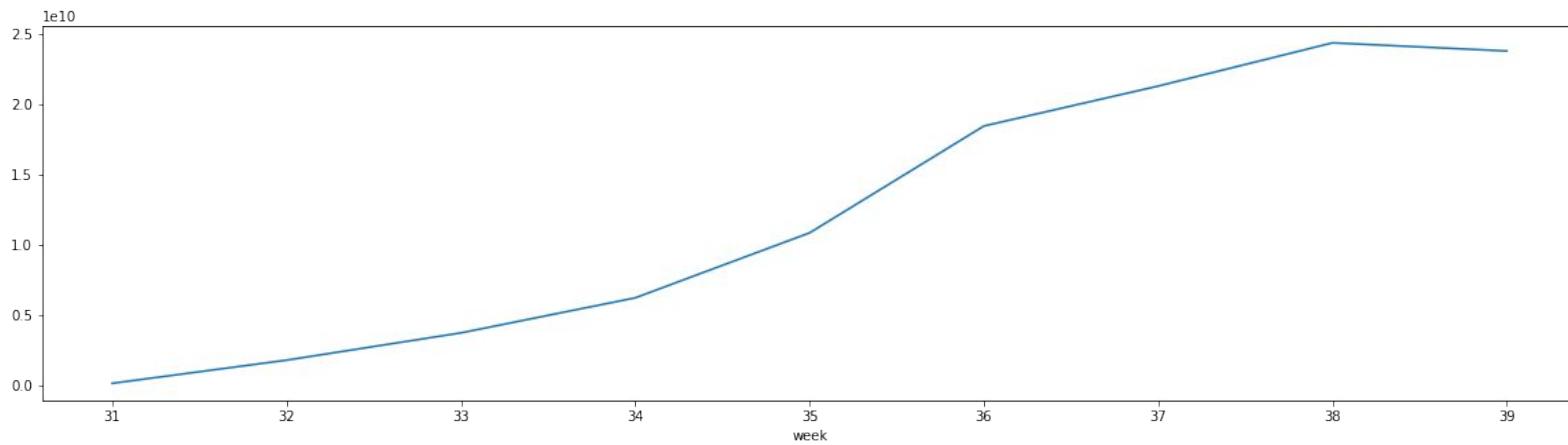
GROUPBY 'WEEK' - 'PENDAPATAN\_TETAP\_TRANSACTION AMOUNT'



the 'Pendapatan Tetap transaction amount' trend line is increasing, though in the last week has decreased slightly



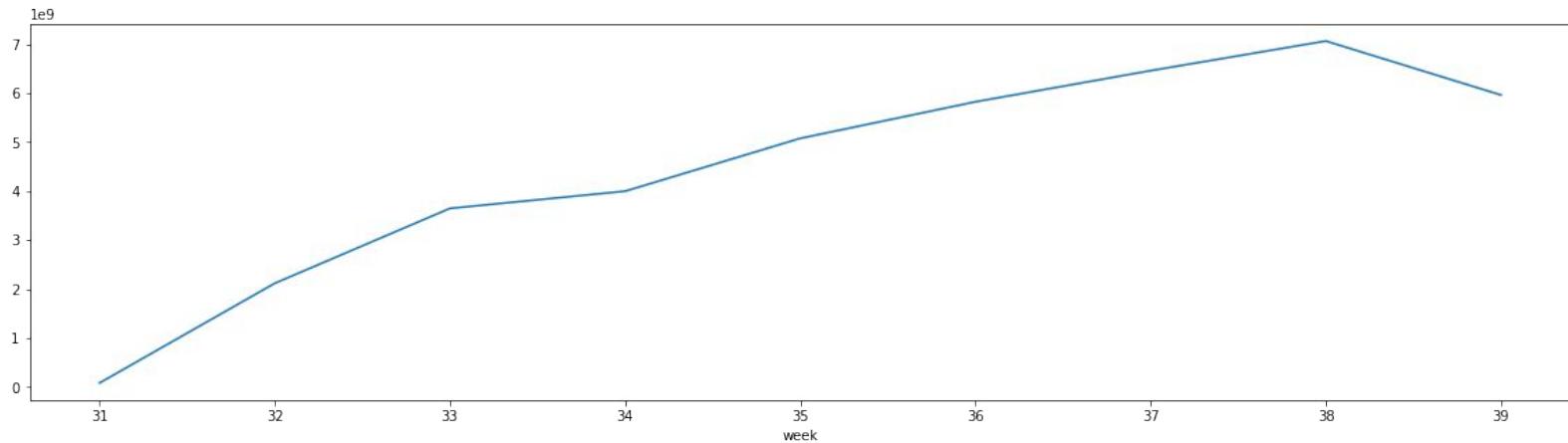
GROUPBY 'WEEK' - 'PASAR\_UANG\_TRANSACTION AMOUNT'



the 'Pasar Uang transaction amount' trend line is increasing, then decline  
increasing though in last week very slightly decreased



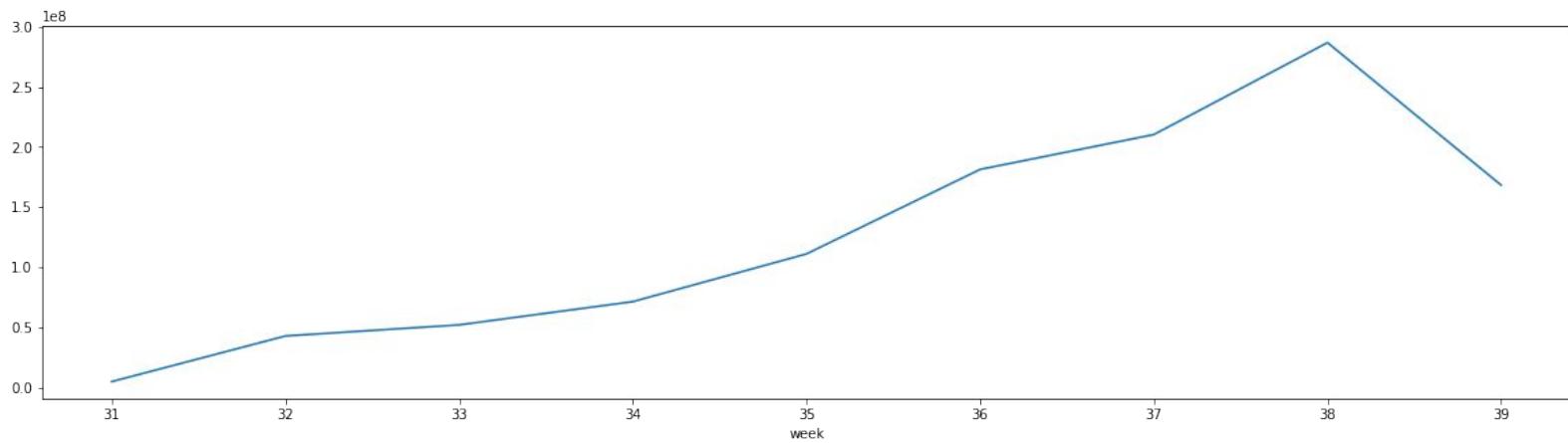
## GROUPBY 'WEEK' - 'CAMPURAN\_TRANSACTION AMOUNT'



the 'Campuran transaction amount' trend line is increasing, though in the last week has decreased.



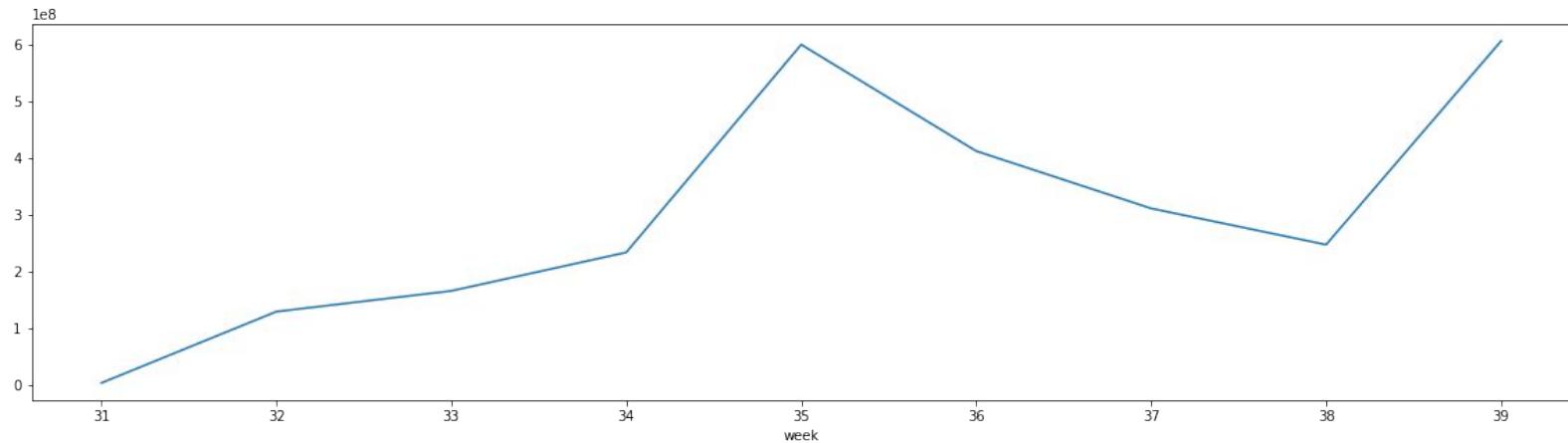
GROUPBY 'WEEK' - 'SAHAM\_TRANSACTION\_AMOUNT'



the 'saham transaction amount' trend line is increasing, though in the last week has decreased .



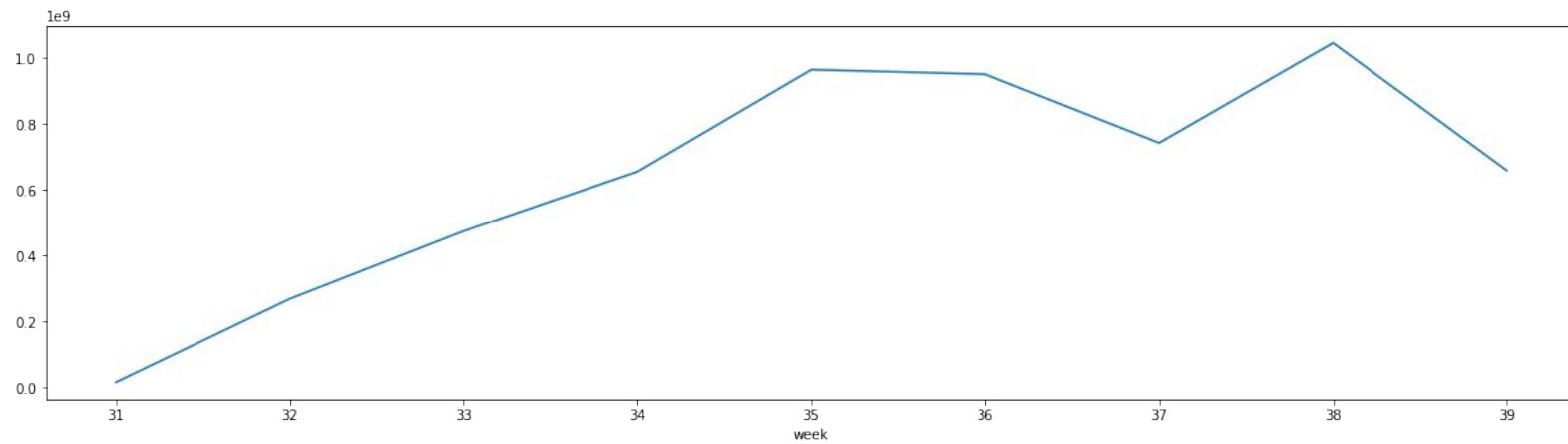
GROUPBY 'WEEK' - 'PASAR\_UANG\_TRANSACTION\_AMOUNT'



the 'Pasar Uang transaction amount' trend line is increasing, though in the week 35 to 38 has decreased then in week 38 to 39 has increased again.



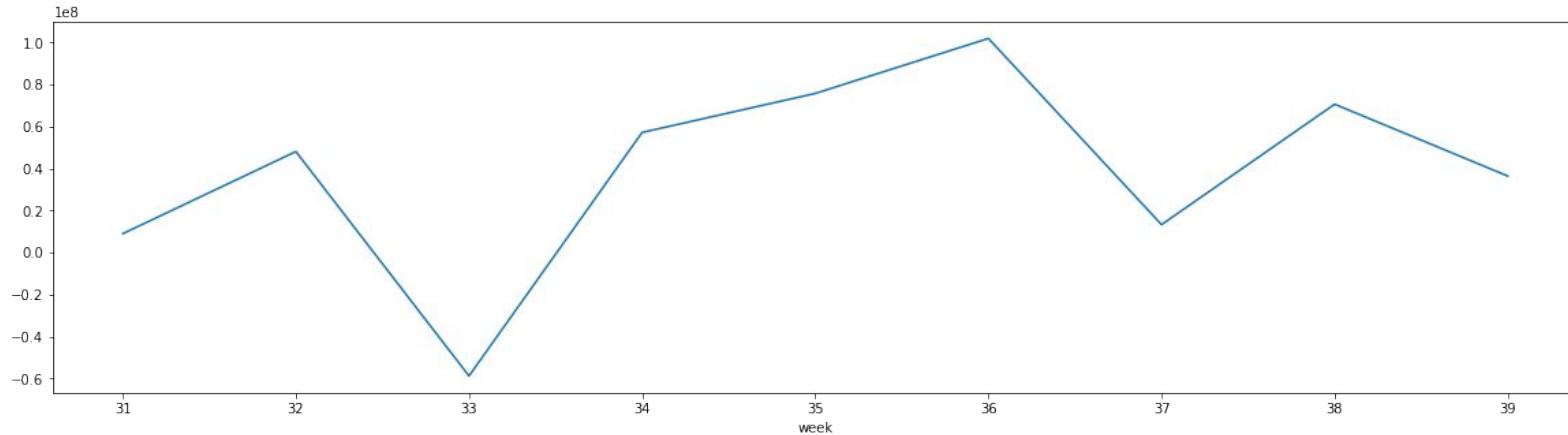
GROUPBY 'WEEK' - 'PENDAPATAN\_TETAP\_TRANSACTION\_AMOUNT'



the 'Pendapatan Tetap transaction amount' trend line is increasing, though in the week 35 to 37 has decreased then in week 37 to 38 has increased but in week 38 to 39 has decreased.



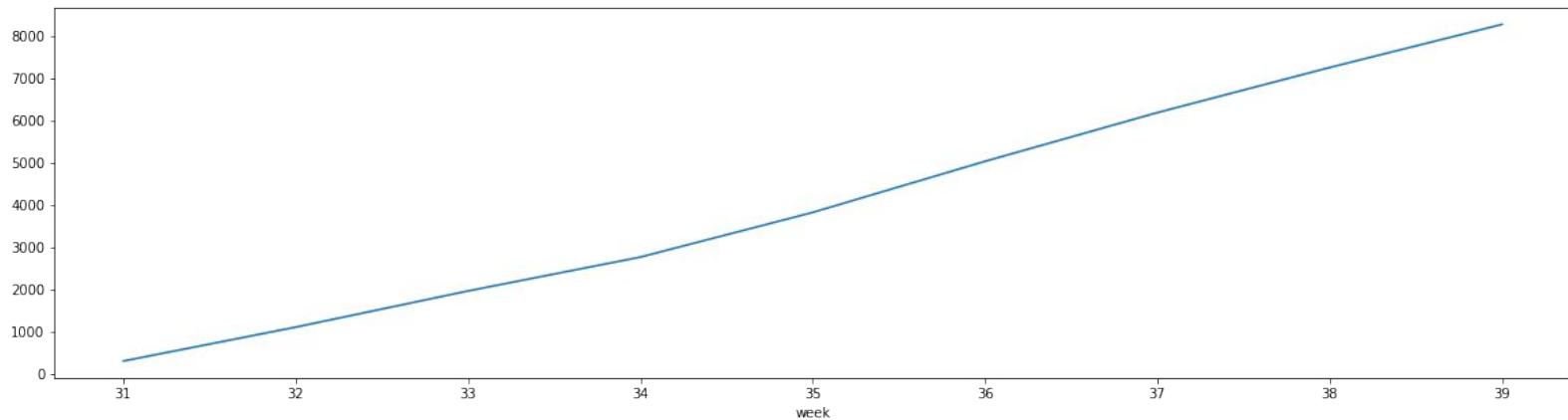
GROUPBY 'WEEK' - 'CAMPURAN\_TRANSACTION\_AMOUNT'



the 'Campuran transaction amount' trend line is increasing, though in the week 32 to 33 has decreased then in the week 33 to 36 has increased but then decrease in the week 36 to 37 then in the week 37 to 38 has increased but then decreasing in the week 38 to 39.



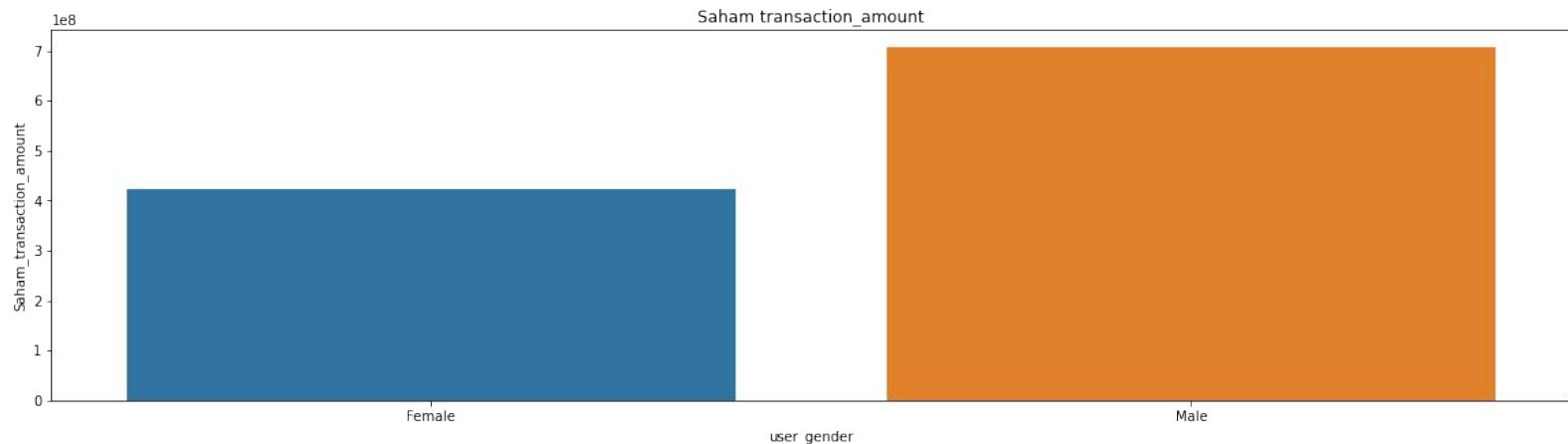
GROUPBY 'WEEK' - 'USER\_ID'



the 'user id' trend line is increasing all time.



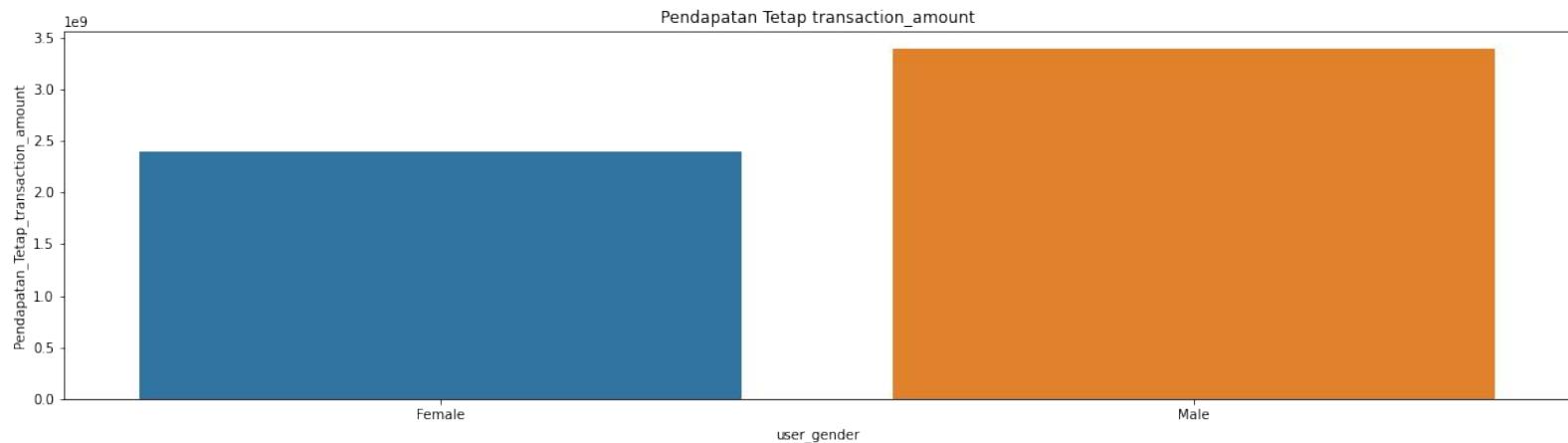
# BY GENDER



Male is dominant in Saham transaction amount proportions.



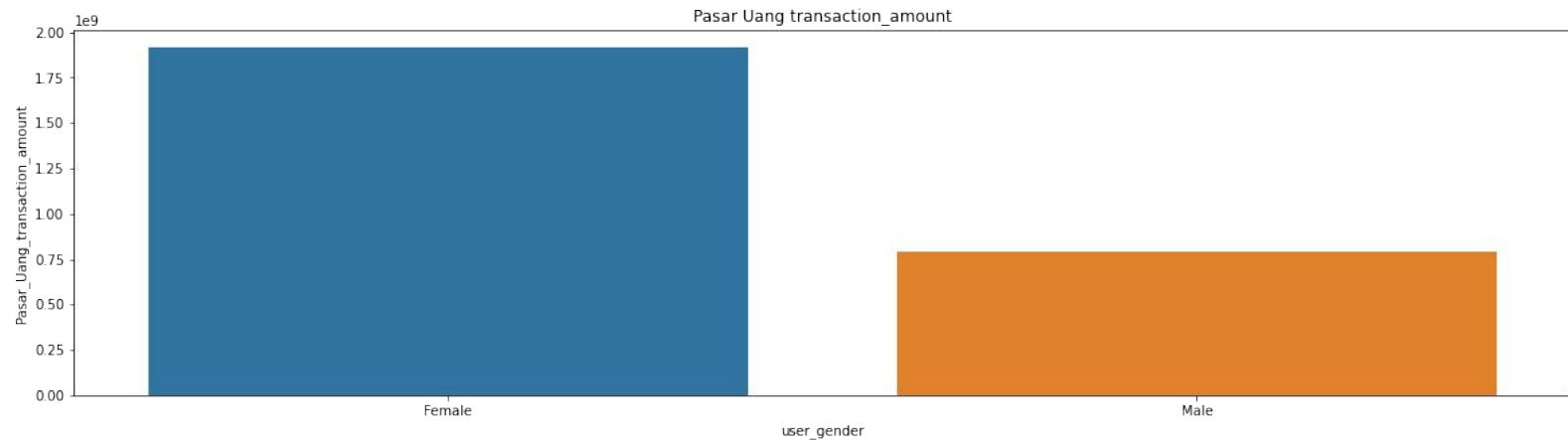
# BY GENDER



Male has dominant in Pendapatan Tetap transaction amount proportions.



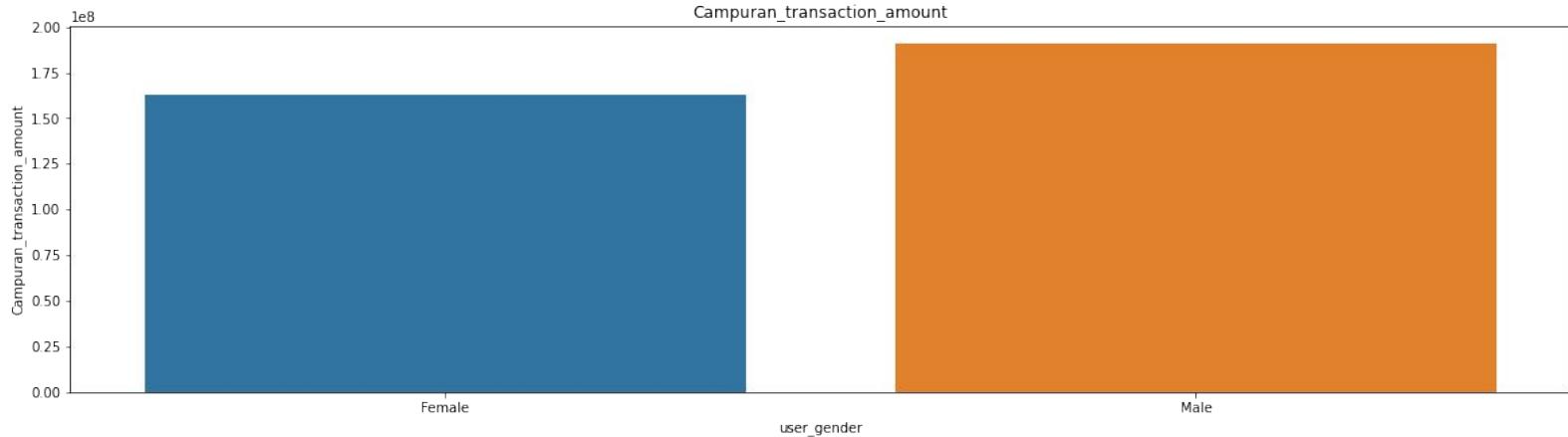
# BY GENDER



Female is dominant in Pasar Uang transaction amount proportions.



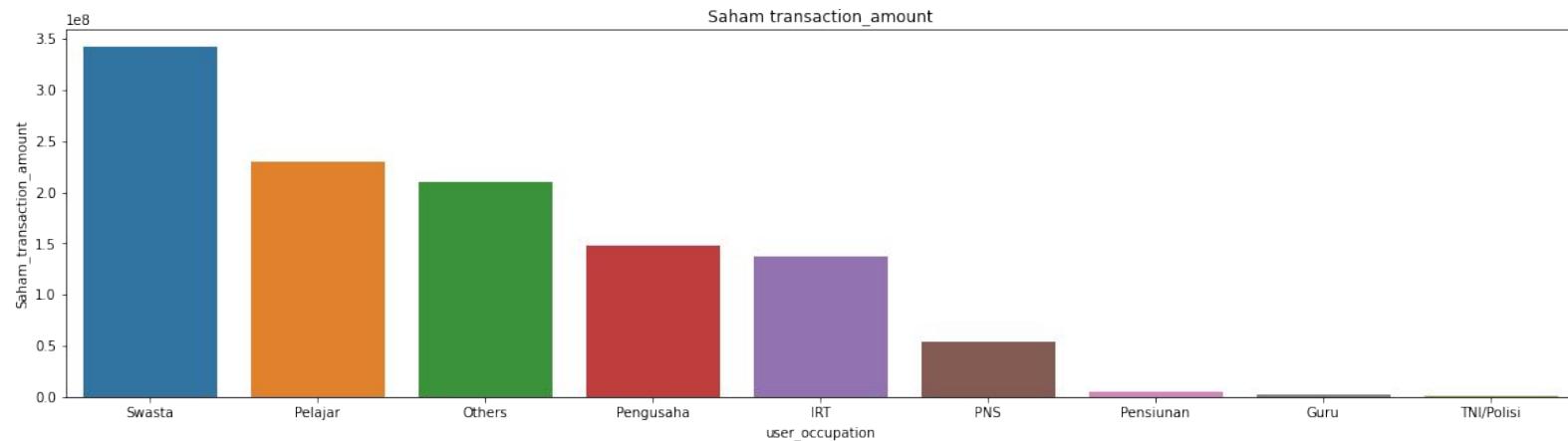
# BY GENDER



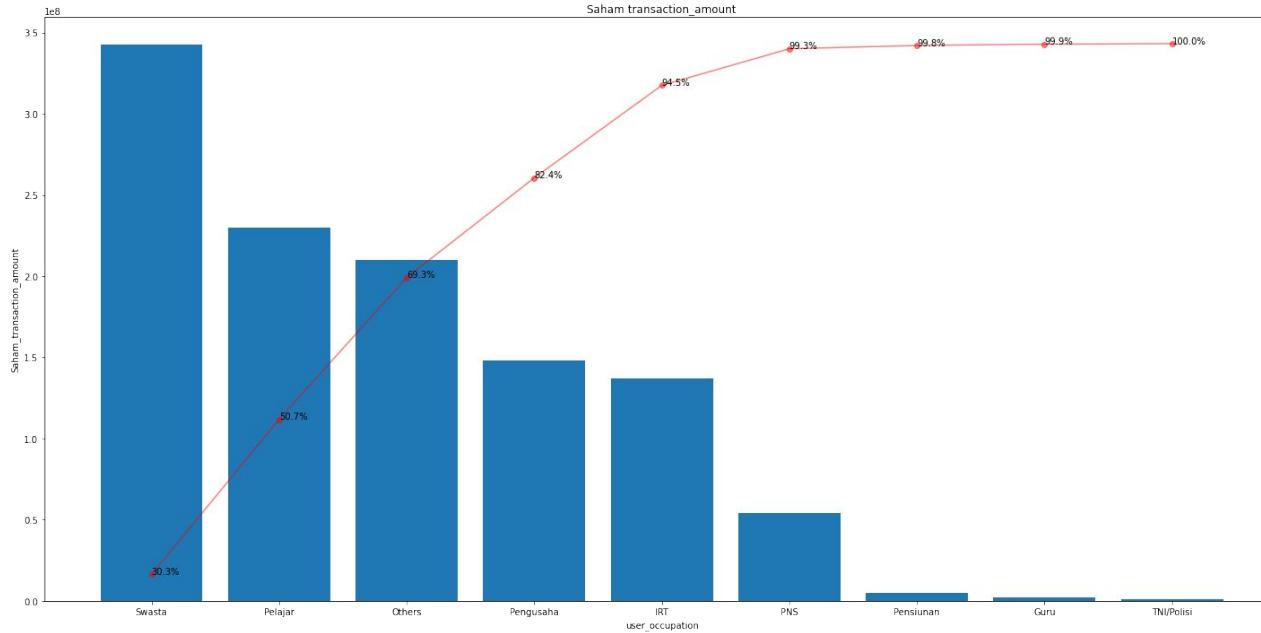
Male is dominant in Campuran transaction amount proportions.



# BY OCCUPATION



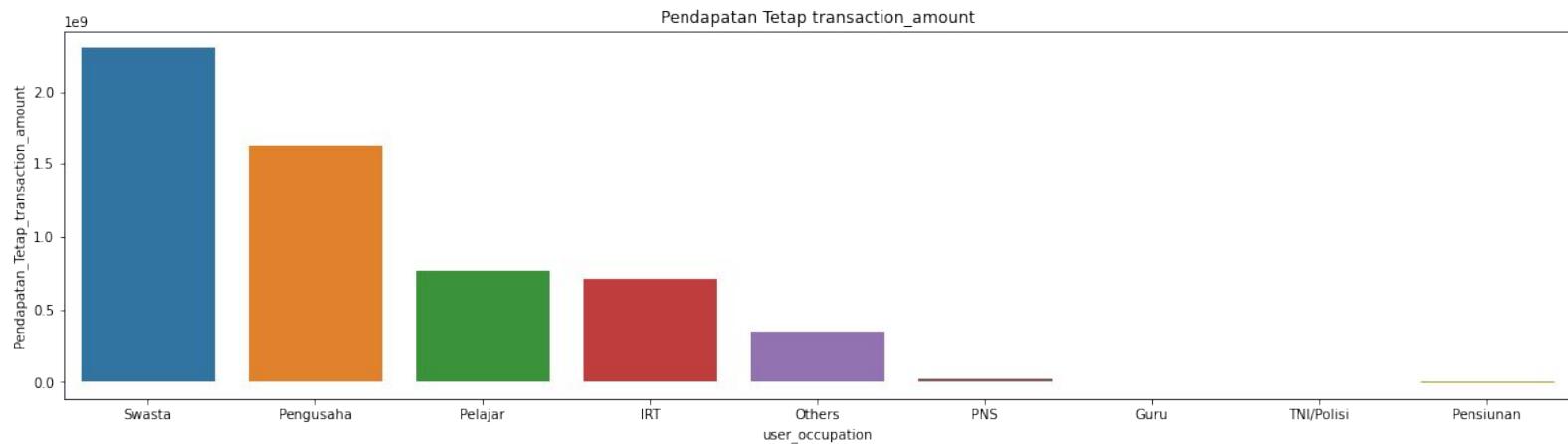
# BY OCCUPATION



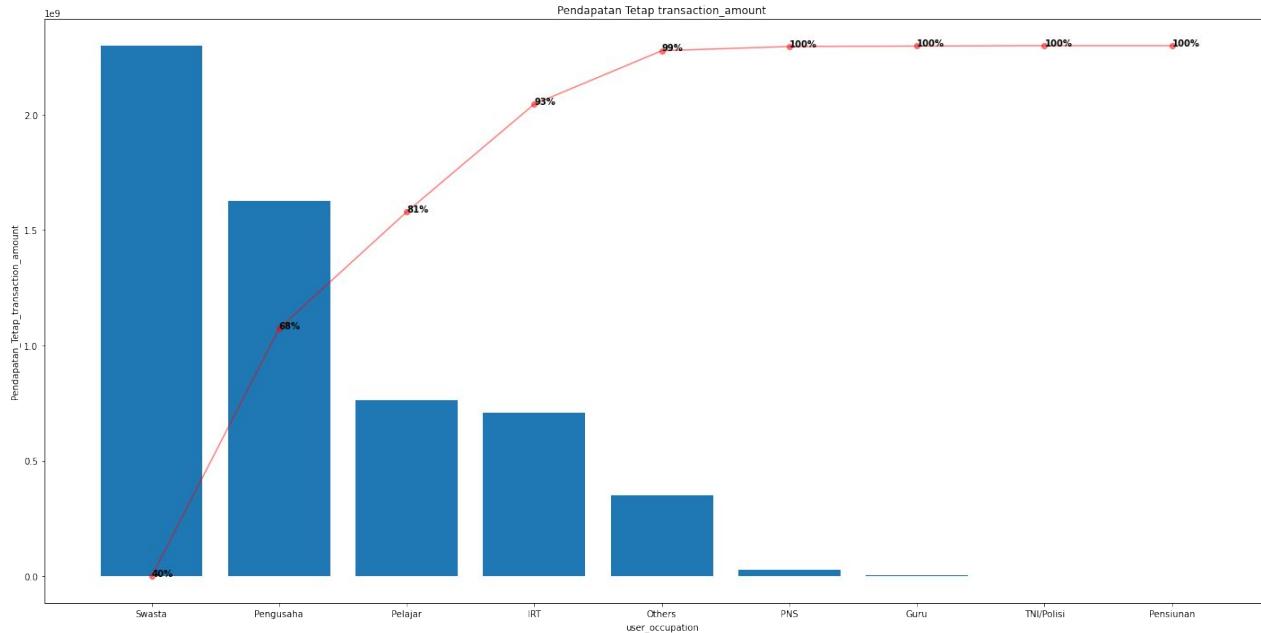
Swasta, Students, others and Pengusaha make 82.4% of Saham\_transaction amount proportions



# BY OCCUPATION



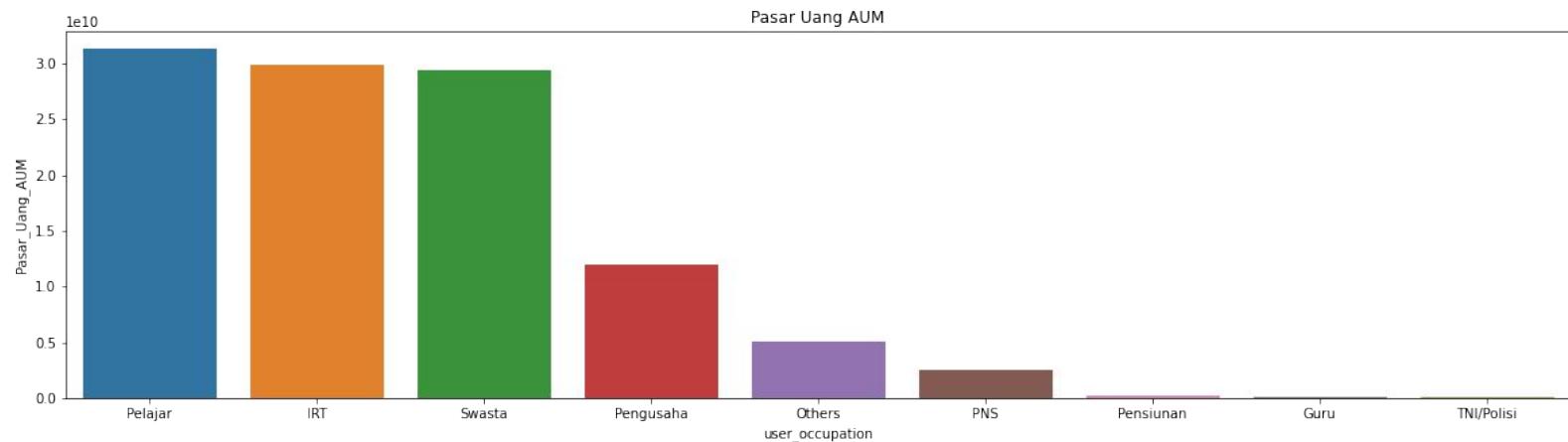
# BY OCCUPATION



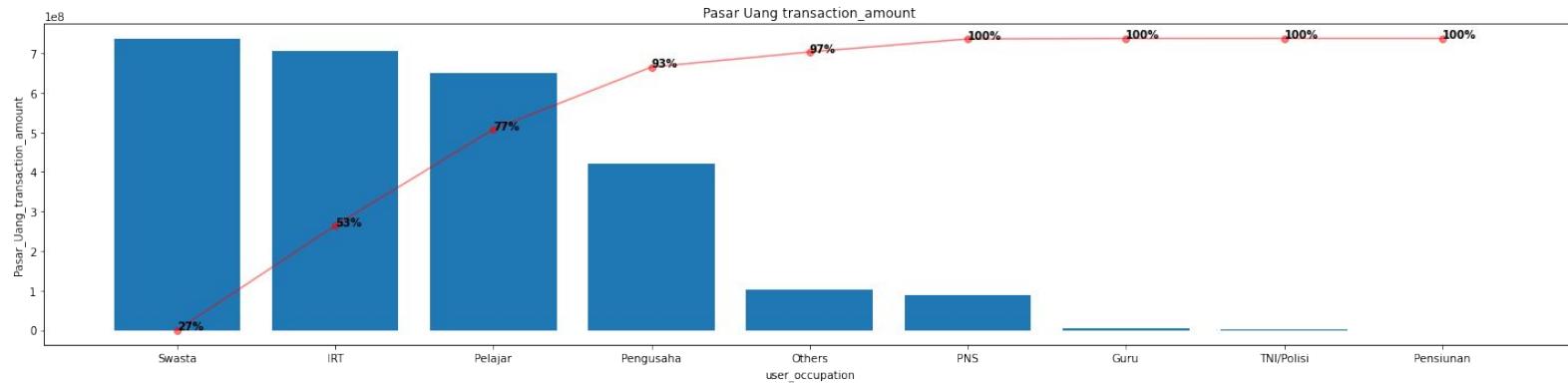
Swasta, Pengusaha, Students make 81% of Pendapatan Tetap transaction amount proportions



# BY OCCUPATION



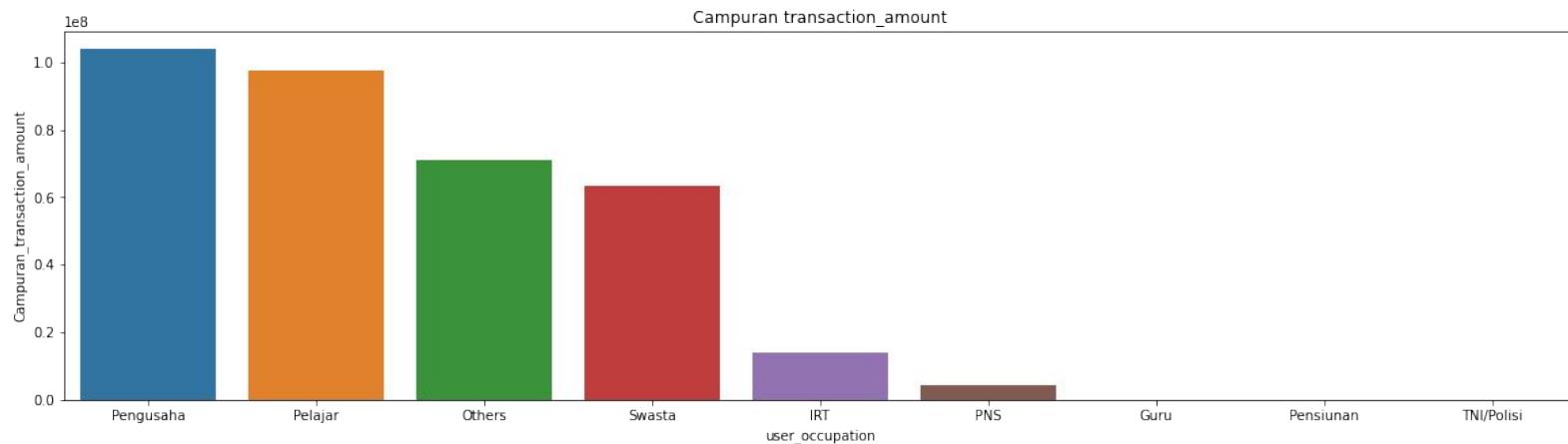
# BY OCCUPATION



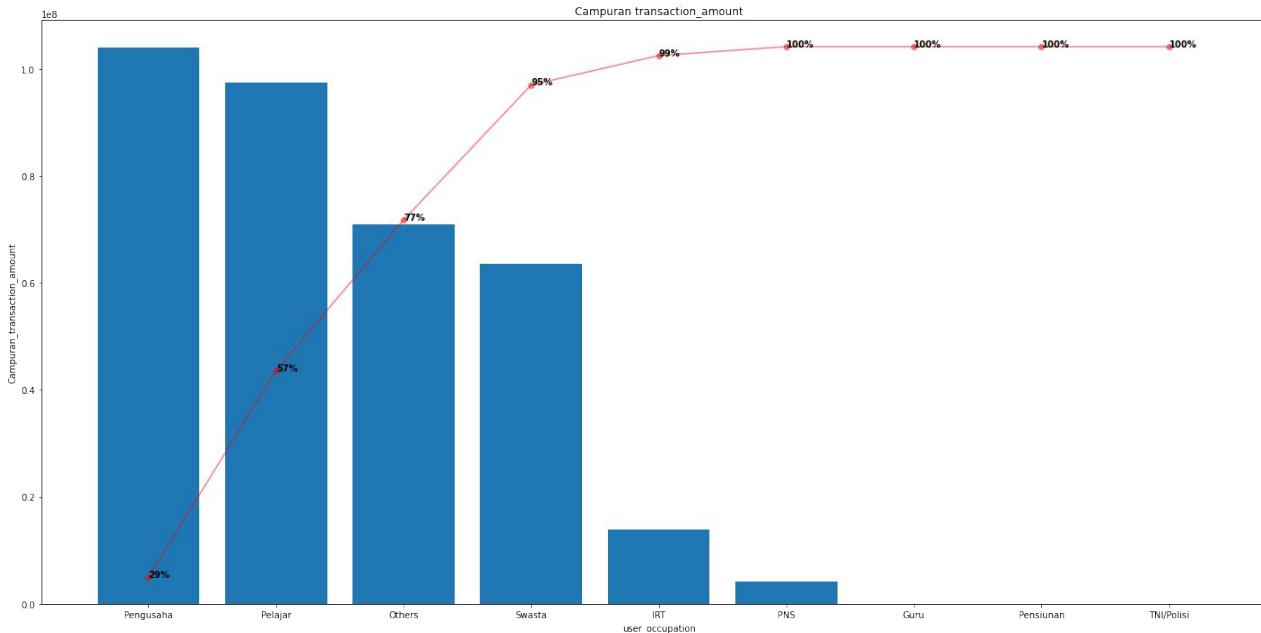
Swasta, IRT, Students, Pengusaha make 93% of Pasar Uang transaction amount proportions



# BY OCCUPATION



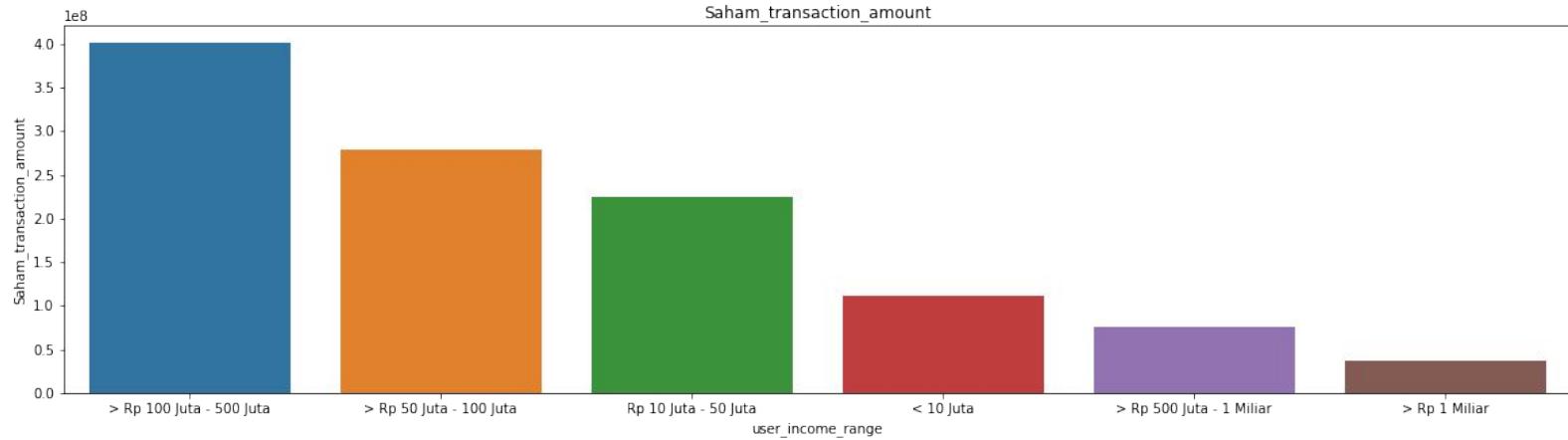
# BY OCCUPATION



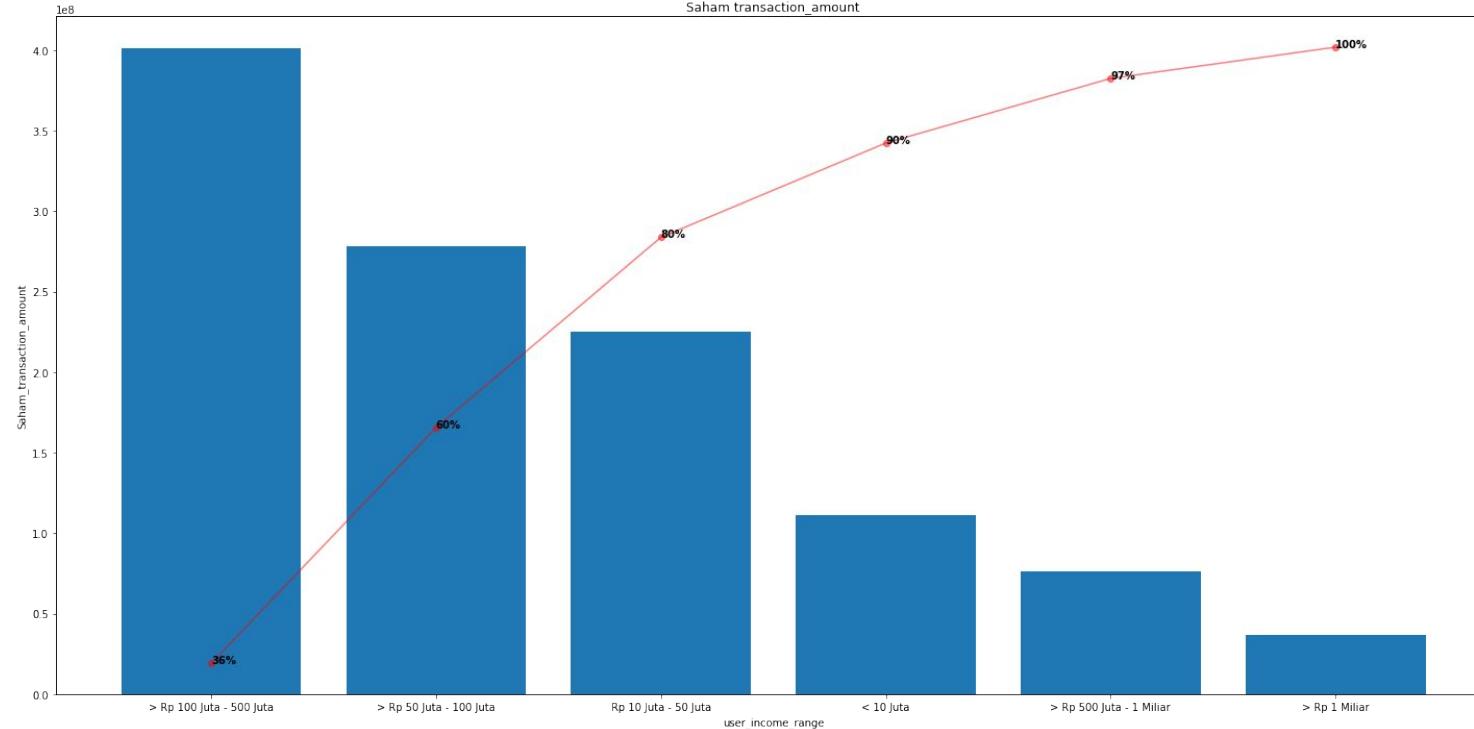
Pengusaha, Students, Others, Swasta make 95% of Campuran\_transaction amount proportions



# BY INCOME RANGE



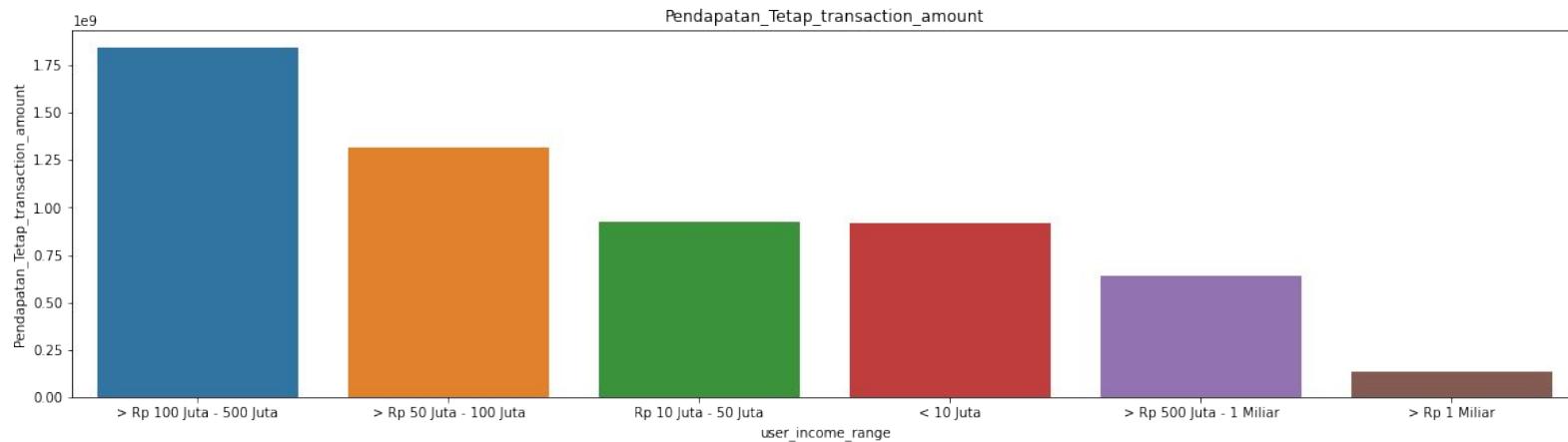
# BY INCOME RANGE



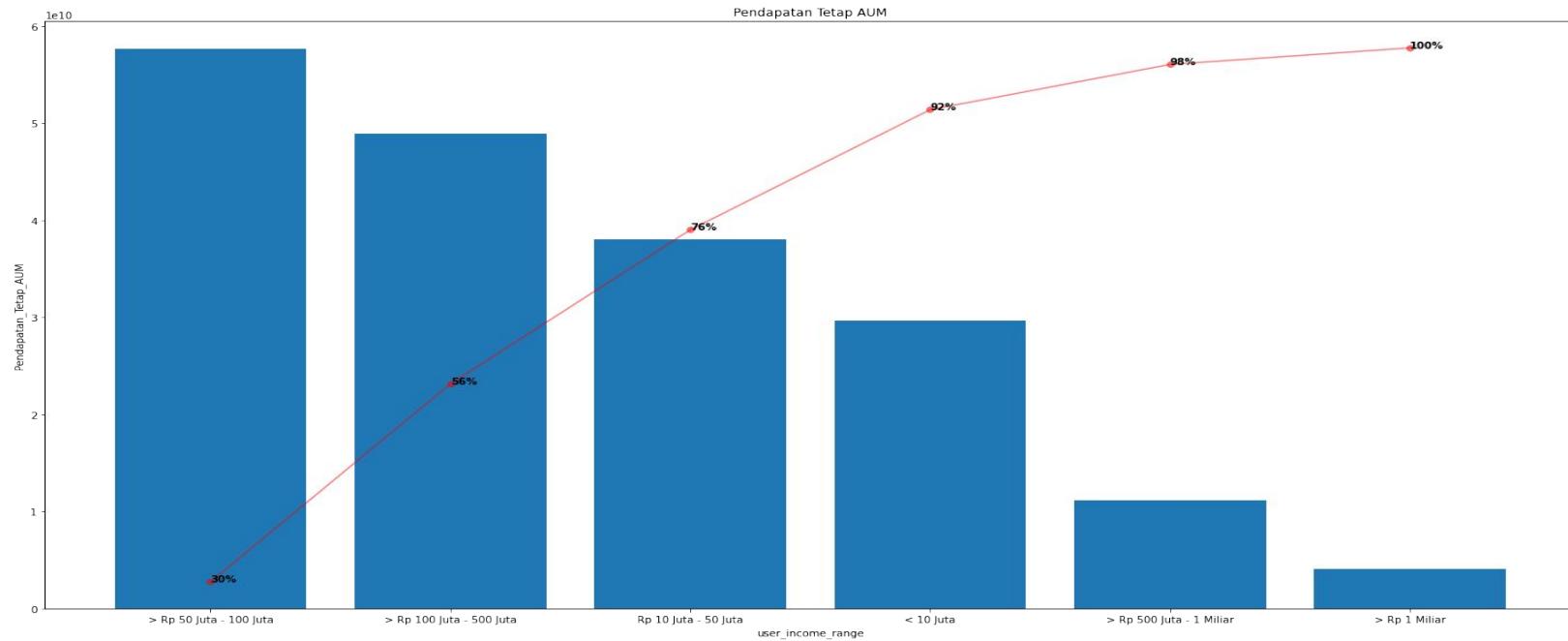
100-500 jt, 50-100jt, 10-50 jt make 80% of Saham\_transaction amount proportions



# BY INCOME RANGE



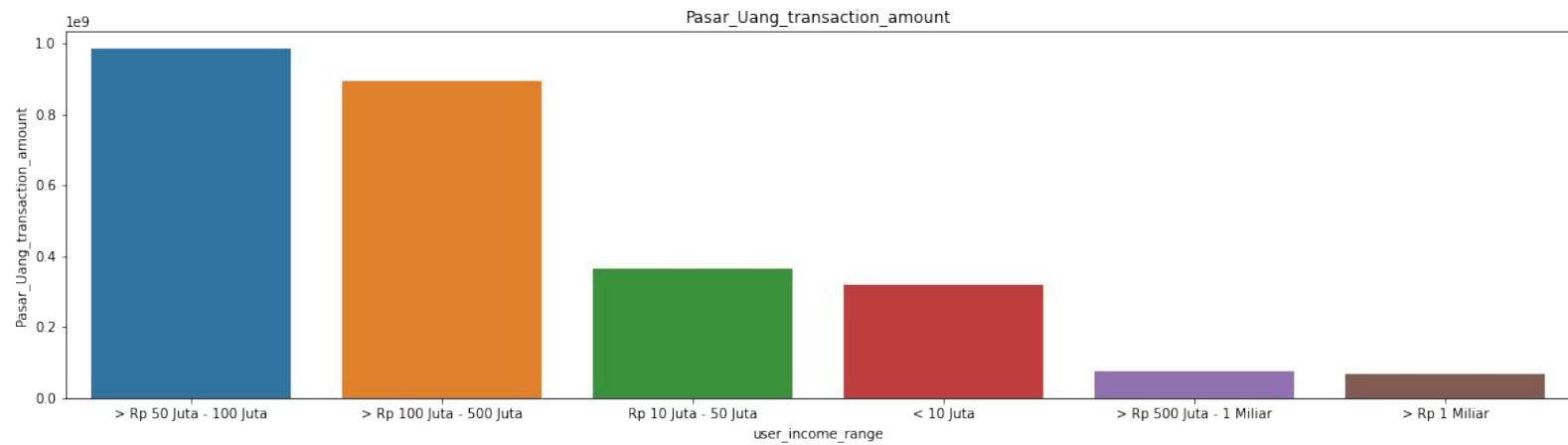
# BY INCOME RANGE



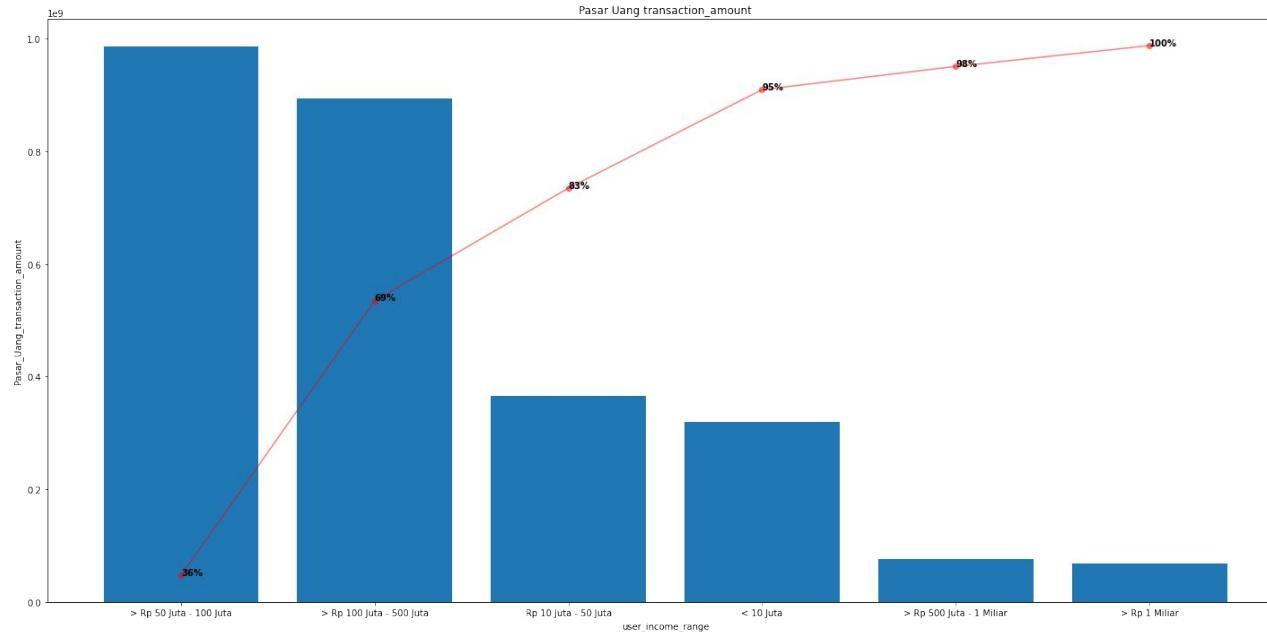
50-100jt, 100-500 jt, 10-50 jt,<10 jt make 92% of Pendapatan Tetap\_transaction amount proportions



# BY INCOME RANGE



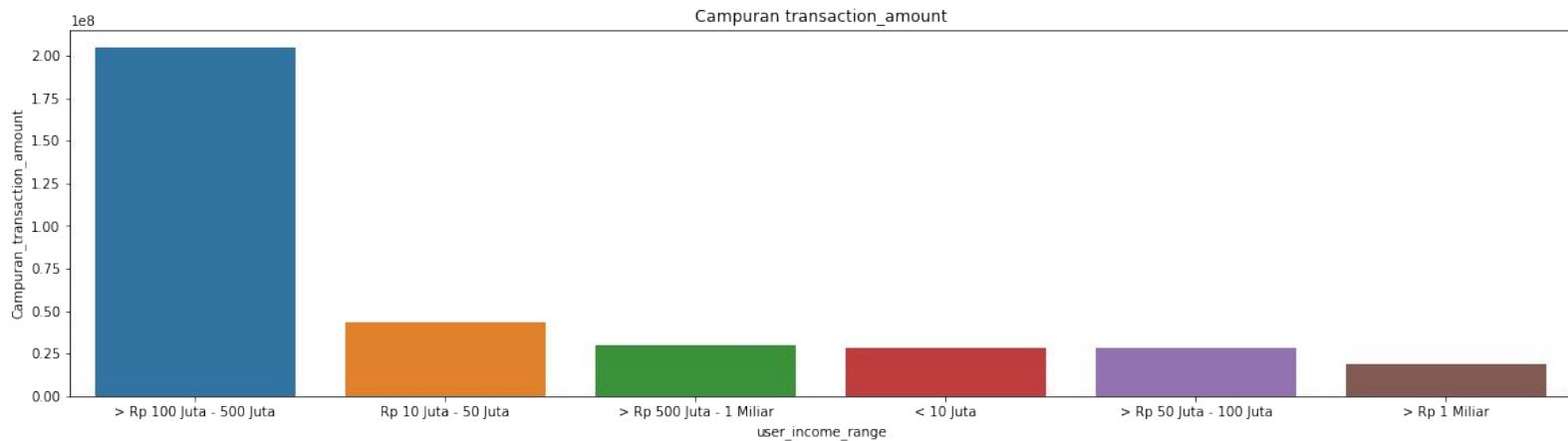
# BY INCOME RANGE



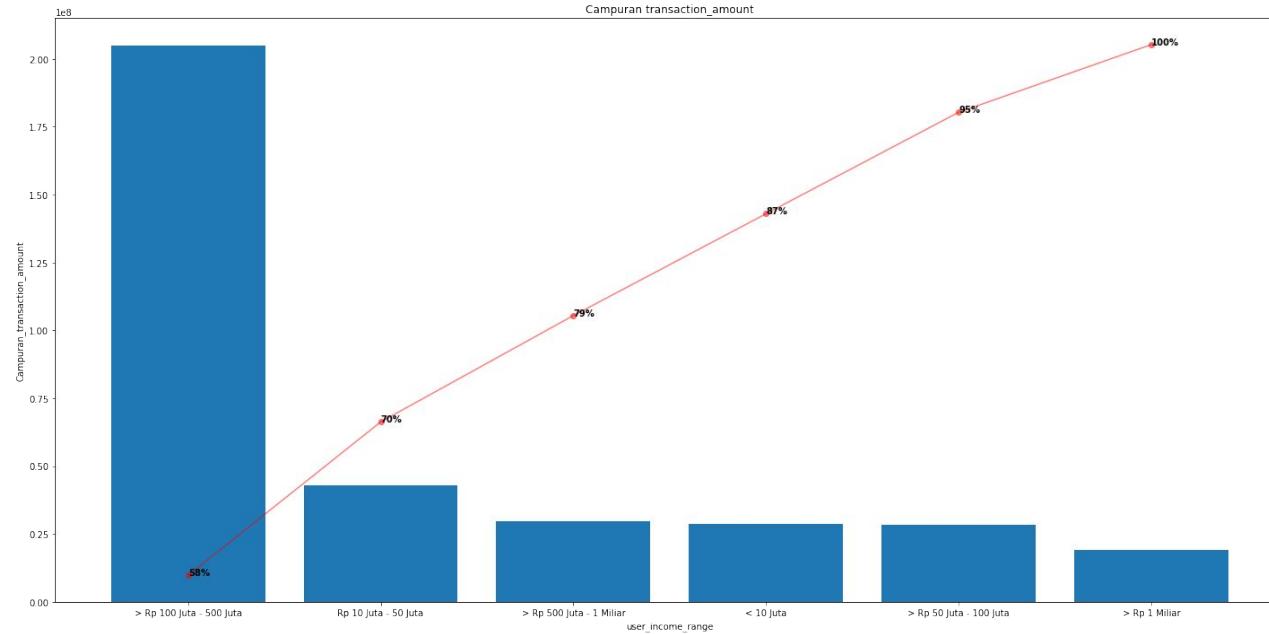
50-100jt, 100-500 jt,10-50 jt make 83% of Pasar Uang\_transaction amount proportions



# BY INCOME RANGE



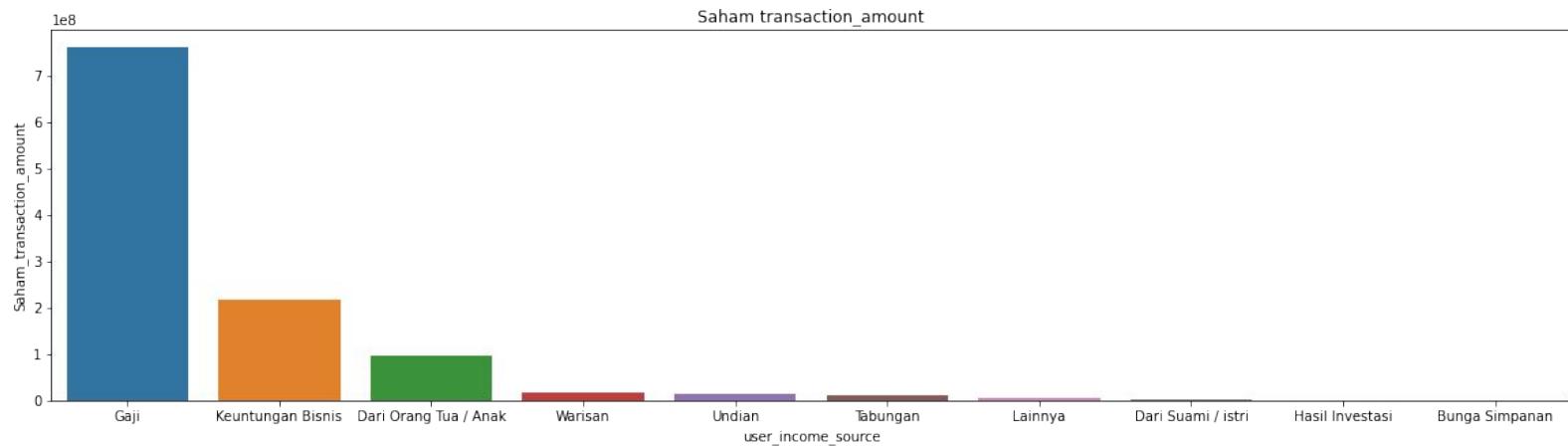
# BY INCOME RANGE



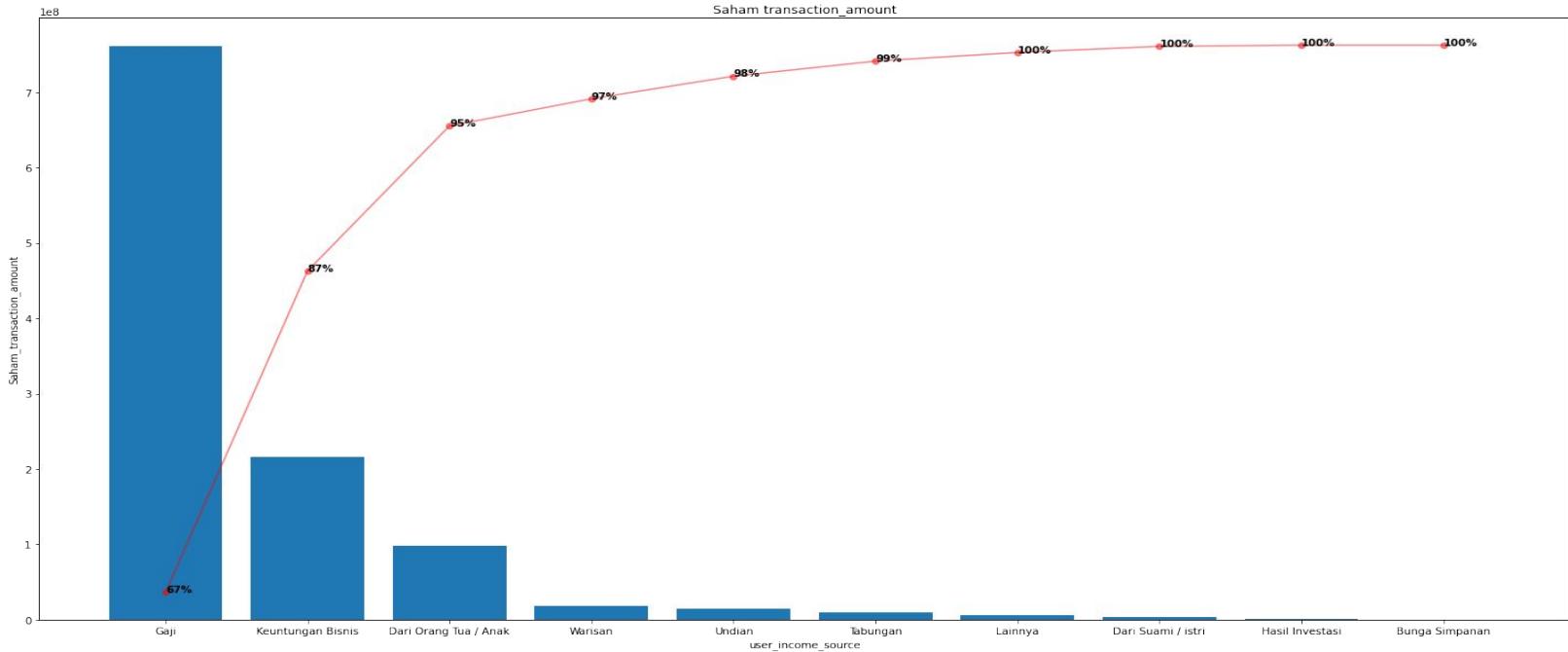
100-500 jt, 10-50 jt, 500jt-1 m,<10 jt make 87% of Campuran\_transaction amount proportions



# BY INCOME SOURCE



# BY INCOME SOURCE



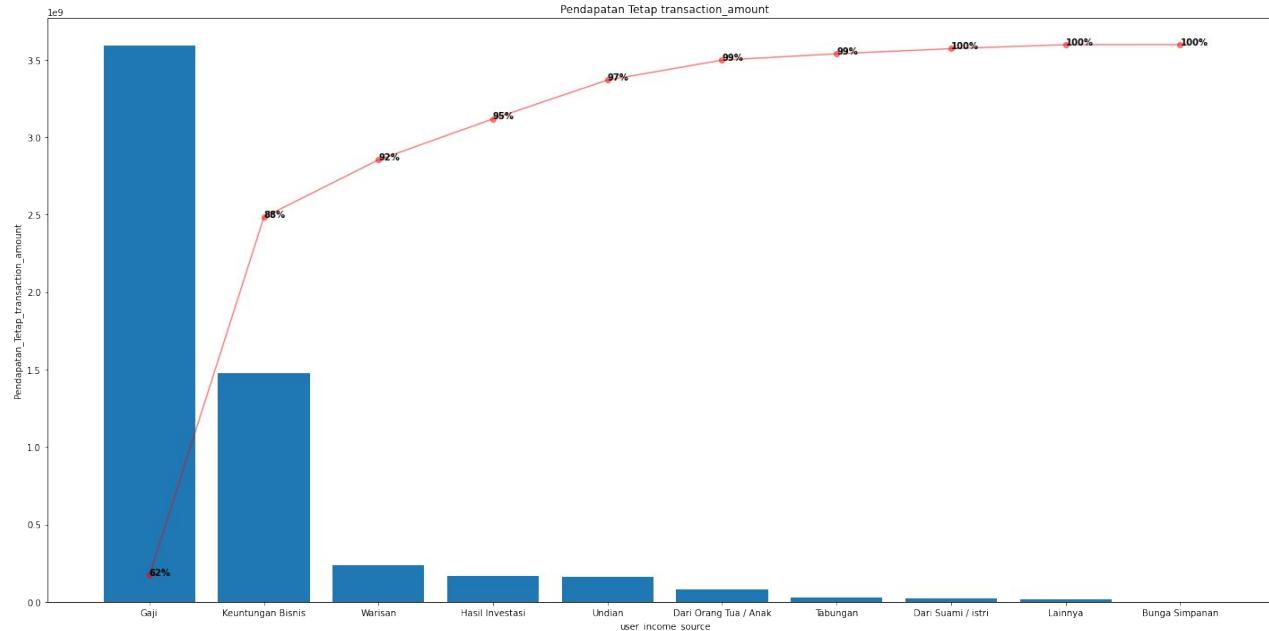
Gaji, Keuntungan bisnis make 87% of Saham\_transaction amount proportions



# BY INCOME SOURCE



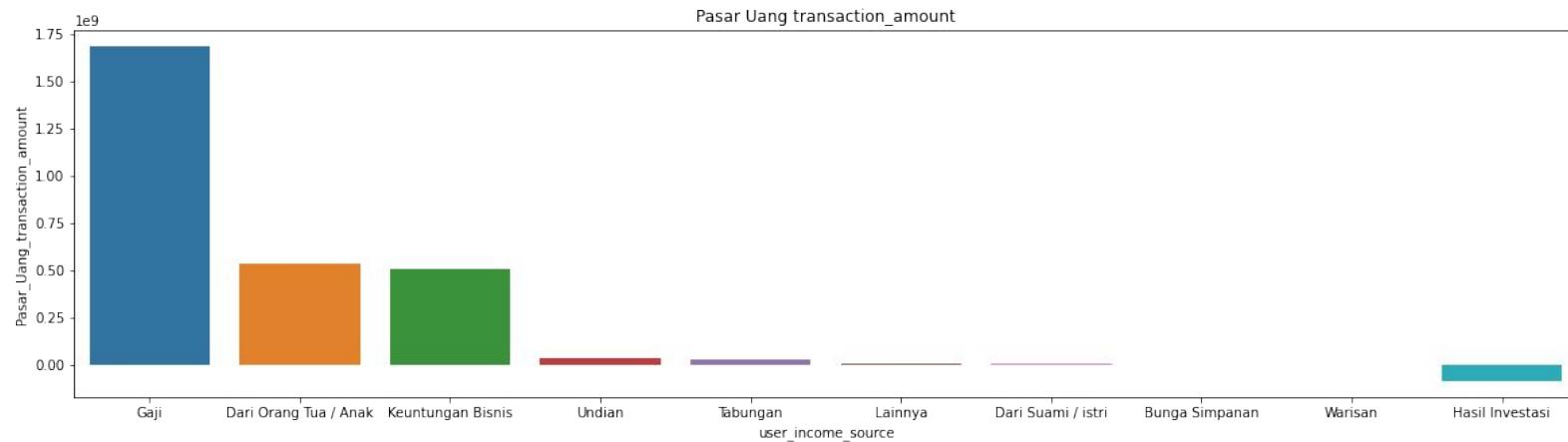
# BY INCOME SOURCE



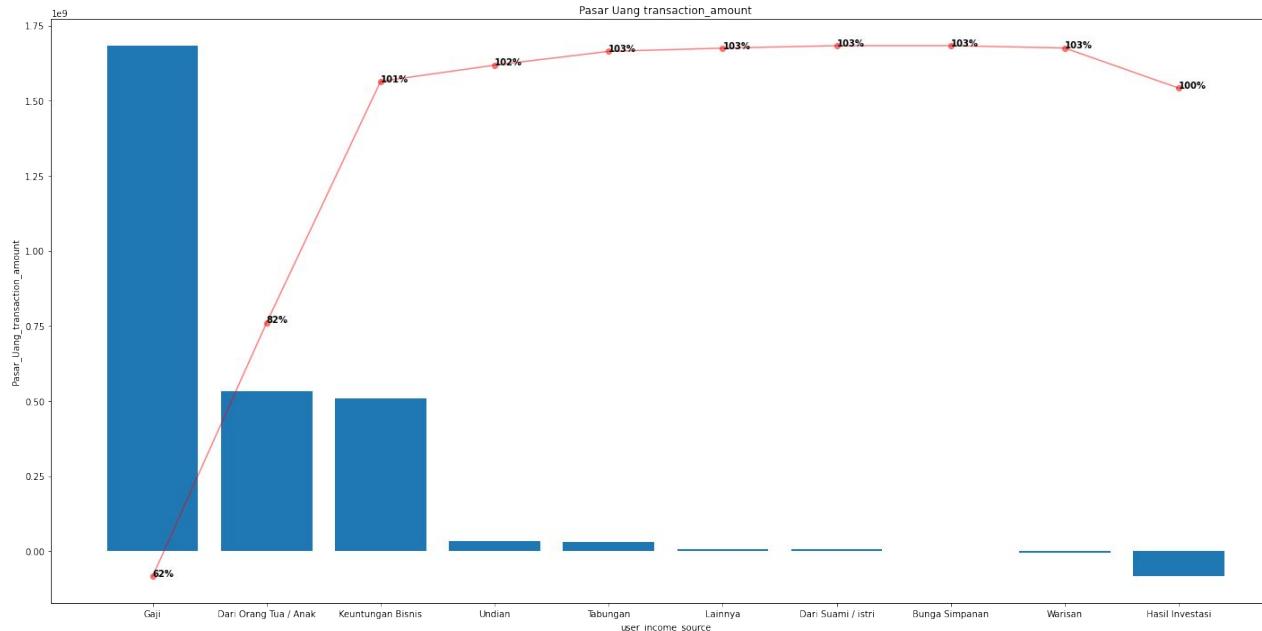
Gaji, Keuntungan bisnis make 80% of Pendapatan Tetap transaction amount proportions



# BY INCOME SOURCE



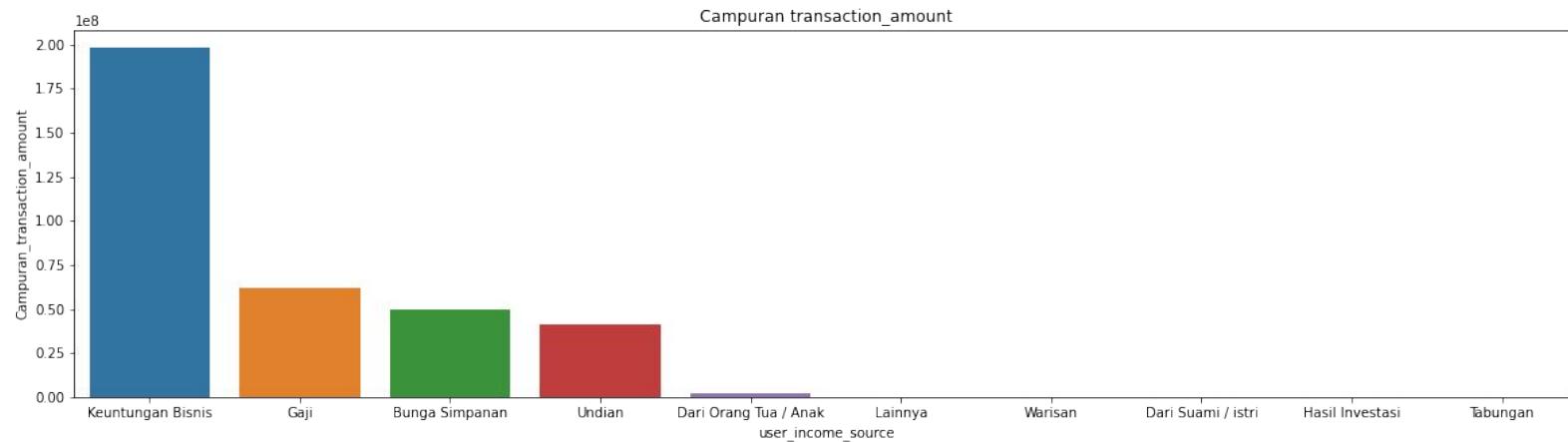
# BY INCOME SOURCE



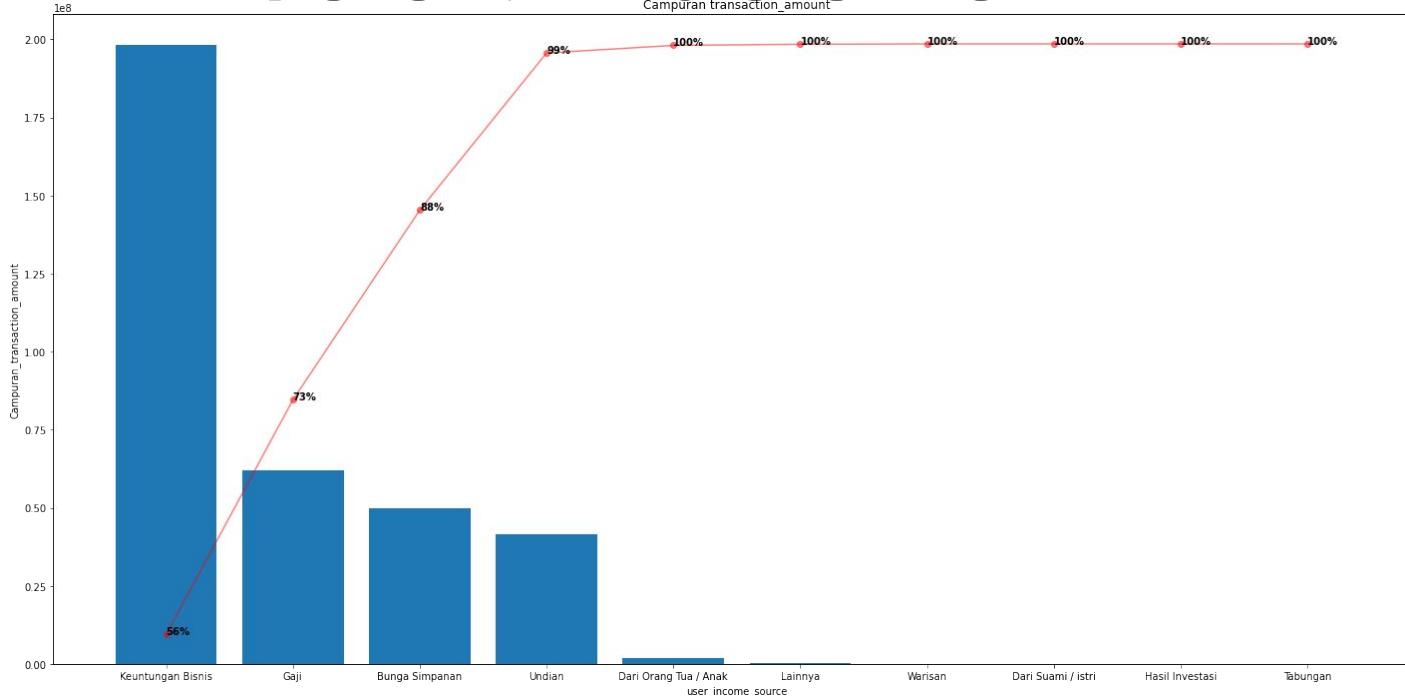
Gaji, dan dari orang tua/anak make 82% of Pasar Uang\_transaction amount proportions



# BY INCOME SOURCE



# BY INCOME SOURCE



Keuntungan bisnis, gaji bunga simpanan make 88% of Campuran transaction amount proportions



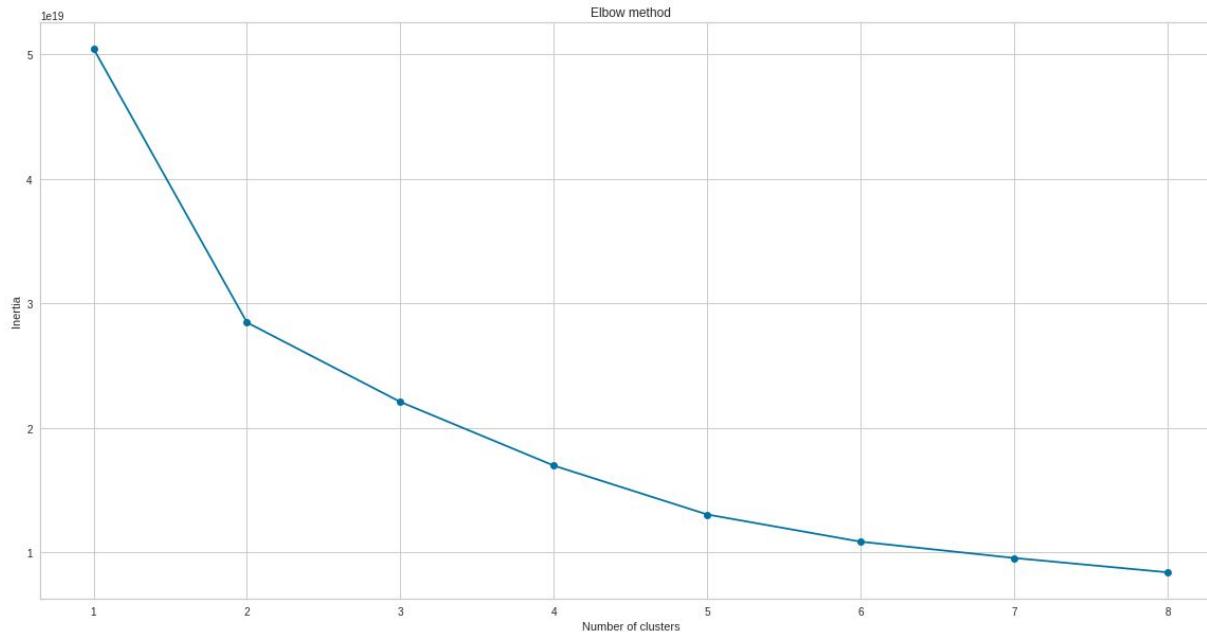
# MILESTONE 2

# PYTHON

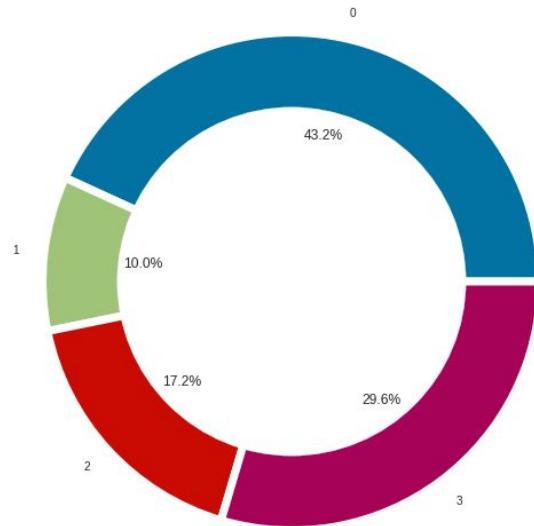
Ivan Sudibyo



# K-MEANS



# K-MEANS RESULT



## Persona

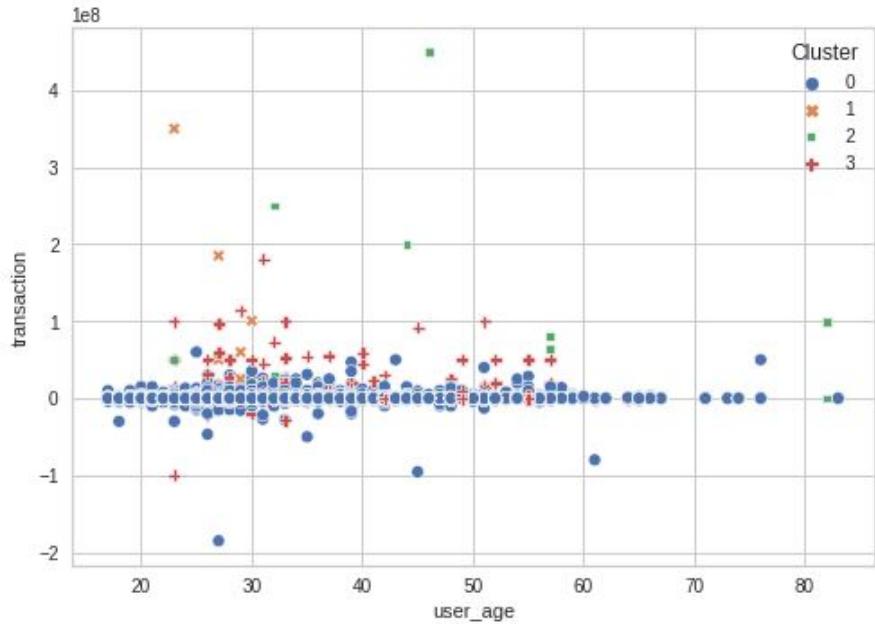
1. 2. Sultan
2. 1. High End
3. 3. Swasta Kelas Atas
4. 0. Rakyat Jelata

Rakyat jelata, swasta kelas atas, high end has 82.8 % proportions of transactions August-September 2021.

The writer use both two clustering method to make comparison and analysis.



# USER AGE AND TRANSACTION



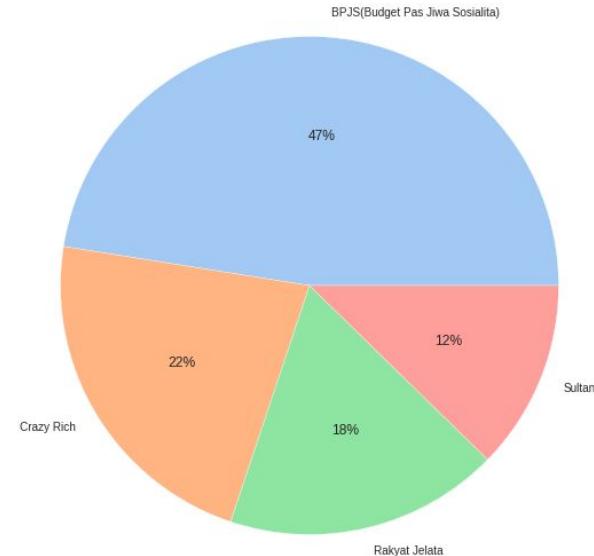
correlation: 0.0244

p-value: 1.990637557497019e-22

The correlation is positive but its small and significant.



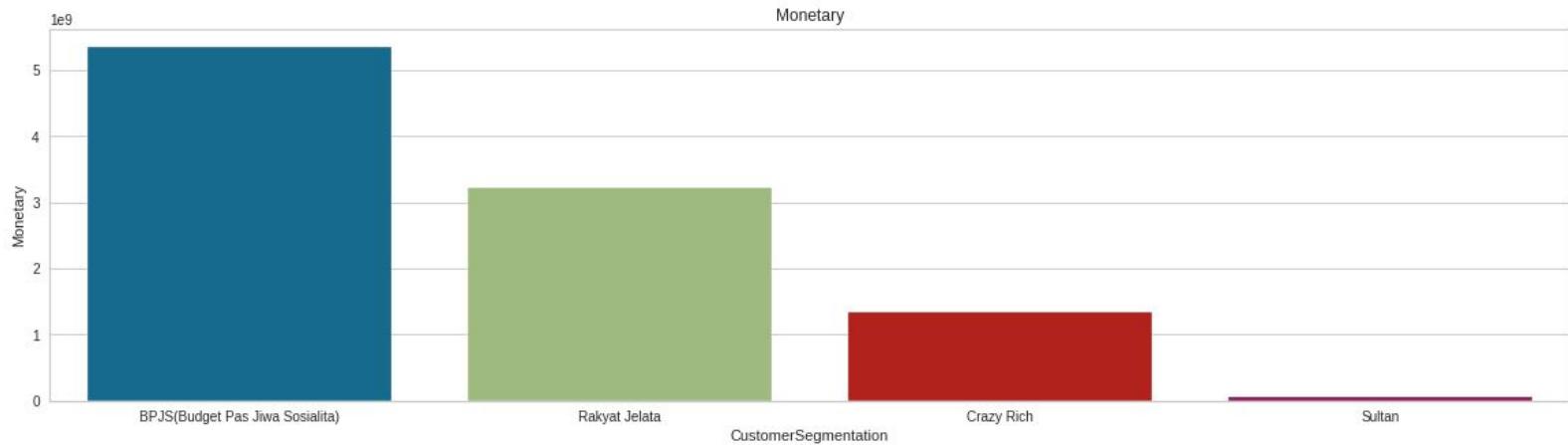
# RFM VALUE COUNTS



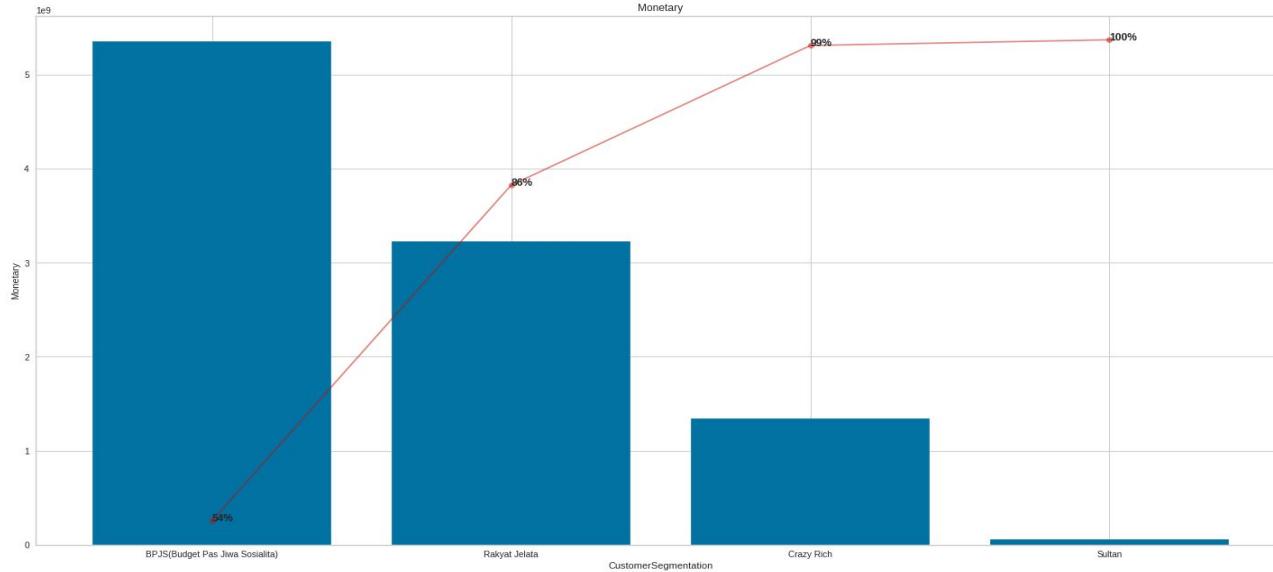
Budget Pas Jiwa Sosialita, Crazy Rich and Rakyat Jelata has dominant value count proportions in Customer Segmentation.



# RFM ANALYSIS



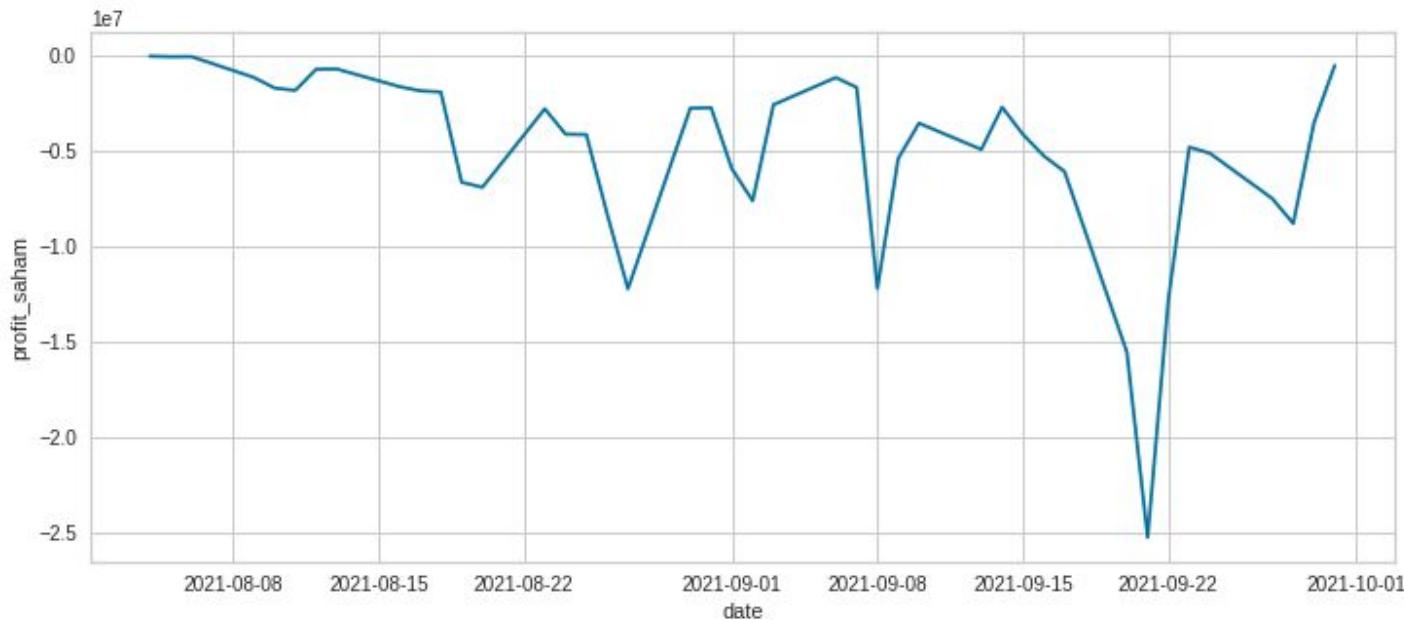
# RFM PARETO



Budget pas jiwa sosialita and rakyat jelata has 86% of proportions in monetary transactions



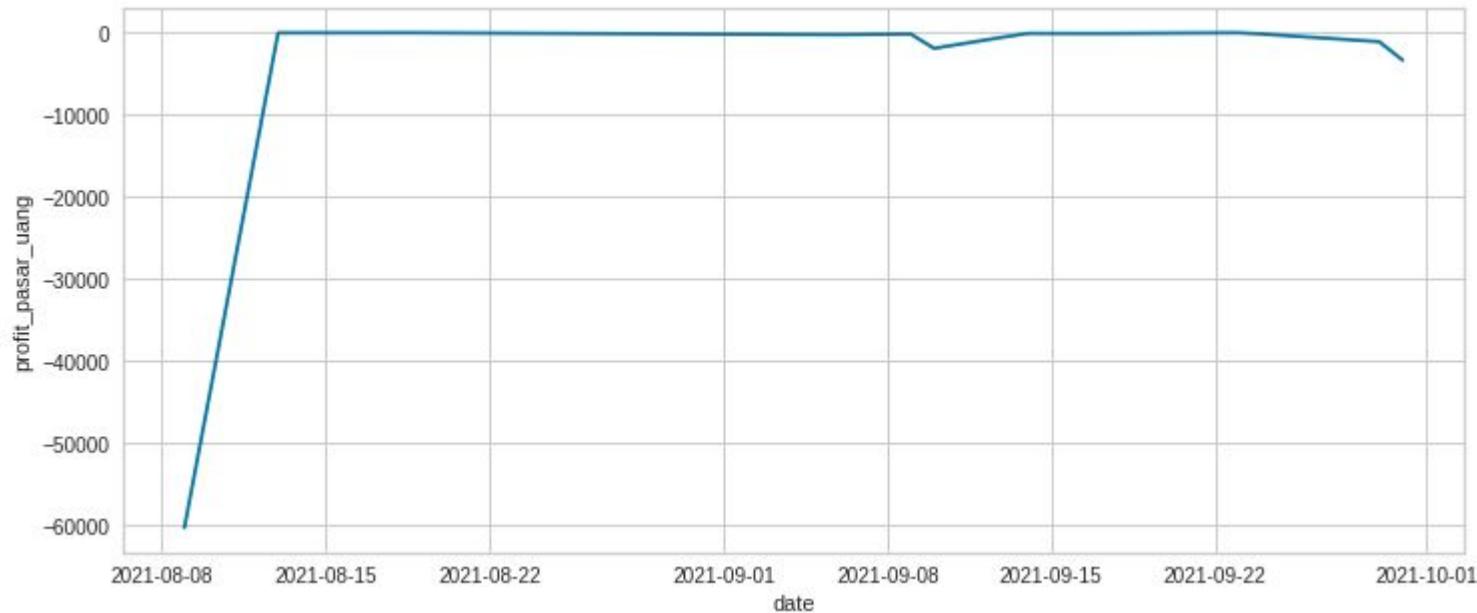
# LOSS PERIODS



The mid September 2021 has been the period at lowest value  
of profit saham lowest value trading transactions.



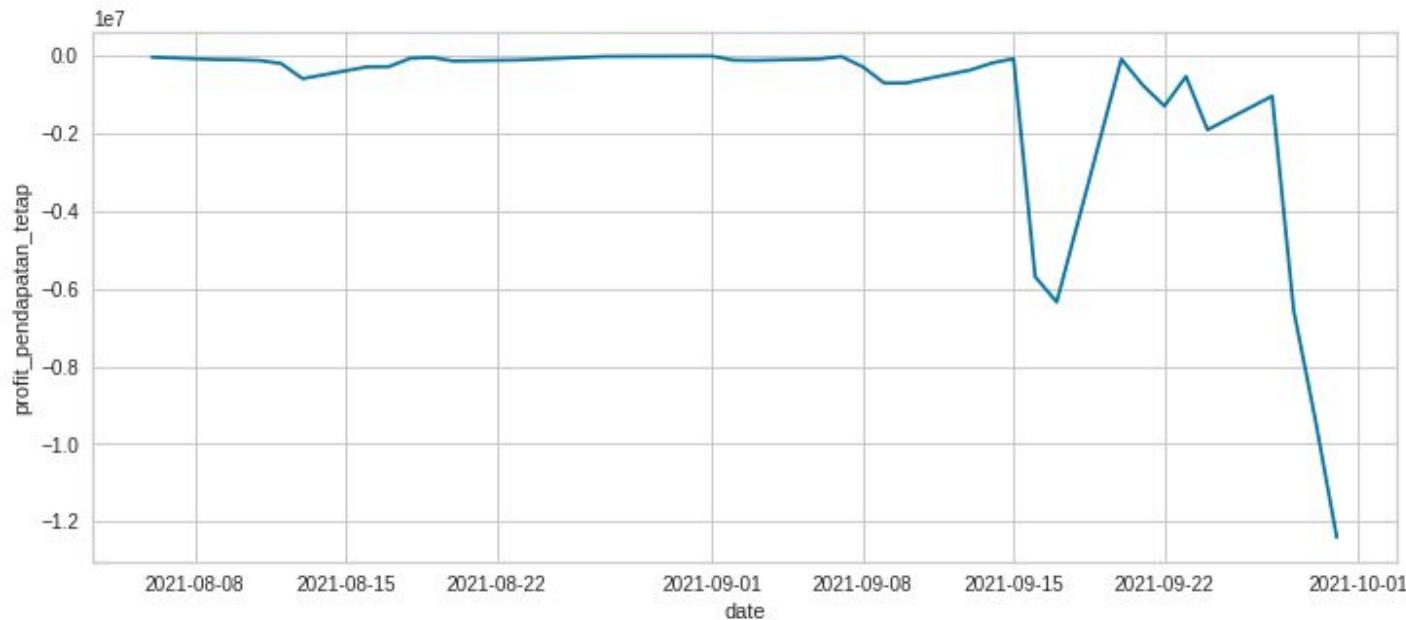
# LOSS PERIODS



The beginning of August 2021 has been the period at lowest value of pasar uang profit period transactions.



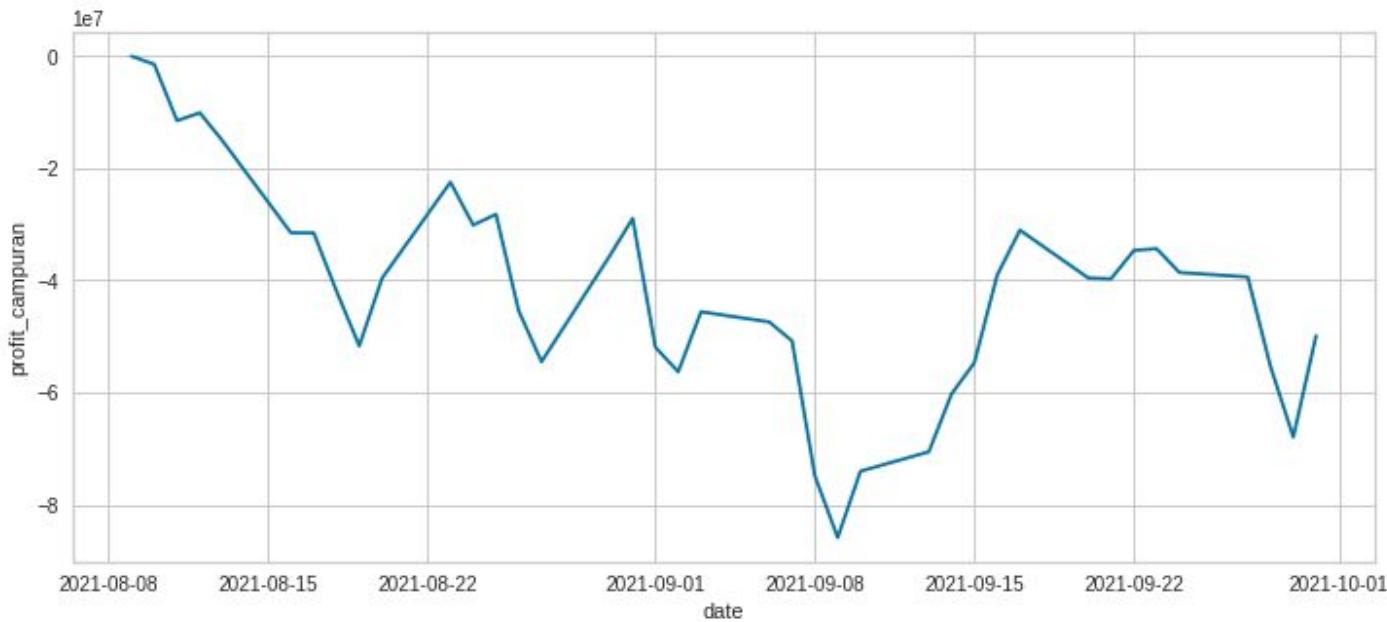
# LOSS PERIODS



The beginning of October 2021 has been the period at lowest value of pendapatan tetap profit period transactions.



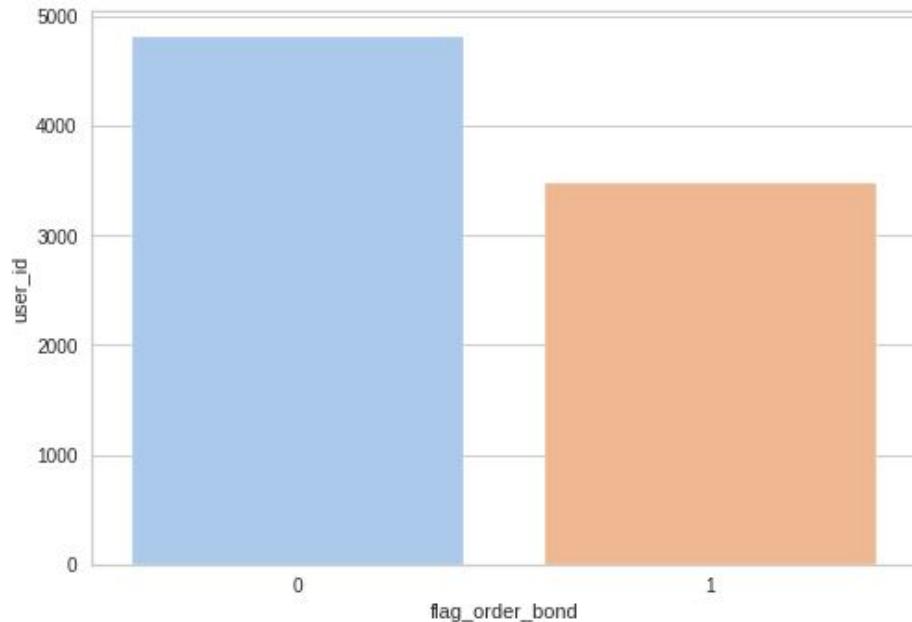
# LOSS PERIODS



The beginning week of September 2021 has been the period at lowest value of campuran profit period transactions.



# ZERO FLAG ORDER BOND SEPTEMBER



The zero value has been dominant in ZERO FLAG ORDER BOND proportions at September 2021.



# BUSINESS RECOMMENDATION

- Based on data, the customer majority transactions is rakyat jelata. The occupations of customer transactions majority are Students and swasta. So to maintain the relationship with customer, the business team should do campaign theme according the background of customer.
- Students should be educated by feature of basic financial analysis, basic technical analysis.
- Swasta should be emotionally and personally attach by theme according to their hobbies and their job.
- All segments should be educated the benefit, safety, the low level of risk, of upcoming government bond.
- The business team should do macroeconomic analysis to measure the risk and predict the market behavior



# ADVANCED PYTHON

Ivan Sudibyo

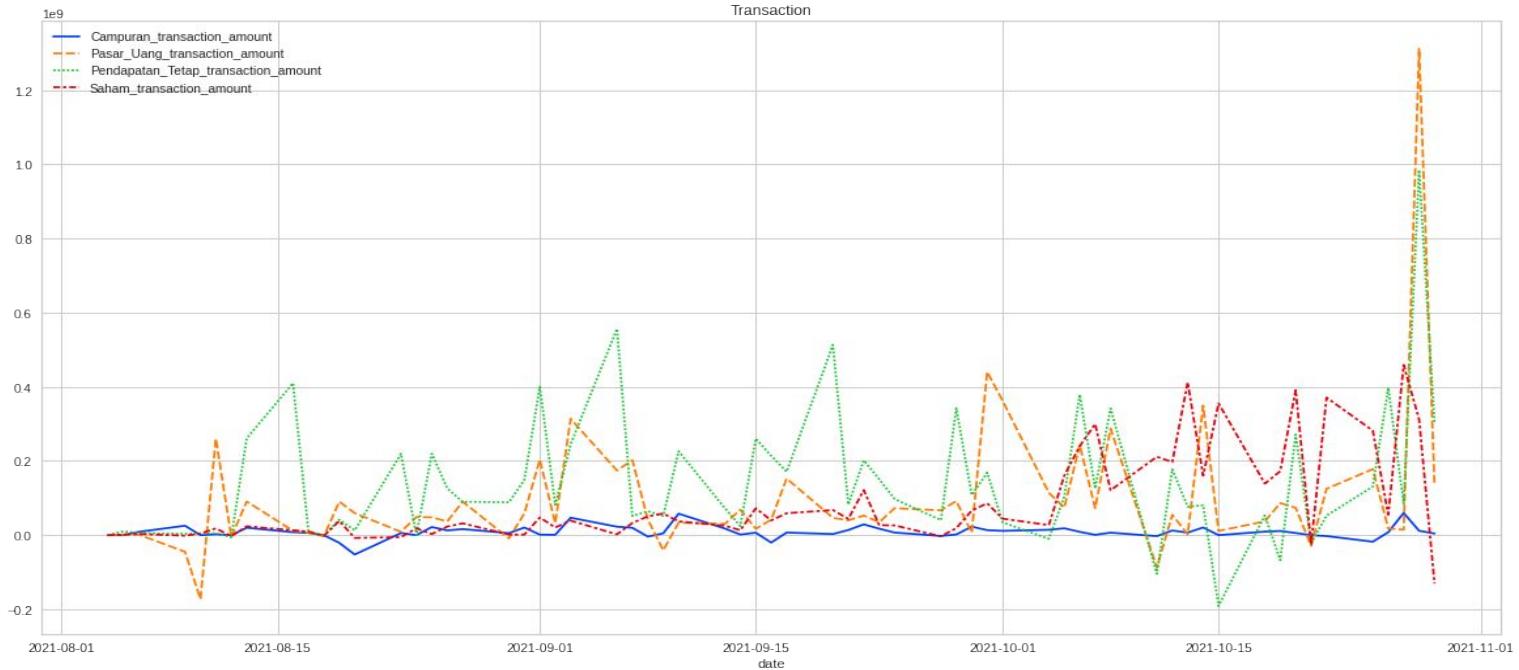


# LINK SCRIPT

- [advanced colab](#)



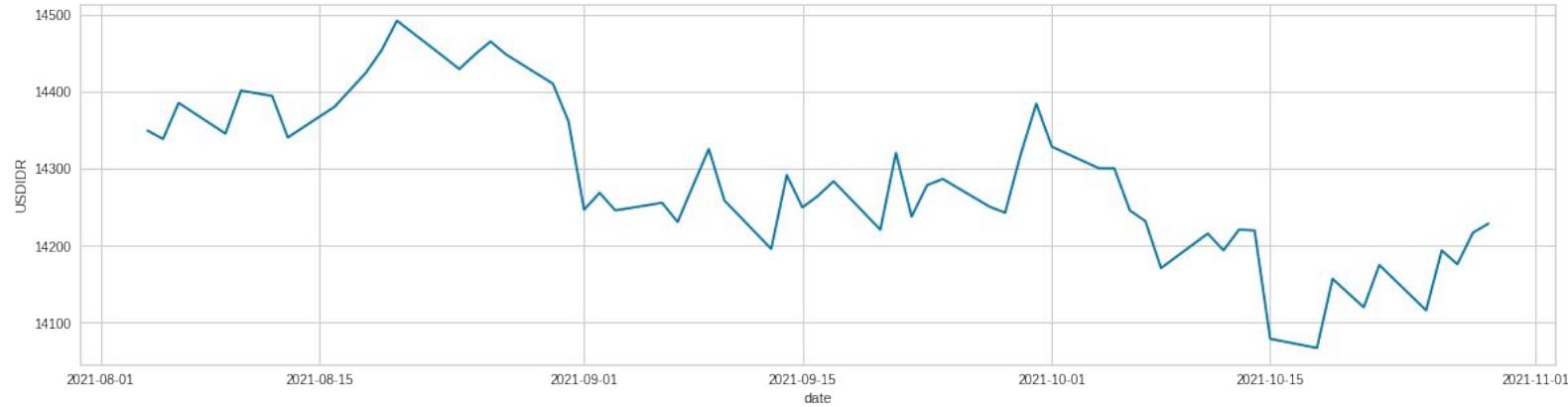
# TRANSACTION



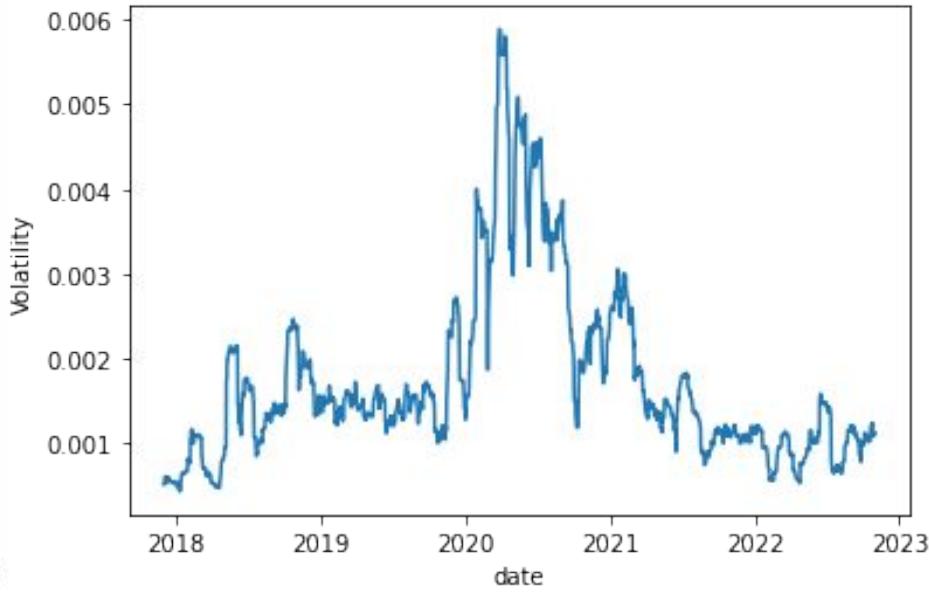
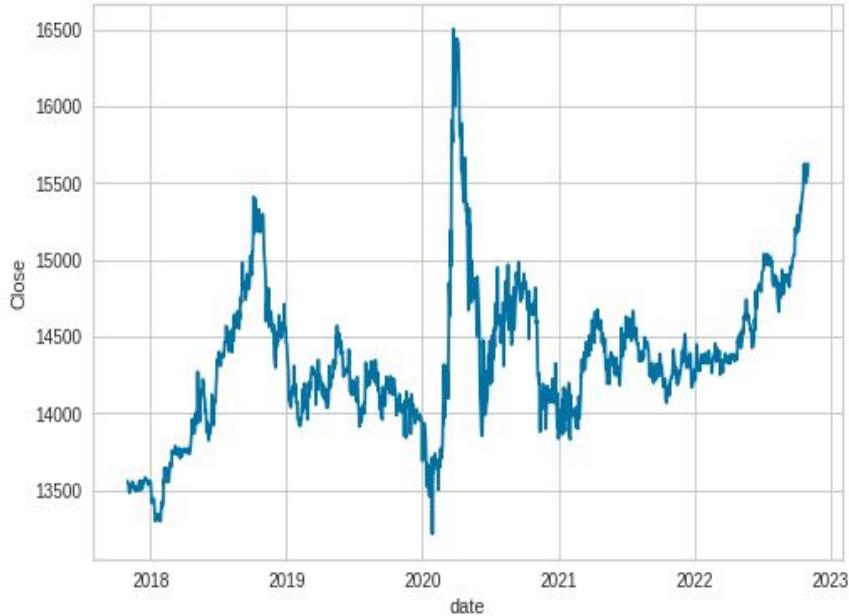
The highest transactions is Pasar Uang transaction amount then Pendapatan tetap transaction amount.



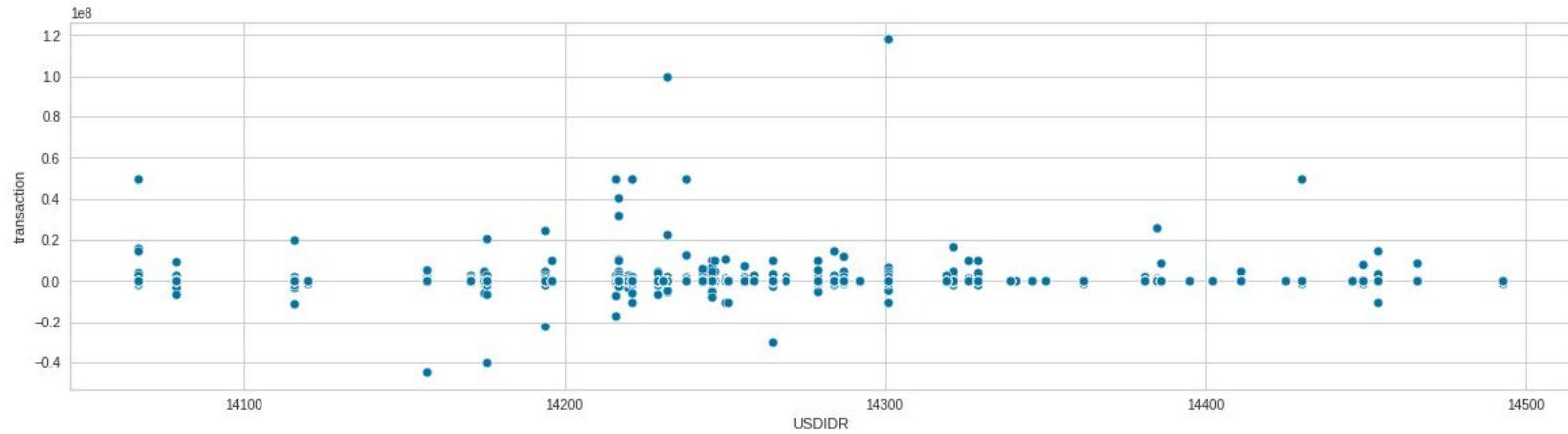
# CORRELATION



# USD TO IDR



# USDIDR & TRANSACTION

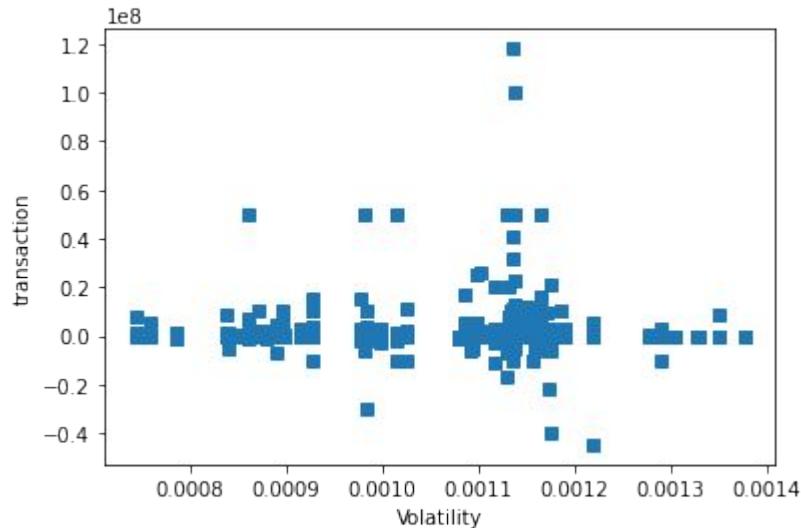


correlation: 0.0014580989365134793 p-value: 0.36498717168881084

The correlation of usdidr and transaction has been positive but very small and not significant.



# TRANSACTION & USDIDR VOLATILITY

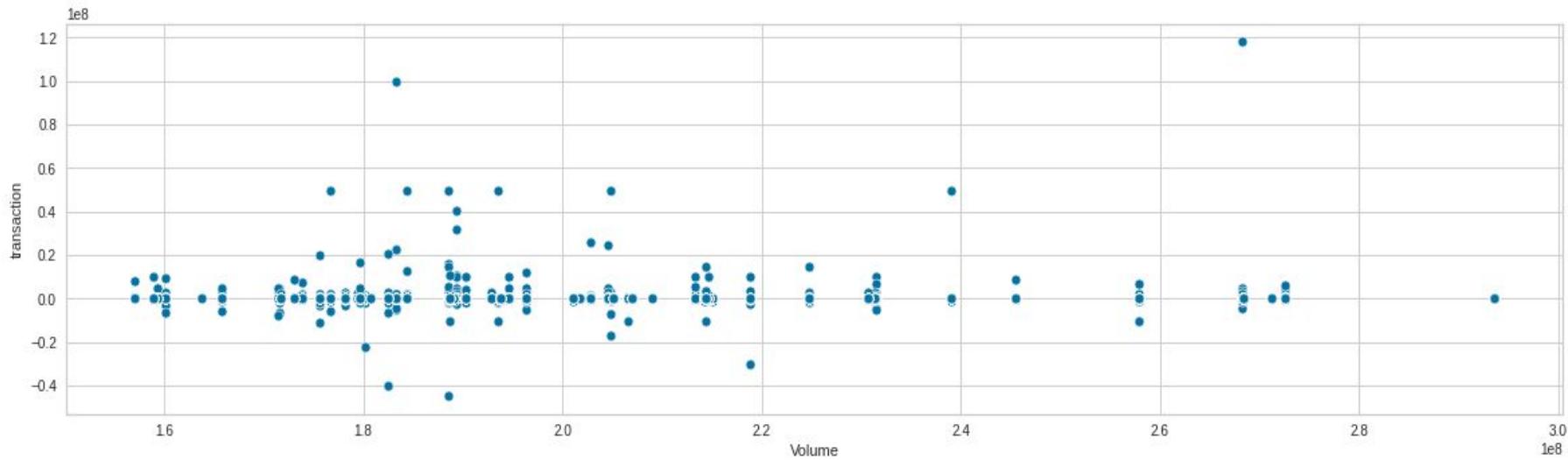


korelasi: -6.115877359894268e-06  
p-value: 0.9969090073022675

The correlation of USDIDR volatility and transaction has been negative, very small and not significant



# VOLUME & TRANSACTION

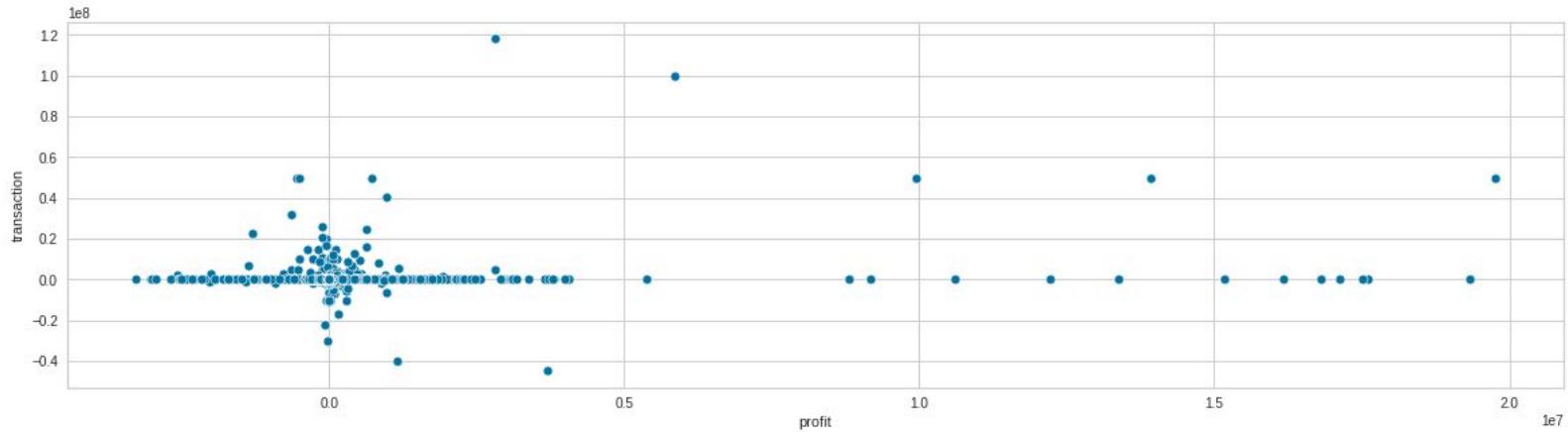


correlation: 0.0018798911851828075 p-value: 0.2428233101990601

The correlation of volume JKSE and transaction has been positive but very small and not significant.



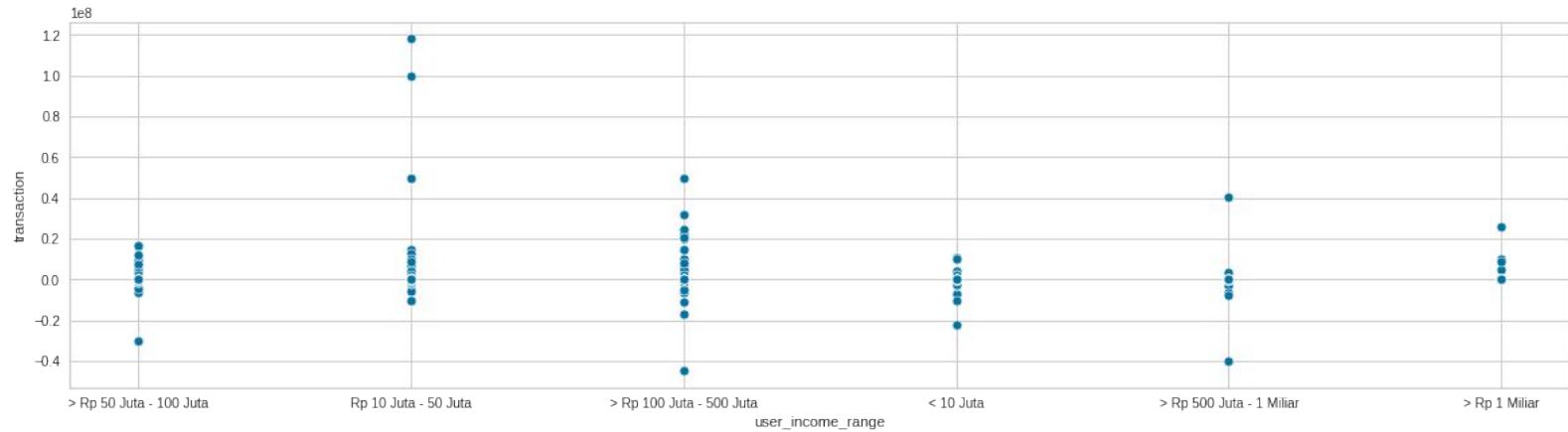
# PROFIT & TRANSACTION



correlation: 0.19029807251908037 p-value: 0.0;  
The correlation is positive and significant .



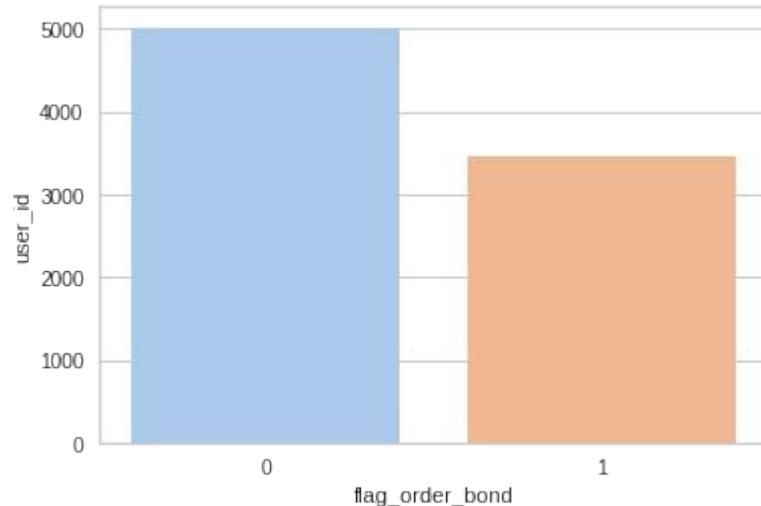
# USER INCOME RANGE & TRANSACTION



There has been some anomaly that some transaction of income range 10jt-50 jt has been the highest value in the graph, there is probability the users camouflage their data.



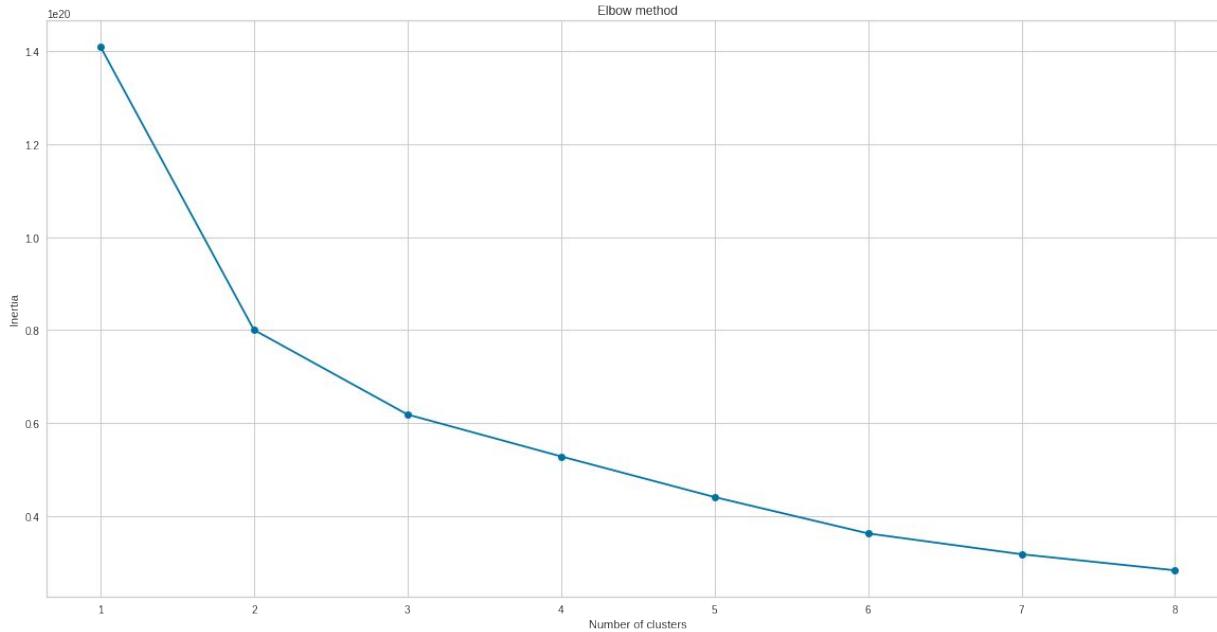
# CUSTOMER ZERO FLAG ORDER BOND MONTH 10



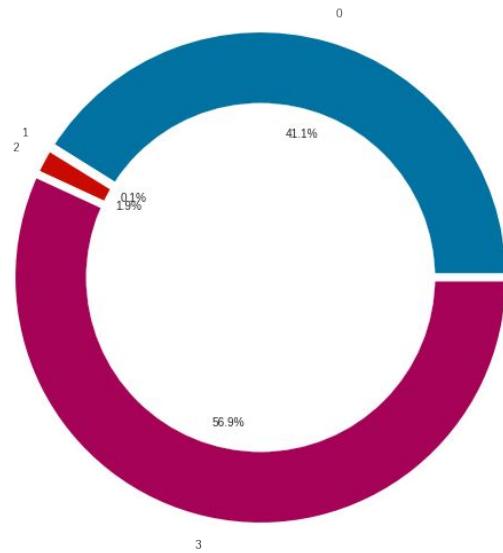
The zero value has been dominant in ZERO FLAG ORDER BOND October 2021.



# K-MEANS



# K-MEANS RESULT



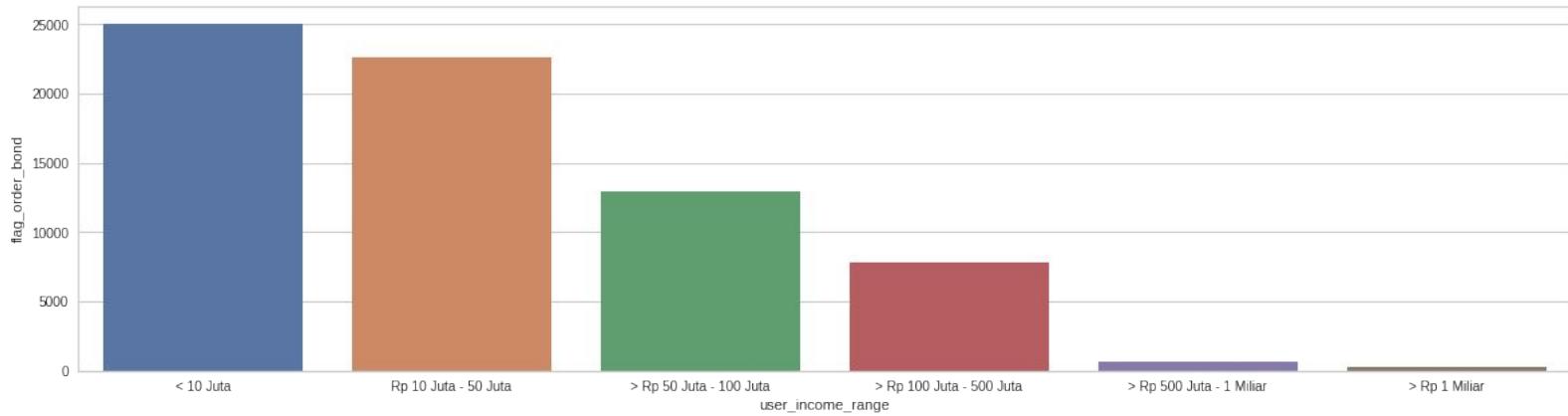
## Persona

1. 3. Sultan
2. 2.High End
3. 1. Swasta Kelas Atas
4. 0. Rakyat Jelata

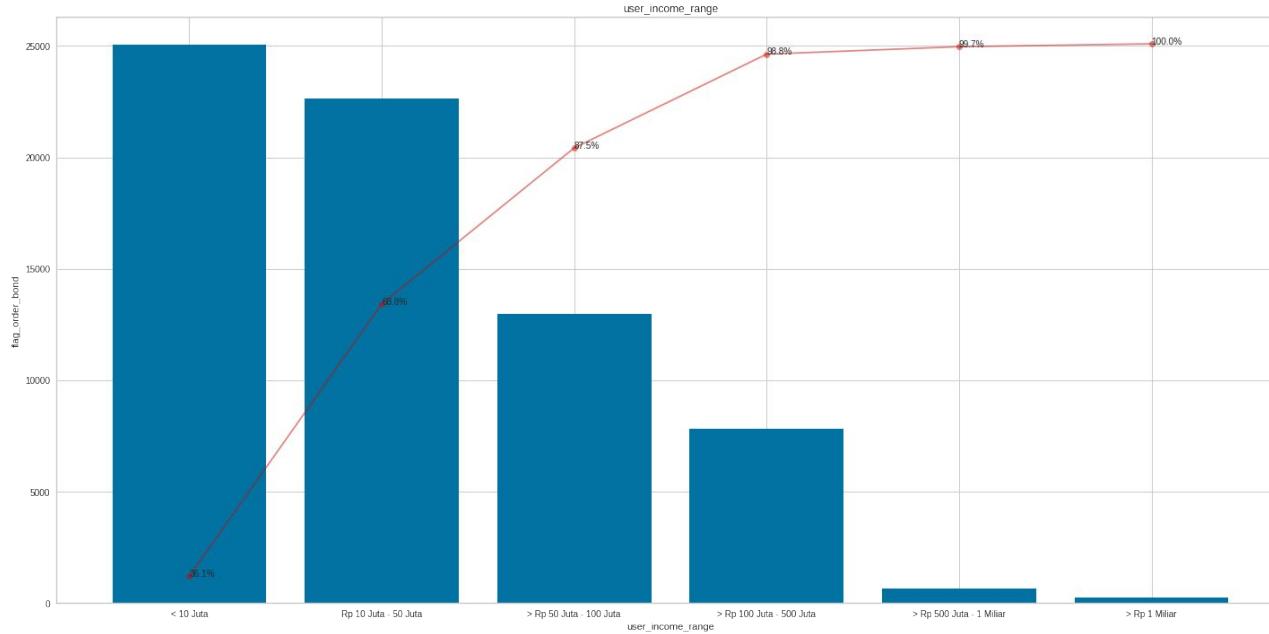
Rakyat jelata, sultan has 98 %  
proportions of transactions  
August-October 2021.



# ZERO FLAG ORDER BOND BY INCOME



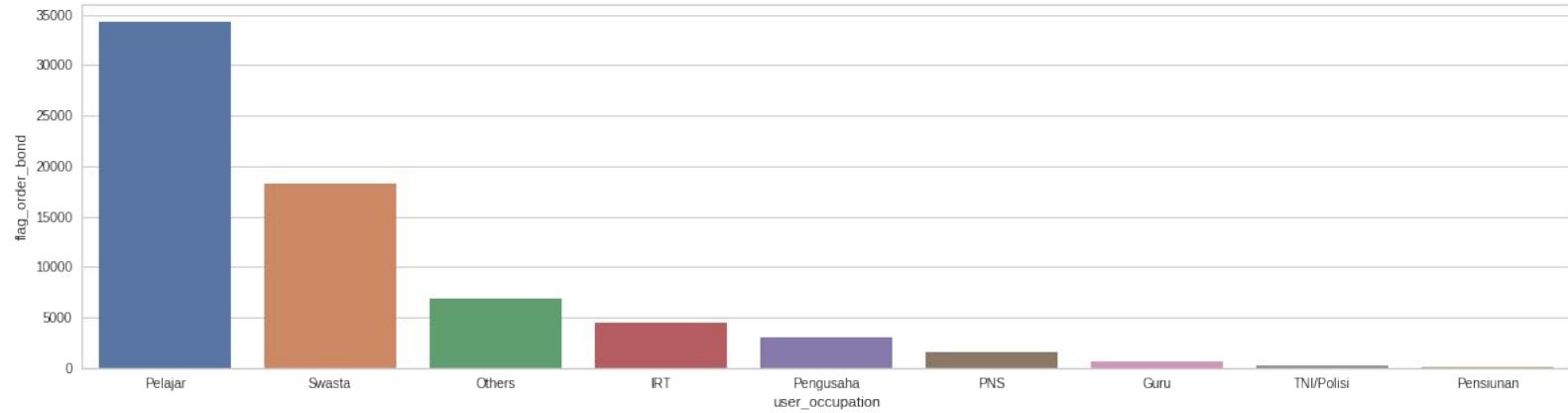
# ZERO FLAG ORDER BOND BY INCOME



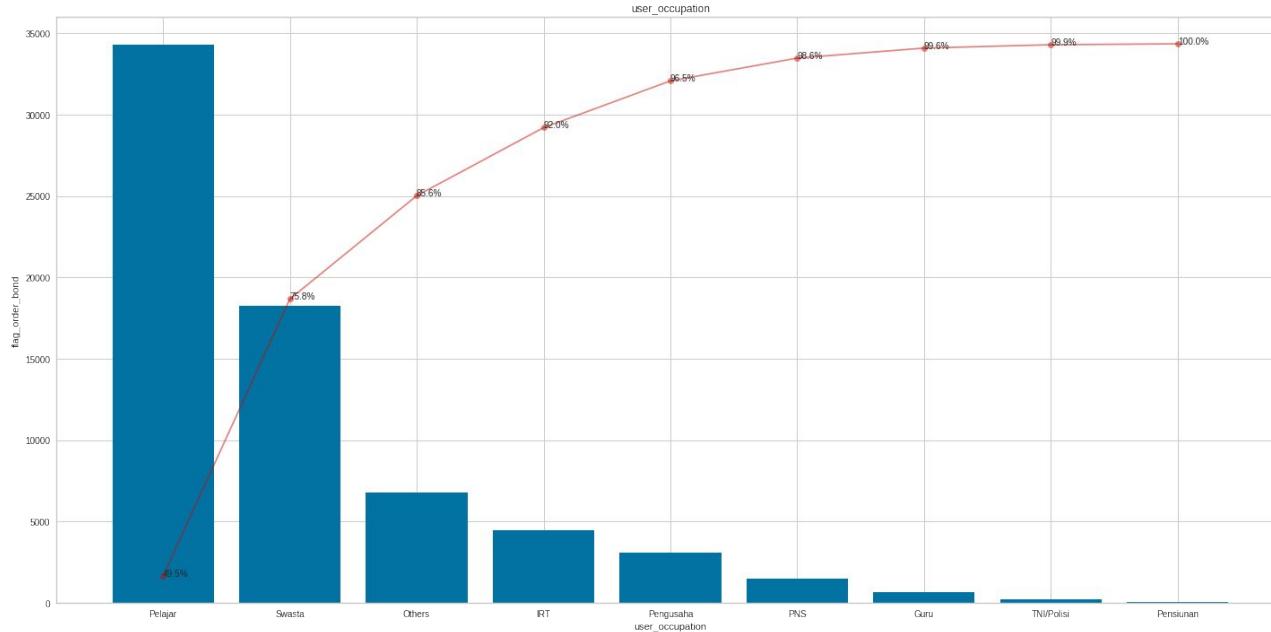
<10 jt, 10 jt-50 jt, 50jt-100 jt has made 87.5% of proportions ZERO FLAG ORDER BOND by income



# ZERO FLAG ORDER BOND BY OCCUPATION



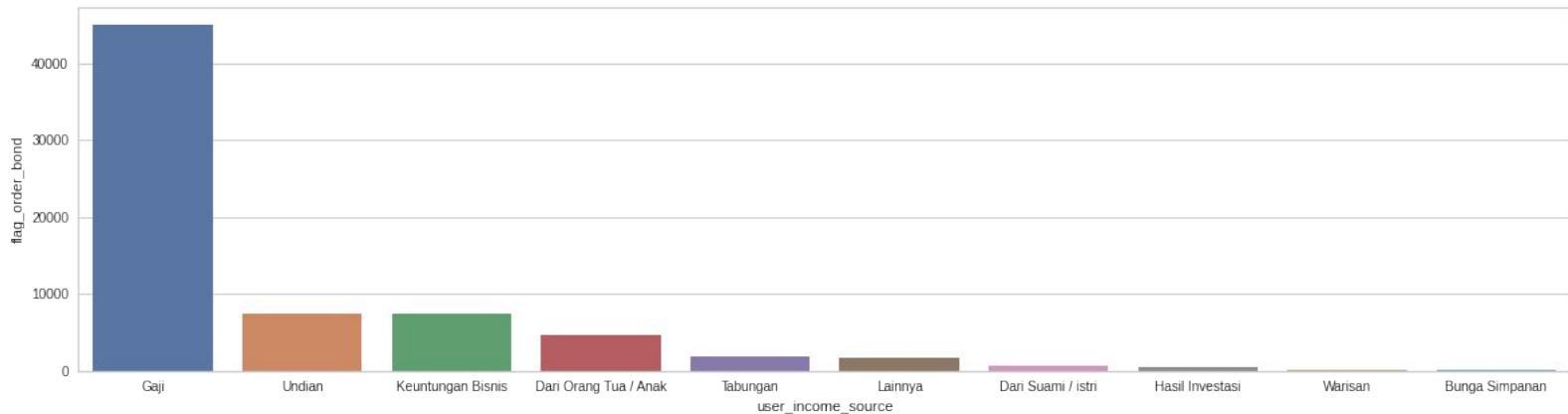
# ZERO FLAG ORDER BOND BY OCCUPATION



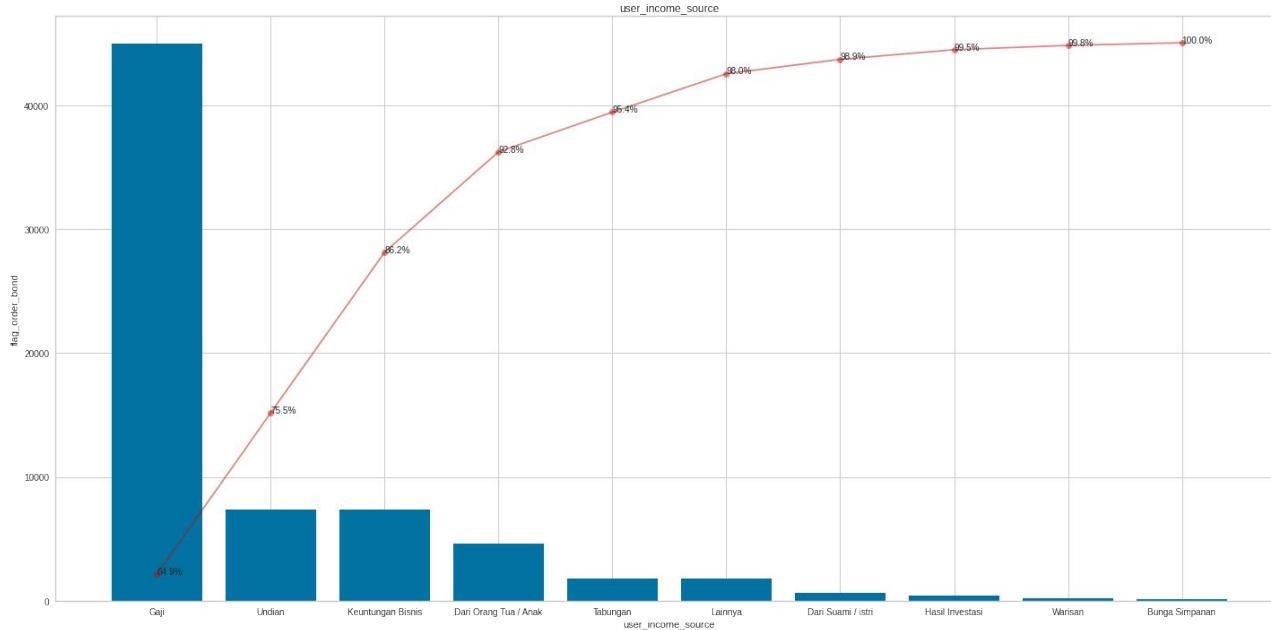
Students, swasta, others has made 85.6% of proportions ZERO FLAG ORDER BOND.



# ZERO FLAG ORDER BOND BY INCOME SOURCE



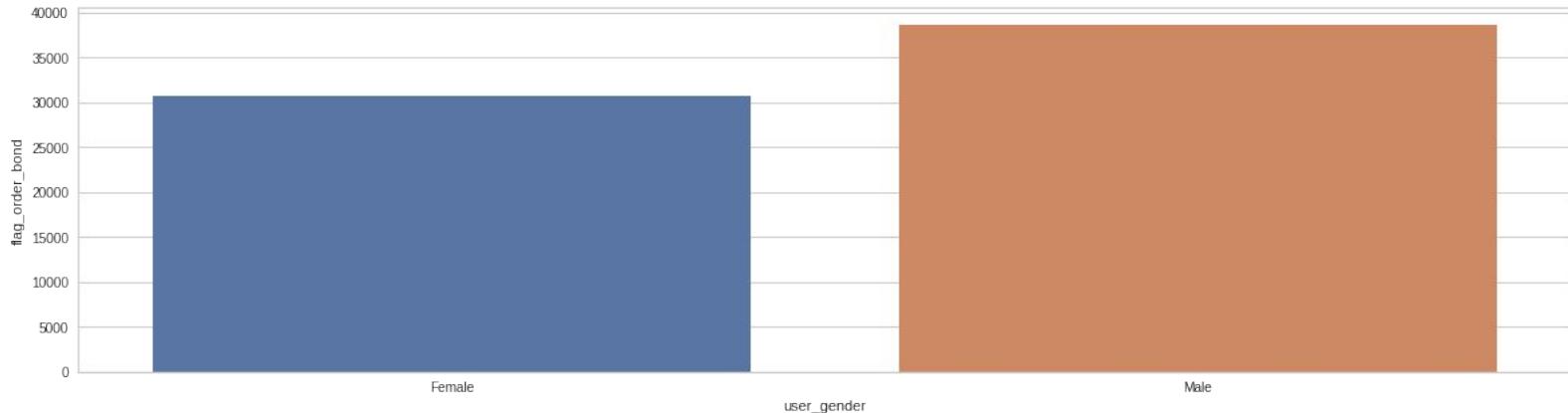
# ZERO FLAG ORDER BOND BY INCOME SOURCE



Gaji, undian, keuntungan bisnis has made  
86.2% of proportions ZERO FLAG ORDER  
BOND.



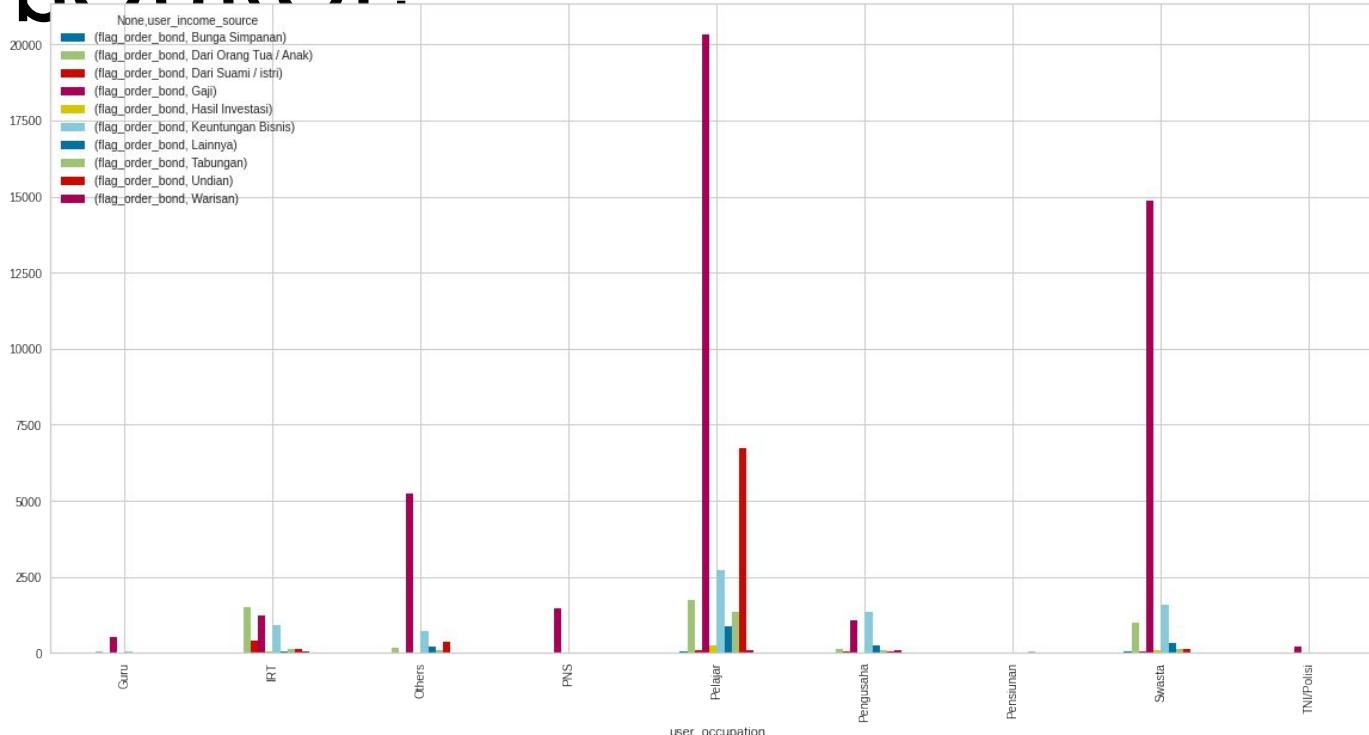
# ZERO FLAG ORDER BOND BY GENDER



Male has been dominant in customer ZERO FLAG ORDER BOND.



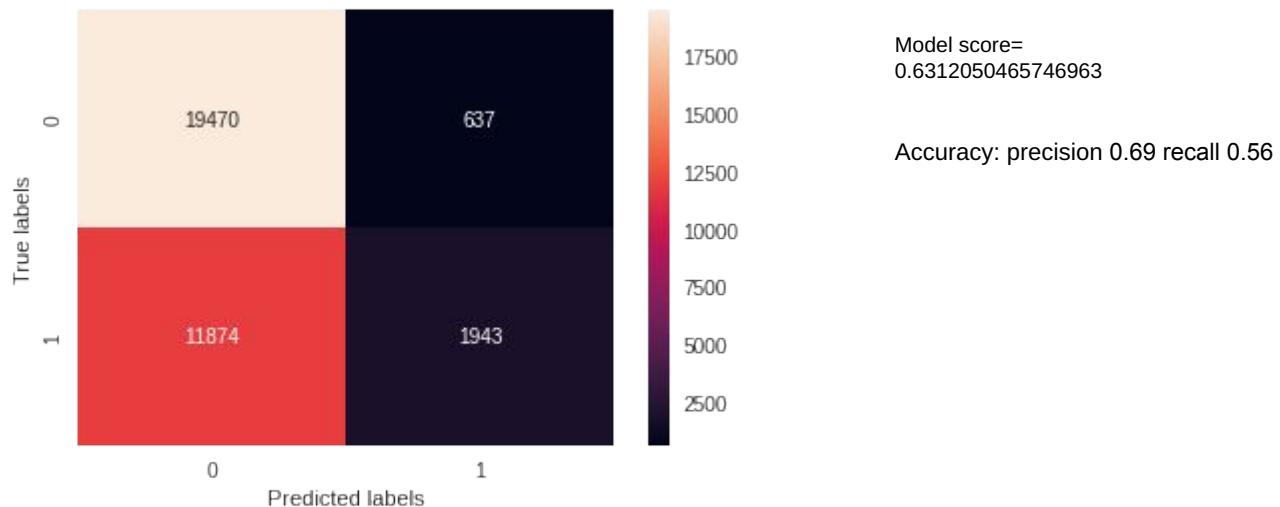
# ZERO FLAG ORDER BOND BY OCCUPATION & INCOME SOURCE



Students with source warisan has been the highest rate of ZERO FLAG ORDER BOND, then the swasta with source warisan, Students with source undian, others with source warisan have high rate of ZERO FLAG ORDER BOND.



# CONFUSION MATRIX PERFORMANCE



# BENEFIT COST ANALYSIS & BUSINESS RECOMMENDATION

- cost of campaign per customer: \$100
- loss if customer ZERO FLAG ORDER BOND: \$50
- potential profit if customer ZERO FLAG ORDER BOND not ZERO FLAG ORDER BOND: \$250

Then the return of the campaign is:

- Return = (Benefit of preventing ZERO FLAG ORDER BOND) - (Loss if ZERO FLAG ORDER BOND happened) - (Cost of marketing campaign)
- $(250*30577) - (50*20327) - (100*50904)$
- 1537500
  
- By calculations, we get that profit total in October is 505092734
- The total user is 8481
- If 30% of profit allocated to promo then,  $\text{allocation\_promo} = 30/100 * 505092734 / \text{total\_user}$
- Allocation promo = 17866 per user. The business team can designed the promo for each user at this budget
- the form of promotion can be in the form of discounts and membership loyalty promos.



# BUSINESS RECOMMENDATION

- To maintain the customer activities with good monetary, we have to get promotions personally to high end customer and Sultan.
- The Students segments has been the highest rate of ZERO FLAG ORDER BOND, the business team should maintain relation with the Students segment, and prevent the ZERO FLAG ORDER BOND, the business team should do some education feature which educate the basic financial analysis, basic technical skill to maintain do the transactions safety.
- The segment of income source 'warisan' should be noticed. They have to educated and get some advice from the expert. Business team should reduce the number of ZERO FLAG ORDER BOND in this segment.
- All segment should get attention of new product which is government bond, they should know the benefit, and the level of risk of this product.

