Loans and Communication

Name: Akhilesh Kumar Mishra

Email : akhilesh857@gmail.com

Introduction

Part - A (**File - Portfolio_data**)

Portfolio data file contains attribute

1. Loan Number - It is uniquely assigned to each loan borrower. Number of values is **15962.**
2. Due date - Date of due of loan repayment..
3. State - In which state the loans granted in .Total Unique States are **35.** (including union territories also)
4. Dob - Date of birth of each customer. **Missing DOB for the Loan Number 1802690.**
5. Amount - Loan amount given to the customer.

Sample:

Loan Number	Due Date	State	DOB	AGE	Loan Amount
1003431	31/10/2022	KARNATAKA	09/02/1987	36	240,000.00
1004356	31/10/2022	MAHARASHTRA	23/05/1994	28	56,000.00
1004464	11/01/2022	UTTAR PRADESH	01/12/1996	26	50,000.00
1004626	11/01/2022	KERALA	14/07/1995	27	63,000.00

Part - B (**File - Communication History**)

Communication history file contains the call details . Attributes are

1. Loan Number - The loan numbers of customers who are contacted. **For 9 loan numbers** present **in** the **Communication History file** there is **No reference** found **in** the **Portfolio data file.**

   Also Loan Number 1631580 is duplicate.

   Note: Loan number 167807 was followed by 1234 i.e, 1678071234 , for the same formatting of all loan numbers '1234' has been omitted.

Loan Number
1674807
1673460
1631580
1610049
1529066
1531307
989341
1646538
1690791

2. Campaign ID - Unique campaign iDs present are **40.**
3. Communication Message operator id.
4. Call time - Changed to date and time.
5. Status - Status of the loan i.e, completed or not completed.

Sample:

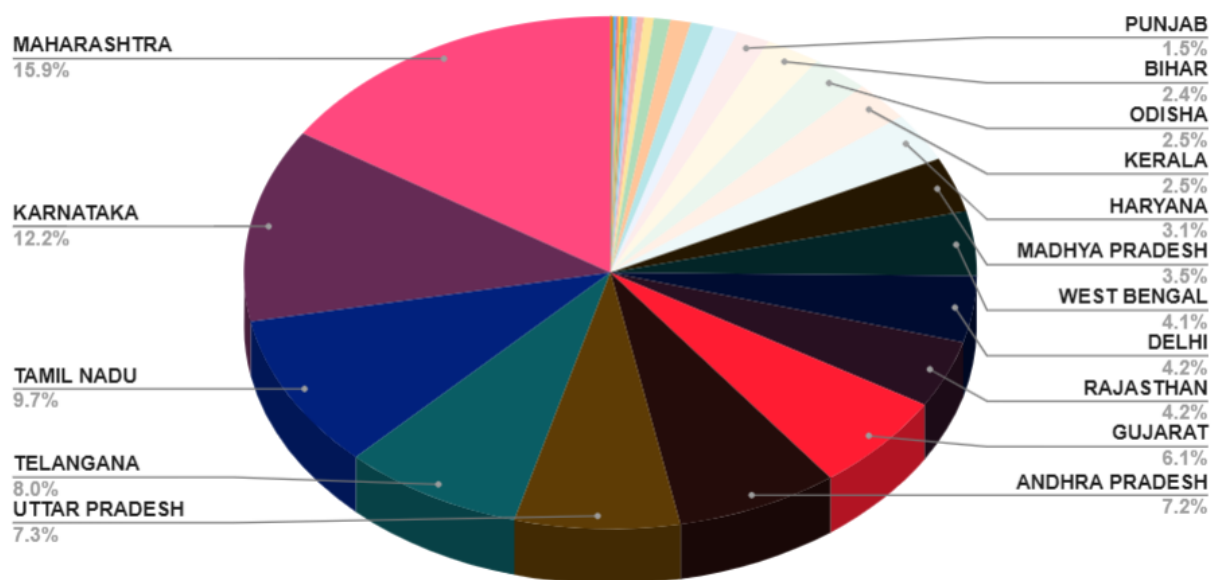| Loan Number	Campaign ID	Communication Operator Message ID	Call time	Duration	Status
1674807	161584404	21a1f7b1ce4d23d558e300626d5016c2	2022-12-02	02:59:40.973Z	completed
1673460	161584404	edecb5cd796826ef8bcde2f4814f16c2	2022-12-02	03:57:51.335Z	completed

1. Distribution of loans across different states

Total States(including UTs) - **35**

Total Loan Amount granted = **117,517,989.55**.

Loan Percentage for each State

MAHARASHTRA 15.9%	PUNJAB 1.5%
KARNATAKA 12.2%	BIHAR 2.4%
TAMIL NADU 9.7%	ODISHA 2.5%
TELANGANA 8.0%	KERALA 2.5%
UTTAR PRADESH 7.3%	HARYANA 3.1%
	MADHYA PRADESH 3.5%
	WEST BENGAL 4.1%
	DELHI 4.2%
	RAJASTHAN 4.2%
	GUJARAT 6.1%
	ANDHRA PRADESH 7.2%

MAXIMUM LOAN BY - **MAHARASHTRA(15.9%)**   **₹18,638,531.10**

MINIMUM LOAN BY - **MIZORAM (0.01%)**   **₹7000**

States	Loan Amounts	Percentage
Mizoram	7,000.00	0.01%
DADRA & NAGAR HAVELI	10,017.00	0.01%
ANDAMAN & NICOBAR ISLANDS	15,000.00	0.01%
DAMAN & DIU	24,028.00	0.02%
Sikkim	70,171.00	0.06%
Manipur	87,017.00	0.07%
Arunachal Pradesh	100,402.00	0.09%
Meghalaya	113,782.00	0.10%
Nagaland	114,148.00	0.10%
TRIPURA	148,028.00	0.13%
Pondicherry	206,220.00	0.18%
Goa	223,281.00	0.19%
Chandigarh	231,132.00	0.20%
JAMMU & KASHMIR	366,373.00	0.31%
HIMACHAL PRADESH	518,303.00	0.44%
UTTARAKHAND	847,421.00	0.72%
JHARKHAND	1,064,243.00	0.91%
CHATTISGARH	1,192,000.00	1.01%
ASSAM	1,285,826.00	1.09%
PUNJAB	1,728,343.00	1.47%
BIHAR	2,873,866.00	2.45%
ODISHA	2,942,516.00	2.50%
KERALA	2,976,789.00	2.53%
HARYANA	3,623,944.45	3.08%
MADHYA PRADESH	4,078,226.00	3.47%
WEST BENGAL	4,766,672.00	4.06%
DELHI	4,916,281.00	4.18%
RAJASTHAN	4,971,278.00	4.23%
GUJARAT	7,220,218.00	6.14%
ANDHRA PRADESH	8,440,482.00	7.18%

UTTAR PRADESH	8,562,052.00	7.29%
TELANGANA	9,393,213.00	7.99%
TAMIL NADU	11,422,095.00	9.72%
KARNATAKA	14,339,091.00	12.20%
MAHARASHTRA	18,638,531.10	15.86%
Total	**117,517,989.55**	

There are 35 states in total to which the loan was granted. Maximum loans were granted in Maharashtra state with the total being ₹ 18,638,531 and the least number of loans were granted in the state of Mizoram i.e, only ₹ 7000.

3 states with maximum amount of loans are :

1. Maharashtra
2. Karnataka
3. Tamil Nadu

3 states with least loan amount granted are :

1. Mizoram
2. Dadra and Nagar Haveli
3. Andaman & Nicobar Island

There are two states in which the loans have not be given :

1. Ladakh
2. Lakshadweep

The population can be a factor affecting the loan granted. States with least loan amount granted are the states with very less population when compared with the states like Maharashtra and Karnataka that have very high populations.

2. <u>Distribution of loans across different amounts</u>

- Maximum Individual loan Granted is ₹ 240,000 in the state of Karnataka.
- Minimum Individual Loan Granted is ₹ 3000 which is granted in many states like Maharashtra , Andhra Pradesh , Rajasthan and more.
- Average loan granted is ₹7,362.5

Loan Amount Distribution (in the whole):

Interval = 20000

Amount Interval	Frequency
0-20000	15537
20000-40000	300
40000-60000	109
60000-80000	11
80000-100000	2
100000-120000	1
120000-140000	1
140000-160000	0
160000-180000	0
180000-200000	0
200000-220000	0
220000-240000	1

Frequency vs Amount Interval
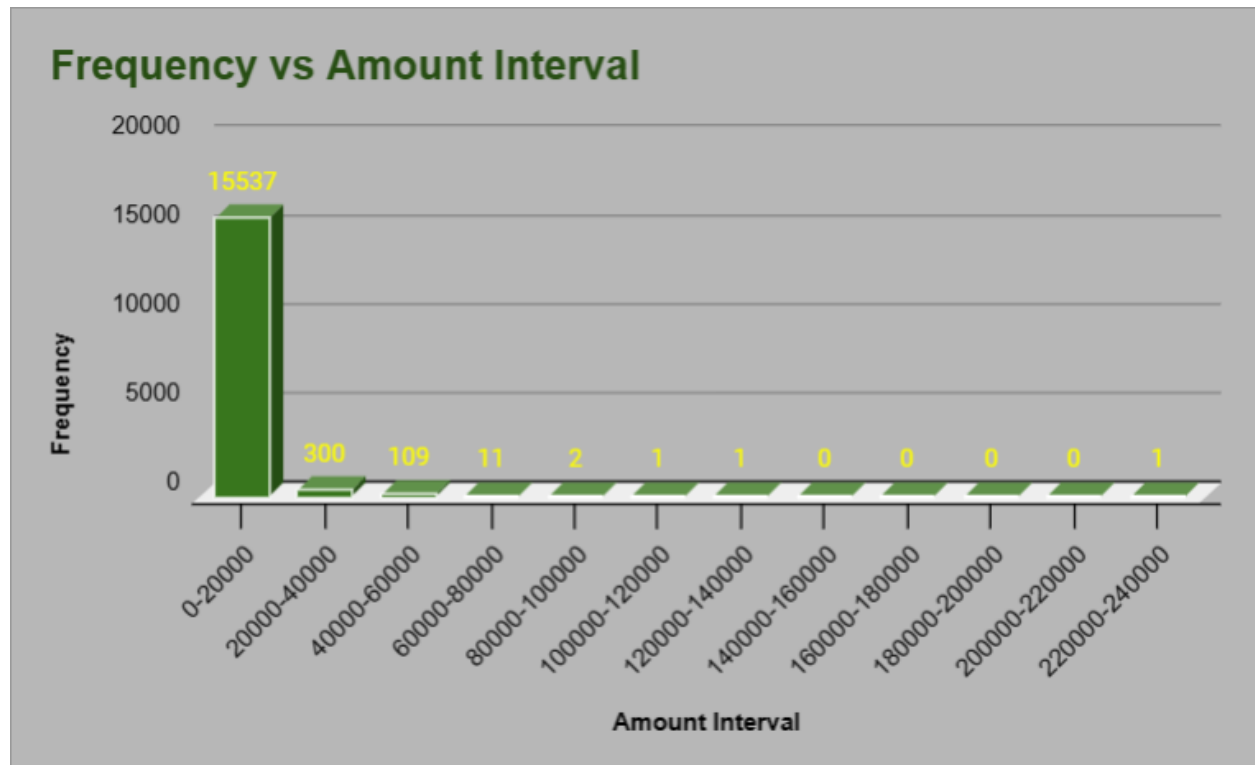
Most of the Loans are given in the range of ₹ 0-20000

Therefore, Inside the range 0-20000 the distribution is:

| Amnt INT	freq
0-4000	477
4000-8000	13078
8000-12000	968
12000-16000	532
16000-20000	482

Frequency vs Amnt Interval
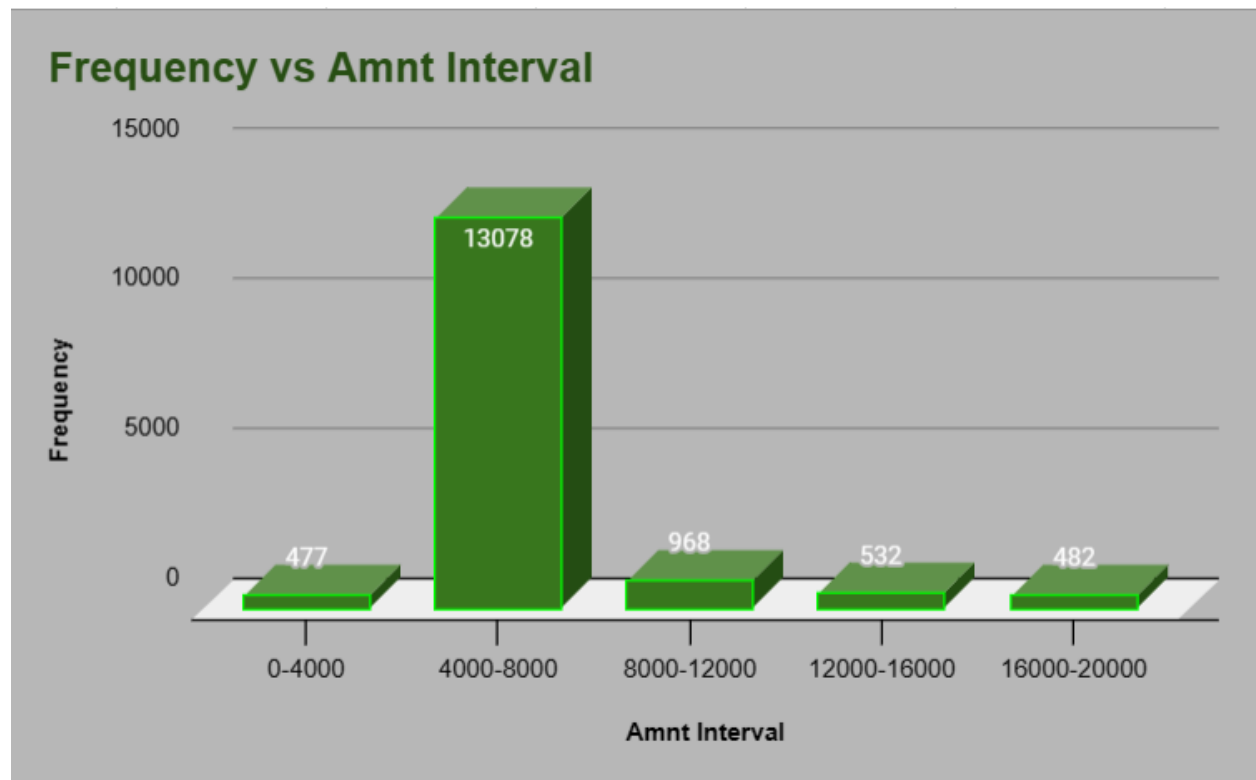
- Maximum number of loans are granted in the range ₹ 4000 - 80000.

- Of the total loan granted the major part of loan granted is in the interval ₹4000-8000. The maximum loan is above 2 lakhs but it is one of its type. There is no loan granted in the range of 1.4 lakhs to 2.2 lakhs and only one loan of 2.4 lakhs.

- After 60k the loans granted are very less.
- Maximum loans are below 60k only.

3. <u>Distribution of customers by age</u>

- Minimum Age of Customer to whom the loan was given : **16 years**
- Maximum Age of customer to whom the loan was give : **79 years**

Age distribution (taking gap of 10 years):

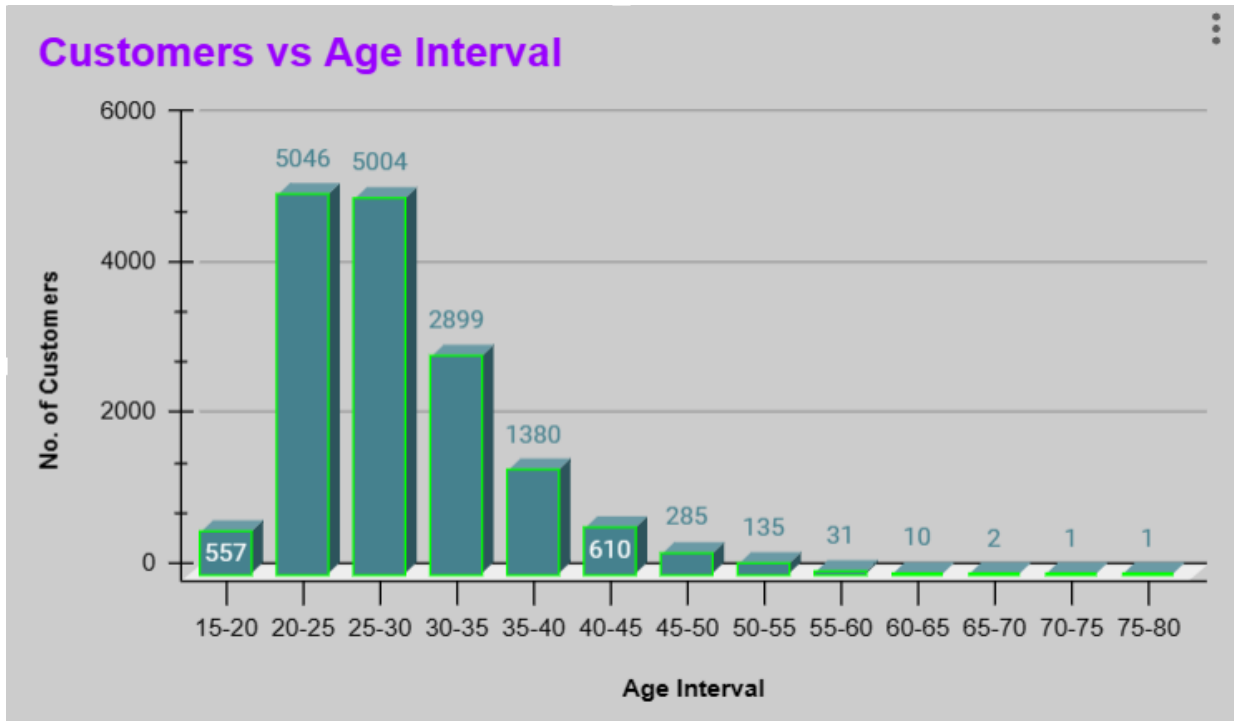| Age Interval	No. of Customers
10-20	557
20-30	10050
30-40	4279
40-60	1061
60-70	12
70-80	2

Customers vs AGE interval
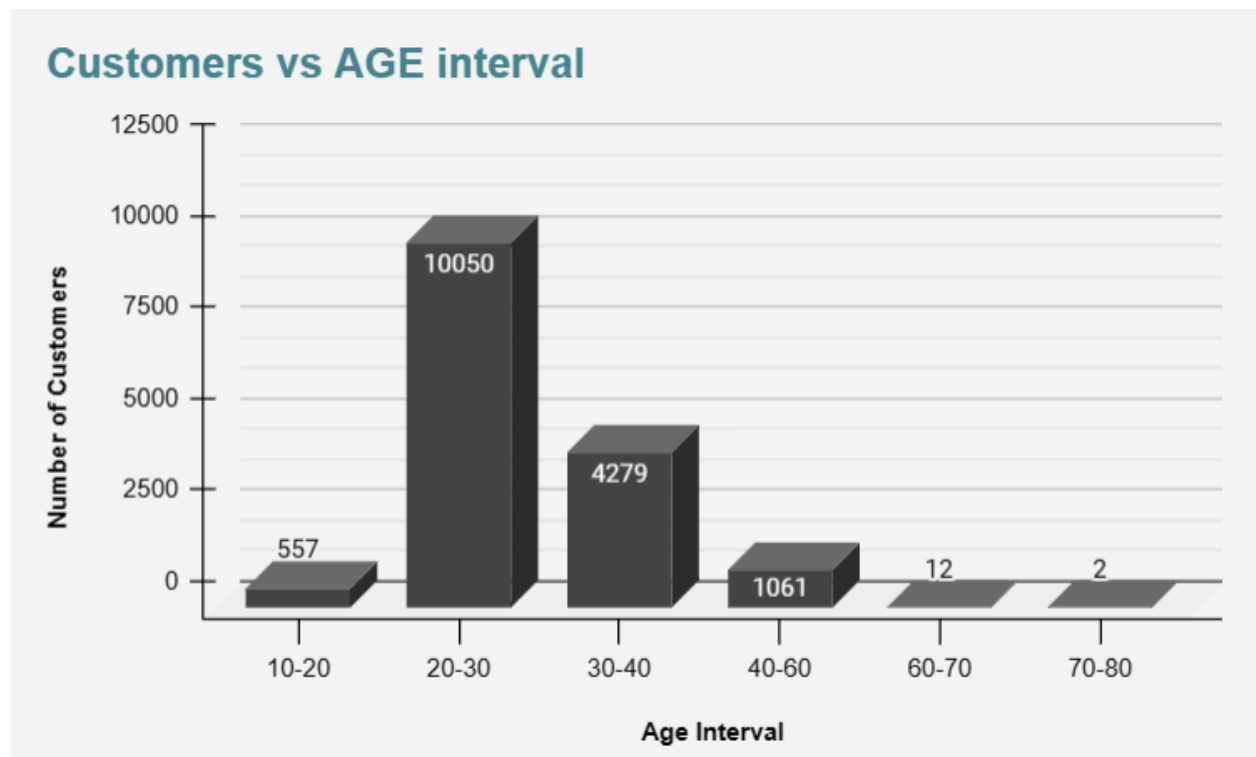
Most of the customers belong to the age group of 20- 30 years.

(Exact number : 10050)

To make it more clear, the age interval can be taken as 5 years.

Age Interval	No. of Customers
15-20	557
20-25	5046
25-30	5004
30-35	2899
35-40	1380
40-45	610
45-50	285
50-55	135
55-60	31
60-65	10
65-70	2
70-75	1
75-80	1

Color pattern is dark - More number of customers and gradually decreasing with the values.

Customers vs Age Interval

Age interval taken as 5 :

1. Most customers are from the age group 20 - 25 years .
2. After 30 years of age the customers decrease at a rapid pace.
3. But after 30 years of age also the potential customer base is there till the age of 45 years.

4. Distribution of Loan by due dates

There are 30 unique due dates.

Unique Dates	Loan Amount
31/10/2022	296000
11/01/2022	6047587
11/02/2022	7058964
11/03/2022	5692179
11/04/2022	6075193
11/05/2022	5906232
11/06/2022	5473140
11/07/2022	3745920
11/08/2022	3843598
11/09/2022	3342970
11/10/2022	3936222
11/11/2022	3711073
14/11/2022	4191028
15/11/2022	3555207
16/11/2022	3668100
17/11/2022	4366250
19/11/2022	7060728
20/11/2022	5239681
21/11/2022	4294134
22/11/2022	3063331
23/11/2022	2729147
24/11/2022	3287582
25/11/2022	7576115
26/11/2022	329841.55
27/11/2022	392570
28/11/2022	433765

18/11/2022		4572188
11/12/2022		3927319
13/11/2022		3344368
29/11/2022		357557
Total due Amount		**117517989.6**

For minimum - Green

For 50 percentile - Yellow

For Maximum - Red

By above data :

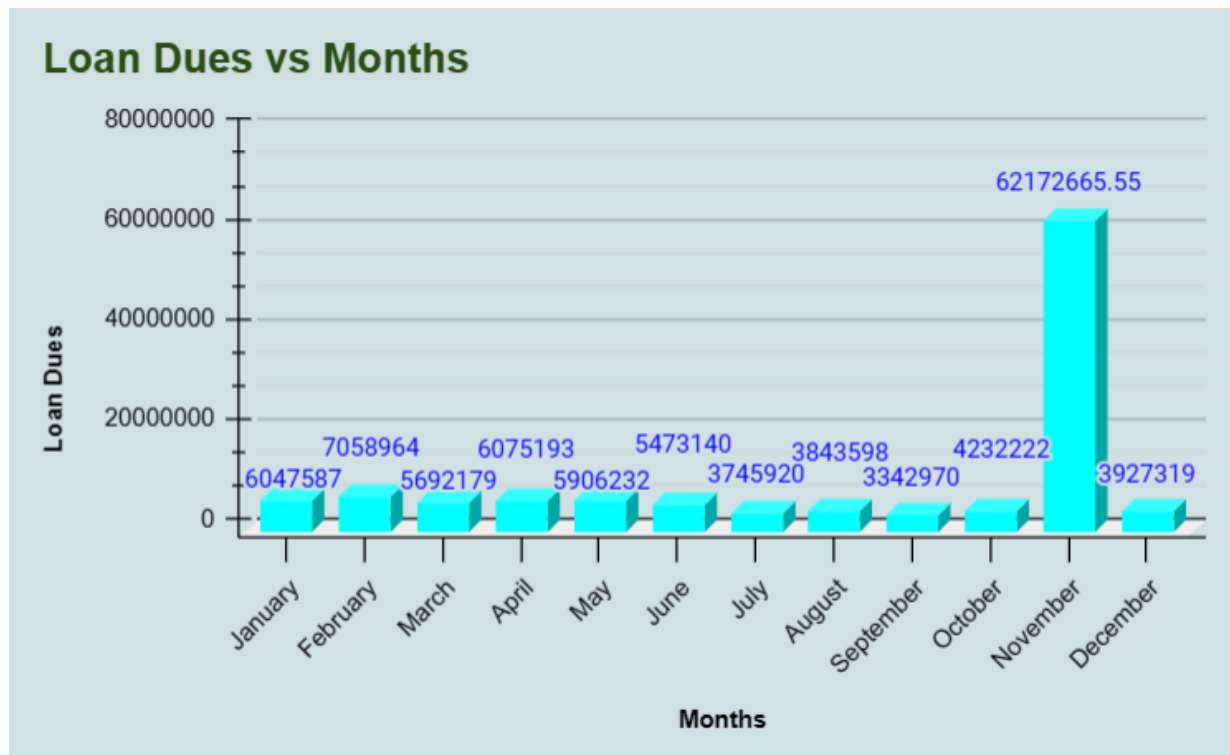1. Most of the due dates are in the month of November.
2. 2 due dates lie in the month of october.
3. In the rest of the months there is only one due date for the loans.

For getting the more insights of the data the due dates can be clubbed in the months in which they are lying.

Months vs the loan amount due.

Months	Loan Dues
January	6047587
February	7058964
March	5692179
April	6075193
May	5906232
June	5473140
July	3745920

August	3843598
September	3342970
October	4232222
November	62172665.55
December	3927319
Total	117517989.6

Loan Dues vs Months

Insights :

1. Most of the loan due dates are in the month of november.

    Exact Number : ₹ 62172665.5

    Which makes 60% of the loan due in November.

2. For the rest of the months the loan dues do not vary very much.
3. Least due loan is in the month of september.

    Exact Number : ₹ 3342970

5. Unique Number of customers contacted every day

Note : This part of analysis includes those 9 *records mentioned in the Introduction part B(File - Communication History), Page No. 3. Those records are included because the status shows 'complete' and the customers have been contacted.*
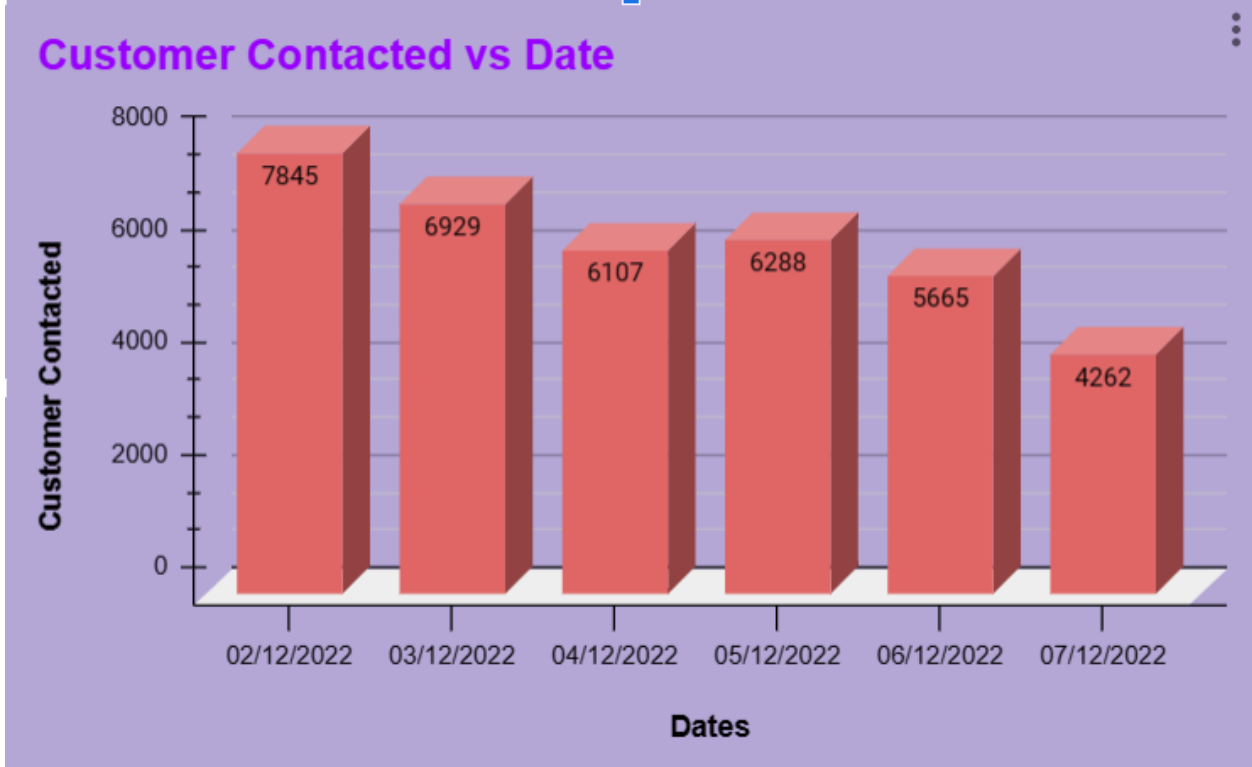
Total unique customers contacted are 11220

The data of communication is present only for the 6 days.

Date	Count
02/12/2022	7845
03/12/2022	6929
04/12/2022	6107
05/12/2022	6288
06/12/2022	5665
07/12/2022	4262
Total Unique Loan_number	11220

- Most customers are contacted on 2/12/2022 i.e, on Friday.
- Least customers are contacted on 7/12/2022 i.e, on Wednesday

Out of 15962 records present in the Portfolio data file plus the 9 records which are not present in file 1 only 11220 customers have been contacted in the 6 days of communication campaign.

Customer Contacted vs Date

Date	Customer Contacted
02/12/2022	7845
03/12/2022	6929
04/12/2022	6107
05/12/2022	6288
06/12/2022	5665
07/12/2022	4262

6. Unique Number of customers NOT contacted every day

- Total Unique customers contacted are 11220.
- Out of contacted i.e, 11220 NOT contacted are :

| Date	Not_Counted(in Contacted)
02/12/2022	3375
03/12/2022	4291
04/12/2022	5113
05/12/2022	4932
06/12/2022	5555
07/12/2022	6958
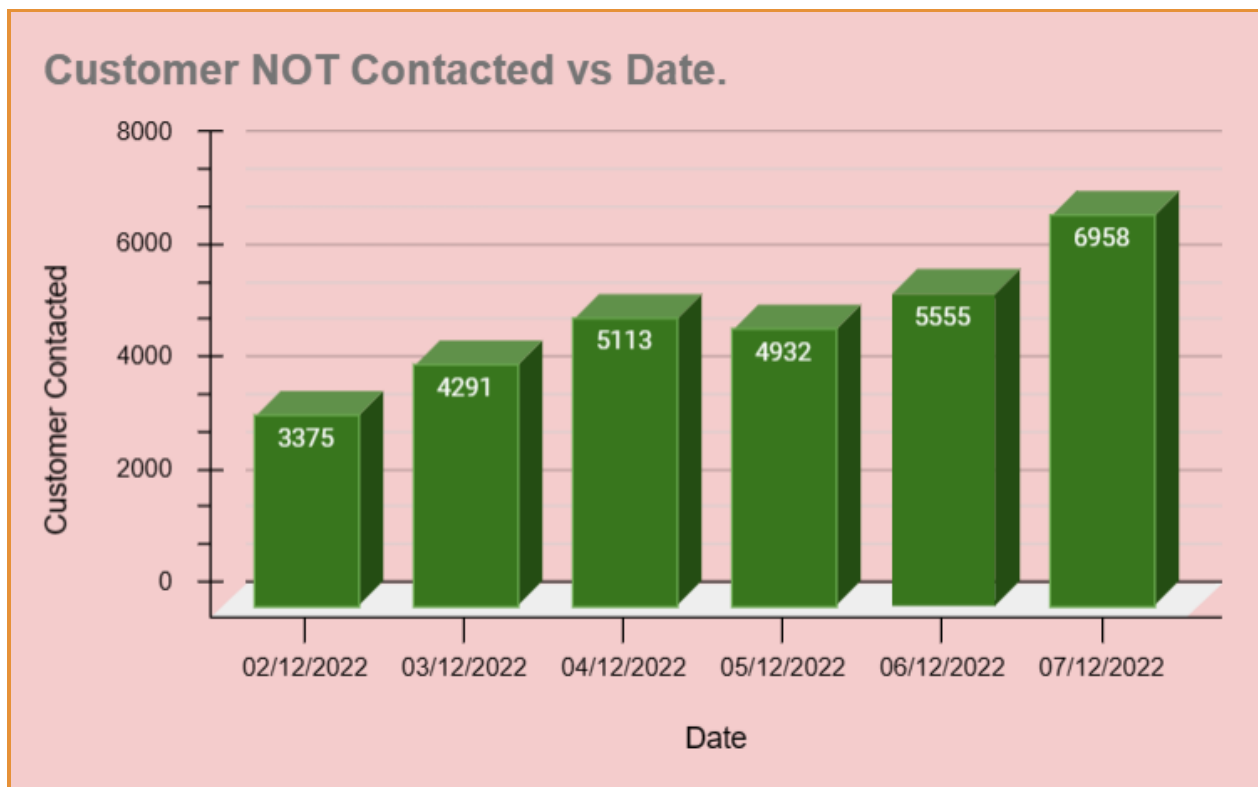
The insights are just opposite of what 'customers contacted' before.

For the **Total customers** that are 15962 + 9 customers.(Page 2 ref.)

Customers **not contacted out of all** the customers.

Date	Not_counted(ALL)
02/12/2022	8126
03/12/2022	9042
04/12/2022	9864
05/12/2022	9683
06/12/2022	10306
07/12/2022	11709

Not_Contacted (ALL) vs Date.
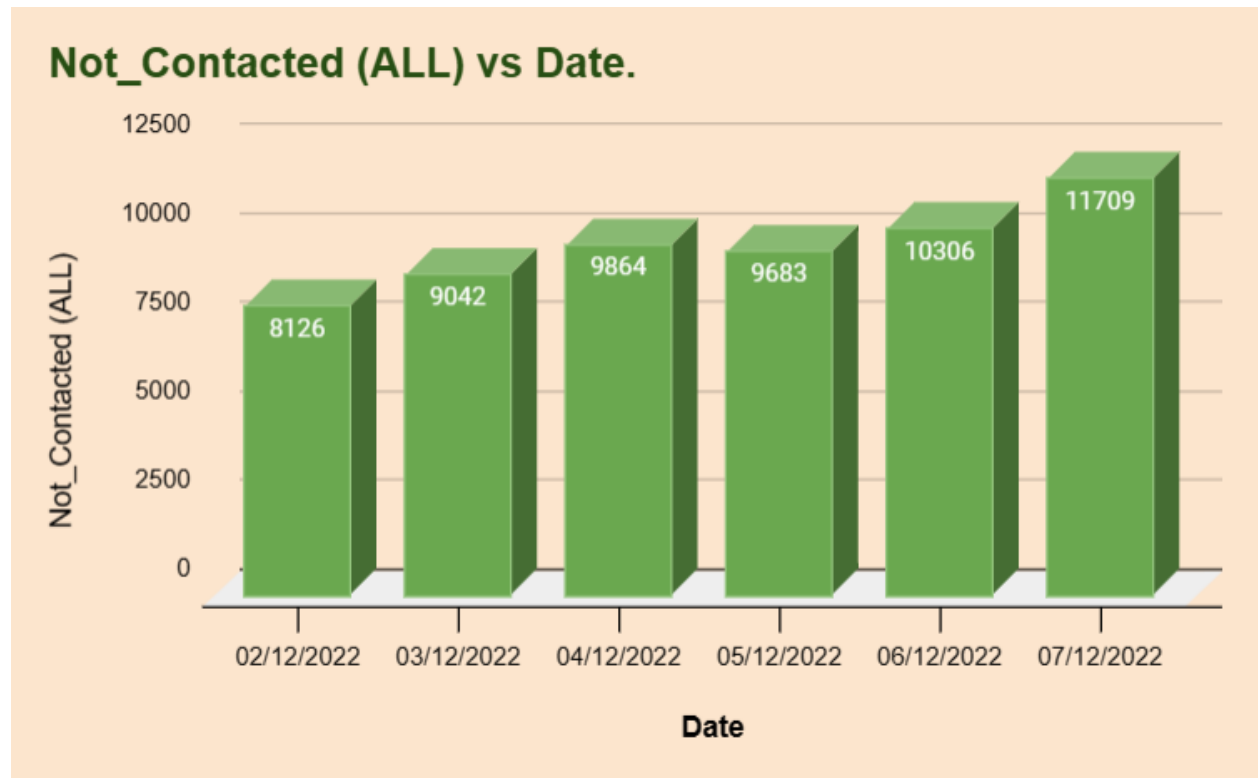
In total, 4751 customers were not contacted.

I.e, **out of 15962 + 9** customers only **11220** customers are contacted.

7. Customers who have been contacted the MOST

The frequency of contacting a customer ranges from 38 to 1.

Most contacted Customers are :

(limit only 10 records)

Unique Loan Numbers	Freq_Contacted	loan_amt_given	State
1659081	38	5,100.00	GUJARAT
1580447	30	7,028.00	HARYANA
1542440	28	15,000.00	BIHAR
1564892	28	5,020.00	MAHARASHTRA
1817574	27	7,000.00	KARNATAKA
1759399	27	7,000.00	TAMIL NADU
1625201	26	5,000.00	ODISHA
1637862	26	5,000.00	BIHAR
1814726	26	5,000.00	GUJARAT
1691978	26	5,000.00	MADHYA PRADESH

The frequency of 'contacted' gradually decreases after this with minimum going to even 1.

Frequency of Contacts vs Loan Amount
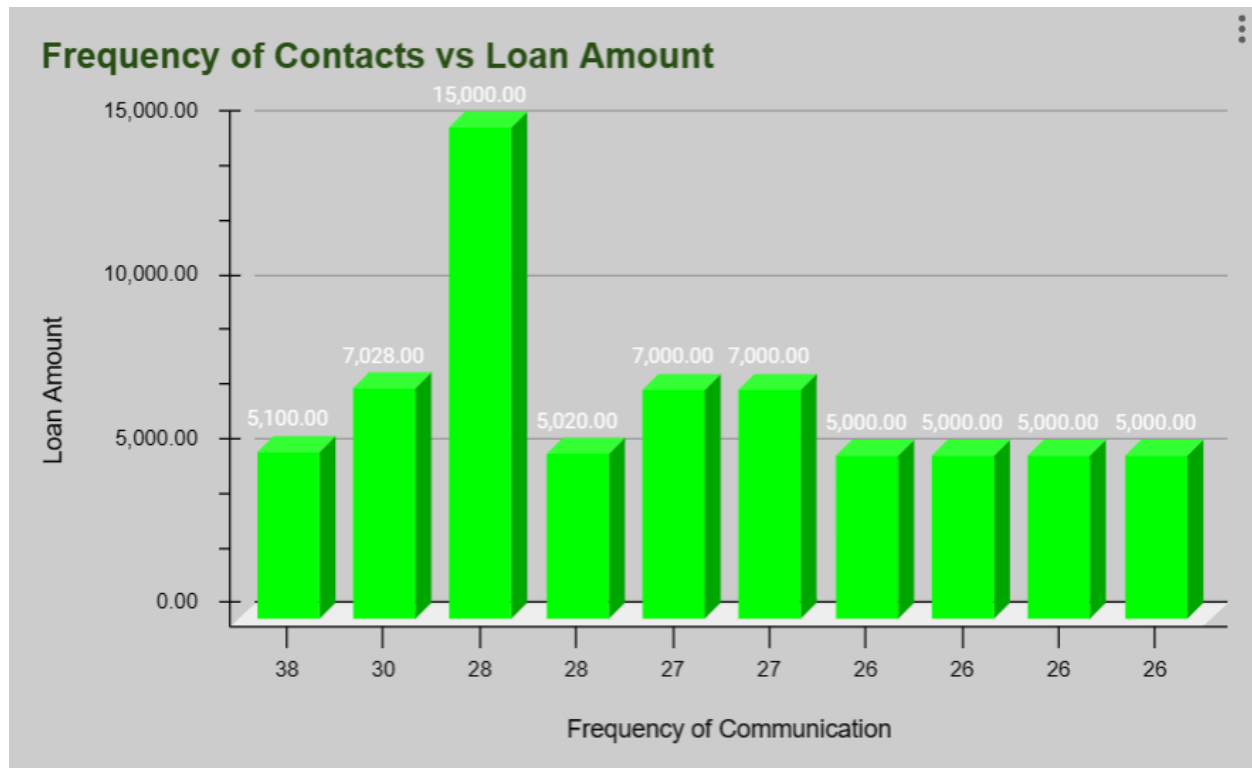
The Loan amount of 5100 has been contacted the most i.e, 38 times. It belongs to the state of Gujarat.

Tried Gaining the insights from the age of the person and due date but no such pattern exists.

Freq_Contacted	loan_amt_given	State	Age	Due_Date
38	5,100.00	GUJARAT	35	16/11/2022
30	7,028.00	HARYANA	23	11/05/2022
28	15,000.00	BIHAR	24	19/11/2022
28	5,020.00	MAHARASHTRA	33	11/01/2022
27	7,000.00	KARNATAKA	33	25/11/2022
27	7,000.00	TAMIL NADU	25	11/10/2022
26	5,000.00	ODISHA	39	11/07/2022
26	5,000.00	BIHAR	26	11/10/2022
26	5,000.00	GUJARAT	36	25/11/2022
26	5,000.00	MADHYA PRADESH	21	24/11/2022

8. <u>**Customers who have been contacted the LEAST**</u>

- The frequency of contacting a customer ranges from <mark>38 to 1</mark>.
- There are <mark>1858</mark> customers that have been <mark>contacted just once</mark>.

It also includes the Loan Numbers which are not present in the file Portfolio_data.

1674807
1673460
1553632
1610049
1690791
1646538
989341

Tried finding the pattern having relation with states, due amount and Age but no such pattern exists.

Loan Number	Freq	Amount	States	Age	Date
1665364	1	7,000.00	UTTAR PRADESH	27	17/11/2022
1667092	1	7,000.00	GUJARAT	42	18/11/2022
1728258	1	5,000.00	JAMMU & KASHMIR	28	11/03/2022
1687254	1	5,000.00	MAHARASHTRA	29	22/11/2022
1817972	1	7,000.00	MAHARASHTRA	32	25/11/2022
1559296	1	20,000.00	HARYANA	33	25/11/2022
1602837	1	5,000.00	KARNATAKA	31	11/03/2022
1517852	1	10,140.00	TAMIL NADU	31	11/03/2022
1814818	1	5,000.00	ANDHRA PRADESH	32	25/11/2022

No. of Customers vs Times Contacted
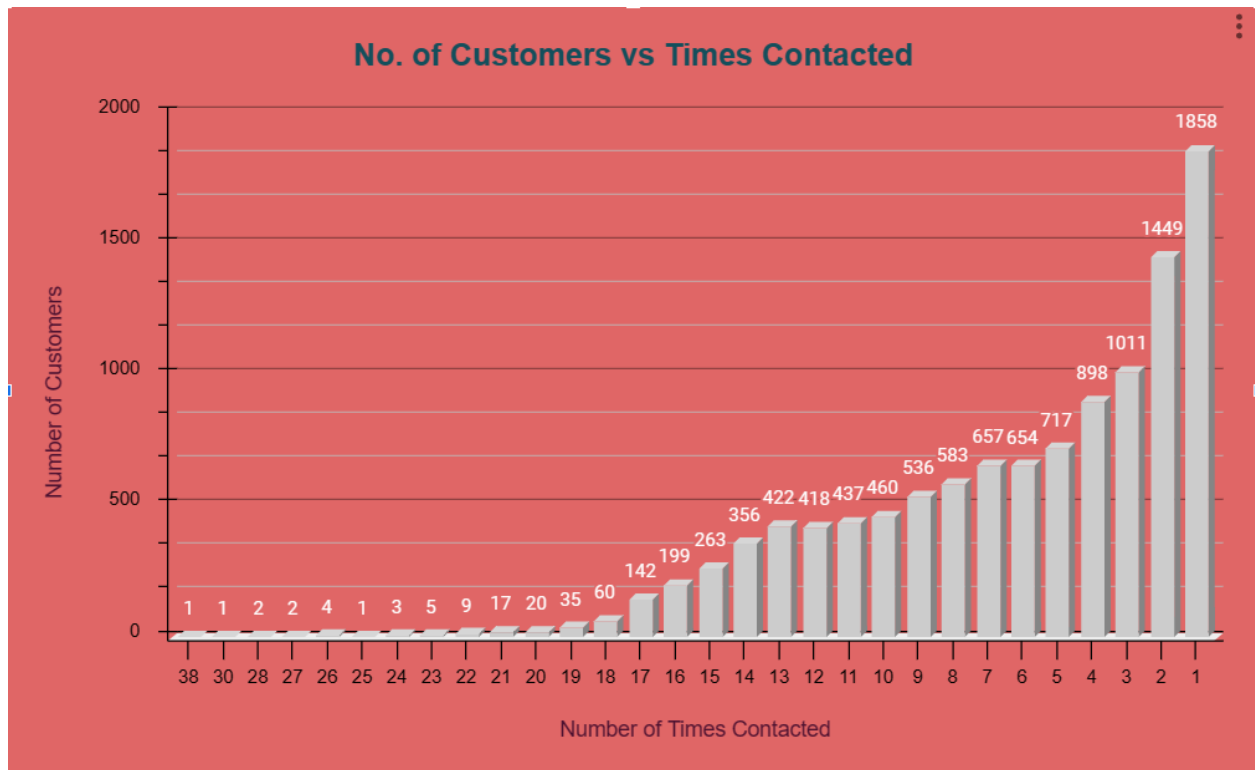
- Most of the customers have been contacted just once.

  (Exact Number : 1858)

- One customer is contacted even 38 times who has taken the loan of 5100 and belongs to Gujarat.

9. How many customers have never been reached out?

Reference from Question 6. (Page Number 17-19)

If we consider 8 Loan Numbers from the Communication history file that are not present in the Portfolio file.

- The total number of customers will be 15962 + 1 = 15971
- Total number of contacted customer are 11220(including 9 records)

In total, 4751 customers were not contacted.

I.e, out of 15962 + 1 customers only 11220 customers are contacted.

10. Distribution of calls by states.

There are 35 Unique states(including UTs).

Note : 9 records have been excluded in this part of analysis.

ALL States	Frequency of Calls
KARNATAKA	8848
MAHARASHTRA	10285
UTTAR PRADESH	5310
KERALA	1541
RAJASTHAN	3309
GUJARAT	4258
TAMIL NADU	7198
ANDHRA PRADESH	5459
ODISHA	1812
UTTARAKHAND	330
WEST BENGAL	2303
MADHYA PRADESH	2802
JHARKHAND	630
CHATTISGARH	648
HARYANA	2133
TELANGANA	6030
HIMACHAL PRADESH	212
JAMMU & KASHMIR	196
DELHI	2794
Arunachal Pradesh	13
BIHAR	1968
Chandigarh	111
PUNJAB	1124
Manipur	54
ASSAM	760
Nagaland	26

Goa		60
Meghalaya		35
Sikkim		29
Pondicherry		173
TRIPURA		93
ANDAMAN & NICOBAR ISLANDS		4
DAMAN & DIU		34
DADRA & NAGAR HAVELI		5
Mizoram		4
Total		70591

Distribution of call by states
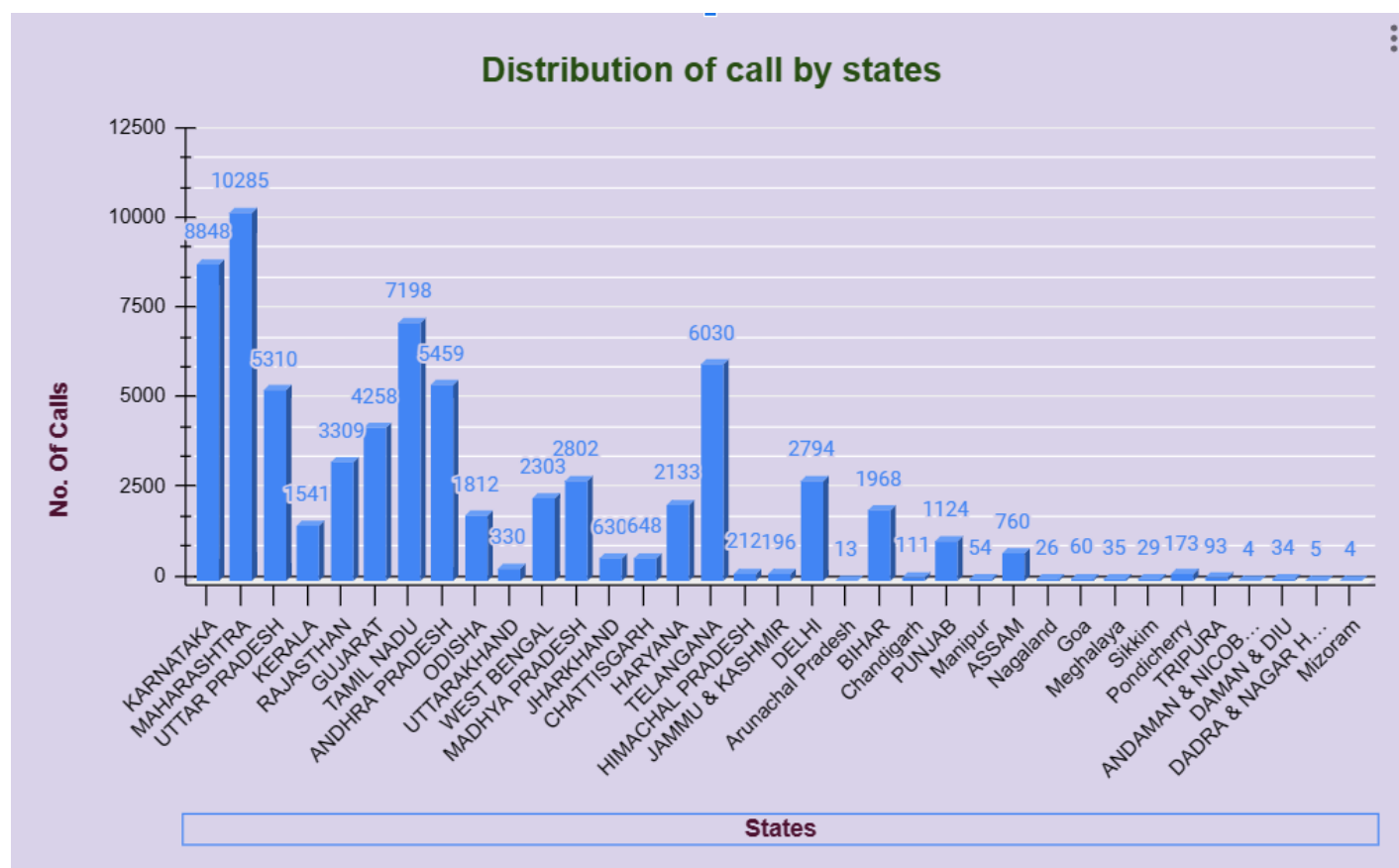
In Maharashtra the highest number of customers are contacted.

(Exact numbers = 10285)

In Mizoram and tripura least number of customers are contacted

(Exact Number = 4)

11. Distribution of calls by campaign ids.

There are 40 unique campaign ids.

Total Number of calls(Not Unique) :   70607

Campaign ID	Loan Number Contacted
135474249	1
156594506	4
161307935	4
161310463	2
161584404	3
164168595	6905
164661895	6413
165448976	1684
165448984	3736
166203285	1507
166203288	3391
166790104	3286
166790108	1467
167104481	5
167104482	3416

167104488		1068
167820915		797
167820924		2692
168389540		3106
168389543		945
168801291		3545
168801293		878
169508122		660
169508126		3014
169508129		11
170181308		3637
170181312		694
170740199		3280
170740200		554
171446611		501
171446618		3045
172117487		2973
172117491		495
172503470		1184
172503471		486
172503474		2
172948097		316
172948100		2802
173536581		1632
173536583		466

- In the campaign (16416859) most no. of customers have been contacted.
  (Exact number - 6905) .
- In the campaign (135474249) least no. of customers have been contacted.
  (Exact number - 1) .

Also in campaign ids - 156594506 , 161307935 , 172503474 ,169508129 ,161310463 and more not many customers have been contacted.
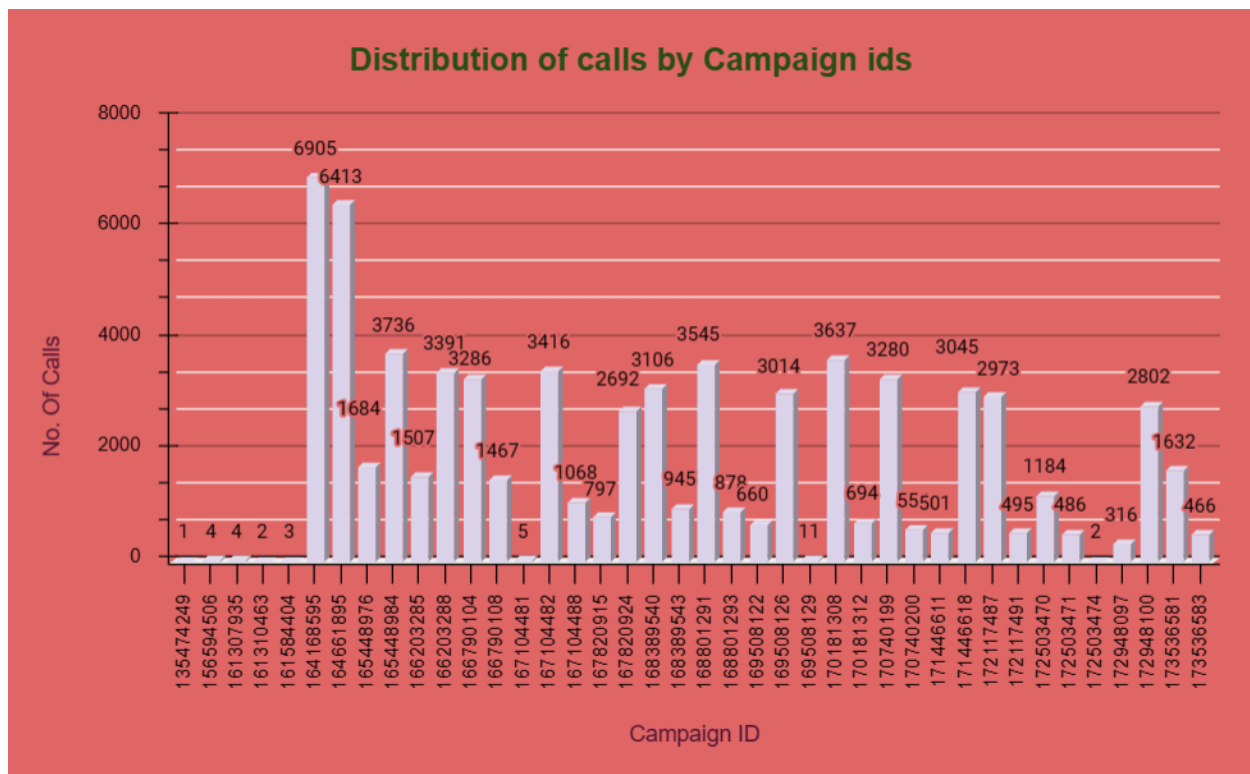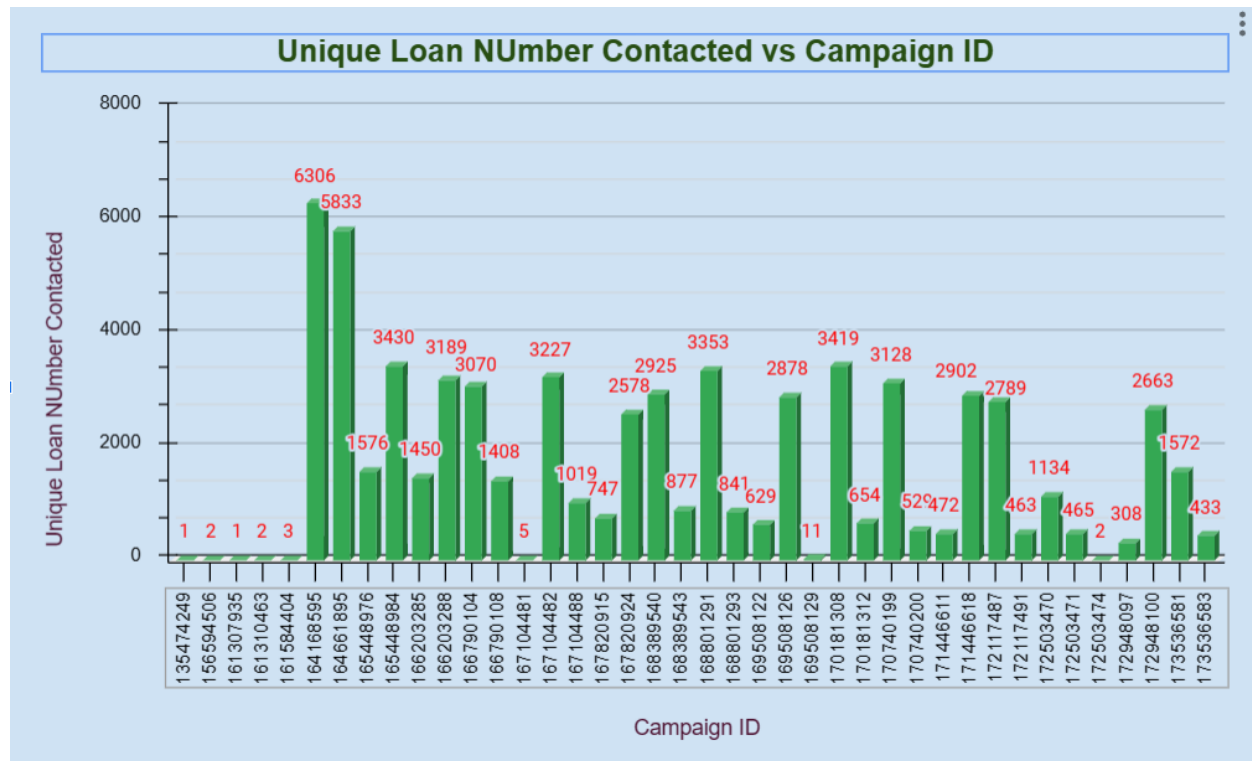
12. Unique number of customers by campaign ID .

Campaign ID	Unique Loan NUmber Contacted
135474249	1
156594506	2
161307935	1
161310463	2
161584404	3
164168595	6306
164661895	5833
165448976	1576
165448984	3430
166203285	1450
166203288	3189
166790104	3070
166790108	1408
167104481	5
167104482	3227
167104488	1019
167820915	747
167820924	2578
168389540	2925
168389543	877
168801291	3353
168801293	841
169508122	629
169508126	2878
169508129	11
170181308	3419
170181312	654

170740199	3128
170740200	529
171446611	472
171446618	2902
172117487	2789
172117491	463
172503470	1134
172503471	465
172503474	2
172948097	308
172948100	2663
173536581	1572
173536583	433

It goes with the trend of just the previous part of analysis.

- In the campaign (16416859) most no. of customers have been contacted.

  (Exact number - 6306) .

- In the campaign (135474249, 161307935) least no. of customers have been contacted.

  (Exact number - 1) .

Thanks

Name : Akhilesh Mishra