Lending Club Case Study

Group Members

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Objective

The project revolves around a consumer finance company specializing in providing various types of loans to urban customers.

The primary challenge is to optimize the loan approval process, striking a balance between expanding the customer base and mitigating the risk of financial losses due to defaults.

The company seeks to improve its ability to identify creditworthy applicants, ensuring it doesn't miss profitable lending opportunities while minimizing the approval of loans to individuals with a high likelihood of default.

The project utilizes a comprehensive dataset sourced from the consumer finance company's loan records.

Income Impact Analysis

- Applicants with an income range of $80,000 or more have lower chances of charged-off loans.
- Those with an income range of $0-$40,000 have higher chances of charged-off loans.
- Overall, the charged-off proportion decreases with an increase in annual income.

Charged Off Proportion Across Annual Income Bins
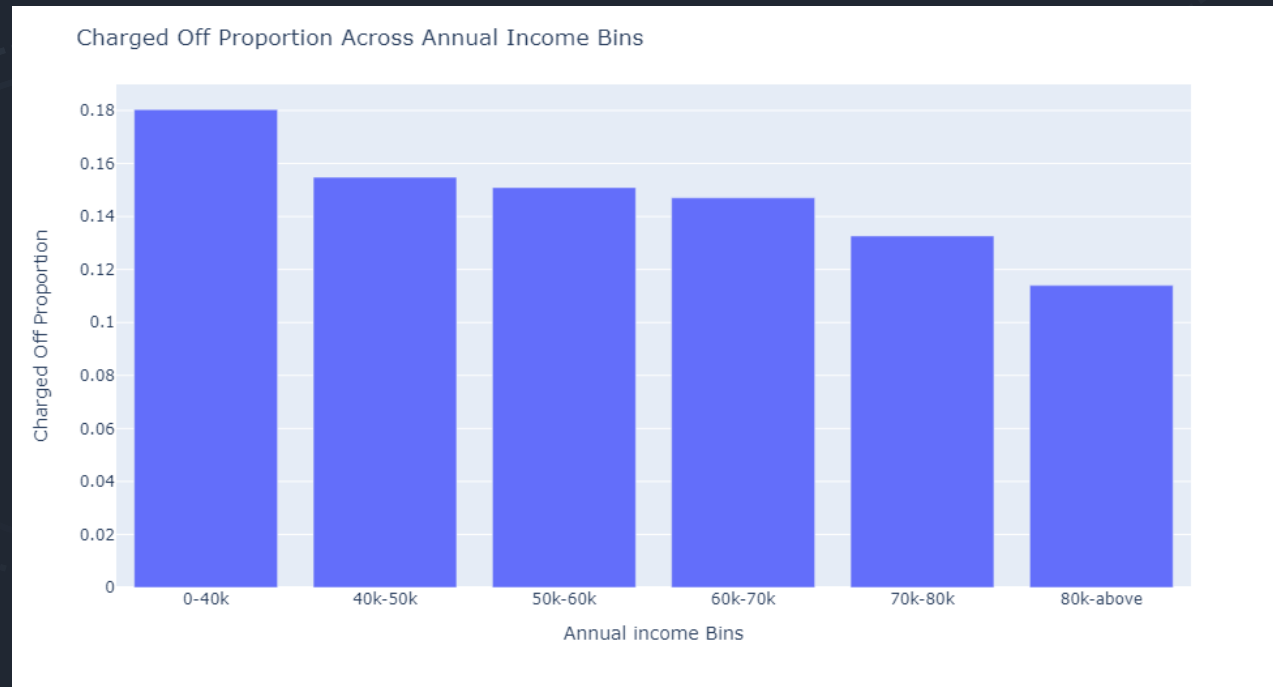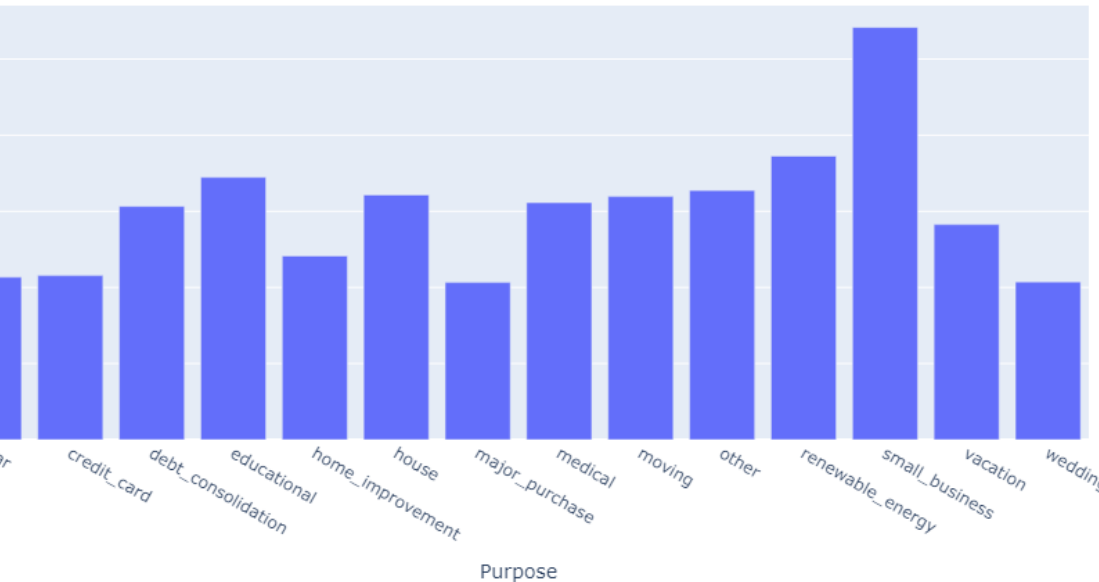
Interest Rate Influence Analysis

- Interest rates below 10% have significantly lower chances of charged-off loans.
- Interest rates above 16% have a higher likelihood of charged-off loans.

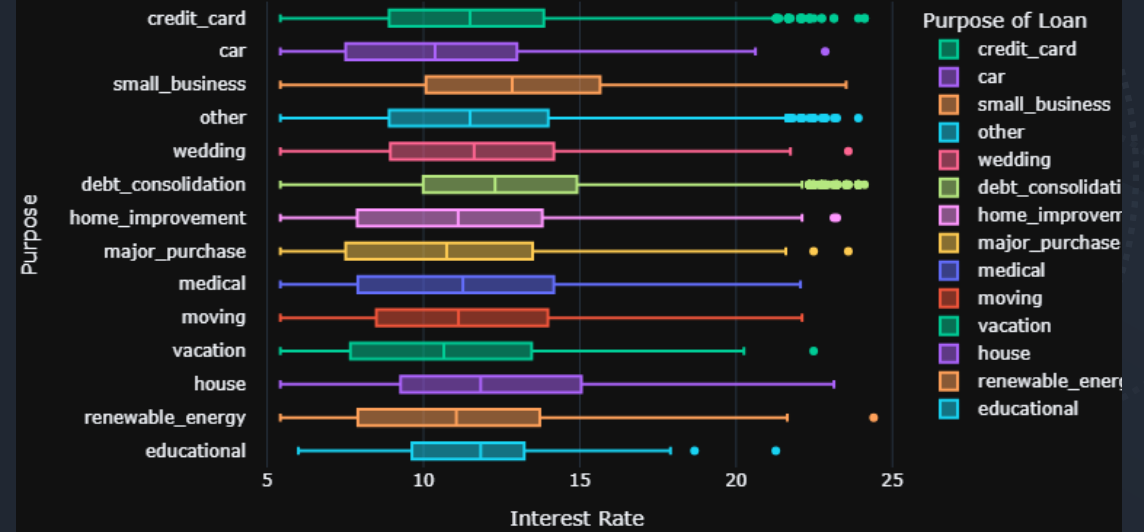Charged Off Proportion Across Annual Income Bins
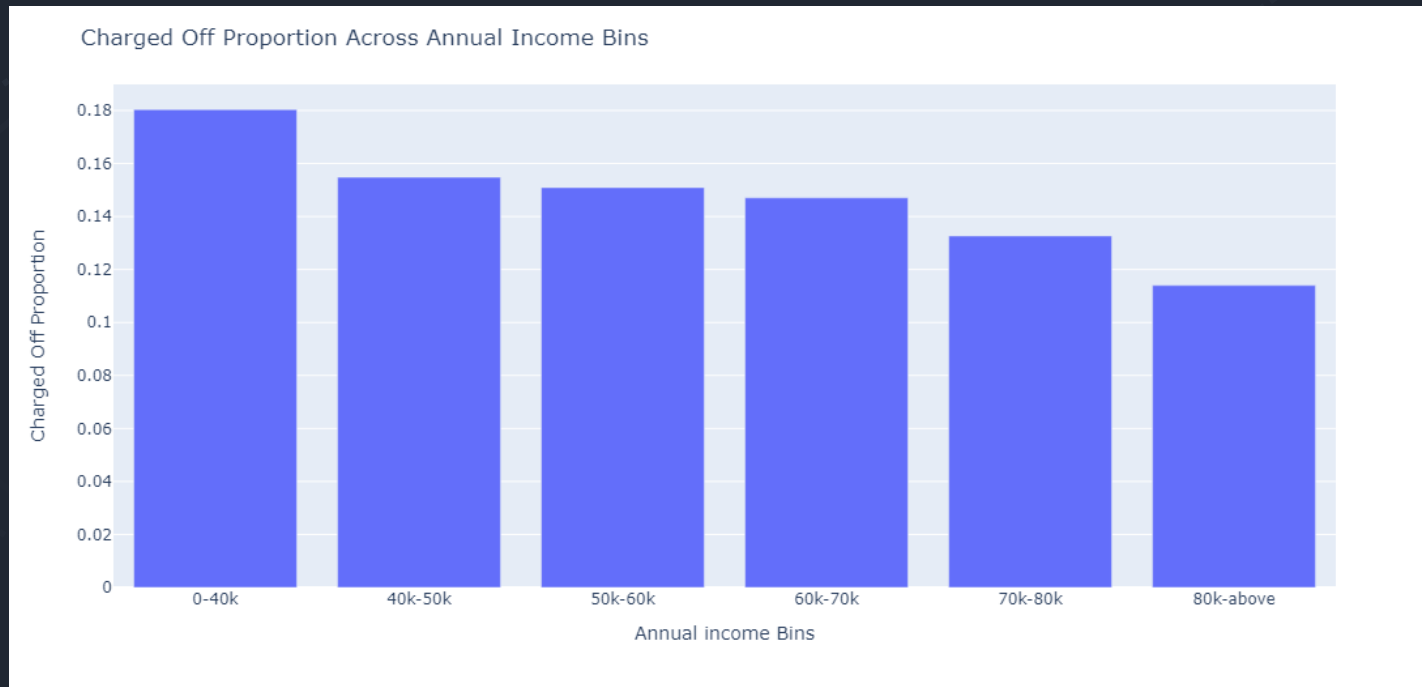
Loan Purpose Analysis

- Loans for small businesses have higher chances of defaults.
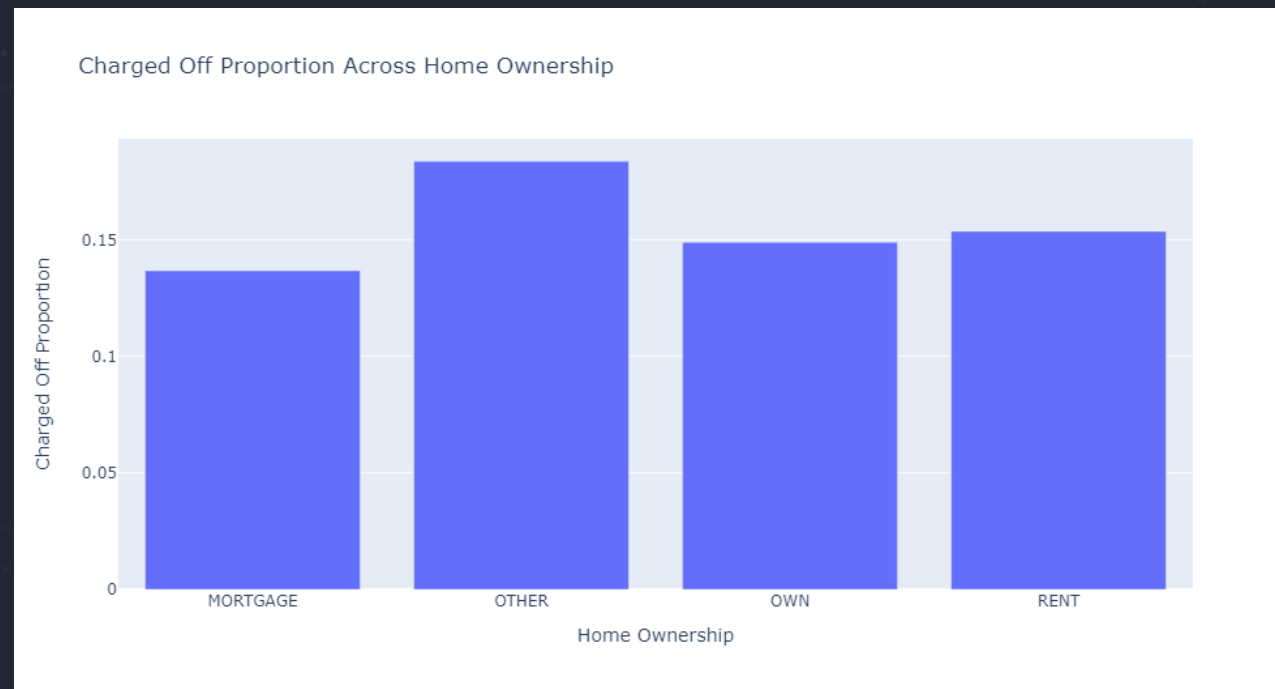- Small business loans have the highest average interest rates, indicating greater risk.

Home Ownership Impact

- Small business and debt consolidation loans have higher chances of defaults.
- Major purchases have a lower likelihood of loan defaults.

Charged Off Proportion Across Home Ownership

Interest rate against Charged off reportion Analysis

- Interest rates below 10% have significantly lower chances of charged-off loans.
- Interest rates above 16% have a higher likelihood of charged-off loans compared to other categories.

Charged Off Proportion Across Interest Rate Bins
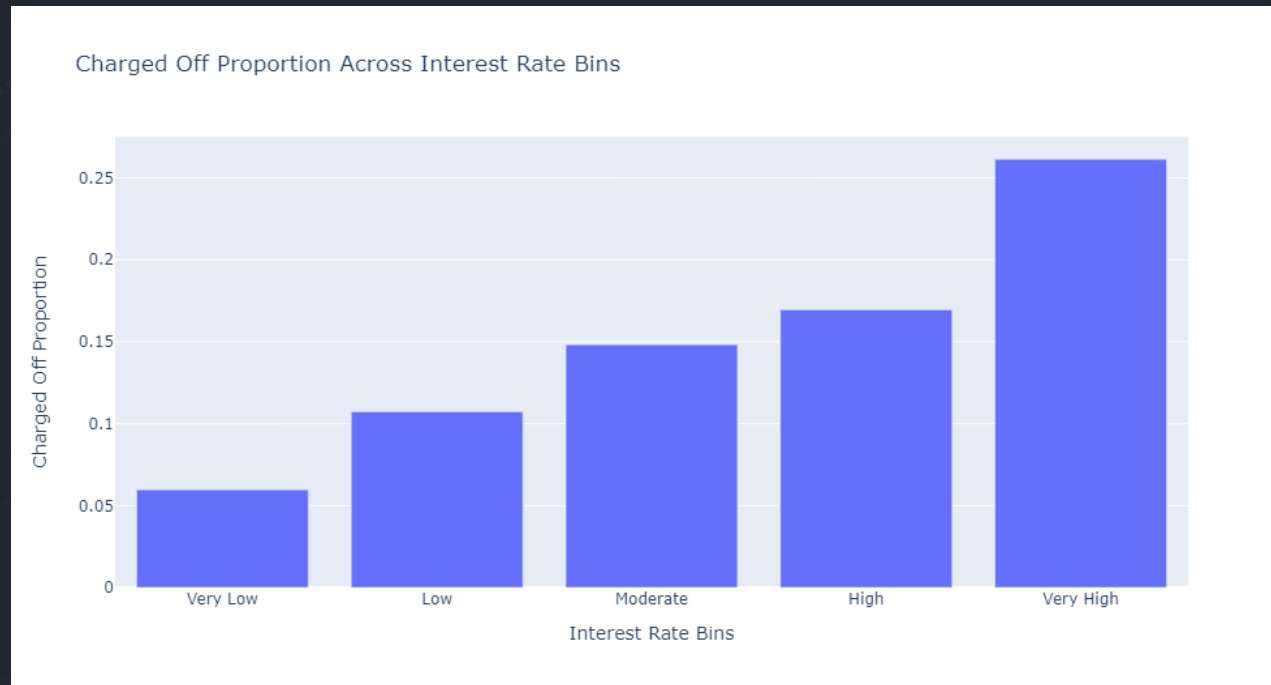
Debt-to-Income (DTI) Ratio Analysis

- Higher DTI values are associated with a higher risk of loan defaults.
- Lower DTI values indicate lower chances of loan defaults.

Charged Off Proportion Across Debt-to-Income Ratio Bins
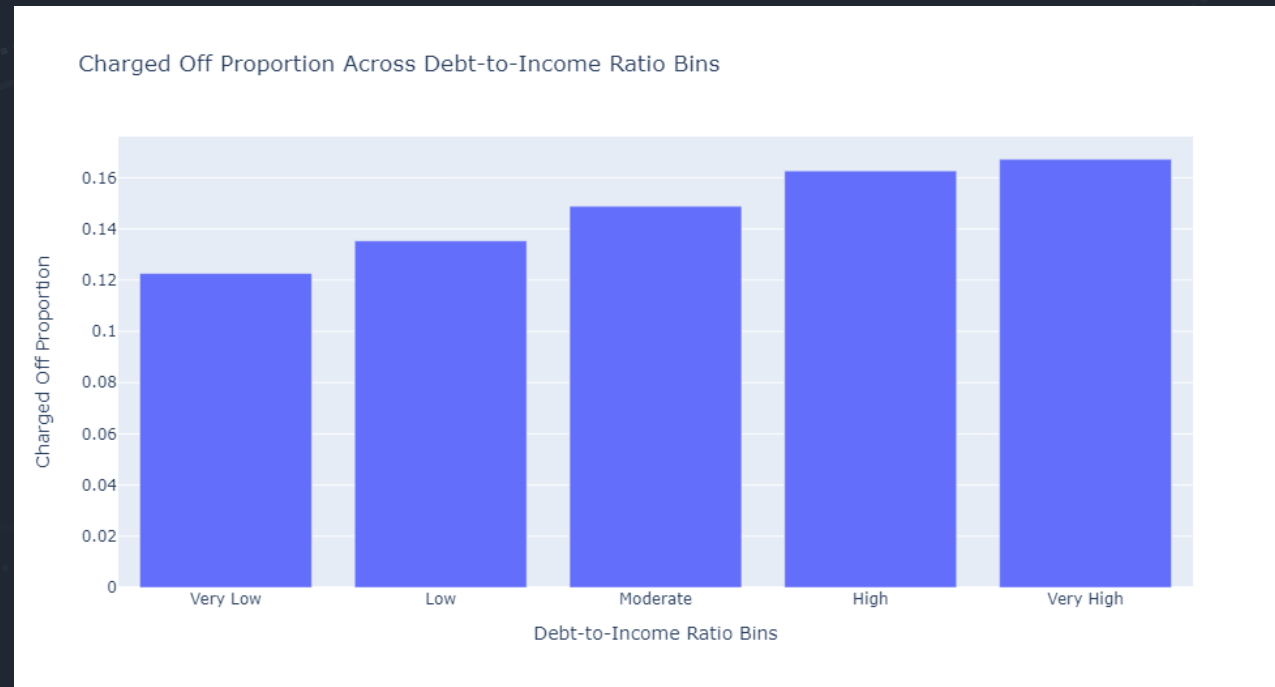
Bankruptcies Record Impact Analysis

- Bankruptcies with a record of 2 have a high impact on loan defaults.
- Bankruptcies with a record of 0 have a low impact on loan defaults.


Charged Off Proportion Across Public Record Bankruptcies
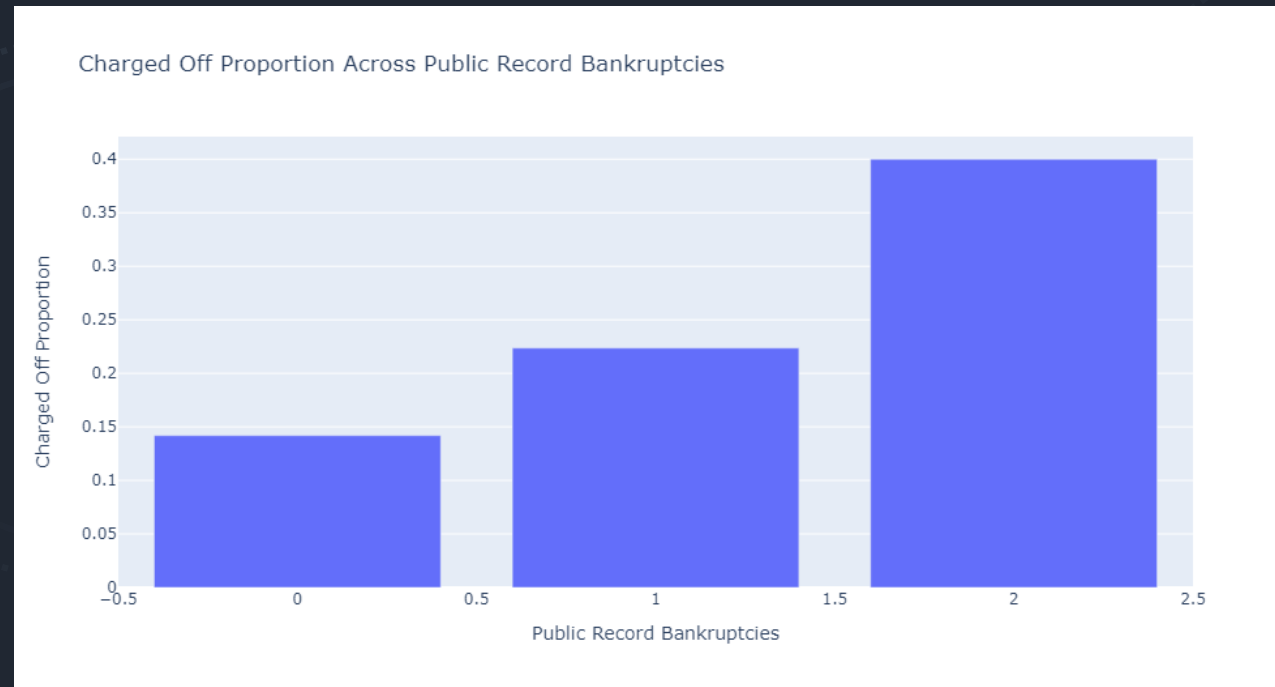
Loan Grade Analysis

- Applicants with loan Grade G have the highest loan defaults.
- Those with loan Grade A have the lowest loan defaults.



Charged Off Proportion Across Grade
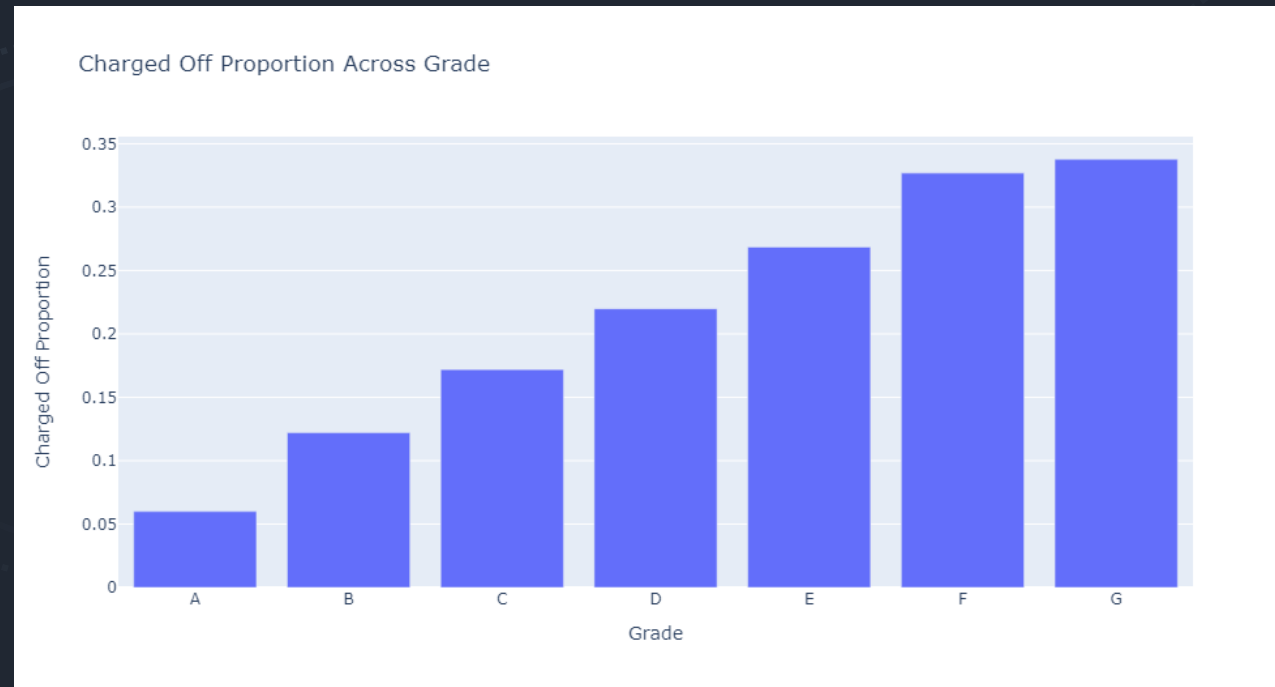
Experience and Income Source Analysis

- Applicants with less or no experience may lack a stable income source, leading to higher loan defaults.
- Other applicants show relatively similar chances of getting charged off.

Charged Off Proportion Across Employment Length
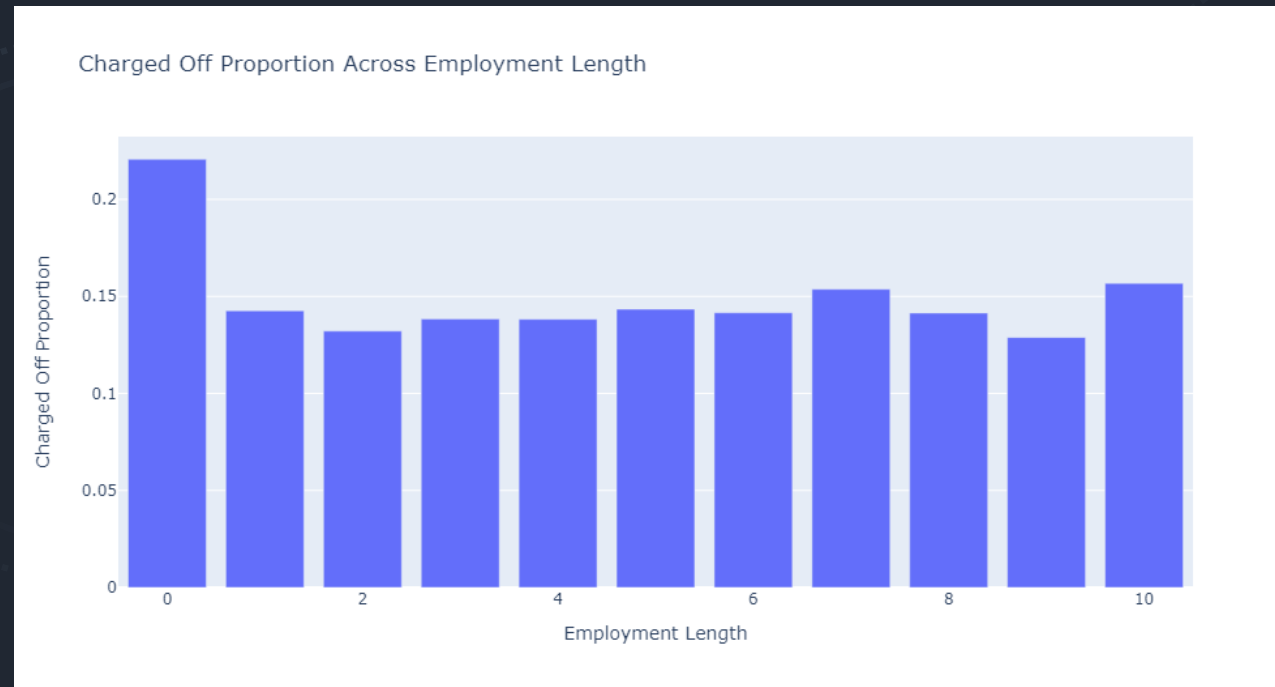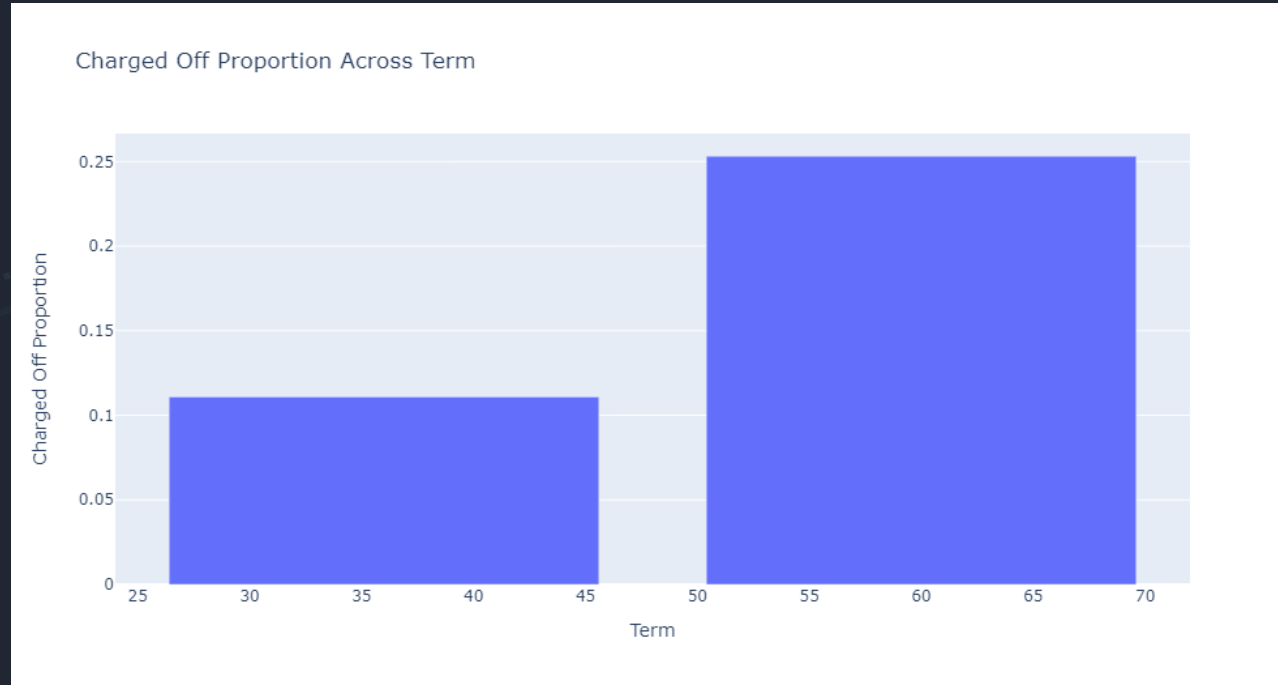
Regional Differences Analysis

- Northeast (NE) states have the highest number of loan defaults.

  - IA and ME have lower numbers of loan defaults.
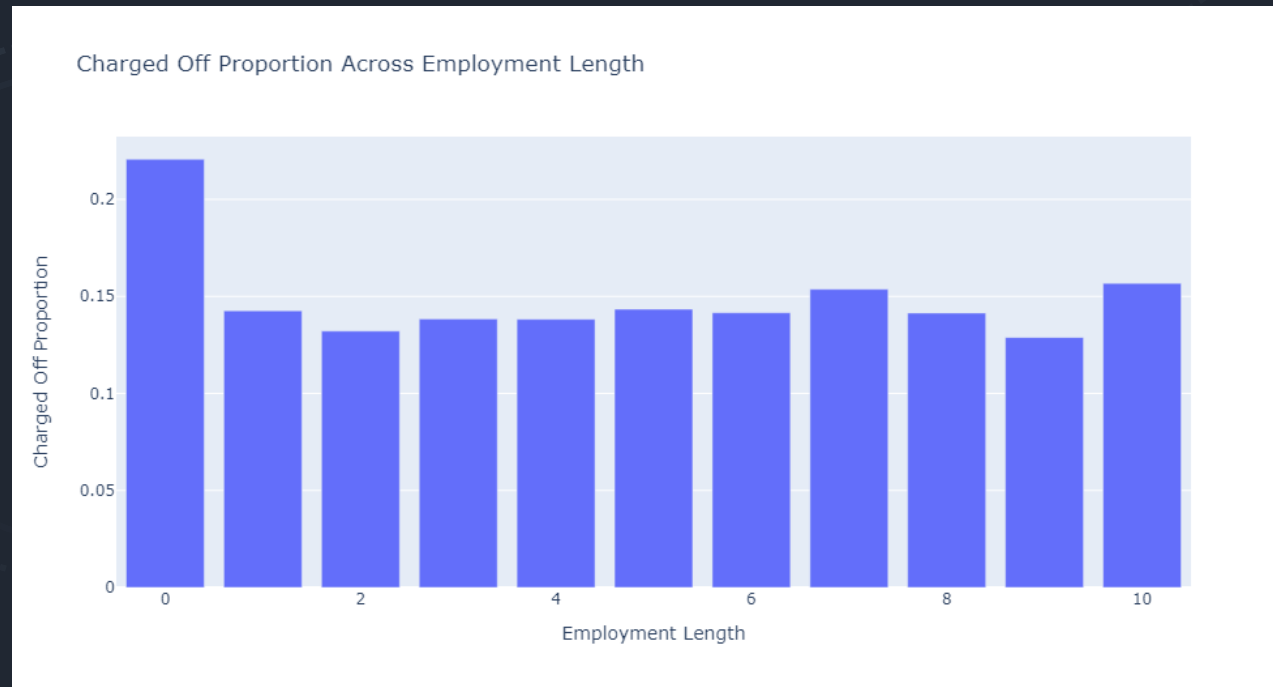
Term Analysis

- Higher term have higher chance of defaulter


Charged Off Proportion Across Term

Correlation Analysis

- Loan Amont has negative correlation with pub_rec_bankrupticies
- annual income has a negative correlation with dti
- positive correlation between annual income and employment years.
- term has a strong correlation with loan amount
- term has a strong correlation with interest rate
- annual income has a strong correlation with loan amount
- Annual income with DTI(Debt-to-income ratio) is negatively correlated.
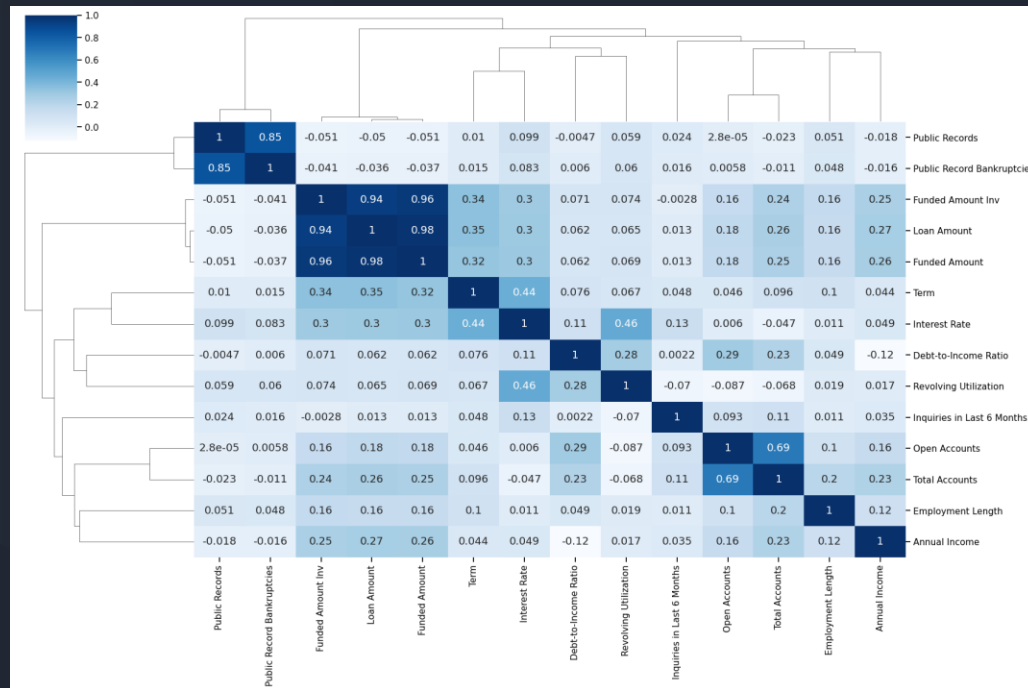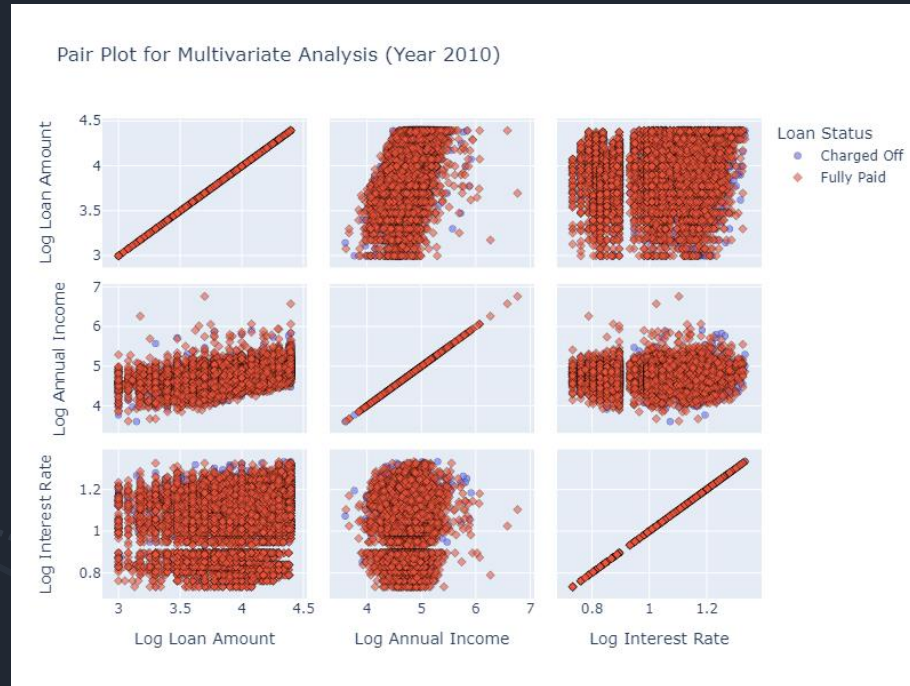
Multivariate Analysis
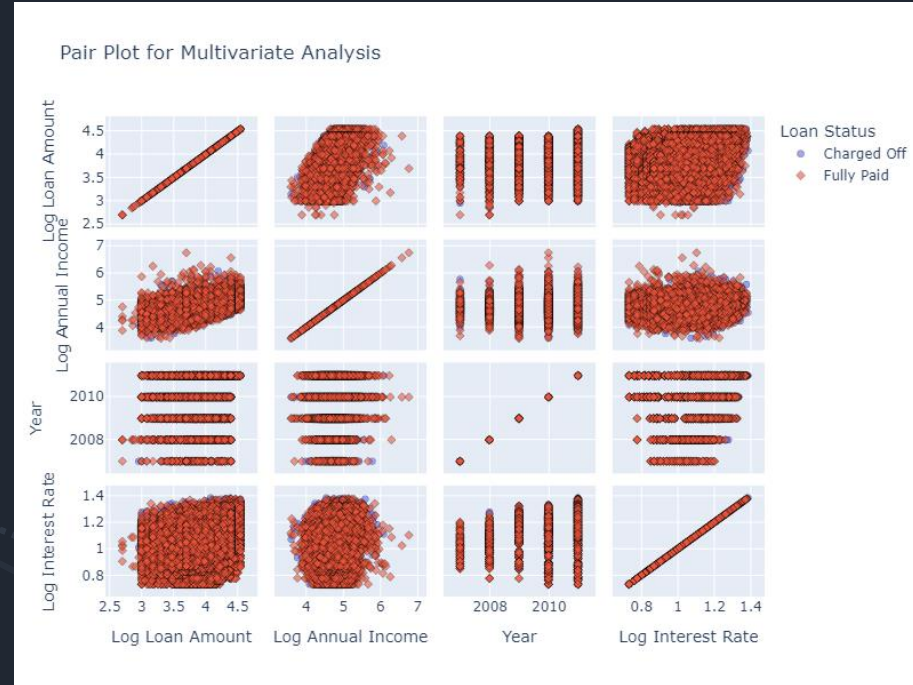
Pair Plot for Multivariate Analysis

- Higher the interest rate higher charged off ratio
- Higher the annual income higher the loan amount slightly.
- increase in number of charged off with increase in year.
- interest rate is increasing with loan amount increase

Pair Plot for Multivariate Analysis (Year 2010)

Multivariate Analysis

- Higher the interest rate higher charged off ratio
- Higher the annual income higher the loan amount slightly
- Interest rate is increasing with loan amount increase this results in high charged off

Conclusions

Lending club should reduce loans to below 40K income borrowers as they are more likely to default	Lending club should reduce giving loans to borrowers without owning house.	Small business loans are defaulted more. Lending club should stop or reduce issuing the loans to them.
Borrows with high DTI should be avoided	People with more number of public derogatory records are having more chance of filing a bankruptcy. Lending club should make sure there are no public derogatory records for borrower.	Lending club should examine borrowers before issuing loans to Low grade (G to A).
Employers who have less than 1 year of experience more likely to default	Lending Club should reduce number of loan issues to borrowers who are from NE	Higher the term more risk of defaulting
	High interest rate have more defaulters. Providing loans to above categories with high interest rate will increase the risk	