LENDING CLUB CASE STUDY

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PROBLEM STATEMENT

AIM

To identify the patterns which indicates if a person is likely to default a loan.

OBJECTIVE

Based on historic data, identify strong indicators of loan default.
Then using these driving variables at the time of loan application and understanding the risks involved.

APPROACH

Utilise EDA to undertake risk analytics in consumer finance by understanding different consumer attributes as well as loan attributes that influence the tendency of loan default.

ANALYSIS APPROACH

CLEAN DATA

Drop columns with null values, random values or single valued columns.
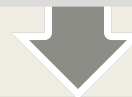
UNIVARIATE ANALYSIS

Check distributions and frequencies of various numerical and categorical variables. Create derived variables.
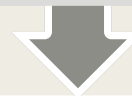
SEGMENTED UNIVARIATE ANALYSIS

Analyse variables against segments of the final variable.
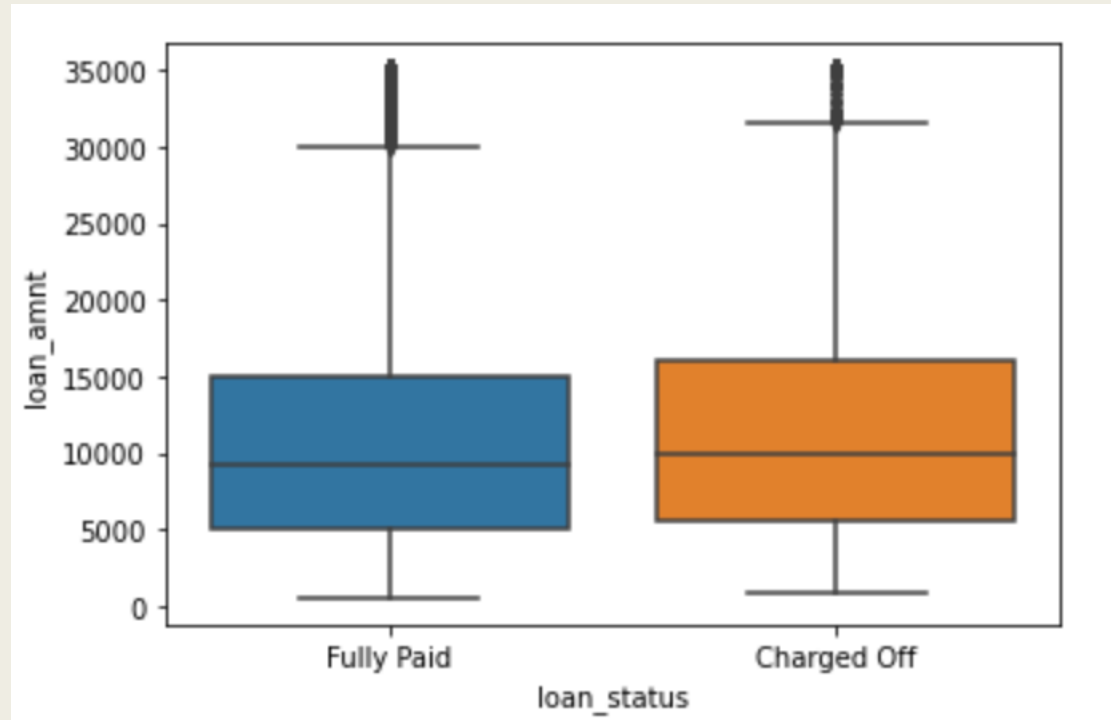
BIVARIATE ANALYSIS

Do correlation analysis. Check how two variables affect each other or a third variable. Analyse joint distributions.

SUMMARISE RESULTS
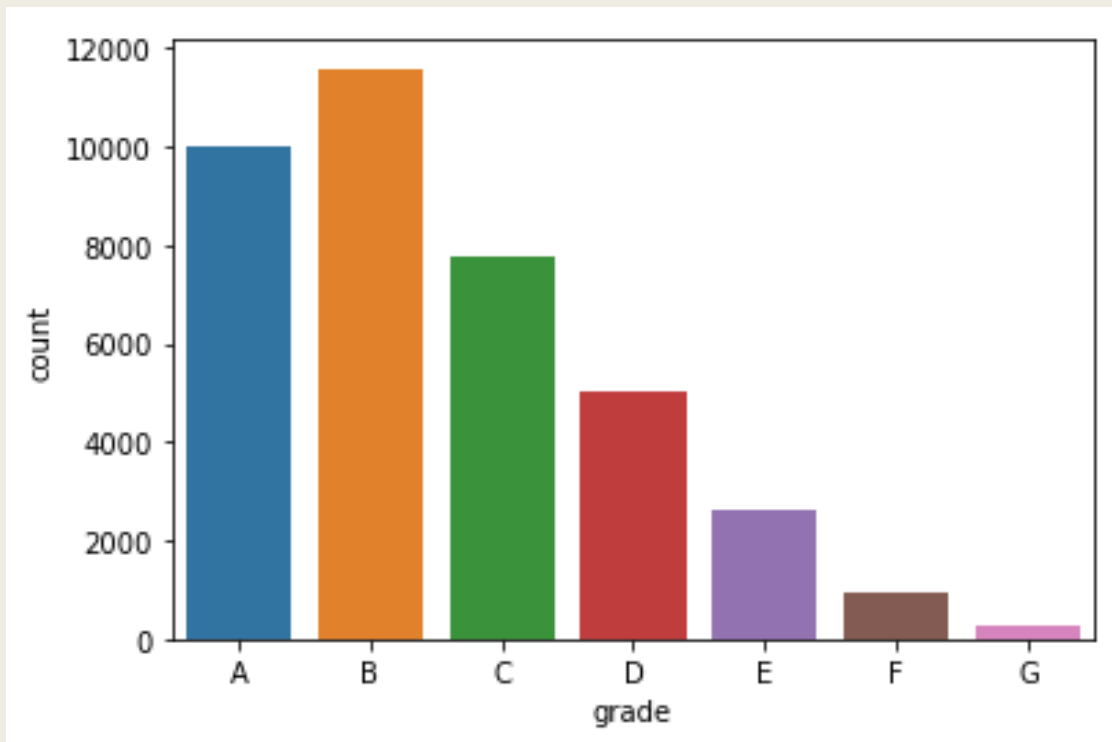
Publish insights and observations.
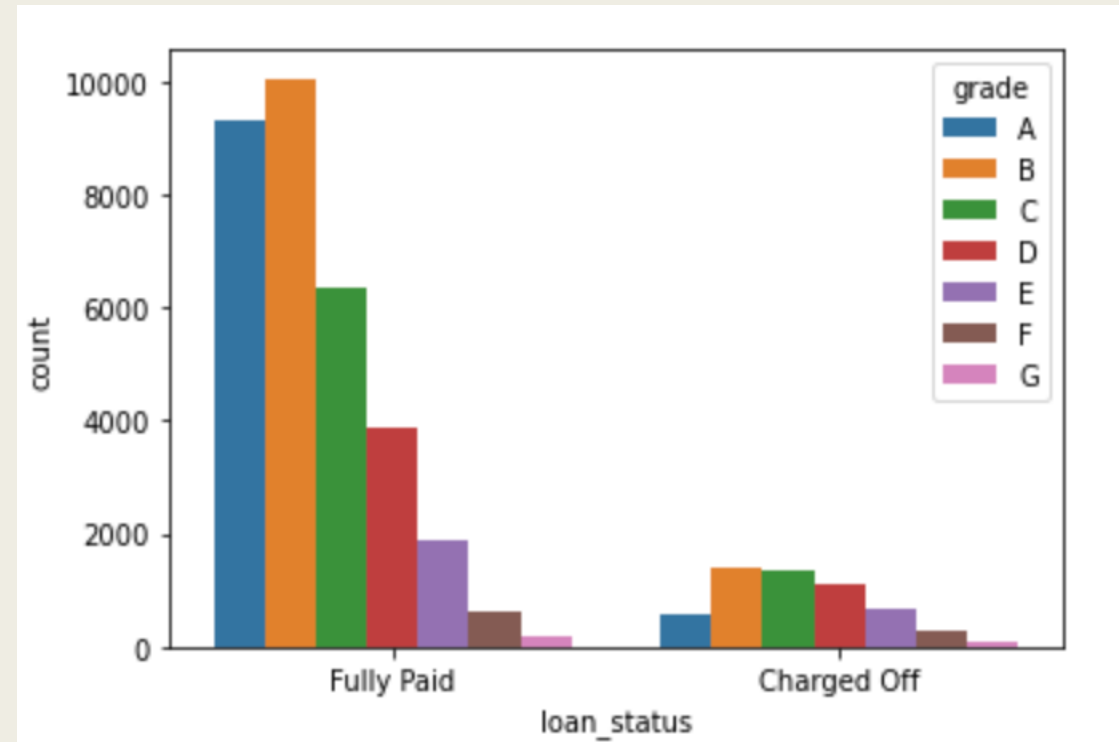
ANALYSIS – LOAN AMOUNT DISTRIBUTION

There is no variation between loan amounts in Fully Paid/ Charged Off loans.
The loan amount varies up to ~35,000 & have a mean of 10,000 in both loan status.
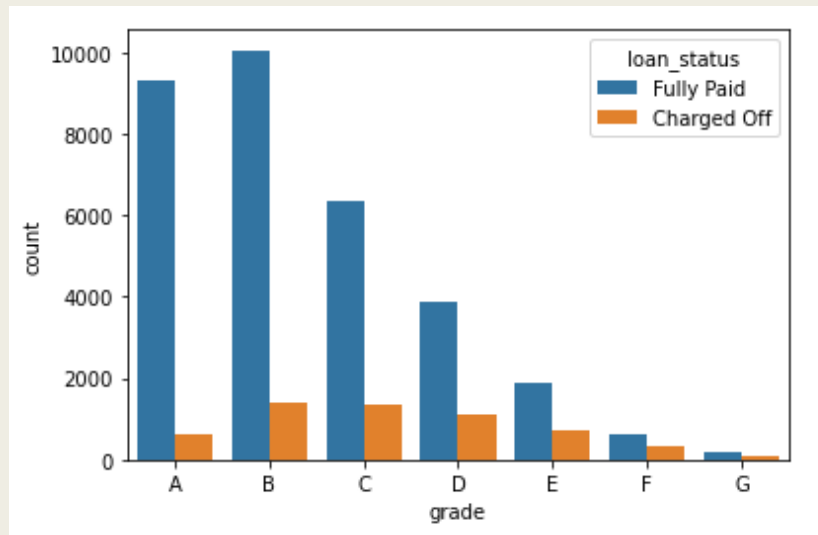
ANALYSIS – GRADES

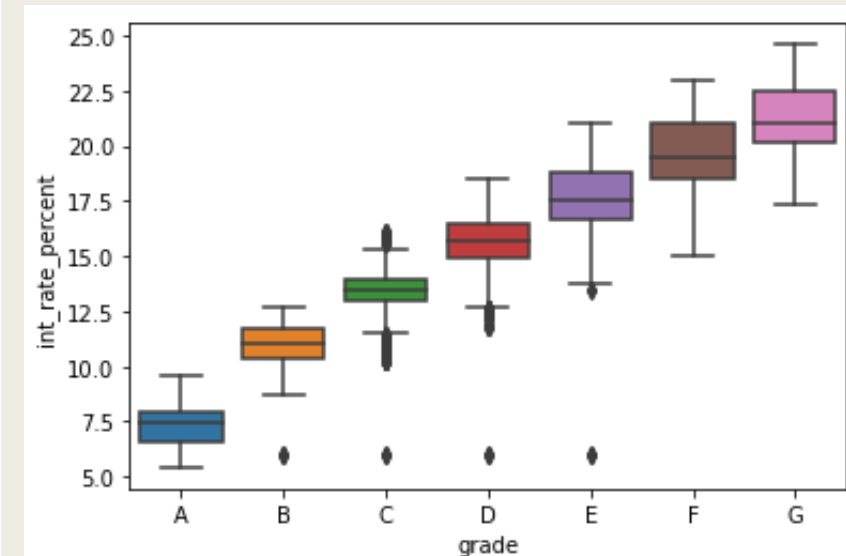Most of the loans are high graded (grade of A and B) loans, about > 50%.

Majority of the Charged Off loans are from B, C, D Grades

ANALYSIS – GRADES (continued)

loan_status	Charged Off	Fully Paid
grade		
A	6.055713	93.944287
B	12.259867	87.740133
C	17.430954	82.569046
D	22.202130	77.797870
E	27.015504	72.984496
F	32.941176	67.058824
G	34.154930	65.845070

Change of rate is increasing with the increase in Grade (from A to G).
Interest Rate is also increasing from Grade A to G, which is in parity with the increase in Charged off rate.

Analysis – Employee Experience
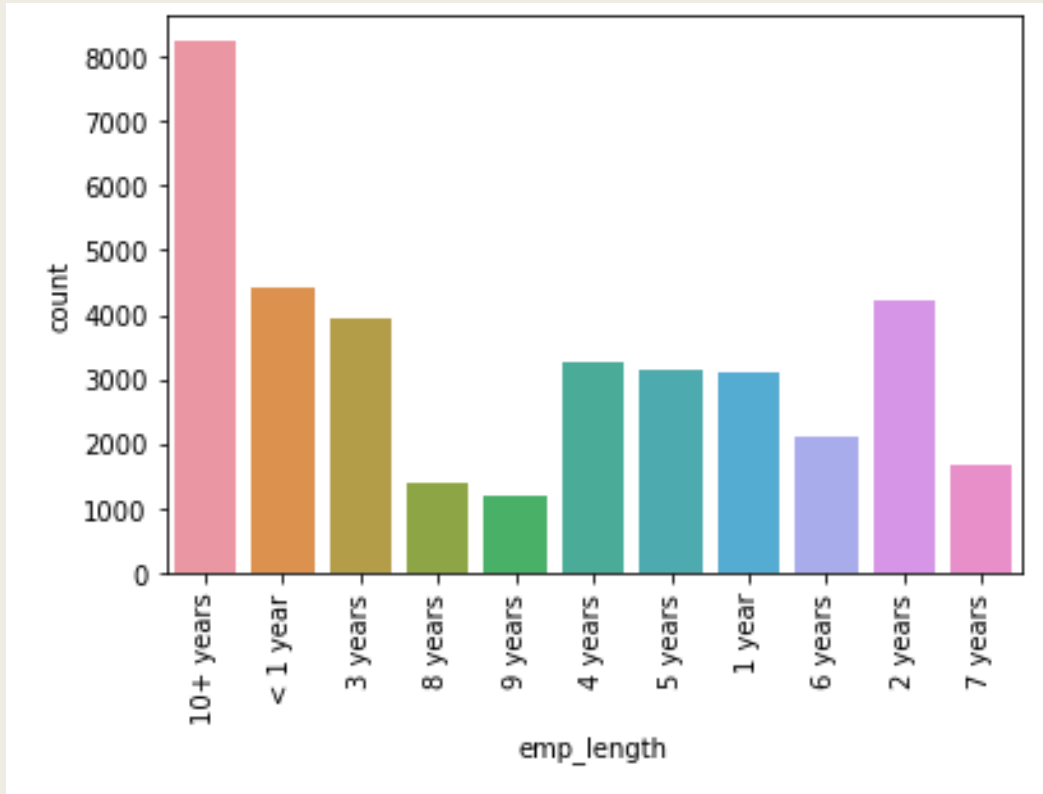
loan_status emp_length	Charged Off	Fully Paid
1 year	14.546620	85.453380
10+ years	15.827163	84.172837
2 years	13.298504	86.701496
3 years	13.905775	86.094225
4 years	13.858364	86.141636
5 years	14.372212	85.627788
6 years	14.225352	85.774648
7 years	15.489614	84.510386
8 years	14.306152	85.693848
9 years	12.956811	87.043189
< 1 year	14.211712	85.788288

Most of the loans are taken by employees with more than 10 years exp (~25%).
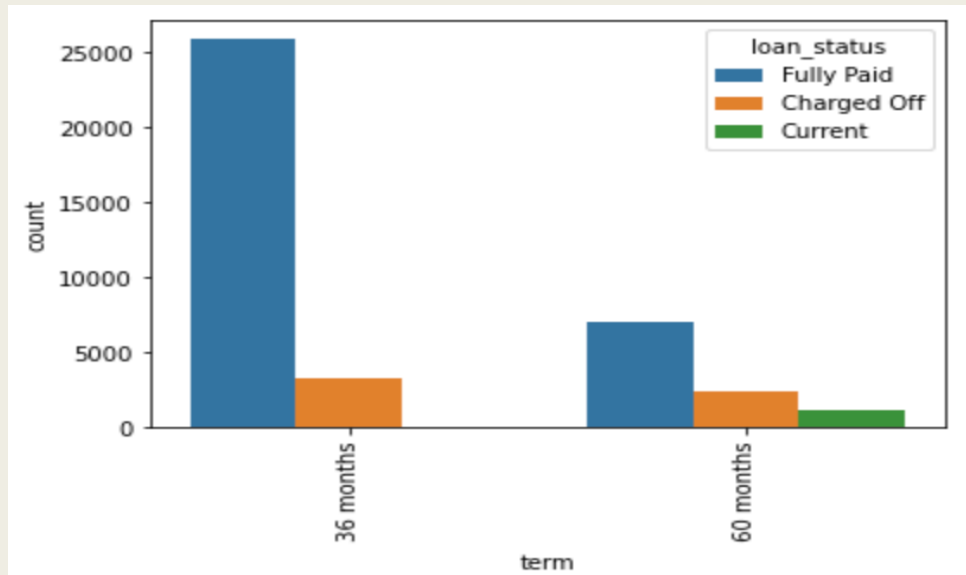But Charge-off rate across all the categories is same.

ANALYSIS – DTI (Debt to Income Ratio)

| dti_bin	0-5%	5-10%	10-15%	15-20%	20-25%	25-30%
loan_status						
Charged Off	12.384632	12.879086	14.643423	15.753896	17.0255	14.009662
Fully Paid	87.615368	87.120914	85.356577	84.246104	82.9745	85.990338
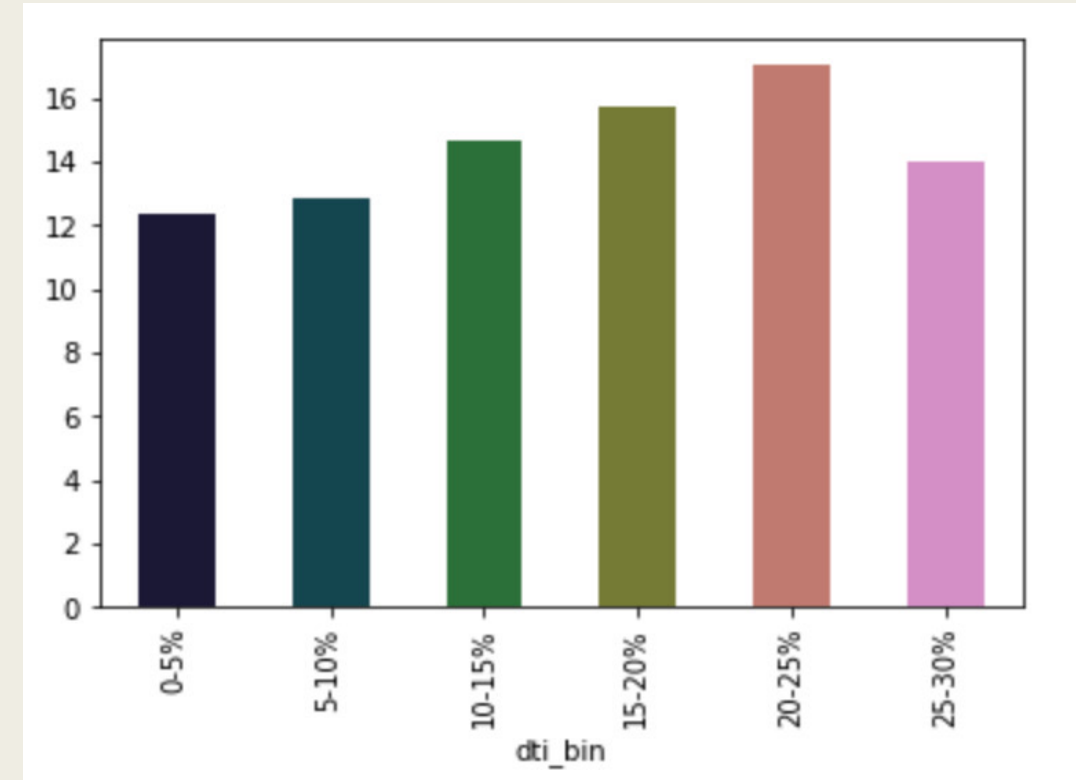
Charge-off Percentage is increasing with the increase in DTI
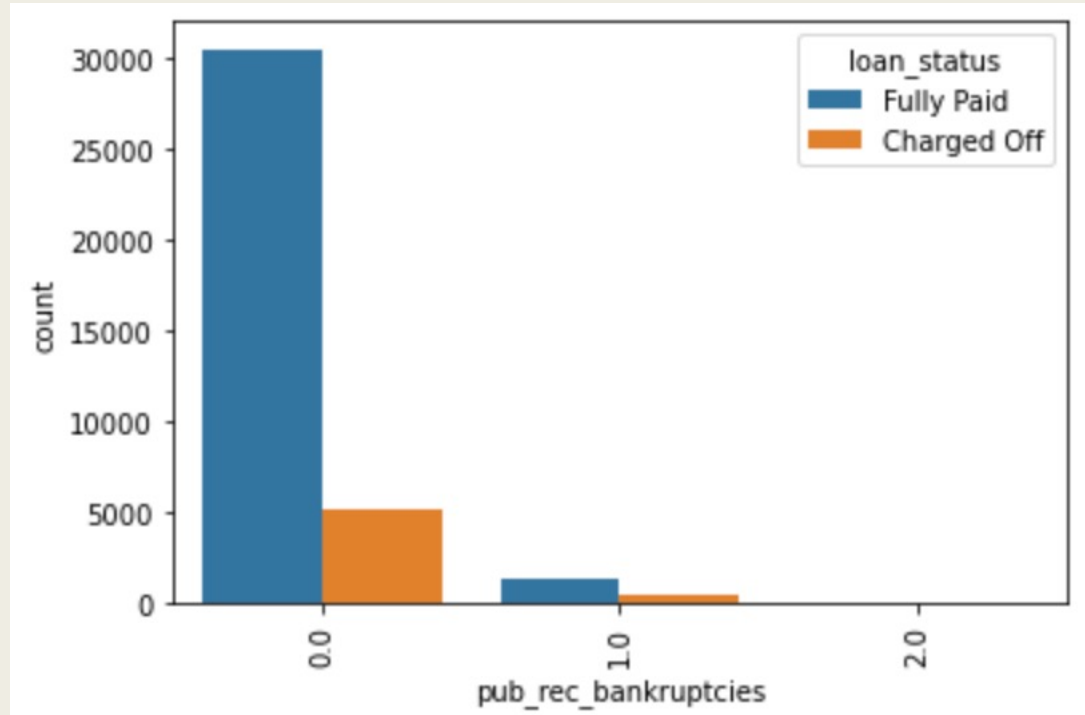
Analysis – Term & Interest

loan_status	Charged Off	Current	Fully Paid
term			
36 months	11.10687	NaN	88.893130
60 months	22.69740	10.724831	66.577769

Majority of the loans are short-term (36 months) but the charged-off rate is very high in long-term loans (60 months).
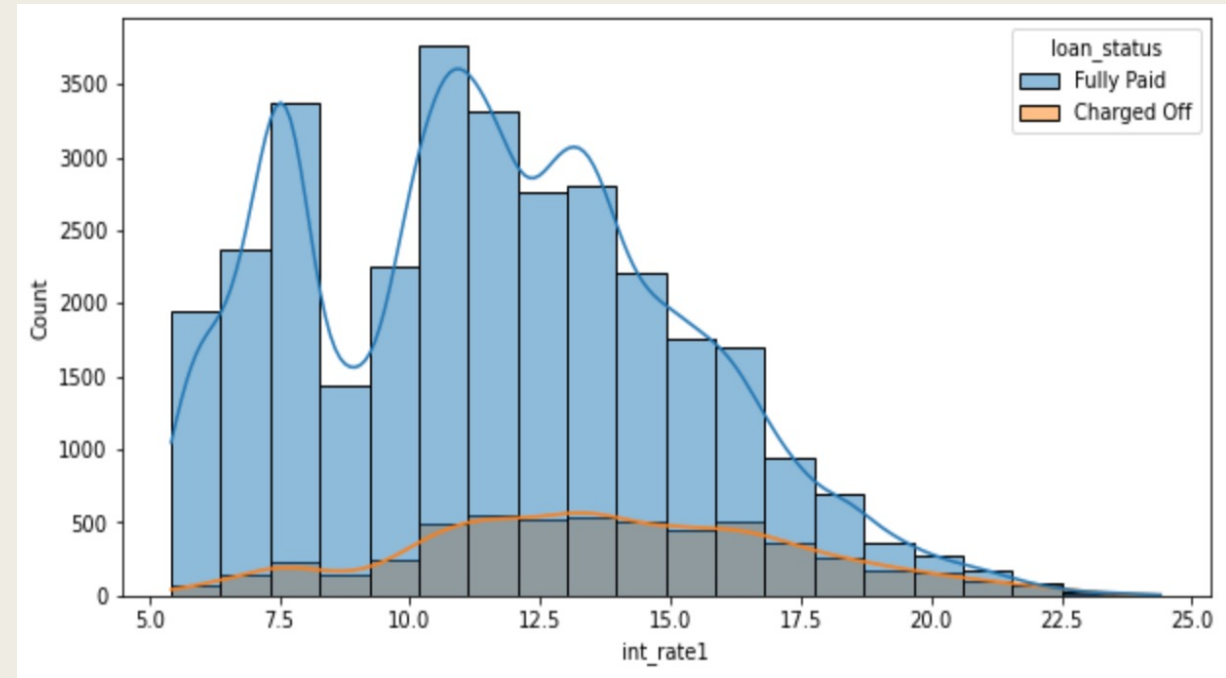
There is a spike in Charged off cases when interest rates between 11%-17%.
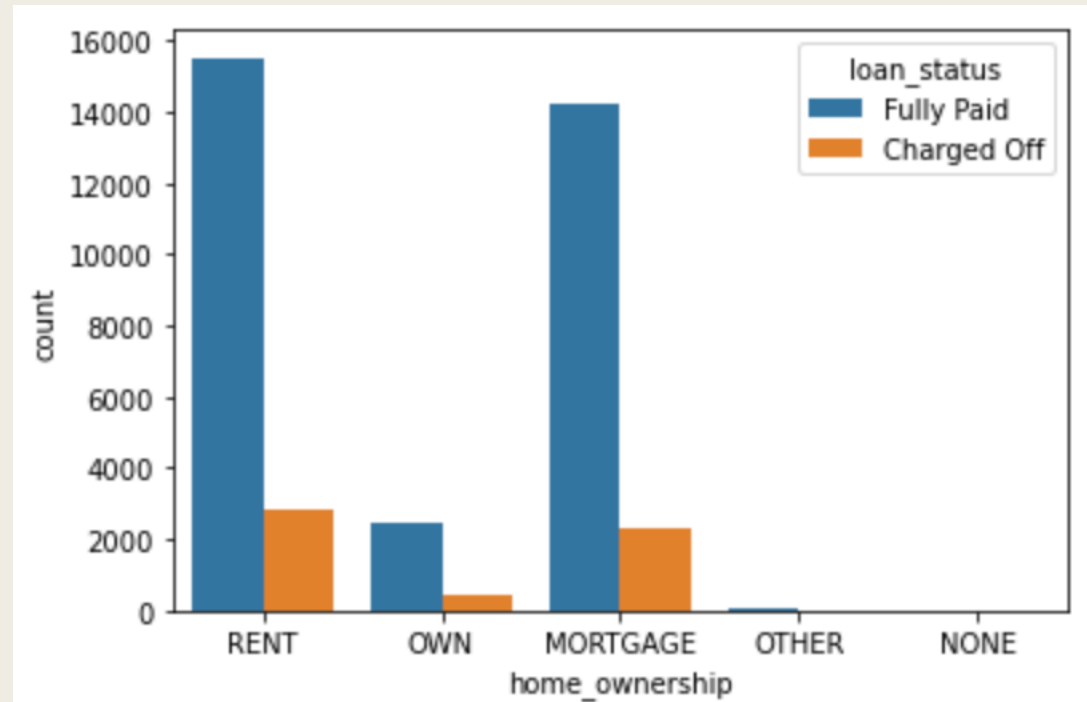
Analysis – Public Bankruptcies


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                                          id
pub_rec_bankruptcies
0.0                                    35507
1.0                                     1624
2.0                                        5
```

| loan_status	Charged Off	Fully Paid
pub_rec_bankruptcies		
0.0	14.273242	85.726758
1.0	22.413793	77.586207
2.0	40.000000	60.000000

Majority of the clients have 0 Bankruptcies (~96%) but clients with Bankruptcies have a high chance of default/ Charged-off loan.

Analysis – Home Ownership

Majority of the clients are lacking own properties and are on Rent, Mortgage. These type of clients have high Charge-off rate.

Analysis - Location
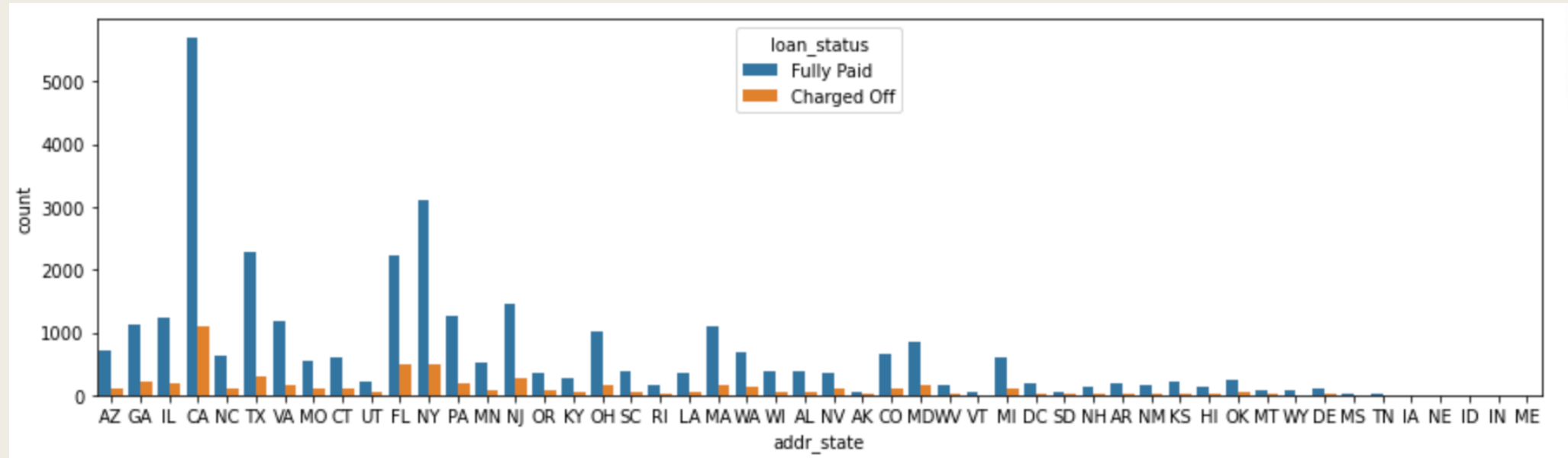
Most of the loans are form CA. Charge-Off Rate from CA is also one of highest compared to other states.

RESULTS

1. Low grade loans have high tendency to default . Most of the loans which are defaulted are from grade B, C ,D.
2. Loans having higher interest rates have more defaulters. Hence, check the background of applicant thoroughly , if the interest rate is high.
3. Extra scrutiny must be done for the applicants belonging to CA state, as tendency to default is high.
4. When the purpose is debt consolidation , check applicant thoroughly as it has high tendency to default.
5. Lower interest rates coupled with short term and easy EMI decrease the chances of default.