Lending case study

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Introduction - Lending Club Case Study

Consumer finance company which specialises in lending various types of loans to urban customers. When the company receives a loan application, the company has to make a decision for loan approval based on the applicant's profile. Two types of risks are associated with the bank's decision:

1. If the applicant is likely to repay the loan, then not approving the loan results in a loss of business to the company.
2. If the applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss for the company

Business Objective

Company has provided the loan data from 2007-2011. Objective is to analyse the data and identify variables which are strong indicator of loan defaults which will give insights to the company whether to approve or reject the requested loan

Data Understanding

Data Understanding

After analysing the data, it has been observed that loan data can be categorized in three category -

1. User Demographics - Location, Annual Income, Loan Purpose, Employment Length, DTI, Home Owner, etc.
2. Loan Information - Term period, Loan Amount, Grade, Loan Status, Interest Rate, Installment, Issue Date, etc.
3. User behaviour towards loan - Public recovery, Revolving Balance, Total account, Outstanding principal, total payment, Delinquency, etc.

As part of analysis, we will be excluding user behaviour towards loan category as these variable are only applicable once loan is granted. These variable may be used to assess if the existing customer who had taken loan is reapplying for the same.
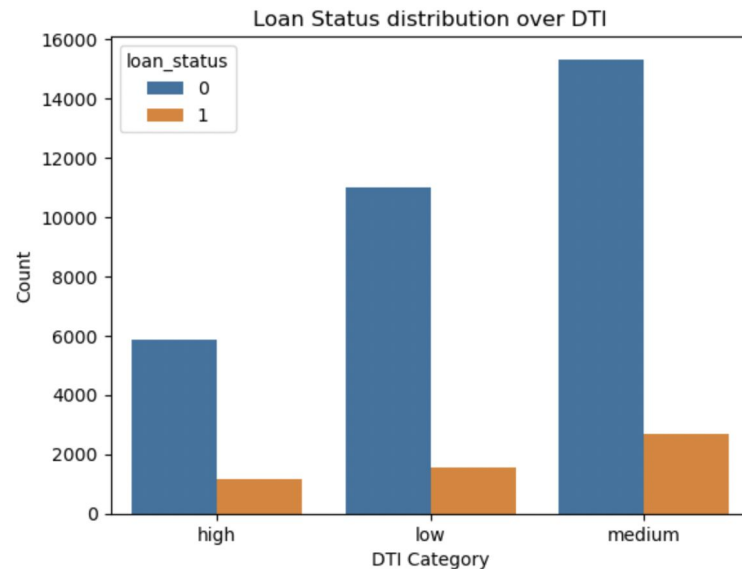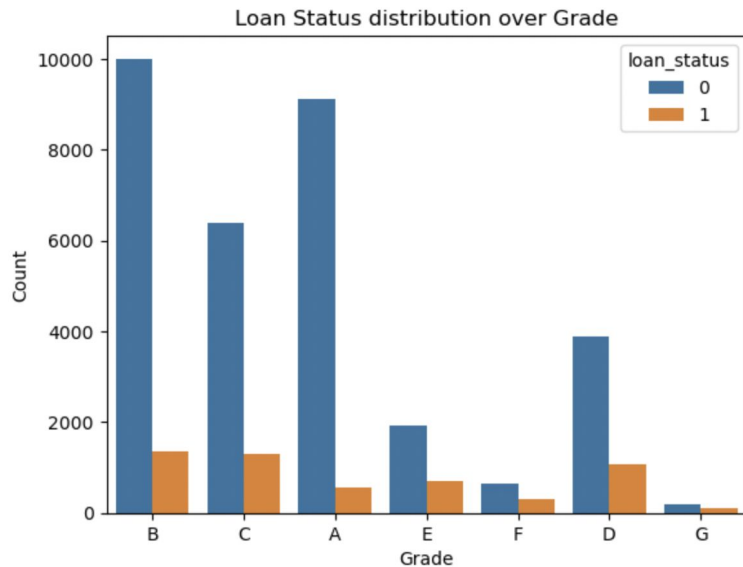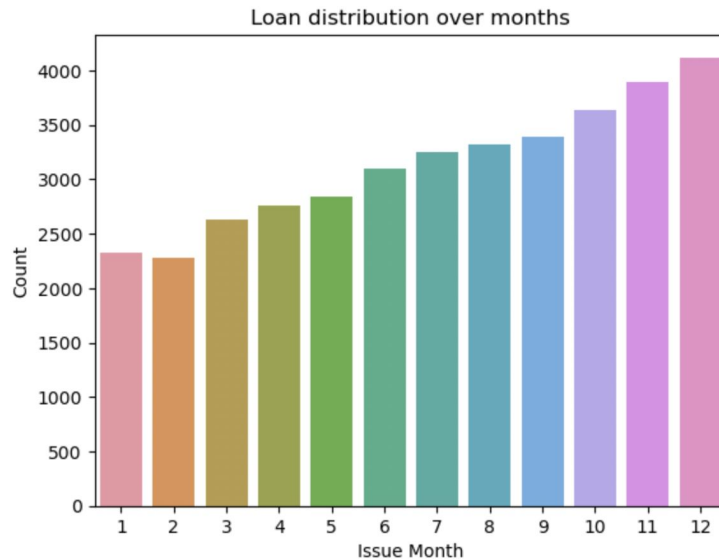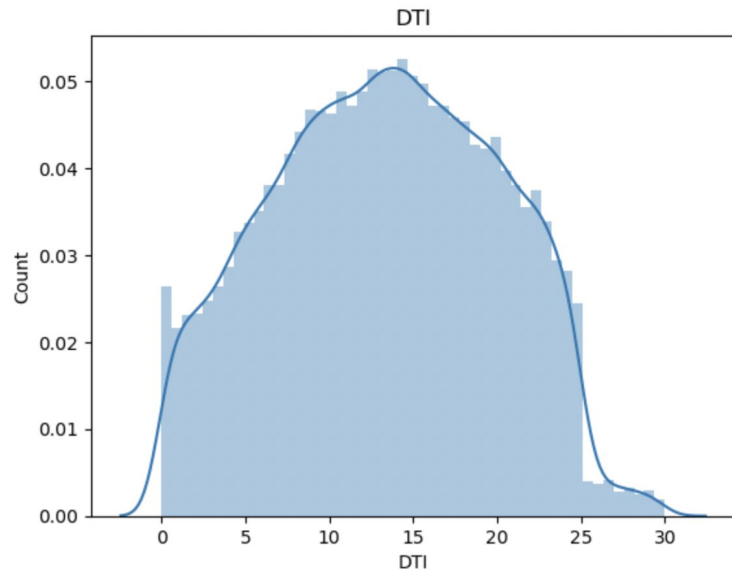
Data Analysis

Data Analysis

- Loan defaults are more at medium DTI
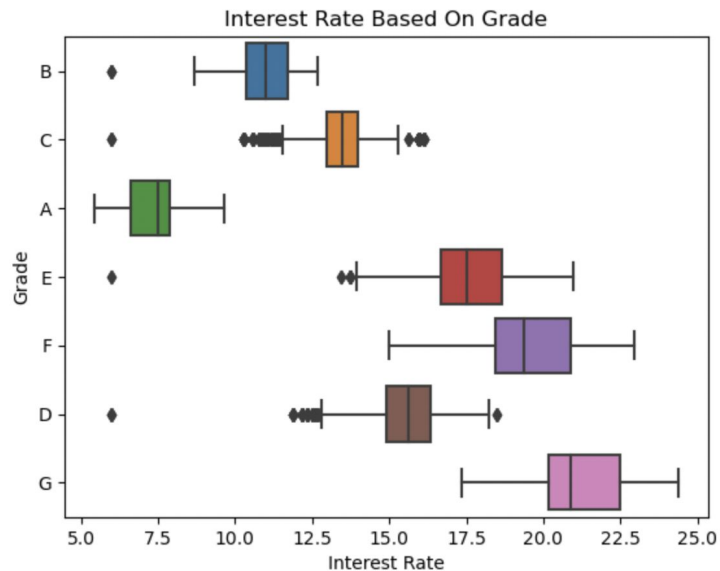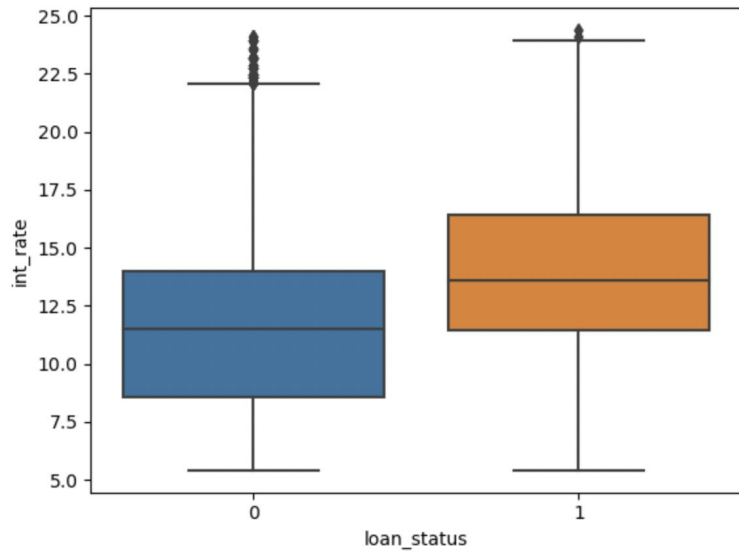- As a percentage, Grade D, F are more likely to default loans

Data Analysis

- Most loan holders have higher DTI
- Most loans are approved at the end of the year

Data Analysis

- Loan defaults are high as interest rate increases
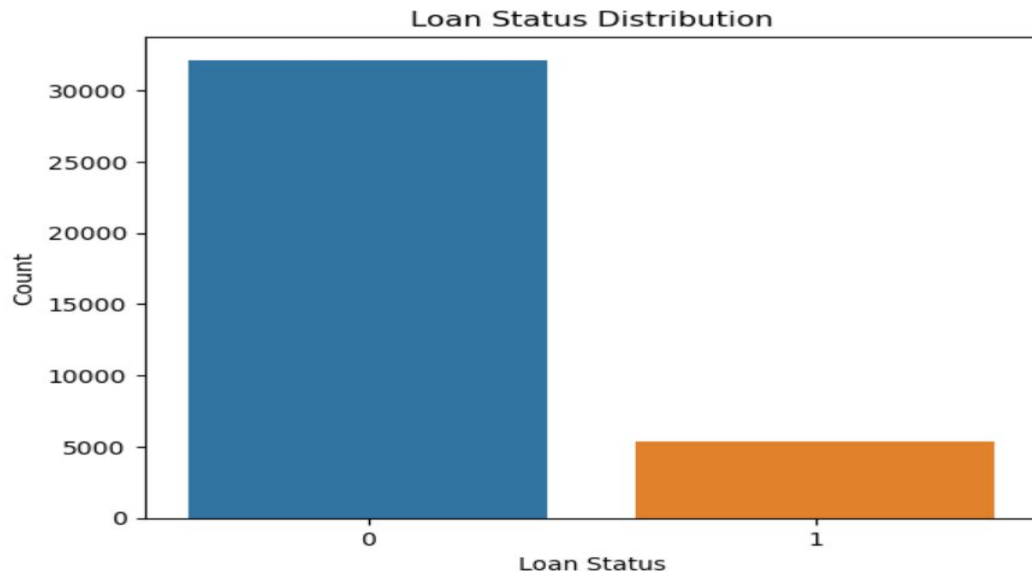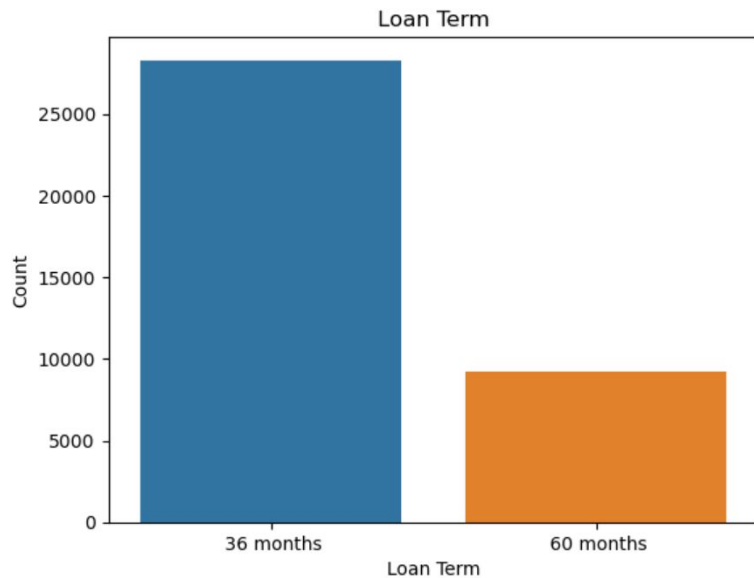- Interest rate increases with the increase in grade

Loan Status

- 0 - Fully Paid Loan ; 1 - Charged off Loan
- Loan defaults are significant lower the Fully Paid Loans.

Loan Status Distribution

Loan Term
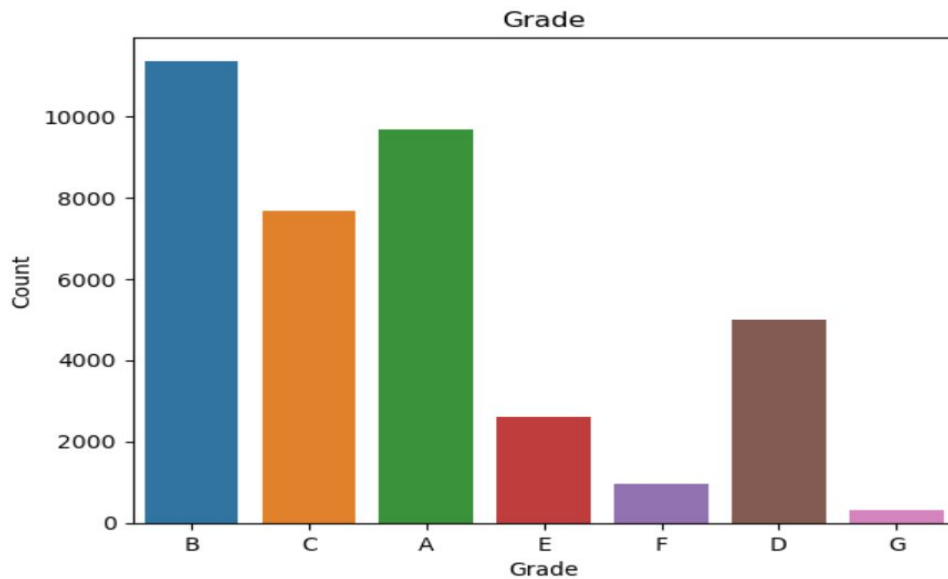
- Approved loans are more popular for 36 months term period.

Loan Grade

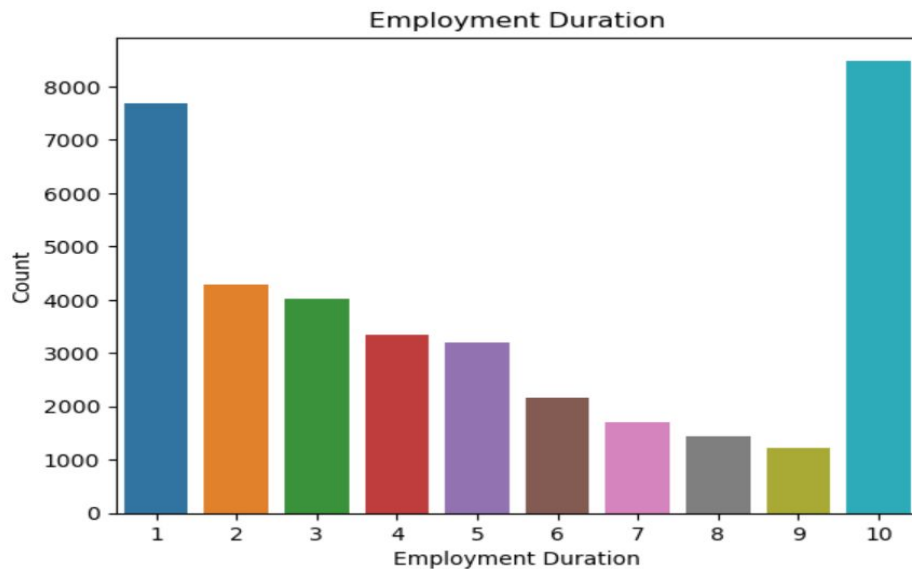- Most of the approved loans are given to customer having good grade - A, B & C.

Employment Length

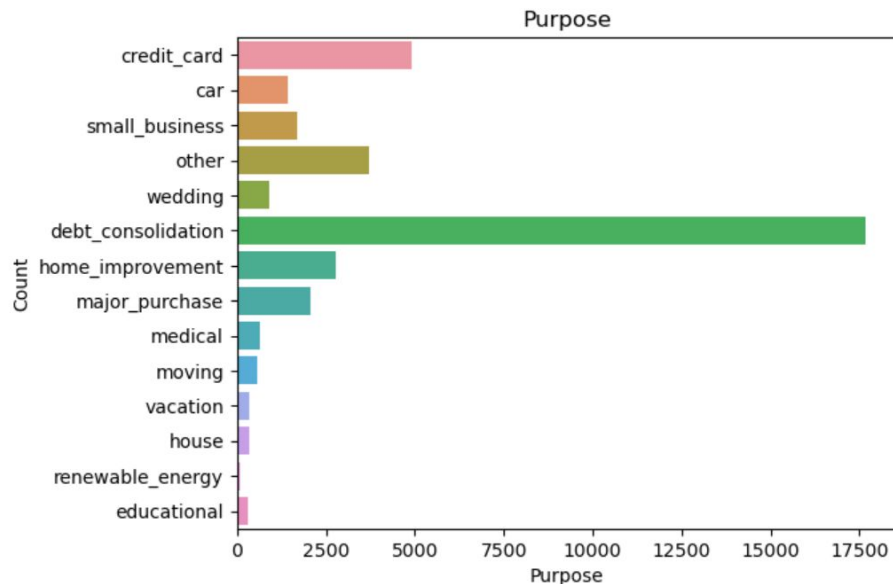- Most of the approved loan are for customer having employment duration more than 10 years.

Loan Purpose

● Most of the approved loan are for purpose - debt consolidation.

Loan Approved Year

- Approved Loan increases with increase of year.

Loan distribution over Years
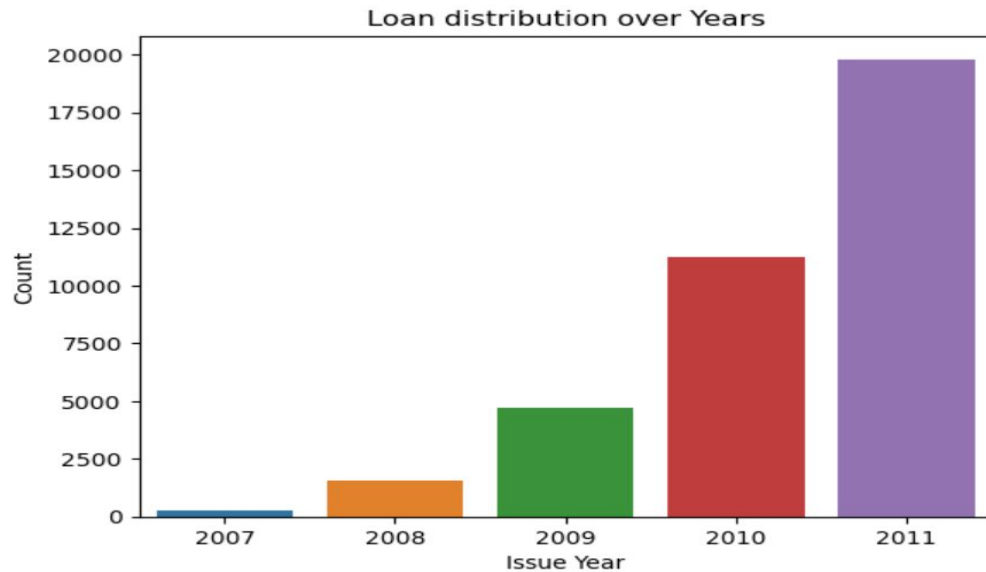
Loan Status vs Loan Amount

- Loan defaults increases with increase in Loan amount.

Loan Status distribution over Term
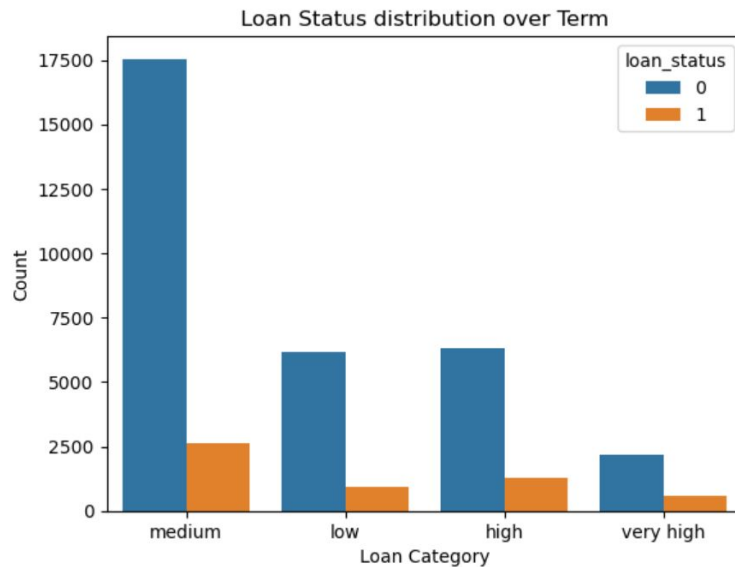
Loan Status vs Interest Rate

- Loan defaults increases with increase in Interest Rate.
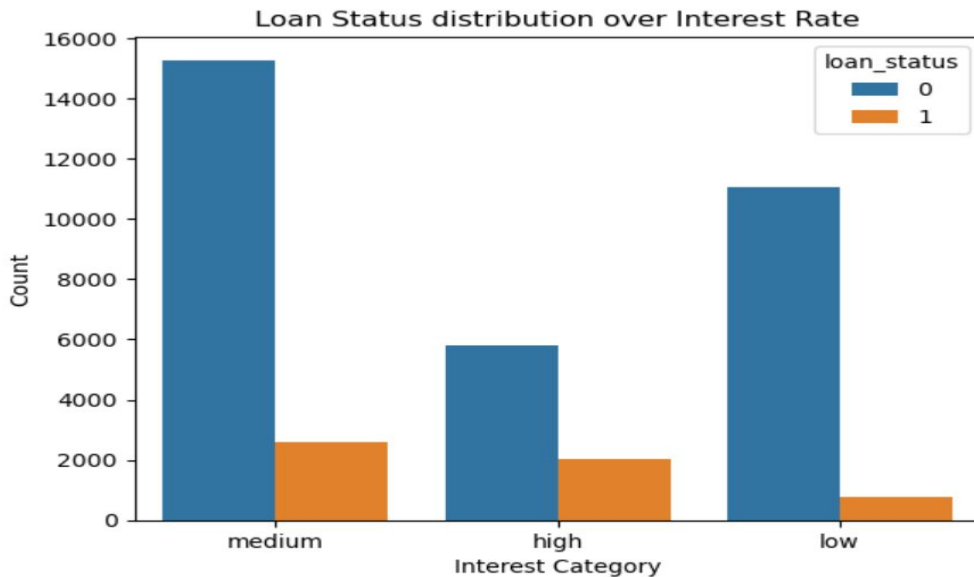
Loan Status distribution over Interest Rate

Loan Status vs Grade

- Loan defaults increases with decrease in Grade

Loan Status distribution over Grade

Loan Status vs Grade
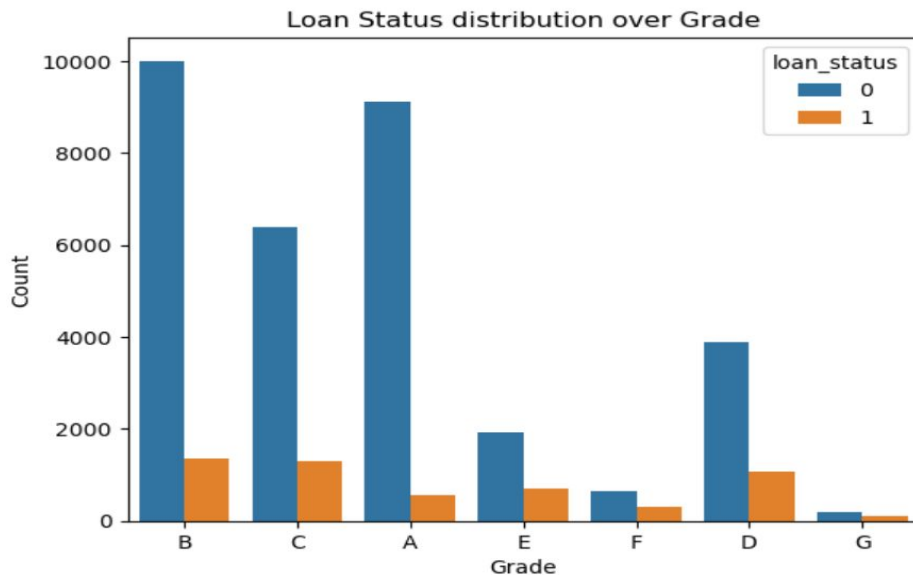
- Loan defaults increases with decrease in Grade

Loan Status distribution over Grade
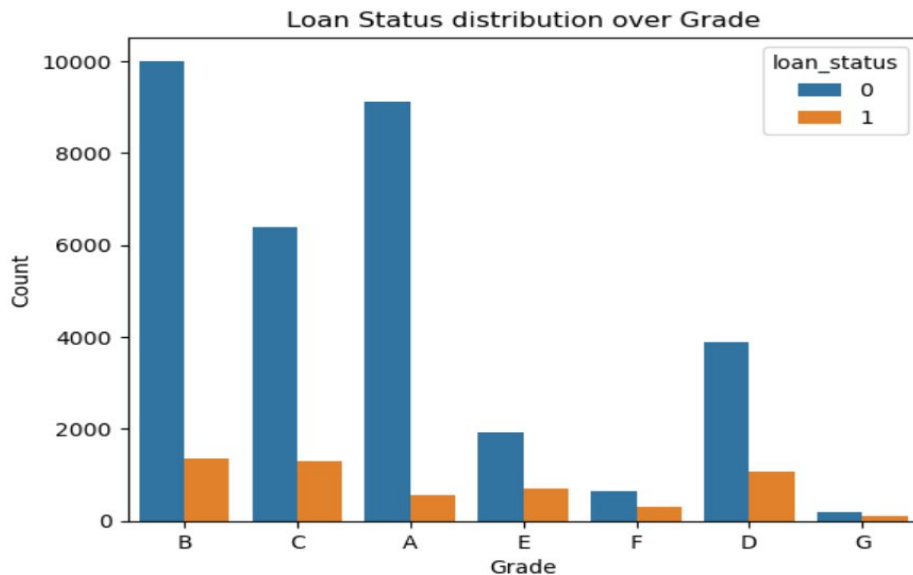
Insights

Univariate Analysis

- Defaulted Loan are low as completed to Fully Paid loans
- 36 months term loan is common as compared to 60 months term period.
- Lower loans were approved at higher interest rates.
- Grade A, B & C holds most of the approved loans.
- Most of loan approved are from employee having less than 1 year experience or more than 10 year experience.
- Most of loan approved are from borrower staying on rent or on mortgage.
- Most number of loans were approved for people having loan amount of 5000-10000. It decreases as the loan amount increases.
- Most of loan approved are for people having low income.
- Highest number of loan were approved for unverified people.
- Highest number of loan approved for purpose - debt consolidation.
- Most of the loan holders as high dti.
- Most number of loan were issued in last quarter of a year.
- Loan approved are increasing with increase is year.

Loan default insights (segmented analysis)

- Loan defaults are higher with increase of:
  - Loan amount
  - Interest rate increases.
  - High DTI.
  - Installment increases.
  - People having less annual income.
  - Loan term increases.
- Loan defaults are more with people having grade as D, E, F & G.
- Loan defaults are more with people having 2-9 years of experience.
- Loan default are increasing with increase of year.
- People taking loan for debt consolidation have higher chances of default as well as fully paid loans.

Bivariate Analysis

- Interest rate increases with decrease of Grade.
- Interest rate rises as Loan amount increases.
- Interest rate has impact on installment.

Recommendations

Recommendation

Below variables need to be considered for Loan Default -

Grade	D, E, F & G categories tends to default more.
Interest rate	Higher interest rates leads to more defaults.
Installment	Higher installment values tends to default more
DTI	People with high DTI tends to default mor.
Annual Income	Low income tends to default more often.
Loan Purpose	Loan given for purpose different than Debt consolidation should be analysed as they have more defaults.
Verification status	Loans offered without verification status are more likely to default