Lending Club Case Study

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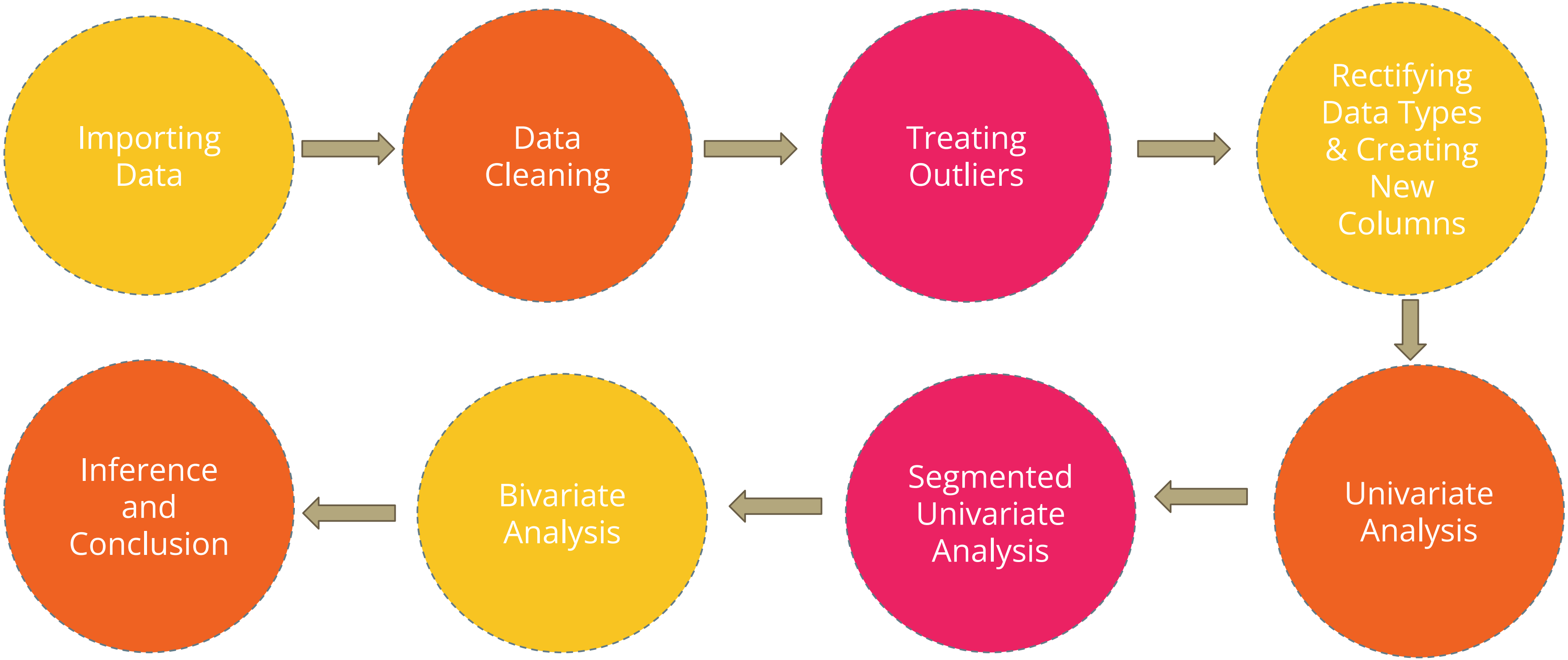
Problem Context and Objective

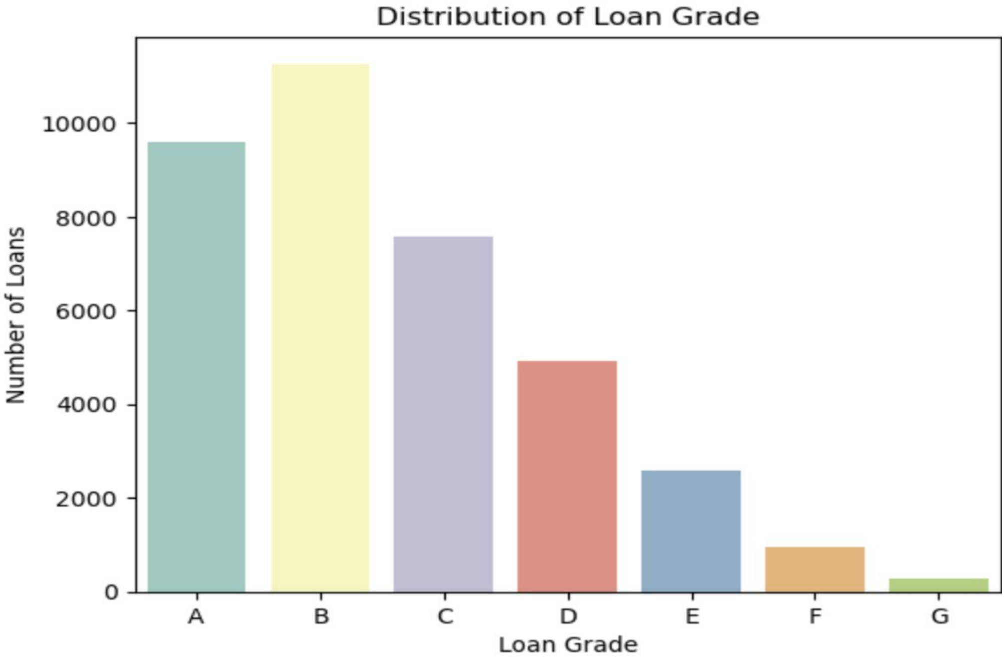
The consumer finance company serves as the largest online loan platform, offering personal, business, and medical financing with easily accessible lower interest rates. Like other lenders, issuing loans to risky applicants is the primary cause of financial loss, termed credit loss, where 'charged-off' borrowers who default cause the most significant loss to lenders. This credit loss results from borrowers refusing to pay or disappearing with owed money, marking them as defaulters.

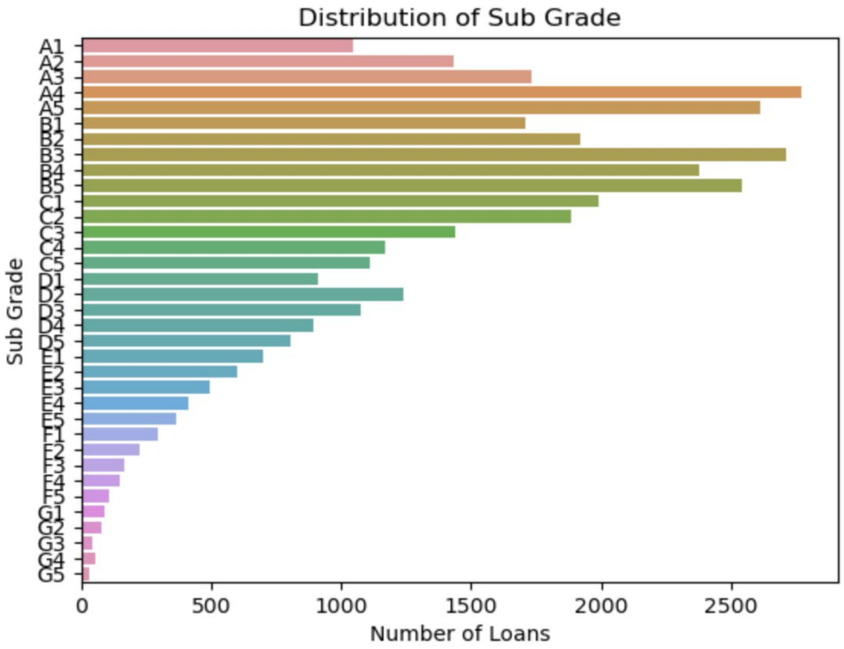
To mitigate financial loss by utilizing Exploratory Data Analysis techniques to identify key factors driving loan defaults. Exploring how data analysis can reduce risky loan applicants.

Steps of Analysis



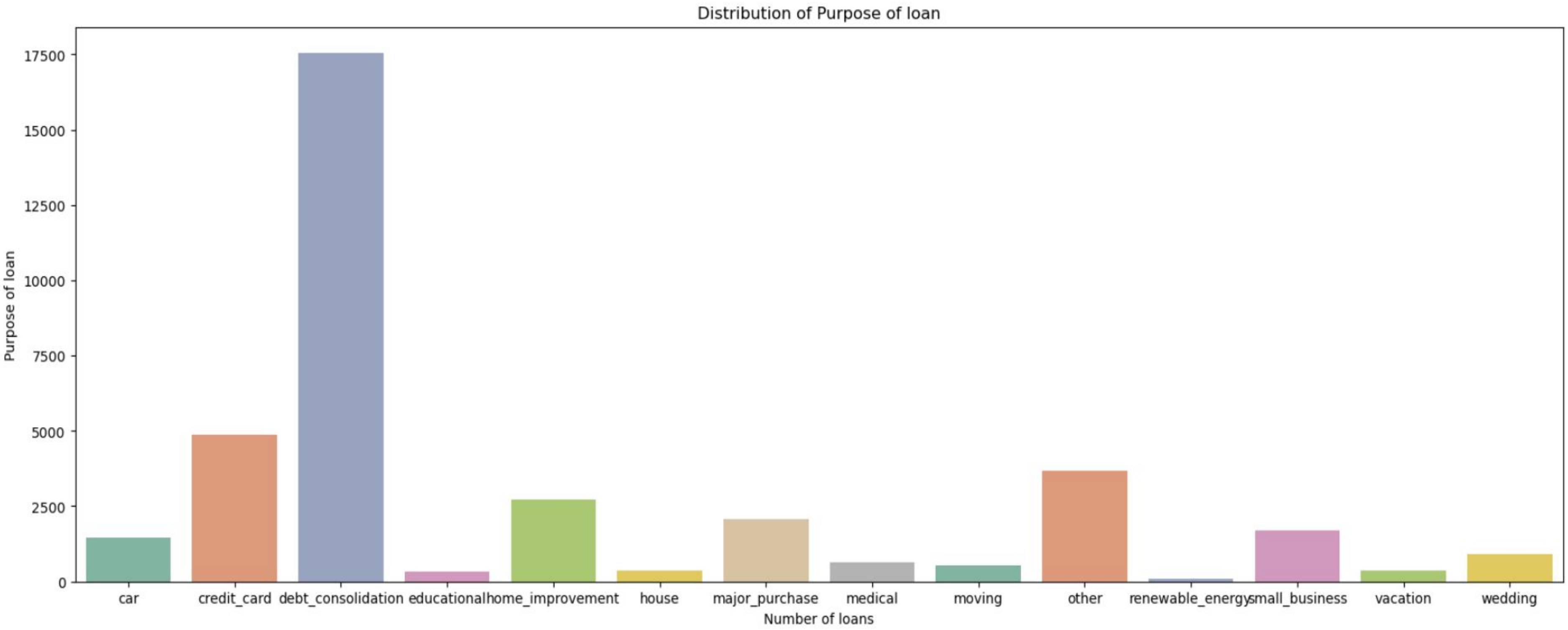
Grade and Subgrade Analysis





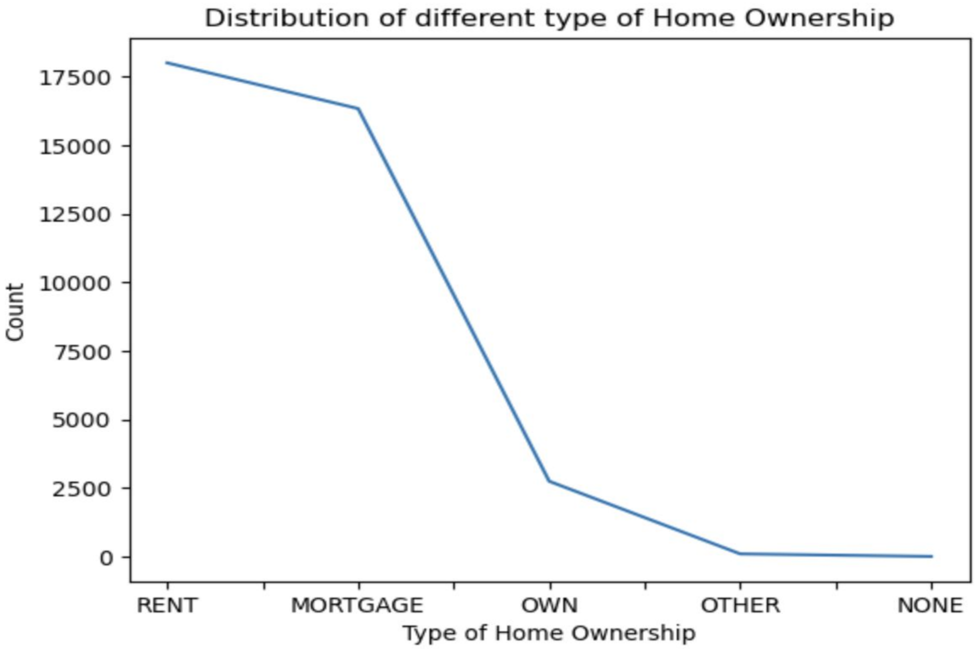
Compared to the other grades, a significant portion of the loans fall into the "A" and "B" categories, indicating that most of the loans are of a higher caliber. Loans in grades 'A' and 'B' tend to have lower subgrades than the other grades, which is consistent with the distribution of loan grades overall.

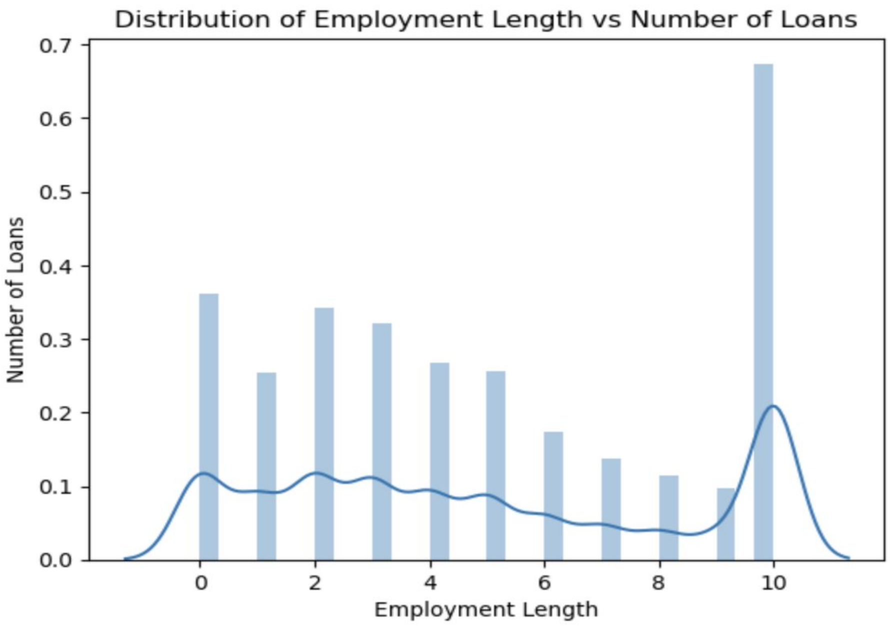
Loan Purpose Analysis



Loans for debt consolidation make up the largest portion of loans, followed by credit card use, and loans for renewable energy make up the smallest. Making strategic decisions for focused lending and resource allocation can be aided by an understanding of these patterns.

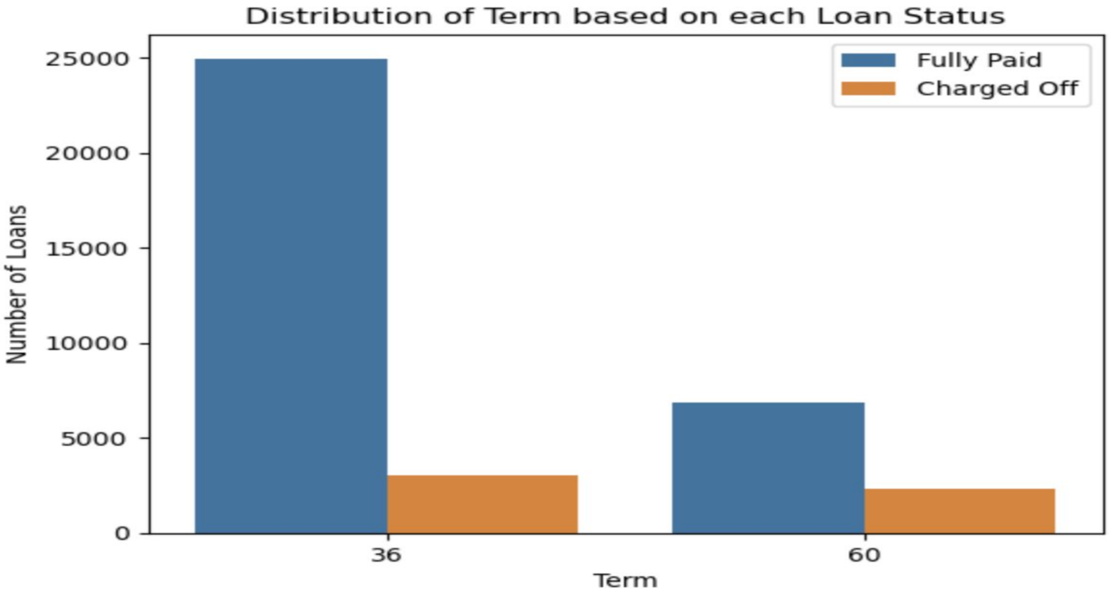
Home Ownership and Employment Length Analysis

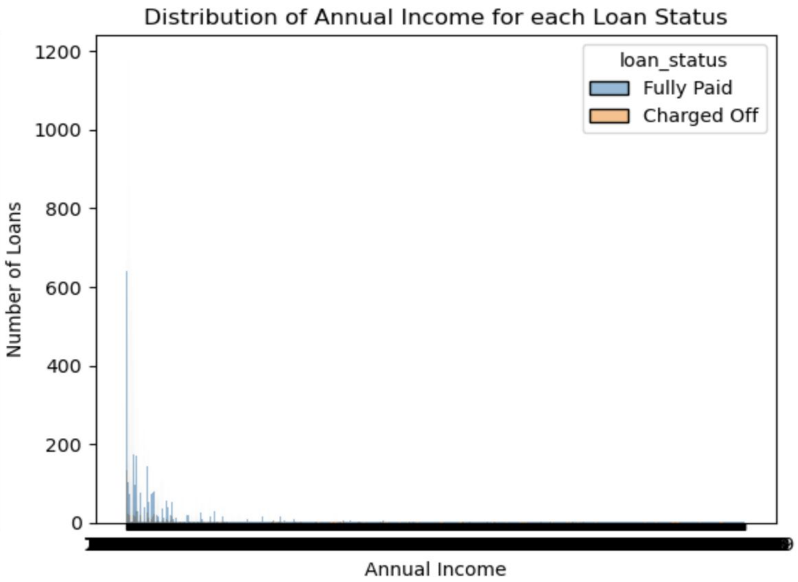




According to the analysis in graph 1, a sizable percentage of borrowers are property-free. Rather, they are primarily involved in mortgage or rental agreements, and graph 2 also shows that a sizable majority of borrowers have employment histories longer than ten years.

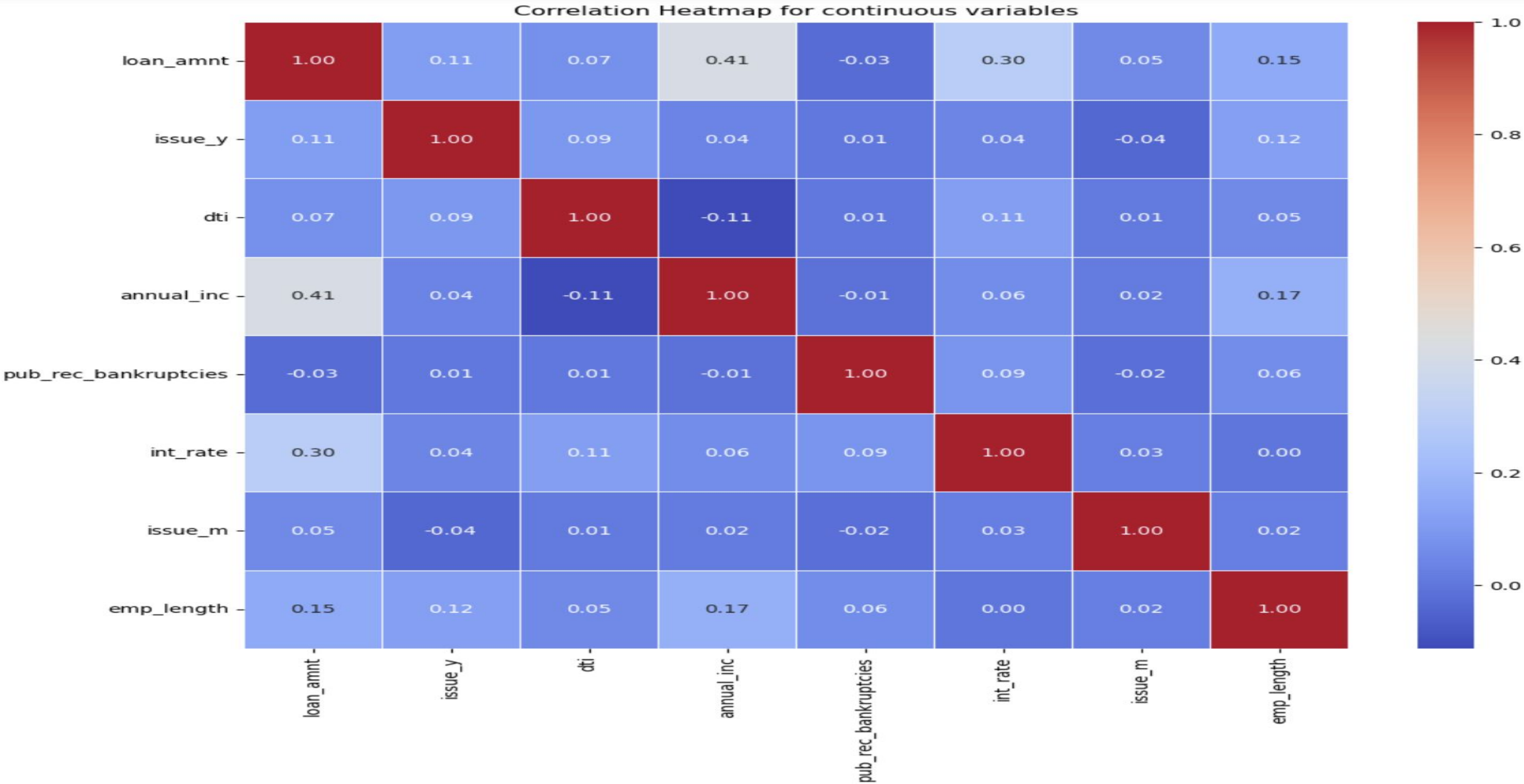
Term of Loan, Annual Income against the Loan Status





According to graph 1, loans with 60-month terms have a higher chance of defaulting than loans with 36-month terms.
The default loan amount and interest rate have a positive correlation, according to graph 2, with a decline seen after the interest rate threshold of 17.5%.

Correlation Matrix for Continuous Variables



Inferences from Univariate

- The majority of borrowers have a work experience exceeding 10 years.
- Most borrowers do not own property, opting for mortgage or rent.
- Most loans have a term of 36 months compared to 60 months.
- Many borrowers have a substantial debt relative to their income, concentrated in the 10-15 DTI ratio.
- A considerable number of loans fall under grade 'A' and 'B', indicating a prevalence of high-grade loans.
- Debt consolidation is the most common loan purpose, followed by credit card usage.
- Defaulted loans are significantly less, about 7 times fewer than fully paid loans.
- Loan approvals increase exponentially over time, indicating a rising loan approval rate.

Inferences from Segmented Univariate Analysis

- Fully paid loans are increasing exponentially over time.
- The 60-month term has a higher chance of defaulting, while the 36-month term has a higher chance of being fully paid.
- Defaulted loan amounts increase with interest rate, peaking around 17.5%.
- Borrowers owning property have lower default rates compared to those on mortgage or rent.
- Borrowers with an annual income less than 50,000 are more likely to default.

Inferences from Bivariate Analysis

- Grade 'A', indicating the lowest risk, has the lowest DTI ratio, suggesting lower default rates.
- Loan amount and interest rate are the 2nd more dependent and correlated variables.
- Grade represents a risk factor; interest rates increase with risk.
- Loan amount has high correlation with the person's annual income among the variables present.
- Annual income and DTI are negatively correlated.

Conclusion

- Borrowers with very high DTI values.
- Borrowers with 10+ years of work experience.
- Borrowers with a history of public recorded bankruptcy.
- Borrowers with lower grades (E, F, G) indicating higher risk.
- Borrowers with an annual income in the range of 50k to 100k.
- Borrowers with no Verification status.