

### **LENDING CLUB CASE STUDY**

### **SUBMISSION**

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### **Project Introduction**

### > Project brief:

- Lending club is a consumer finance company which specializes in lending various types of loans to urban customers.
- Based on applicant's profile, the company has to make decision for loan approval.
- Company has to be very careful and risk involved in getting the loan approved from bank.

### **>** Business Objectives:

- Identify the key factors that contribute to default risk, allowing Lending Club to improve its loan underwriting process and reduce the risk of default.
- Identify the largest amount of loss to the lenders are default borrowers.

### Goals of data analysis:

- By building a predictive model that accurately identifies the default risk for loan applications.
- Lending Club can reduce its default rates and increase profitability.





## **Overall Analysis Process**

#### **Import Data**

- Fix the encoding issue.
- Import companies & rounds2 files into DF's (Data Frames).

# **Merging Data Frames**

- Evaluate the data in both the DF's.
- Merge it to create a single DF.



#### **Cleaning data**

- Drop the unnecessary columns and missing data rows.
- Drop not required investment types except angel, seed, venture, private equity.

#### **Sector Analysis 1**

- Extract primary sector from category list column.
- Import the mapping file and convert wide format DF to long format DF.
- Merge it with master data frame.

#### **Country Analysis**

- For selected funding type, find the top 9 heavily invested countries.
- Take top 3 English speaking countries (using wiki page for reference).



#### **Investment Type Analysis**

- Evaluate using quantiles.
- Treat the outliers.
- Evaluate using Mean, Median, count
  & standard deviation.

#### **Sector Analysis 2**

- Create the separate DF's for selected countries.
- Use them to find total investments, total invested amount, top sectors & highest investment companies in top sectors.

#### **Plotting the Analysis**

- Funding type Analysis.
- Investment in top countries.
- Top 3 sectors in three highly invested countries.





## **Data Understanding**

- ➤ Dataset having some unwanted columns and records which needs to remove from dataset for the accurate analysis.
  - Null value columns
  - Unwanted columns
  - column whose values are less than 25% of data
- Data has some with the values.
- Dataset has some outliers.
- After analyzing all the statistical measures, the data seems to be positively skewed. But as there are no more outliers, considering 'Mean' as the representative value is right.





## **Data Cleaning and Manipulation**

➤ Dropped some columns having null values. With the help of below code and removed unwanted columns as well.

```
for i in empty_cols:
 print(df[i].isnull().sum())
```

- > Excluded the data for Current customers.
- ➤ Annual income has some outliers, eliminated outlier data and added Issue\_Loan\_Month variable from issue\_d variable.
- > Extracted only numeric value from int\_rate column and updated same column.
- >Assumed the 'term' values will be numeric to plot the graph in appropriate manner.
- ➤ Created to different dataset one having "Fully Paid" and other "Charged Off" to differentiate the data.





## **Loan Status analysis**

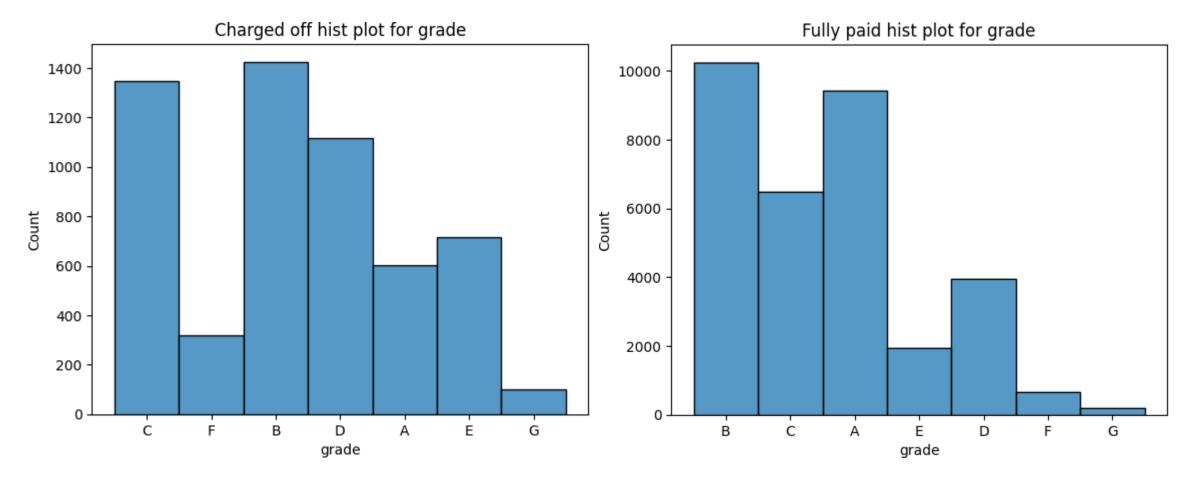
- ➤ LC wants to analyze the based on the loan status default customers, based on this we have filtered the data accordingly from dataset
- This data will be useful for plotting insights.

Loan Status	Total Invested Amount
Fully Paid	32937
Charged Off	5626





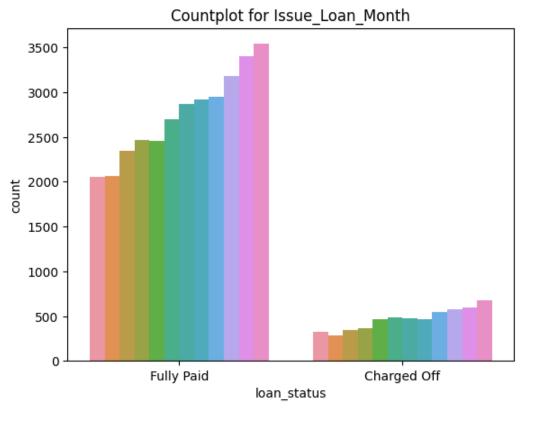
➤ Histogram plotted for all the 'loan\_amnt','annual\_inc','grade','dti' against same to check the loan status catogory and found some below statistics.







➤ You can look at the trend for customers who are defaulters for issue loan month from JAN, NOV and DEC

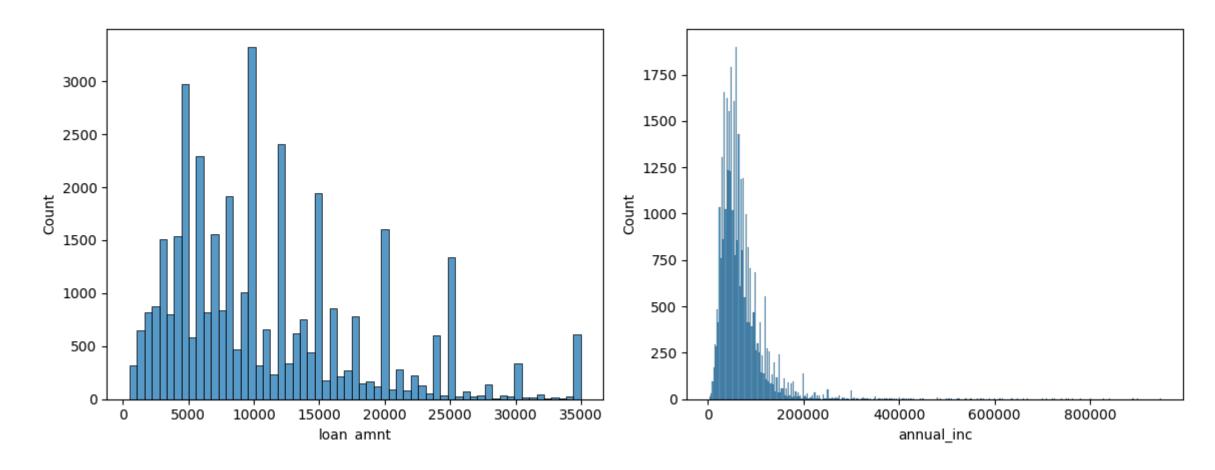








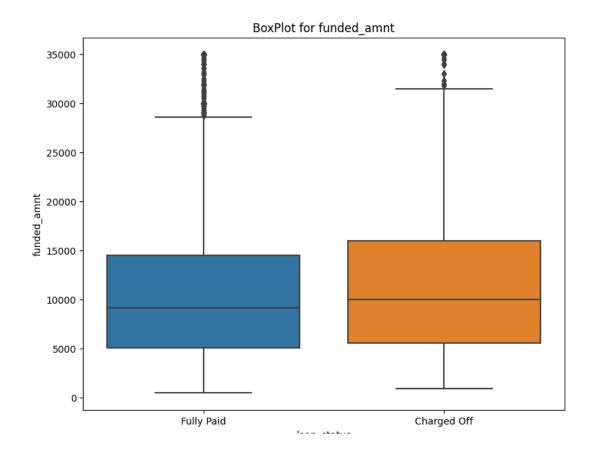
➤ Loan avg loan amount is disbursing is from 5000 to 15000 and can view avg annual income.

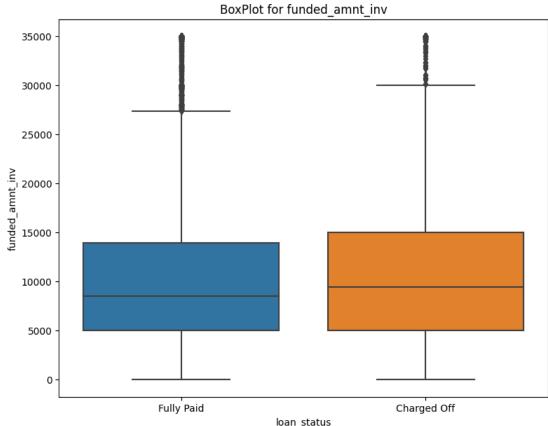






It has been observed that individuals who receive funding amounts in the third quartile (Q3) are more likely to default compared to the amounts approved by the companies for those who do default.

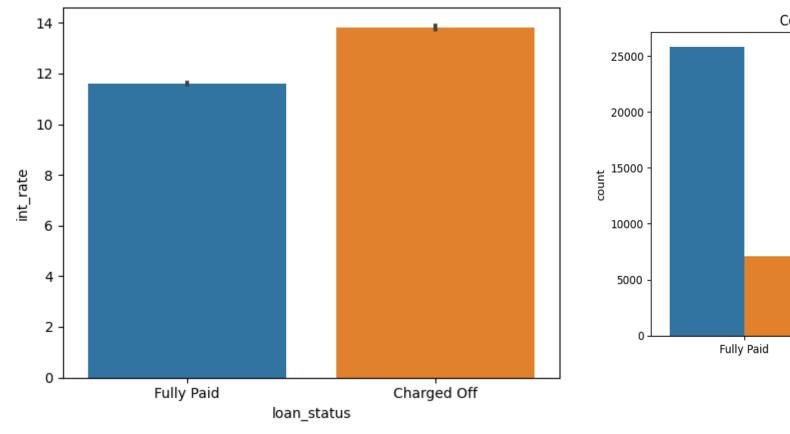


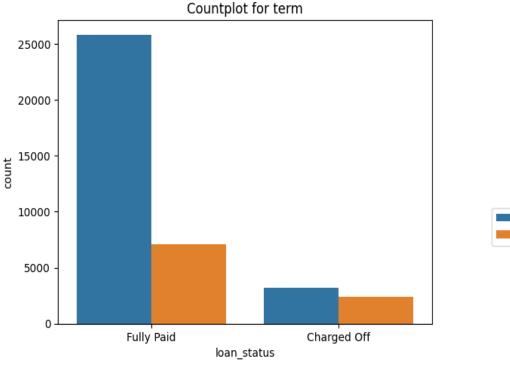






> Customers with the highest interest rates are charged off more frequently, while loans with a 36-month term are paid off more often

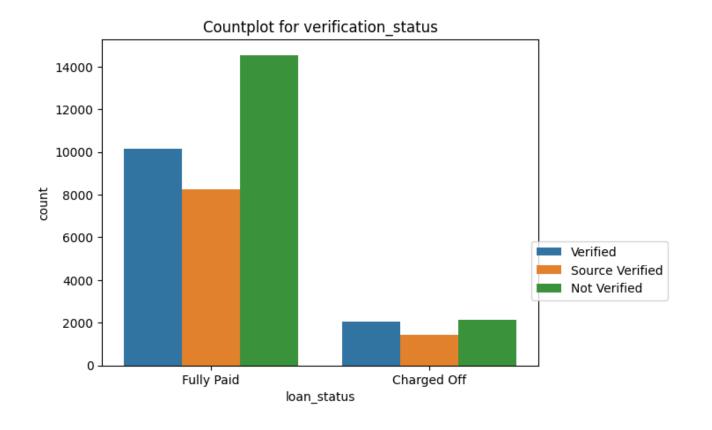


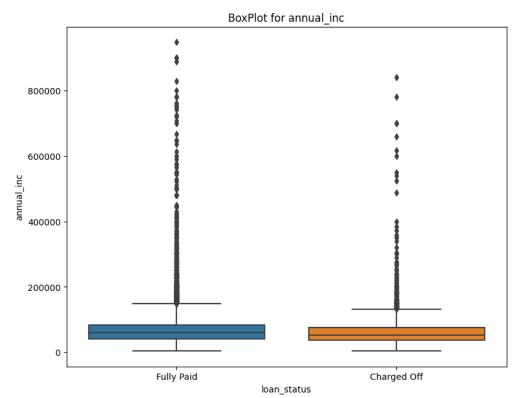






In here we can see the source verified customers are paying the amount higher than other two categories and those who are annual income less the defaulters are more in number.









### Recommendations

- ➤ Loans can be provided to customers who fall in grade A and ignore of Grade D customers.
- > Source verified customers are less defaulters.
- > The loan disbursed in Jan, Nov and month are significant defaulters.
- > It is observed that the loan term of 36 months is typically paid loans.
- ➤ Loan avg loan amount is disbursing is from 5000 to 15000 is significantly high.