

Lending Club case study

Group members :

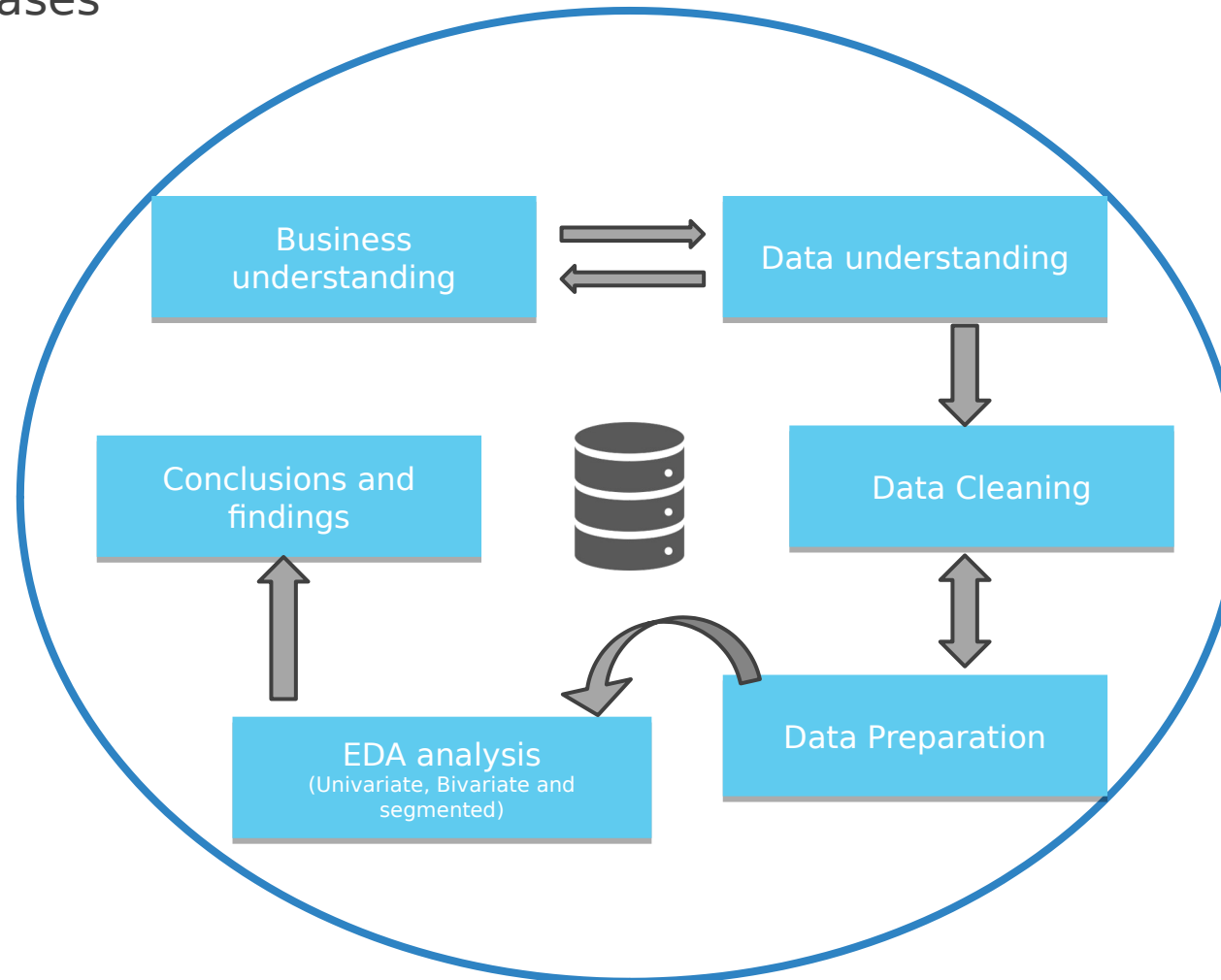
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Objective and business understanding

- ▶ **Key objective** : The company wants to understand the **driving factors (or driver variables)** behind loan default, i.e. the variables which are strong indicators of default. The company can utilise this knowledge for its portfolio and risk assessment
- ▶ **Decision types** : There are **two types of decisions** that could be taken by the company:
 - ▶ **Loan accepted**: If the company approves the loan, there are 3 possible scenarios described below:
 - ▶ **Fully paid**: Applicant has fully paid the loan (the principal and the interest rate)
 - ▶ **Current**: Applicant is in the process of paying the instalments, i.e. the tenure of the loan is not yet completed. These candidates are not labelled as 'defaulted'.
 - ▶ **Charged-off**: Applicant has not paid the instalments in due time for a long period of time, i.e. he/she has **defaulted** on the loan
 - ▶ **Loan rejected**: The company had rejected the loan (because the candidate does not meet their requirements etc.). Since the loan was rejected, there is no transactional history of those applicants with the company and so this data is not available with the company (and thus in this dataset)

Methodology

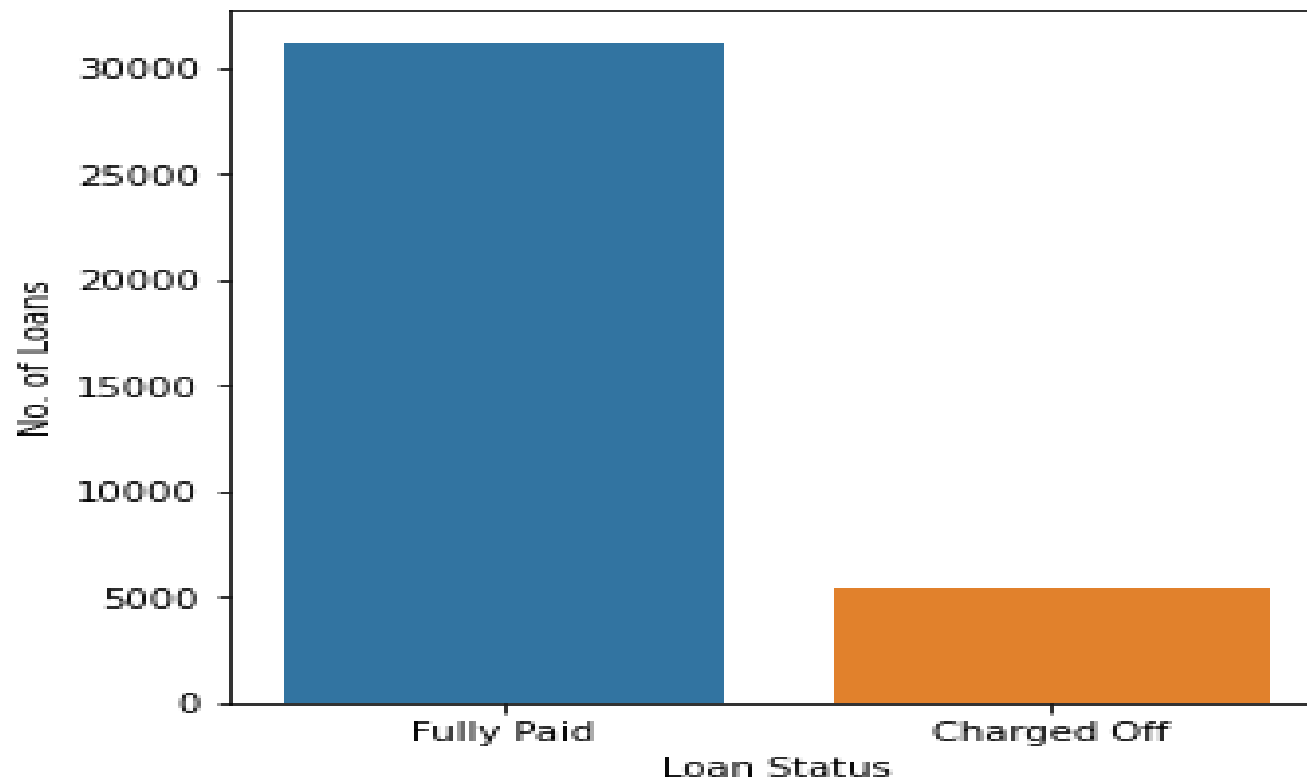
- ▶ **Key objective** : We have used the CRSP-DM process for this case study with the below phases



Data Cleaning

- ▶ **Drop Columns** : We have dropped columns with null values and those that are irrelevant to us
- ▶ **Missing Values** : Handled missing values for relevant columns
- ▶ **Outlier Removal** : Removed outliers with very high value or low value that would disproportionally affect the results
- ▶ **Filter Rows** : Filter by segment

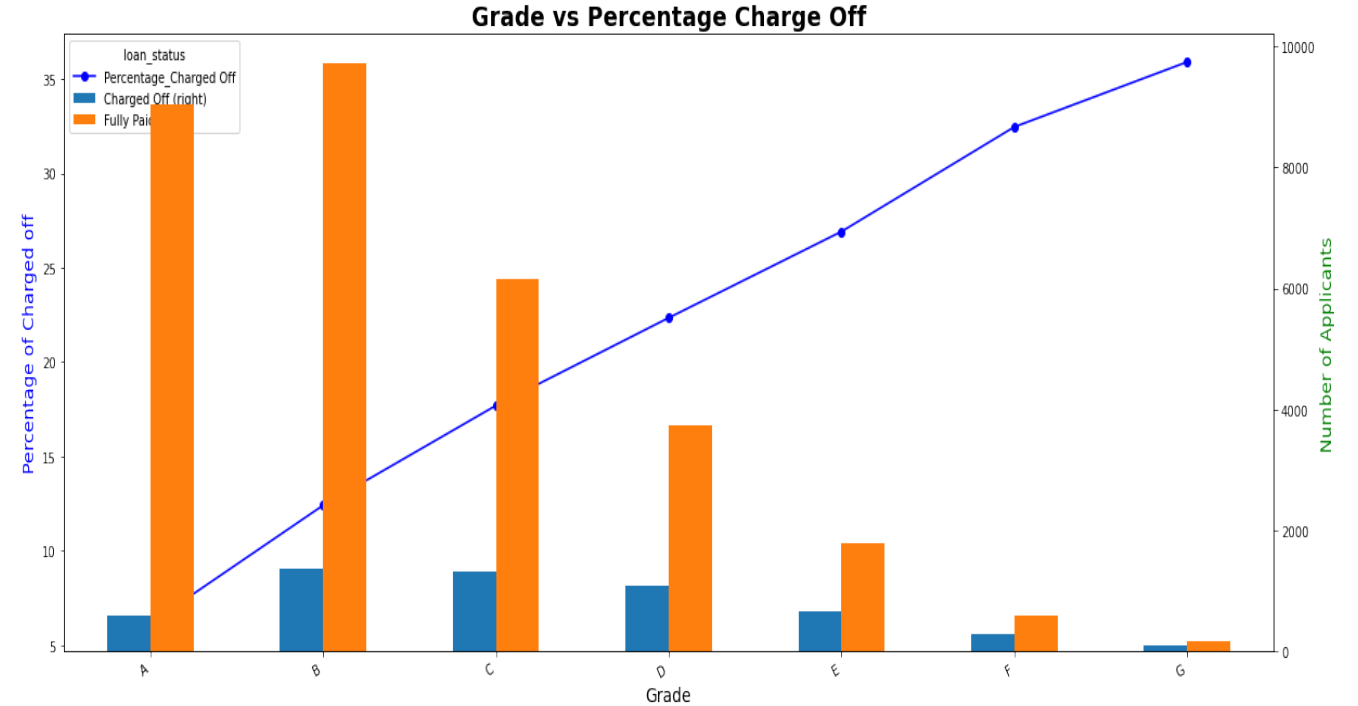
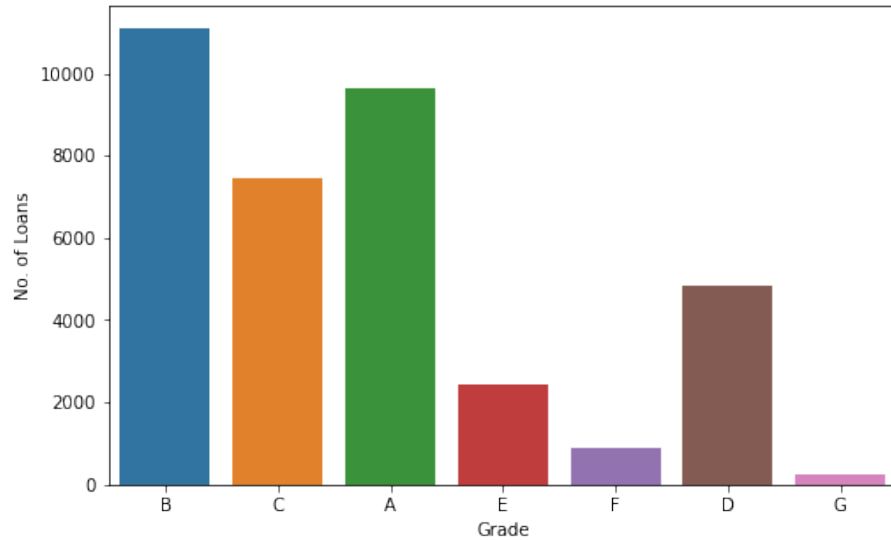
Loan status analysis



Key Insights

- ▶ Maximum loans ~**85%** are Fully paid
- ▶ ~**14%** of the of the total loans have been charged off

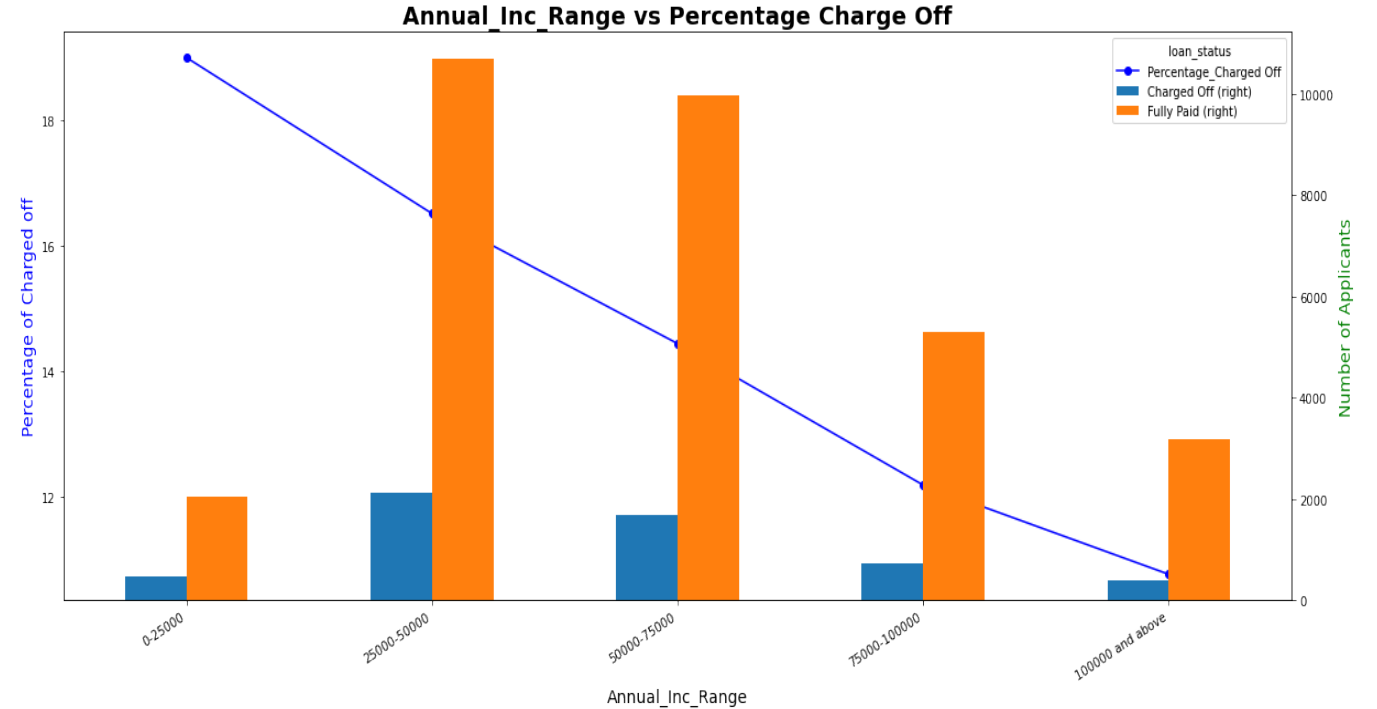
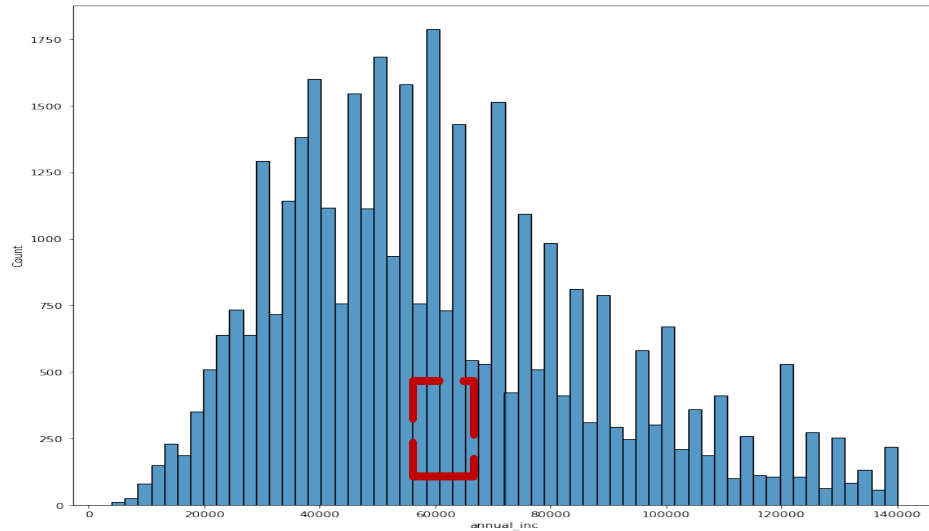
Loan grade analysis



Key Insights

- ▶ Most loans ~**54%** given to grades A and B whereas only ~**3%** loans were given to grades F and G
- ▶ Grade A has the least % charge off loans ~**6%** followed by grade B with % charge off loans ~**12%**
- ▶ Grade F and G have the maximum charged off loans ~**32%** and **36%** respectively

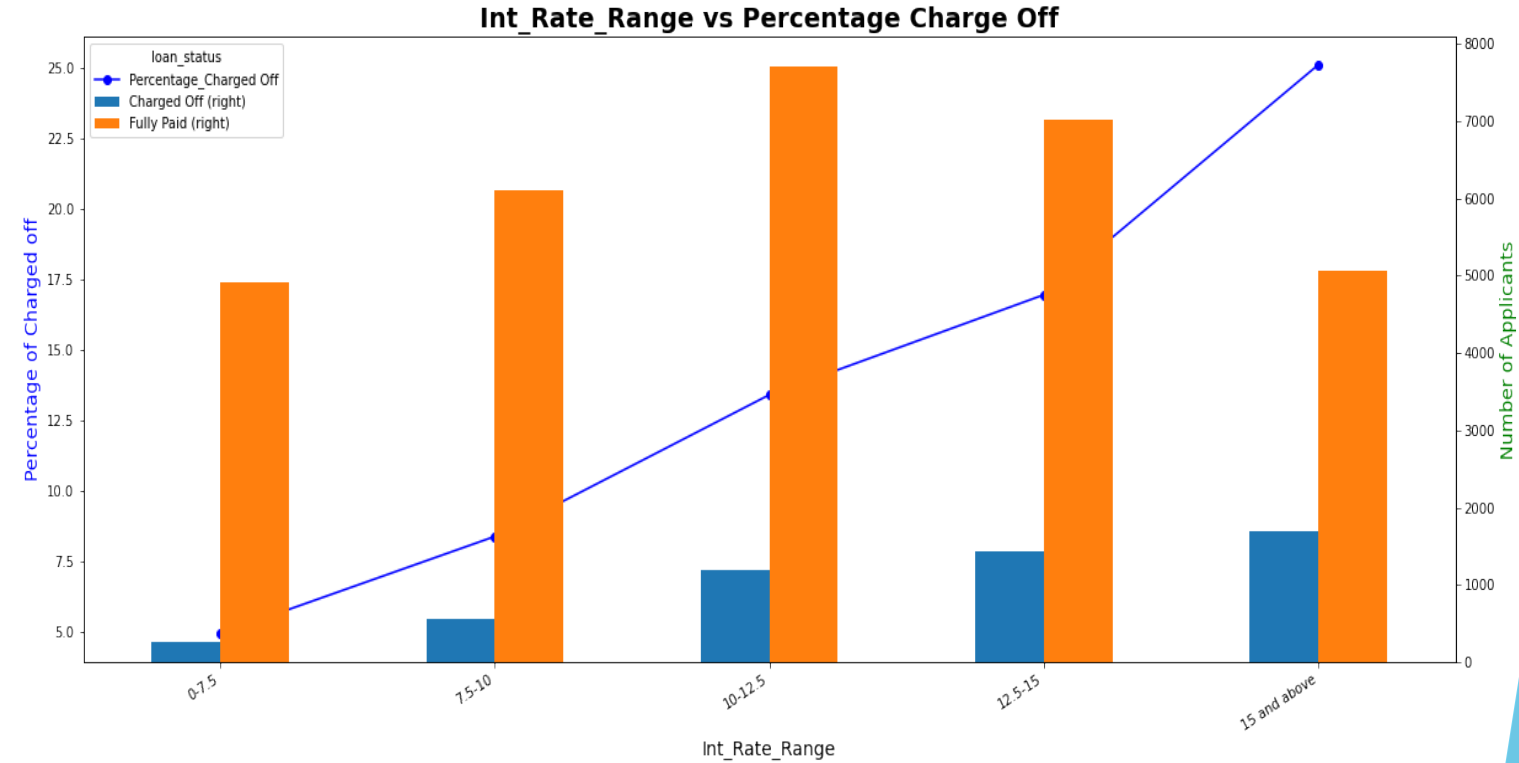
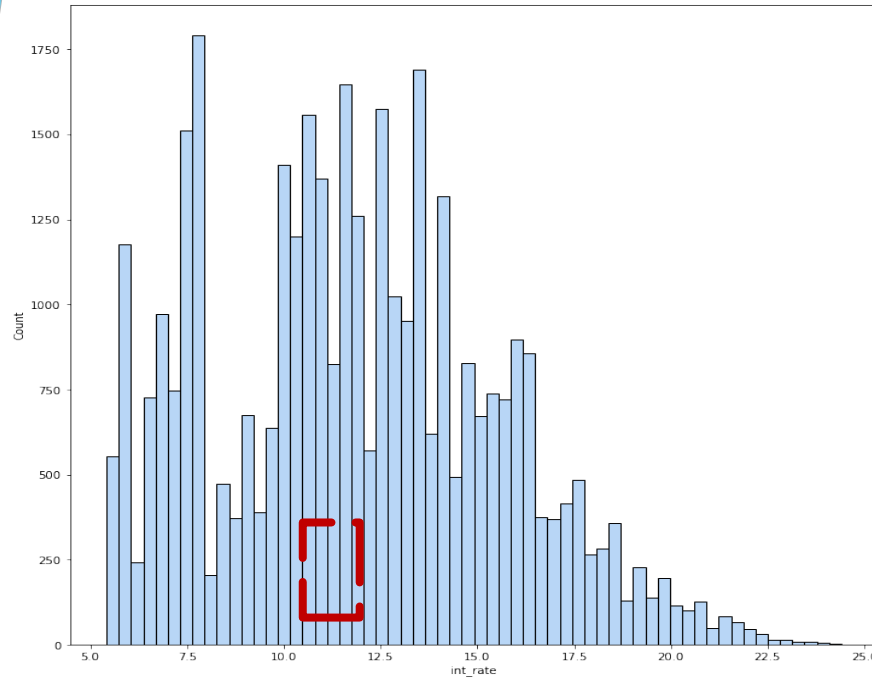
Annual income analysis



Key Insights

- ▶ Mean income of an applicant is ~**60k** and min and max income of an applicant is ~**4k** and ~**140k** respectively
- ▶ With increasing annual income % charge off loans are decreasing. % Charge off loans is minimum for >100K (~**10%**) and maximum for < 25k (~**19%**)
- ▶ Maximum loan applicants are in the range of 25K - 75k annual income

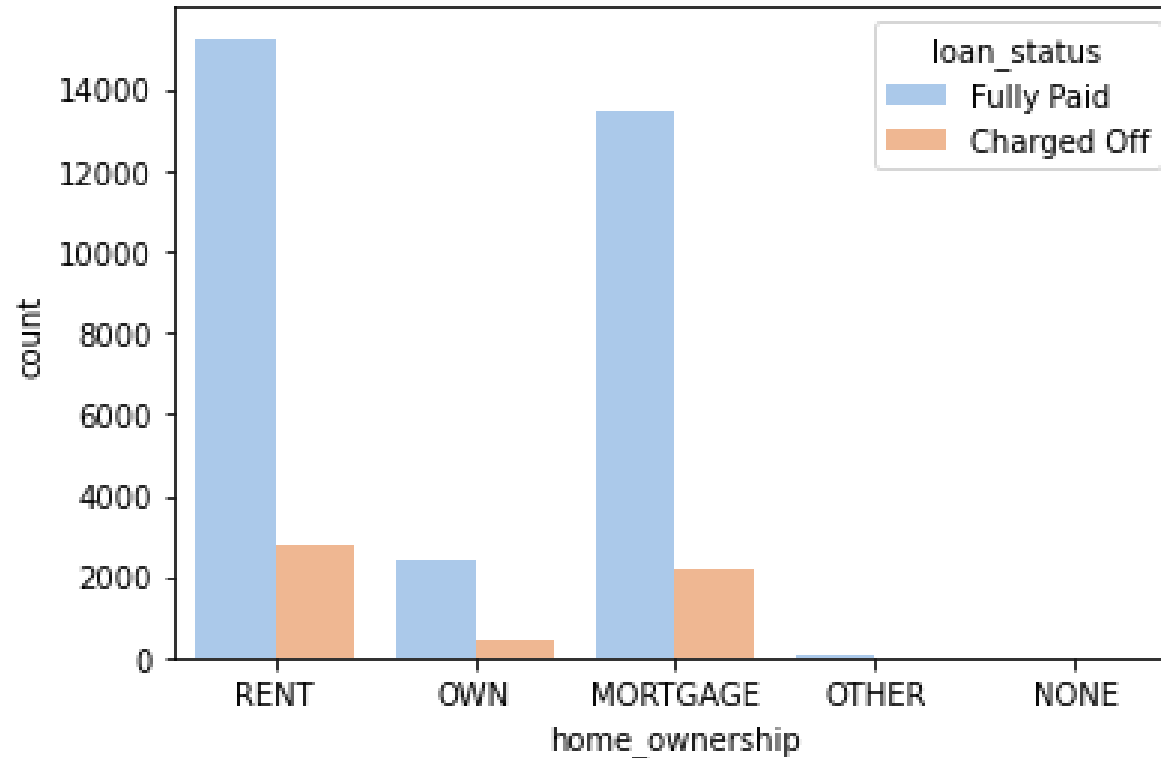
Loan interest rate analysis



Key Insights

- ▶ Mean interest for an applicant is ~**11%** and min and max interest for an applicant is ~**5.4%** and ~**24%k** respectively
- ▶ With increasing interest rate % charge off loans are increasing. % Charge off loans is minimum for <7.5% (~**5%**) and maximum for > 15% (~**25%**)
- ▶ Maximum loan applicants have interest rate between 10-15 %

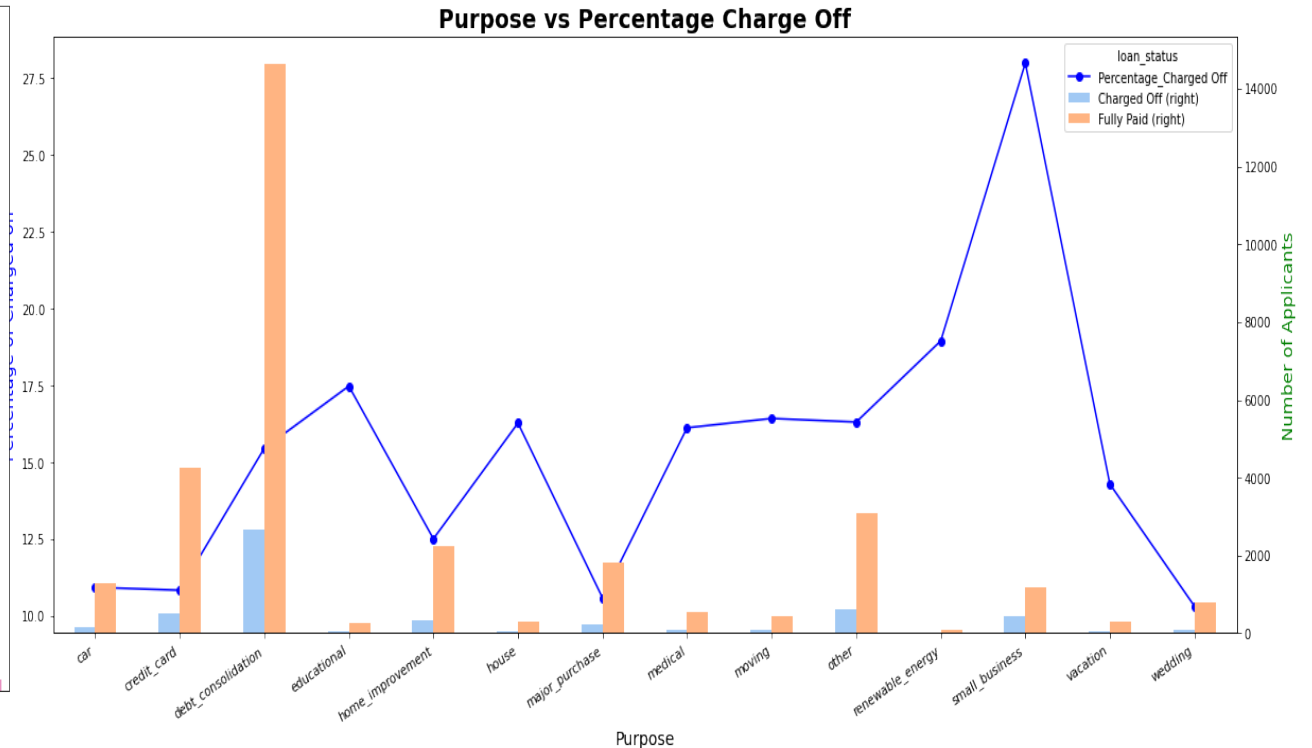
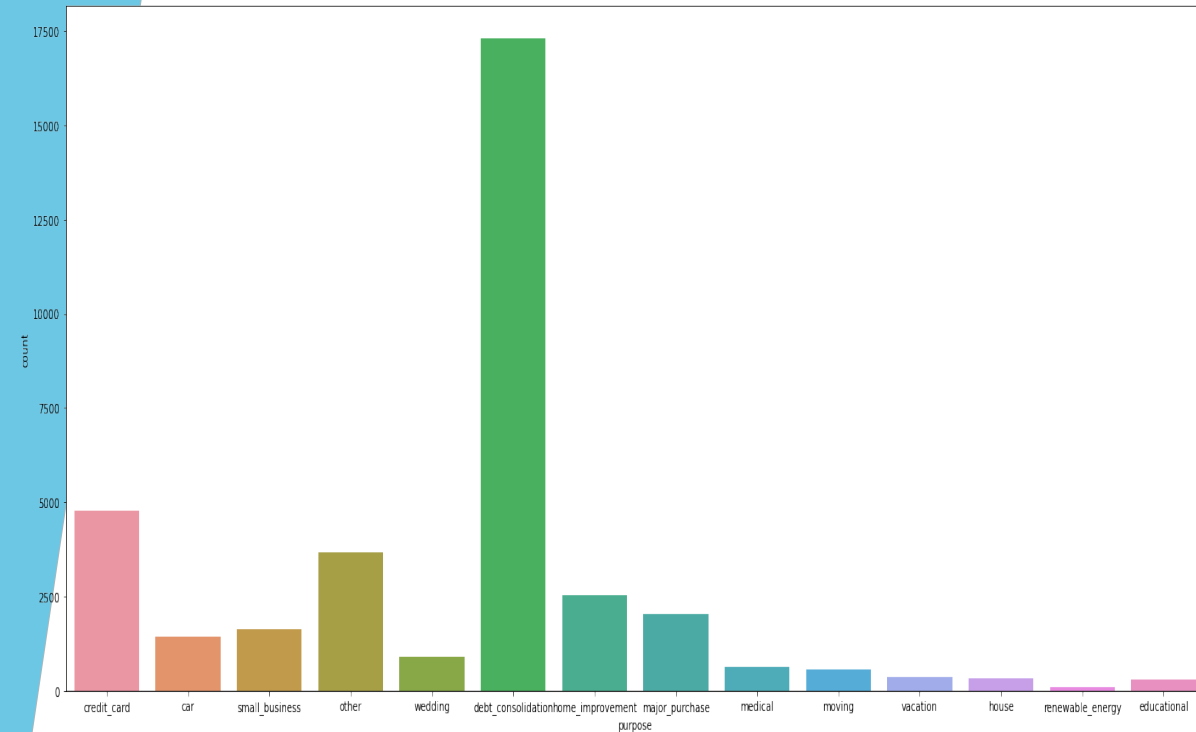
Home ownership analysis



Key Insights

- ▶ We can understand from this that applicants with rent or mortgage have equal tendency of default. However, it least for applicants with own home

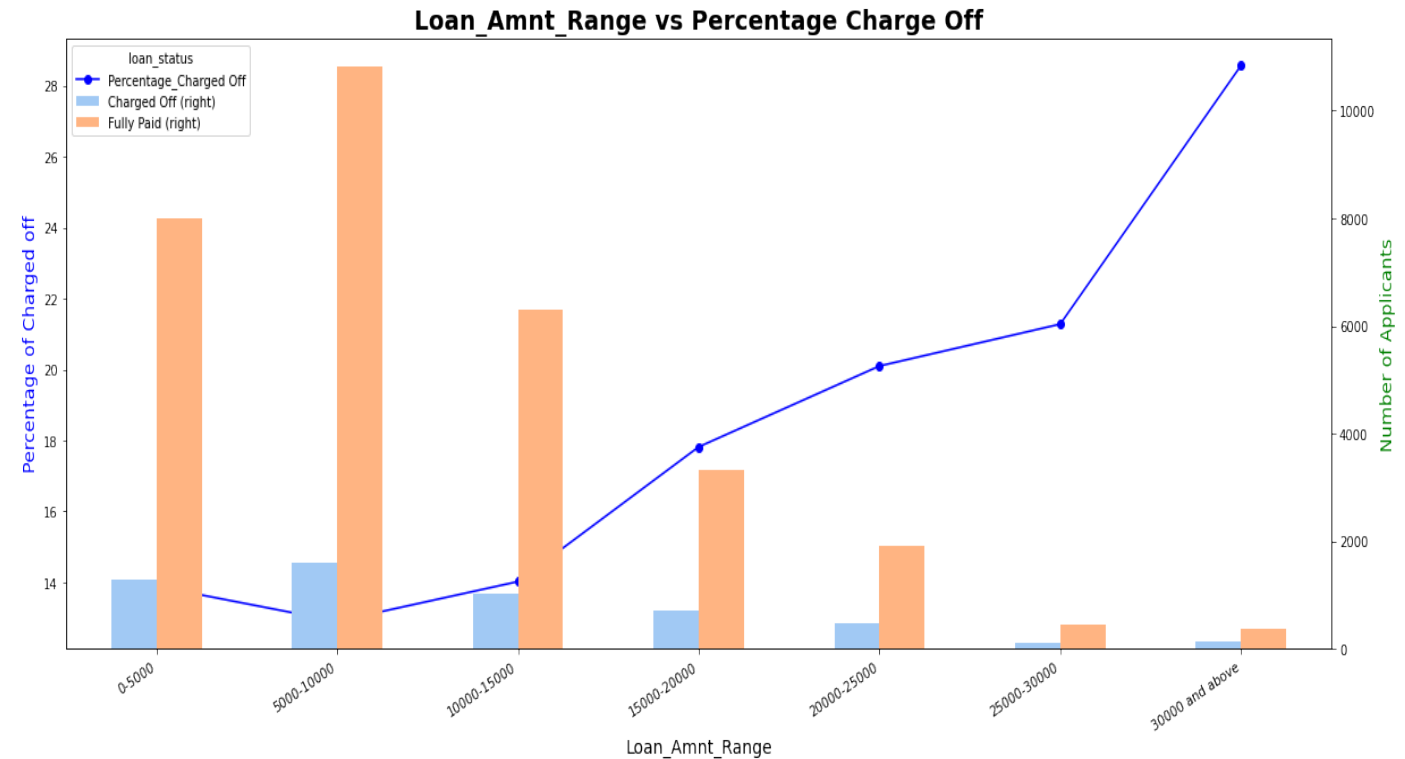
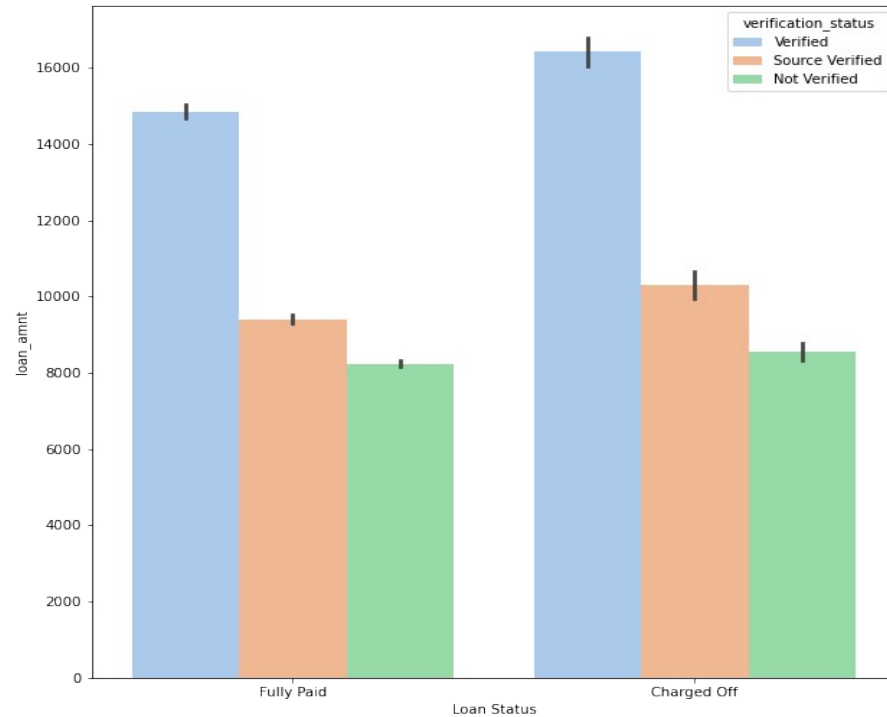
Loan purpose analysis



Key Insights

- ▶ Maximum loans are fulfilled for the purpose of debt consolidation ~**17k**. ~**15%** of these are charged off hence we can say high chance of loan default in the purpose of debt consolidation
- ▶ Maximum % of loans being charged off are of small business ~**27.5%**
- ▶ Minimum % of loans charged off is for wedding and major purchase ~**10%**

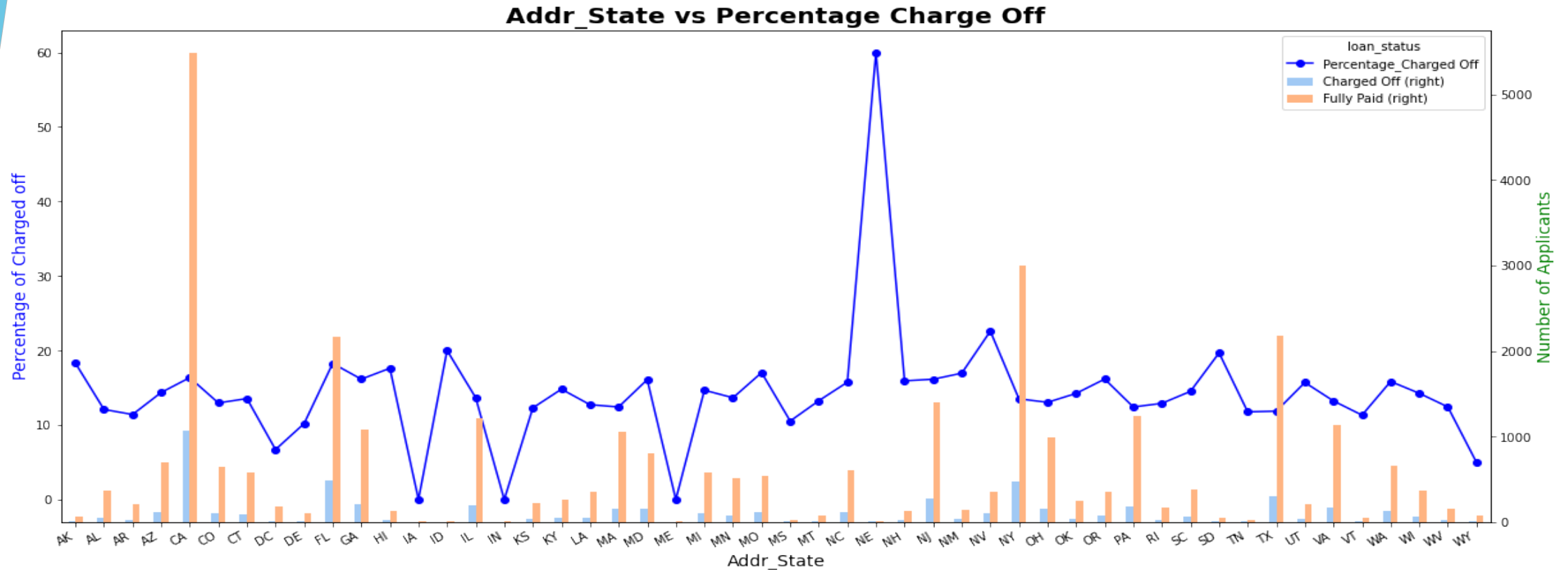
Loan amount analysis



Key Insights

- ▶ Loan amount is maximum for charged off loans and most of the loans charged off have verification status as *verified*
- ▶ As the loan amount is increasing % charge off is also increasing. % charge off is maximum (~**30%**) for amount > 30K
- ▶ Maximum loan applicants (~**12k**) have applied in the loan amount range 5K-10K

State level analysis



Key Insights

- ▶ Maximum loan applicants are from the state CA
- ▶ Maximum loans charged off are also from CA, FL and NY with % Charge off loans is greater than the average % charge off loans of ~**14%** across all states

Conclusions

- ▶ As Grades F and G have maximum number of charged off loans 32% and 36% respectively. Lending club should examine more information for these Grades.
- ▶ As percentage of charged off loans are higher than average for CA, FL and NY. Lending Club should do more due diligence for loans applicants from these states.
- ▶ Small business loans are defaulted more. Lending club should stop/reduce issuing the loans to them.
- ▶ Borrowers with mortgage and rent home ownership are taking higher loans and also have highest charged off loans.
- ▶ Lending club should give less number of approvals where purpose is small business as they are most charged off loans based on purpose.
- ▶ With increasing interest rate % charge off loans are increasing. % Charge off loans is minimum for $<7.5\%$ ($\sim 5\%$) and maximum for $> 15\%$ ($\sim 25\%$). Lending club should reduce high interest loans for 60 months tenure.

Thank You