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Lending Club Case Study:

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Problem Statement :-

Lending Club is a 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

The data given below contains information about past loan applicants and whether they 'defaulted' or not.

The aim is to identify patterns which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending (to risky applicants) at a higher interest rate, etc.

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Analysis :-

Analysis based upon correlation Matrix :-

1. Loan amount, investor amount, funding amount are strongly correlated(near to 1).

2. Annual income and DTI(Debt-to-income ratio) is negatively correalted(-0.075). Debt income ratio is the percentage of a borrower's monthly gross income that goes toward paying debts. This means when annual income is low then DTI is high & vice versa.

3.Positive correlation between annual income and employment years(0.19) which means borrower income increases with employment length ie work experience

4. Going ahead we will work only with 'Loan Amount as the Loan Amount, Funded Amount and Funded Amount Inv are strongly correlated. This we can confirm further by seeing the distribution plot.

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Univariate Analysis:-

1. Loan amout is spread between 5000 -15000
2. Most of the borrower's Annual incomes are in range of 40000- 80000
3. Most of the Interest rates on loans are in range of 10% - 15%
4. Most of the loans were taken for the purpose of debt consolidation & paying credit card bill.Charged off is higher in debt_consolidation.
5. Most of them living in rented home or mortgage home. Therefore " Charged off" is high in these category as the application count is high.
6. Those who had taken loan to repay in 36 months had more percentage of number of applicants getting charged off as compared to applicants who had taken loan for 60 months

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Bivariate Analysis:-

- Annual Income range 80000+ has less chances of charged off. Annual Income range 0-20000 has high chances of charged off. With increase in annual income charged off proportion got decreased.

- Grade "A" has very less chance of charged off. Grade "F" and "G" have very high chance of charged off. Chances of charged off is increasing with grade moving from "A" towards "G"

- Sub Grade "A" has very less chance of charged off. Grade "F" and "G" have very high chance of charged off. Among the grades as A1,A2 ...A5 varies, charged off proportion also increased . Similarly this is applicable for other Grades (B,C....G)

- Interest rate < 10% has very less chances of charged off. Interest rate > 16% has good chnaces of charged off as compared to other category interest rates. Charged off proportion is increasing with higher intrest rates.

- Work experience less than 1 year of experience have high chances of getting charged off. Rest years of experience remains same.

- Small Business applicants have high chances of getting charged off.

- Low DTI gets low interest rate. There is slight increase in interest rate with increase in DTI.

- Interest rate is increasing with an increase in loan amount. - Average intrest rate is highest for small business purpose ie it had to pay the loan with more interest rate then any other purpose.

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Recommendations:-

Following should be carefully analysed before approving for loan

- Annual income and DTI(Debt-to-income ratio) is negatively correalted(-0.075).
  Debt income ratio is the percentage of a borrower's monthly gross income that goes toward paying debts.
  This means when annual income is low then DTI is high & vice versa.
- Most of the loans were taken for the purpose of debt consolidation & paying credit card bill.Charged off is higher in debt_consolidation.
- Most of them living in rented home or mortgage home. Therefore " Charged off" is high in these category as the application count is high.
- Those who had taken loan to repay in 36 months had more percentage of number of applicants getting charged off as compared to applicants who had taken loan for 60 months+
- Grade "A" has very less chance of charged off.
  Grade "F" and "G" have very high chance of charged off.
  Chances of charged off is increasing with grade moving from "A" towards "G".
- Small Business applicants have high chances of getting charged off.
- Work experience less than 1 year of experience have high chances of getting charged off. Rest years of experience remains same.

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Thank You!