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▼ Introduction

This data analysis work is being performed for limited data analysis for an agency with a subscription based service model. Agency wants to find out underlying trends of the data and what can be done to improve the business (acquiring new members and improving retention rate).

Importing input and displaying data

We used google colab as infrastructure to perform the analysis. Google Colab is designed to help disseminate machine learning education and research. First we import excel input from google drive shared with us. Libraries used were google.colab and pydrive to mount and authenticate drive and load data in our notebook. We'd load data analysis library including numpy and pandas and matplotlib for graphical support.

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	ID	Months_in_contract	Renewal_count
count	4.435000e+03	4436.000000	4436.000000
mean	3.528286e+14	6.744139	4.516456
std	4.758599e+13	2.154181	2.750824
min	3.521141e+14	0.000000	0.000000
25%	3.521141e+14	5.000000	2.000000
50%	3.521141e+14	7.000000	5.000000
75%	3.521141e+14	8.000000	7.000000
max	3.521141e+15	13.000000	11.000000

▼ Graphical Support

In this section, we define some routines to analyze our data.

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▼ Add supplementary data

We'll add 16 different data types derived from existing data

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ID	Months_in_contract	Store	Renewal_count	Activation_date	Last...
AI STORE					

▼ Create two more data frames

We create two more data frames for clear understanding and analysis of trends.

1. New Business
2. Existing Business

3.521141e+14

0

1.5121

0

15.44.07

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	ID	Months_in_contract	Renewal_count	Activation_DD	Activation_mc
count	2.333000e+03	2334.000000	2334.000000	2334.000000	2334.000000
mean	3.521141e+14	6.459726	4.128106	16.145244	6.077100
std	3.639390e+04	2.183179	2.640050	8.772785	2.189000
min	3.521141e+14	0.000000	0.000000	1.000000	1.000000
25%	3.521141e+14	5.000000	2.000000	8.000000	5.000000
50%	3.521141e+14	6.000000	4.000000	16.000000	6.000000
75%	3.521141e+14	8.000000	6.000000	24.000000	7.000000
max	3.521141e+14	13.000000	11.000000	31.000000	12.000000

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	ID	Months_in_contract	Renewal_count	Activation_DD	Activation_mc
count	2.093000e+03	2093.000000	2093.000000	2093.000000	2093.000000
mean	3.536282e+14	7.057812	4.946488	16.540373	5.526000
std	6.926938e+13	2.078756	2.807223	8.534259	2.086000
min	3.521141e+14	1.000000	0.000000	1.000000	1.000000
25%	3.521141e+14	6.000000	3.000000	9.000000	4.000000
50%	3.521141e+14	7.000000	5.000000	17.000000	5.000000
75%	3.521141e+14	8.000000	7.000000	23.000000	7.000000
max	3.521141e+15	13.000000	11.000000	31.000000	12.000000

▼ Compare Existing vs New Customers renewal rate and contract length

From the two tables above:

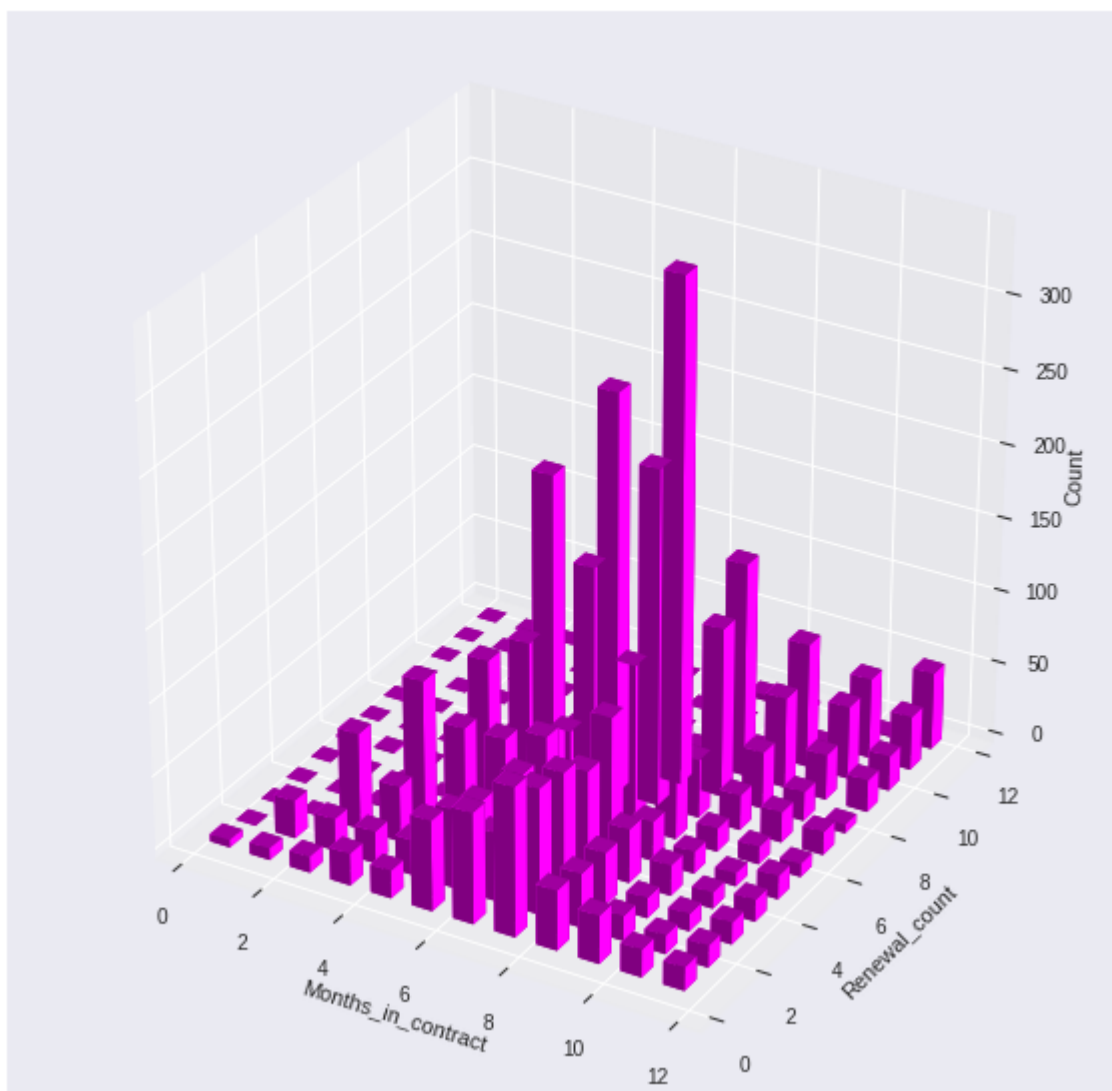
x	Existing_Average	Exsting_Sigma	New_Average	New_Sigma
Months_in_contract:	7.05	2.07	6.45	2.18
Renewal_count :	4.95	2.80	4.13	2.64

Trends

1. On the average, existing customers stay in contract about 10% longer than new customers. (7mo. vs 6mo.)
2. On the average, existing customers renew about about 20% more than new customers. (5mo. vs 4mo.)
3. On the spread (variance), 50% of existing customers stay in contract upto 7months with 5 renewals.
4. On the spread (variance), 50% of New customers stay in contract upto 6months with 4 renewals.

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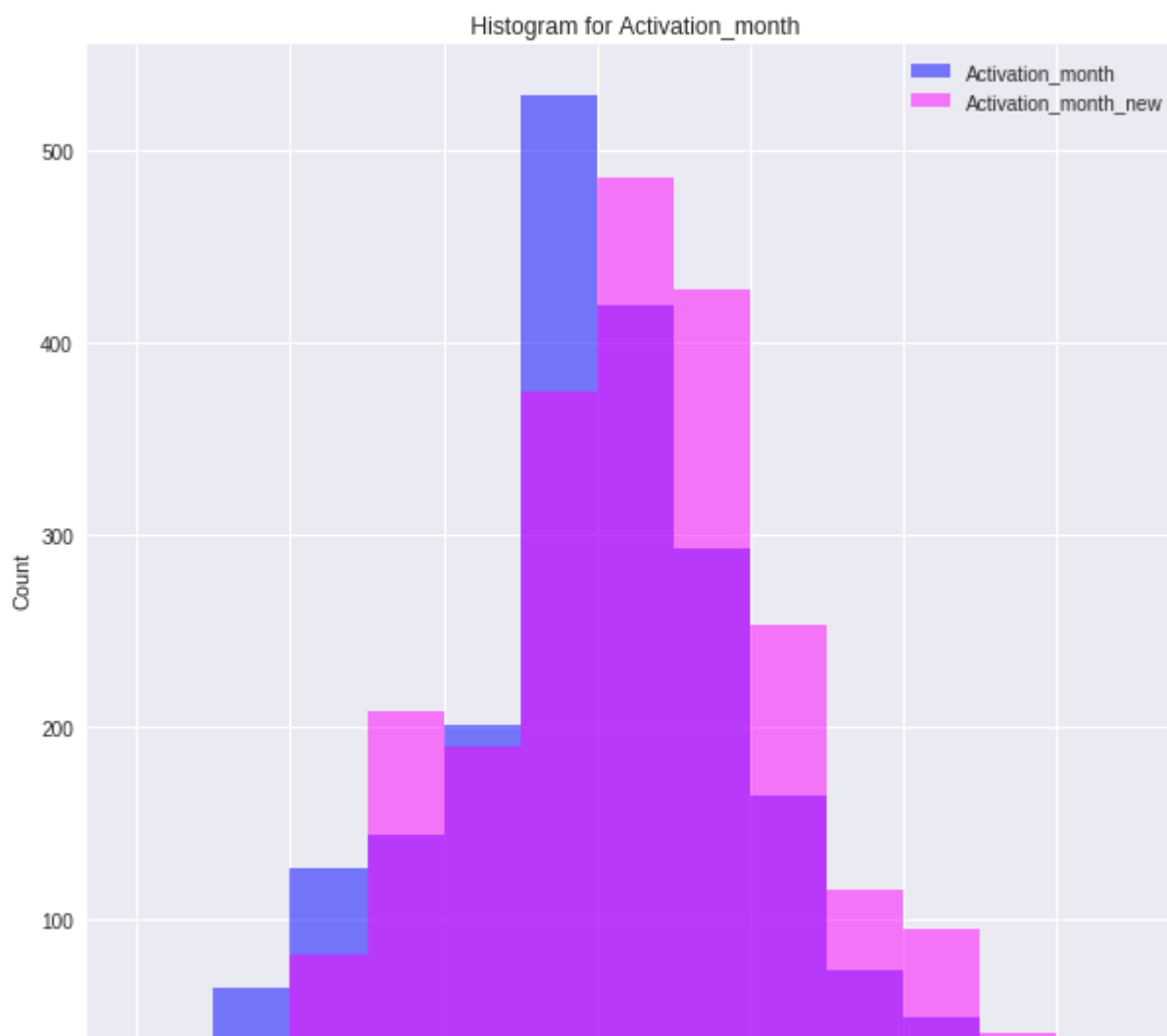
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▼ What is Renewal Frequency of Loyal Customers?

Trends

1. Highest renewal count is during the months of Jun-Aug with members 6-9 months in contract.
2. Very high percentage of members are with 6-9 month of contract.

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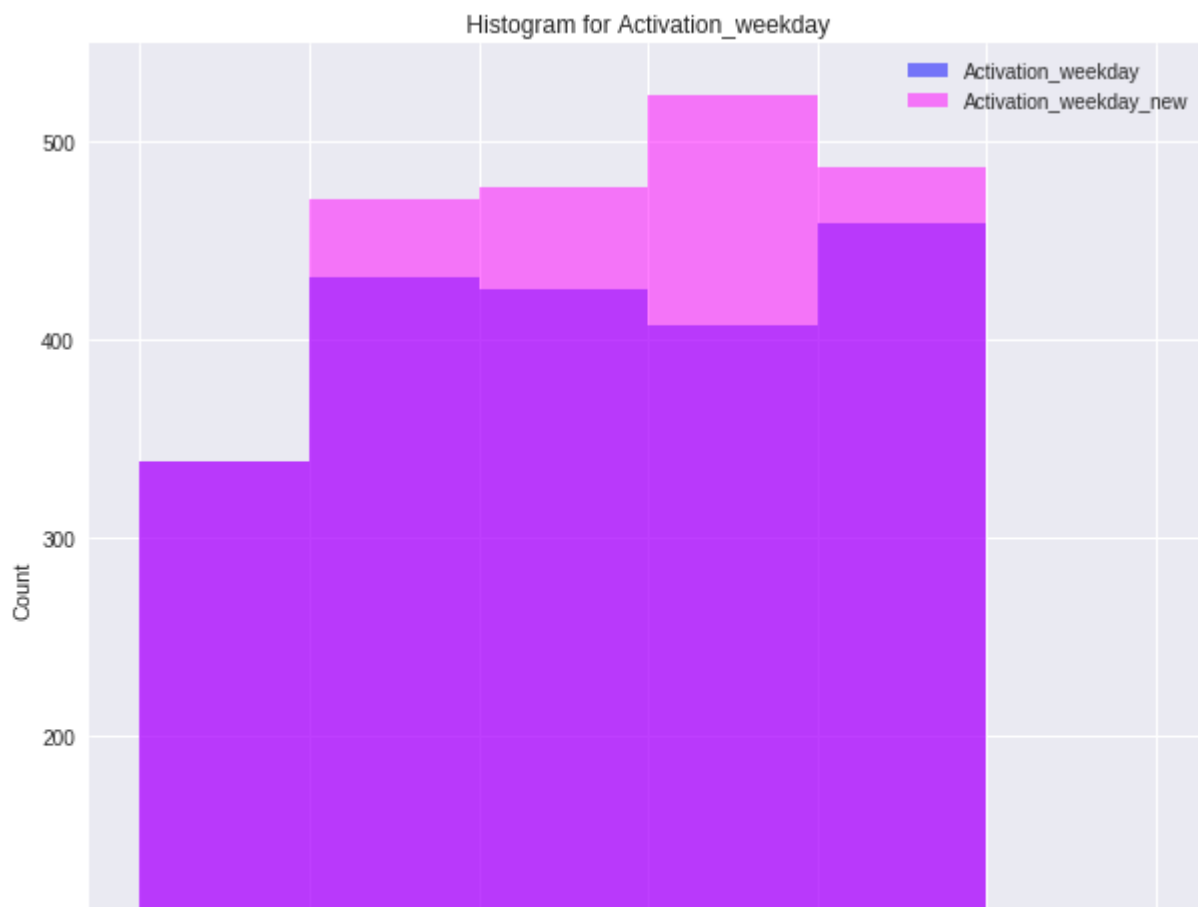
▼ How do renewals fluctuate through the year?

Trends

1. Renewals go up from Jan-Jun and they go down for the rest of the year.
2. New renewals exceed existing ones by over 10% (2334 vs 2093) over the year.
3. Existing renewals top in the month of May with over 500 renewals.
4. Existing renewals exceed new ones in 4 months (Jan, Feb, Apr, and May).
5. New renewals exceed existing ones in 8 months (Mar, and Jun-Dec).

```
show_histogram(df_existing, ['Activation_weekday'], 7, df_new)
```





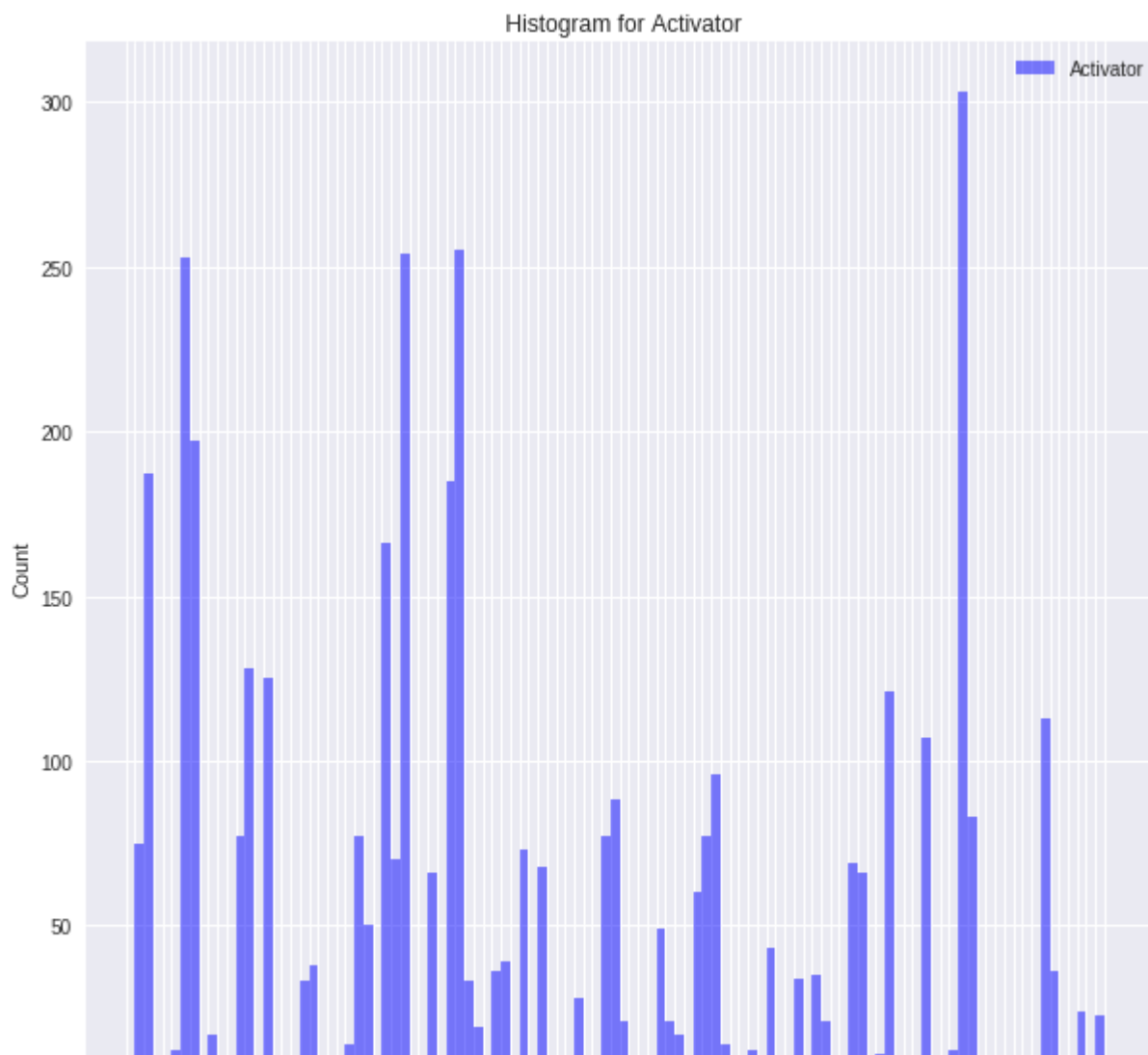
▼ Which weekdays are effective for renewals?

Trends

1. Over 98% renewals happen during the week from M-F. Sat-Sun are negligible.
2. New Renewals always exceed from existing with a range of 0-20%. Thu is best for new renewals.

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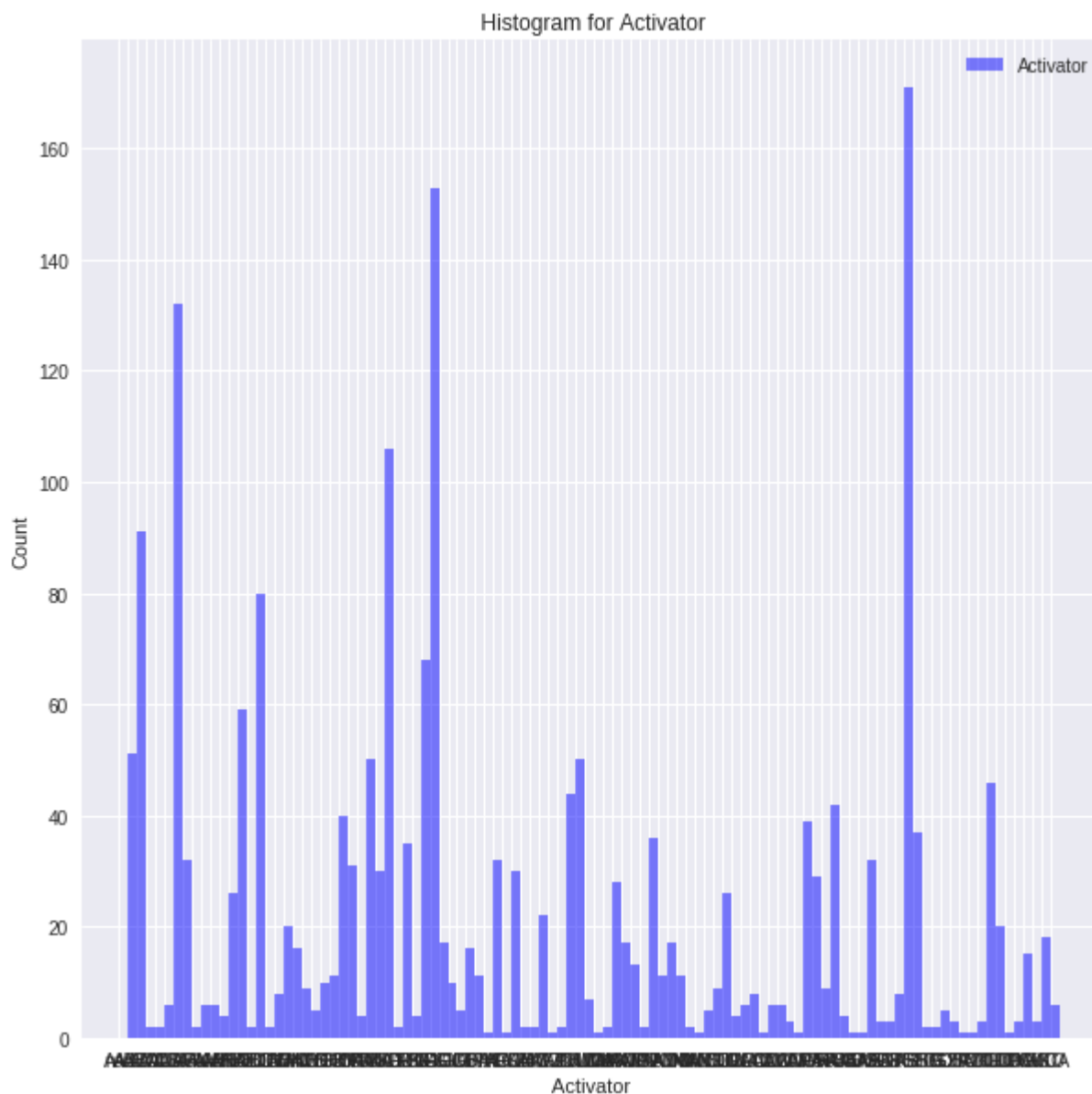
▼ Who are my top performing agents overall?

Trends

Over 50% of renewals (2287) were activated by 12 agents out of 108 agents.

1. STCH : 303
2. FIOG : 255
3. DAUM : 254
4. ADEH : 253
5. ADOL : 197
6. ABBA : 187
7. ESEK : 185
8. DAOK : 166
9. ANOD : 128
10. BLUG : 125
11. PROB : 121
12. TOOD : 113

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1 . STCH : 171
2 . FIOG : 153
3 . ADEH : 132
4 . DAUM : 106
5 . ABBA : 91
6 . BLUG : 80
7 . ESEK : 68
8 . ANOD : 59
9 . AAAA : 51
10 . JOUD : 50
11 . DAOK : 50
12 . TOOD : 46

```

Over 50% of renewals (1057) were activated by 12 agents out of 103

▼ Which agent renews existing customers more (loyalty rate)?

Since no Marketing Budget goes in renewing existing customers, it is better return.

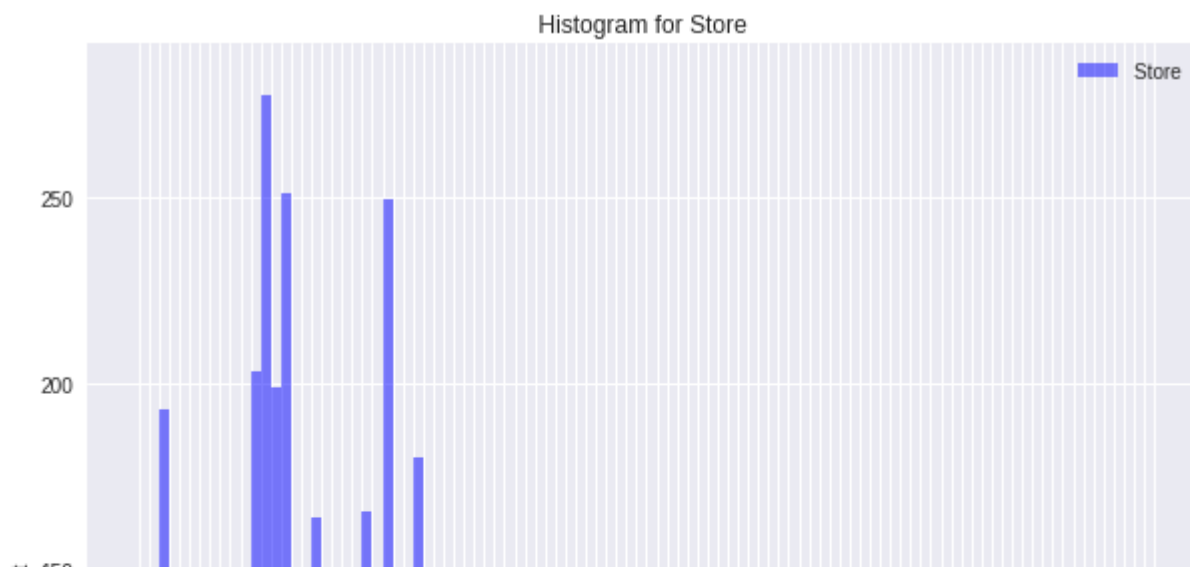
Trends

Over 50% of renewals (1057) were activated by 12 agents out of 103.

1. STCH : 171
2. FIOG : 153
3. ADEH : 132
4. DAUM : 106
5. ABBA : 91
6. BLUG : 80
7. ESEK : 68
8. ANOD : 59
9. AAAA : 51
10. JOUD : 50
11. DAOK : 50
12. TOOD : 46

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▼ Which stores are leading renewals?

Trends

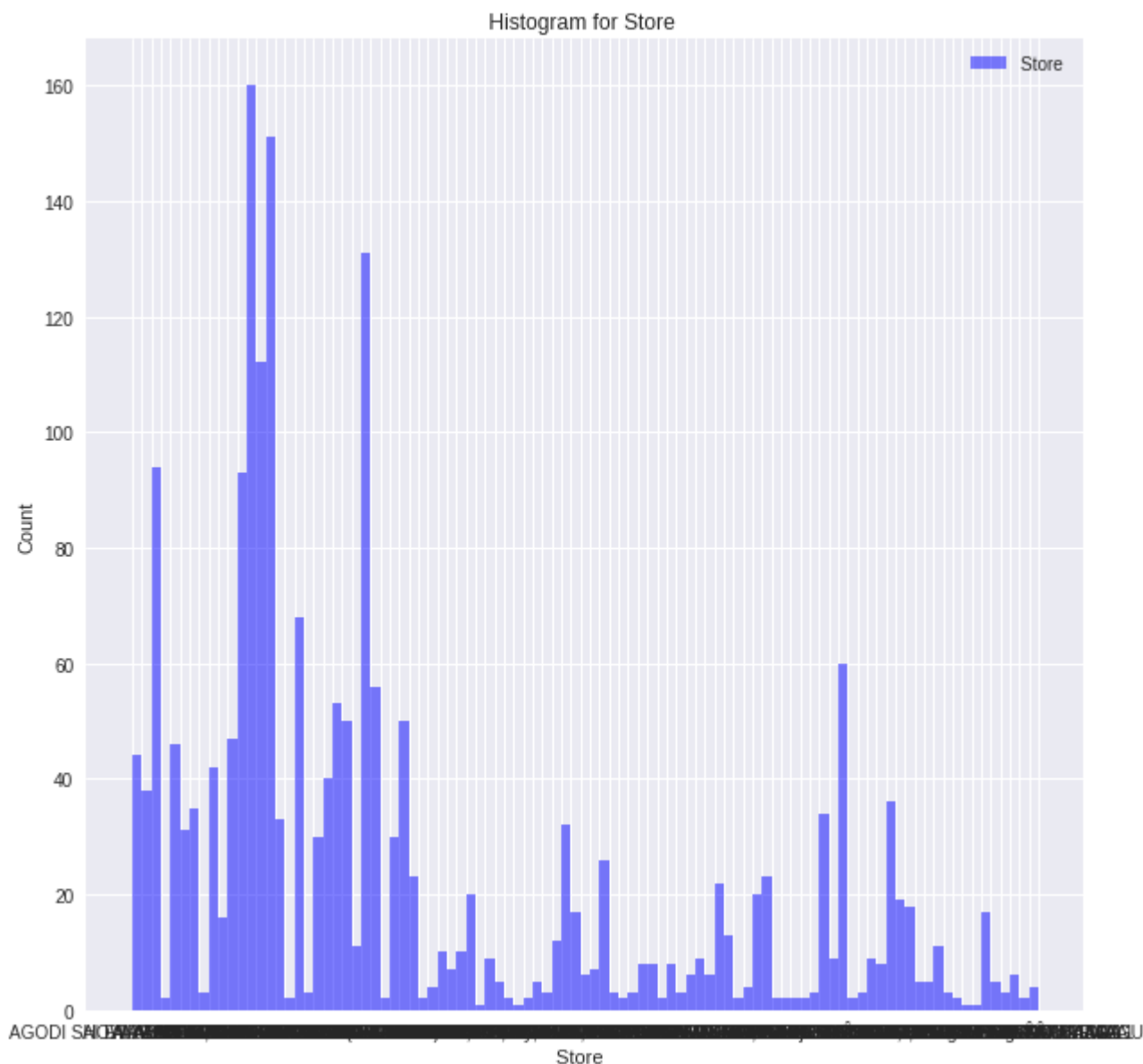
Over 50% of renewals (2269) were activated by 12 Stores out of 101 Stores.

1. AI LAGOS ILUPEJU : 277
2. AI LAGOS OBA AKRAN : 251
3. AI STORE ADEOLA ODEKU : 249
4. AI LAGOS IKORODU : 203
5. AI LAGOS LEKKI MALL : 199
6. AI ABUJA : 193
7. AI STORE RINGROAD : 180
8. AI SILVERBIRD GALLERIA : 166
9. AI LAGOS SURULERE : 164
10. AI SHOPRITE ENUGU : 143
11. AI STORE IKEJA : 123
12. AI KADUNA : 121

6. AI ABUJA : 193

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1 . AI LAGOS ILUPEJU : 160

Which stores foster loyalty in customers base?

Trends

Over 50% of renewals (1078) were activated by 12 Stores out of 96.

1. AI LAGOS ILUPEJU : 160
2. AI LAGOS OBA AKRAN : 151
3. AI STORE ADEOLA ODEKU : 131
4. AI LAGOS LEKKI MALL : 112
5. AI ABUJA : 94
6. AI LAGOS IKORODU : 93
7. AI LAGOS SURULERE : 68
8. SL IKOTUN : 60
9. AI STORE IKEJA : 56
10. AI SHOPRITE ENUGU : 53

11. AI UYO : 50

12. AI SILVERBIRD GALLERIA : 50

Summary

We explored data present in the inputs and provided suggestions for underlying trends observed in.

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