Gramener Case Study

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Introduction

Solving this case study will give you an idea about how real business problems are solved using EDA. In this case study, apart from applying the techniques you have learnt in EDA, you will also develop a basic understanding of risk analytics in banking and financial services and understand how data is used to minimise the risk of losing money while lending to customers.

Business Understanding

You work for a **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:

- If the applicant is **likely to repay the loan**, then not approving the loan results in a **loss of business** to the company
- 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

Problem Statement

To understand how **consumer attributes** and **loan attributes** influence the tendency of default.

Problem Summary

When a person applies for a loan, there are **two types of decisions** that could be taken by the company:

- **Loan accepted:** If the company approves the loan, there are 3 possible scenarios described below:

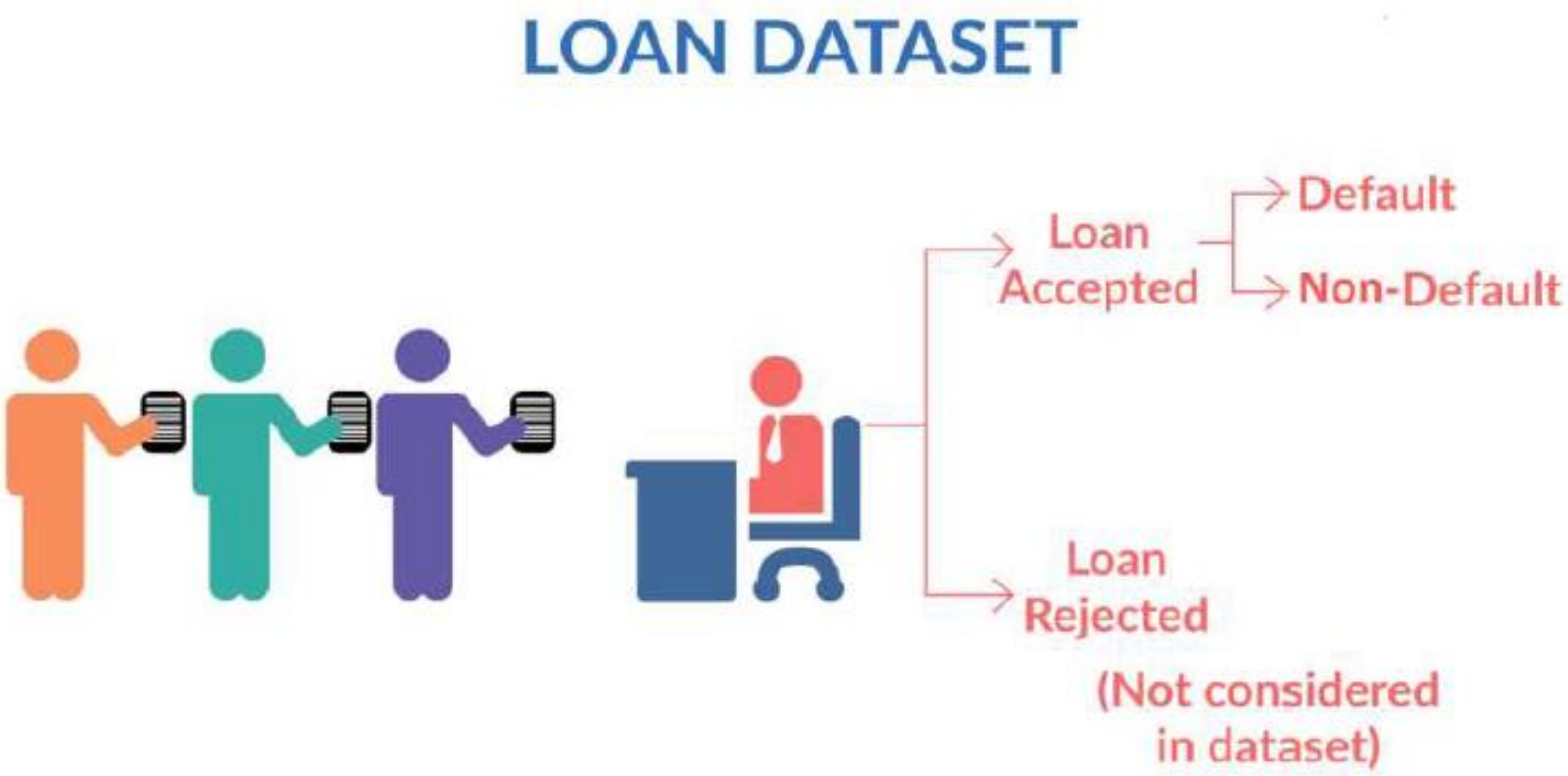
  Fully paid: Applicant has fully paid the loan (the principal and the interest rate).

  Current: Applicant is in the process of paying the instalments, i.e. the tenure of the loan is not yet completed. These candidates are not labelled as 'defaulted'.

  Charged-off: Applicant has not paid the instalments in due time for a long period of time, i.e. he/she has **defaulted** on the loan.

- **Loan rejected**: The company had rejected the loan (because the candidate does not meet their requirements etc.). Since the loan was rejected, there is no transactional history of those applicants with the company and so this data is not available with the company (and thus in this dataset).

Process Flowchart



Data understanding

- Customer’s Demographics

    (Employment length, Employment title, Annual income, Zip code, Description)

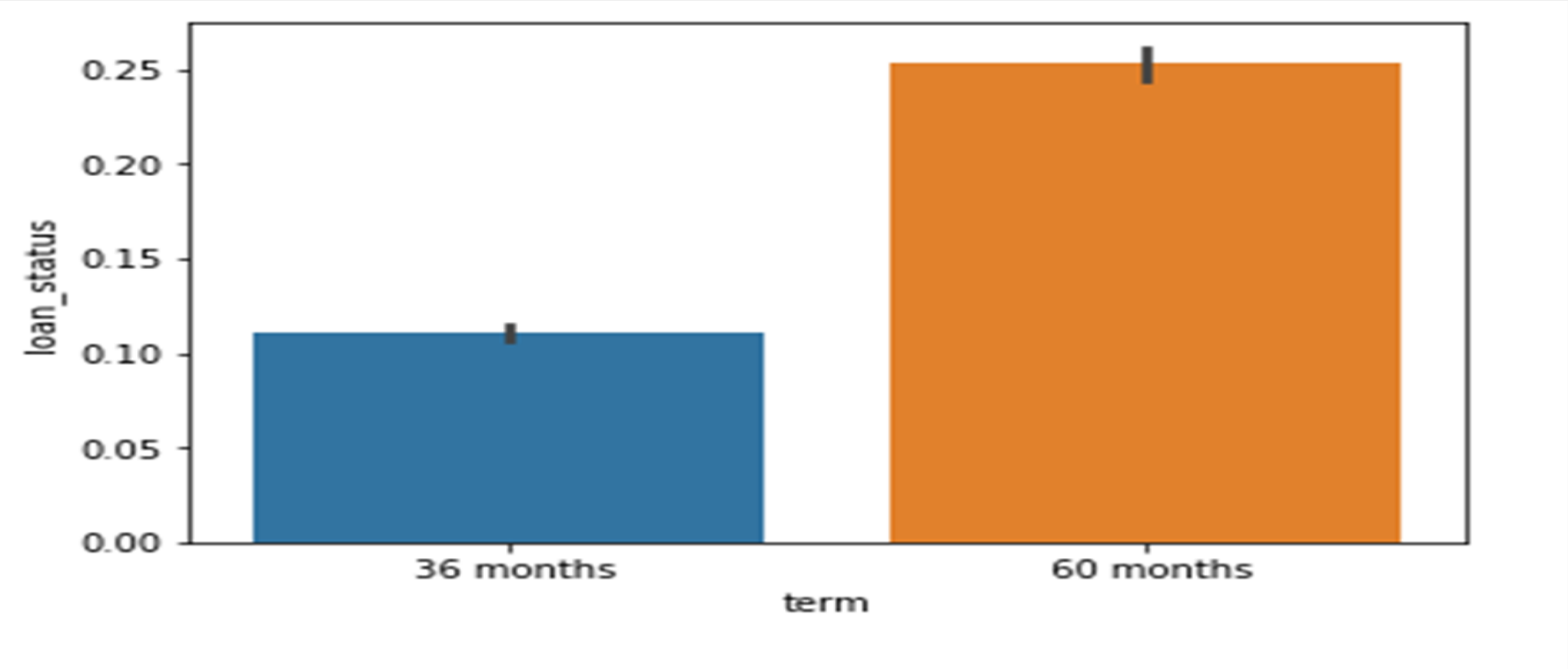
- Loan related information and characteristics

    (Loan amount, Funded amount, Funded amount investment, Interest rate, Loan status, Loan Grade)

- Customer behaviour(If loan is granted)

    (Delinquency year, Earliest credit line ,Revolving balance, Recoveries, Application type, Loan purpose)

Term vs Default Relationship



Finding:- Customers availing loan for shorter term, i.e. 36 months tenure has better payment record compare to the customers who take loan for a longer period.

Default Rate vs Loan Ammount

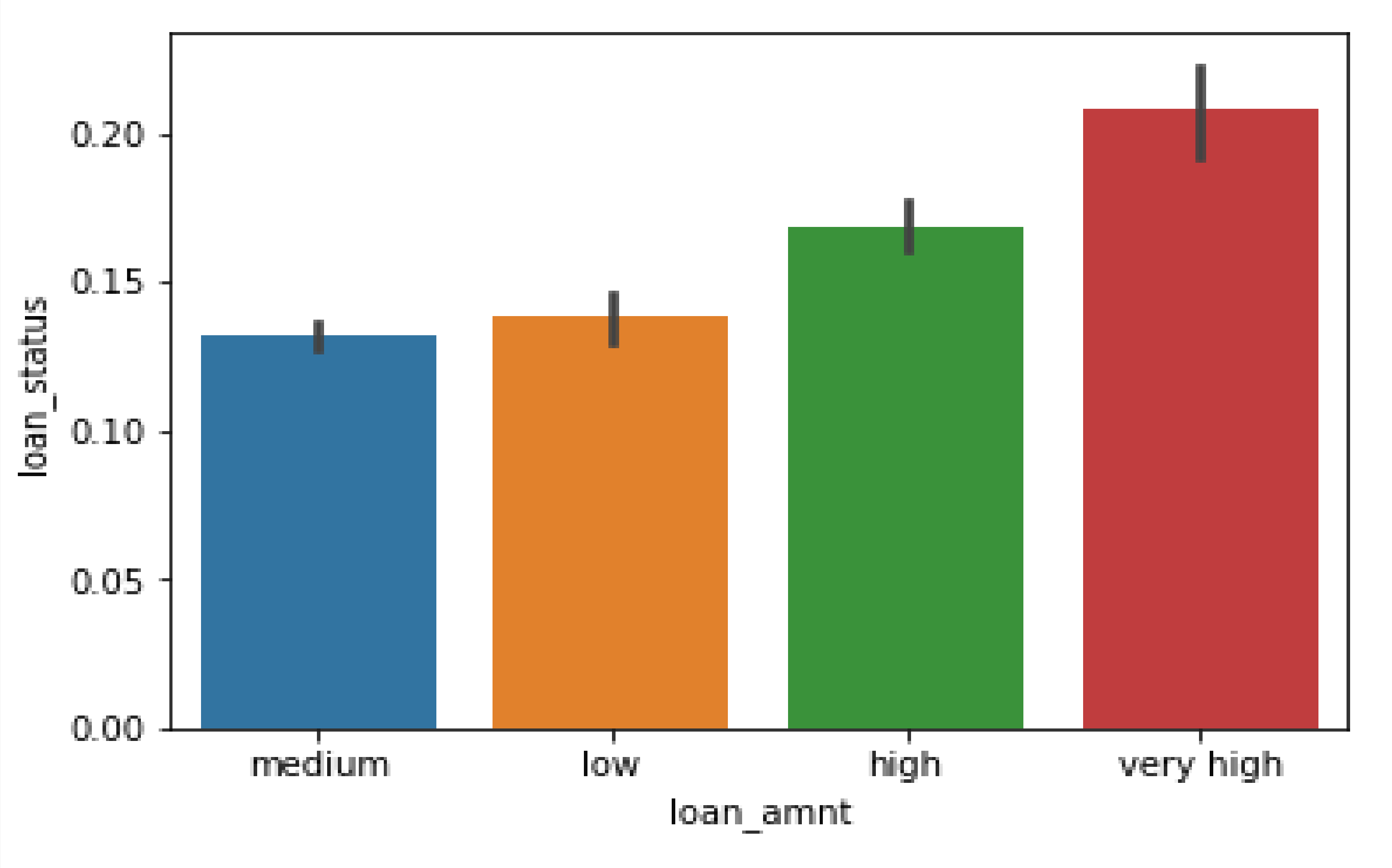
Low => less than 5000

Medium=> Between 5000 & 15000

High=> Between 15000 & 25000

Very High=> Greater than 25000

Finding:- Higher the loan amount higher defaulter rate.



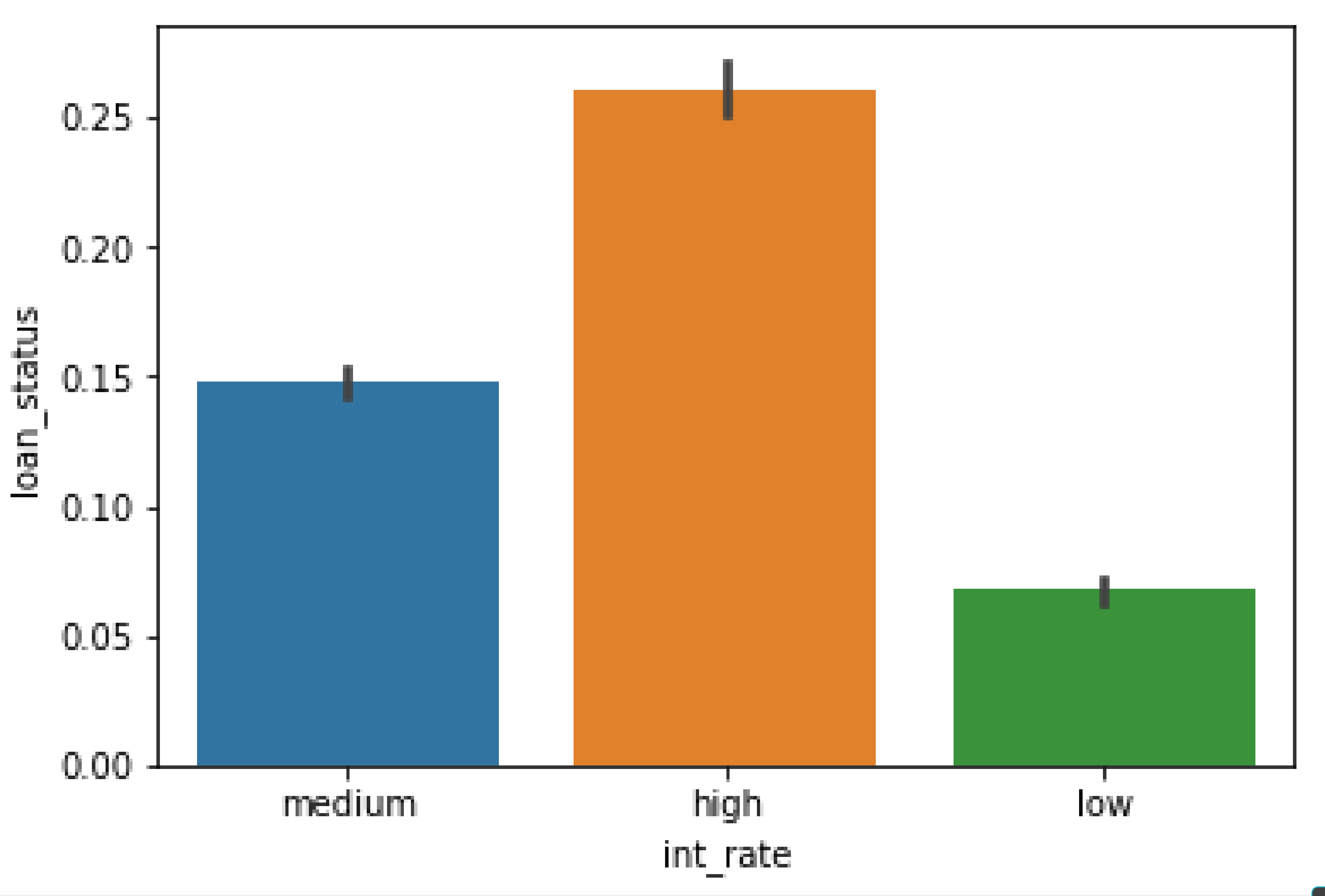
Default Rate vs Interest Rate

Low => less than 10%

Medium=> Between 10% & 15%

High=> Greater than 15%

Finding:- Higher interest rates tend to give more defaulters



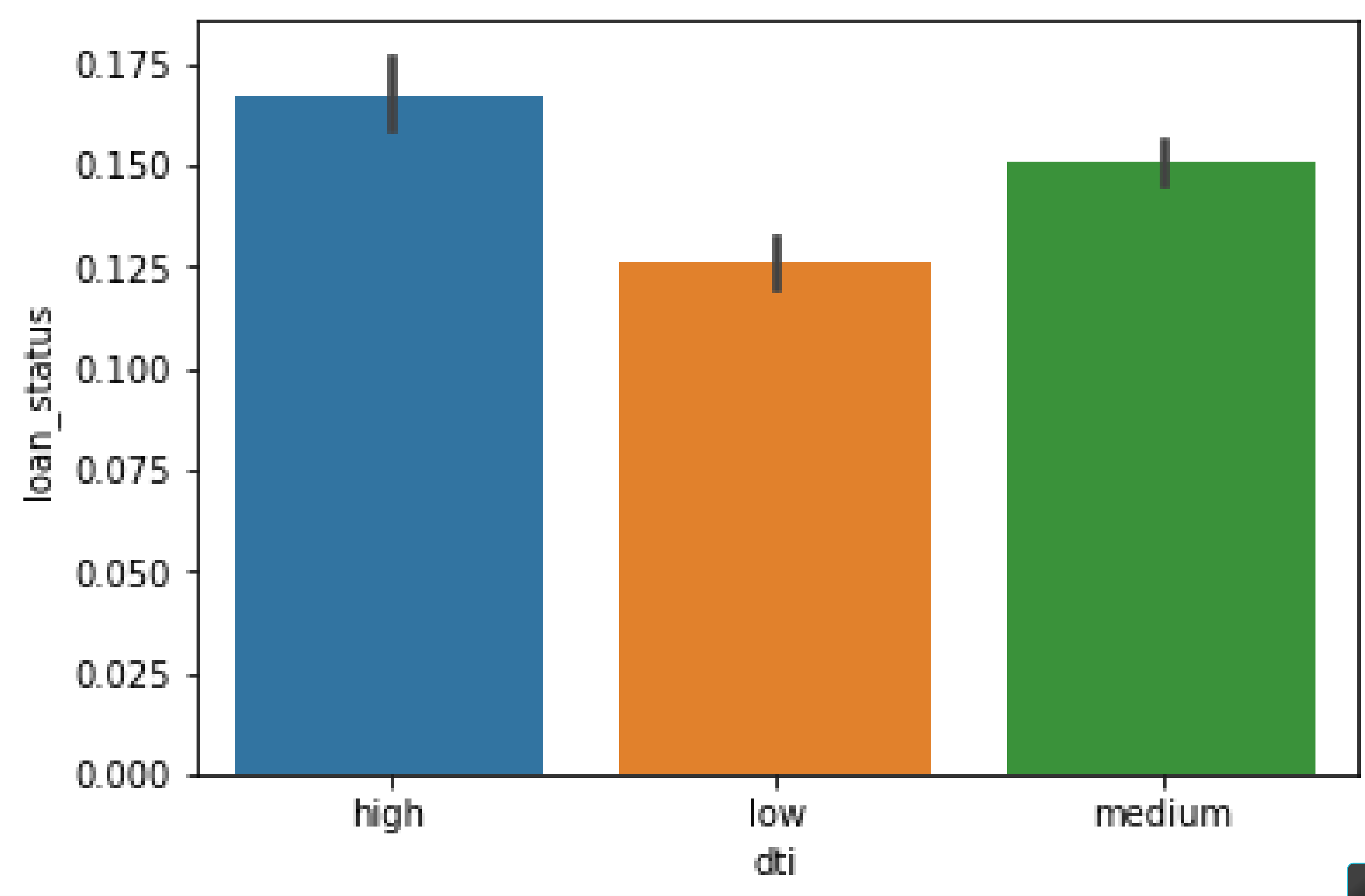
Defaulter rate vs Depth to income ratio

<u>Low</u> => less than 10%

<u>Medium</u>=> Between 10% & 20%

<u>High</u>=> Greater than 20%

<u>Finding</u>:-high debt to income ratio translates into higher default rates



Default rate vs Annual Income

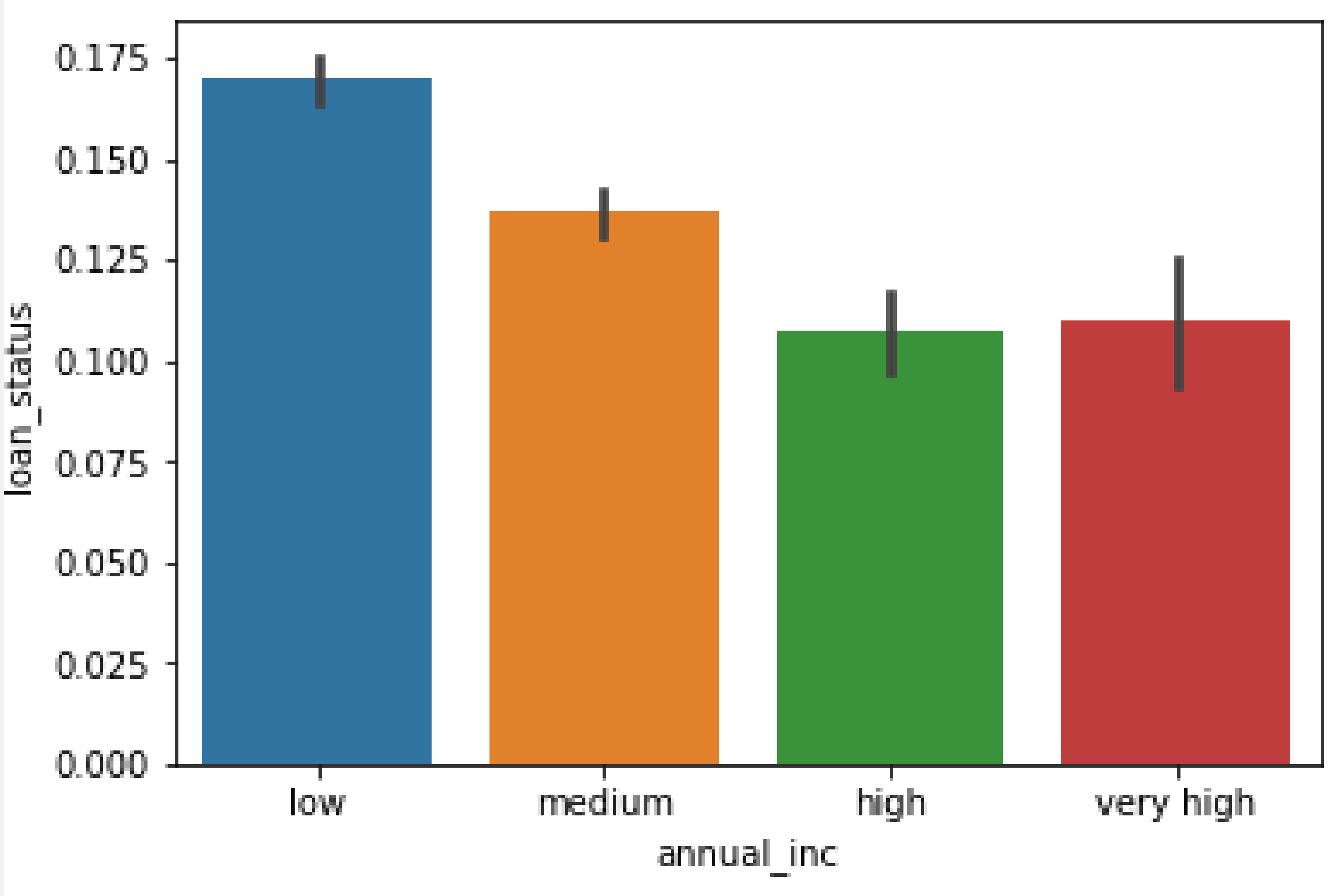
<u>Low</u> => less than 50000

<u>Medium</u>=> Between 50000 & 100000

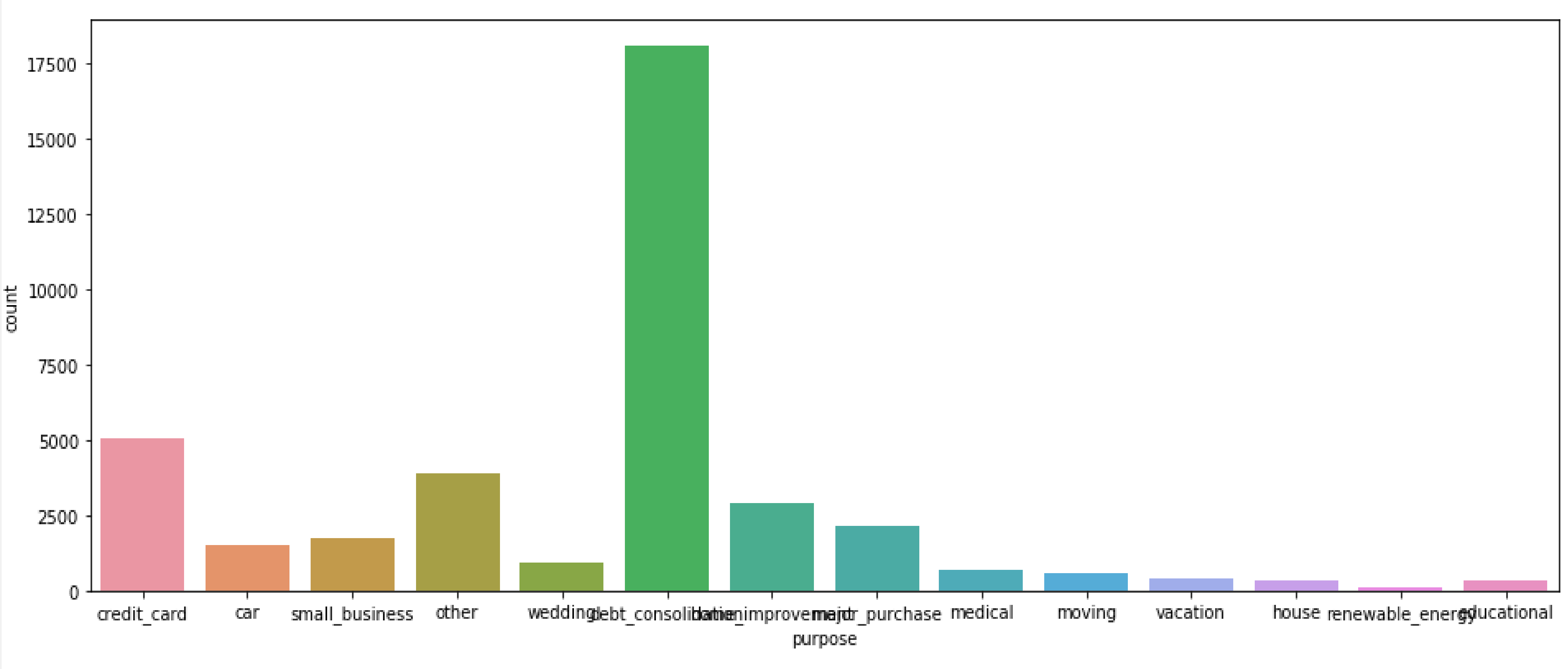
<u>High</u>=> Between 100000 & 150000

Very High=> Greater than 150000

<u>Finding</u>:- Low annual income tends to more default rate.

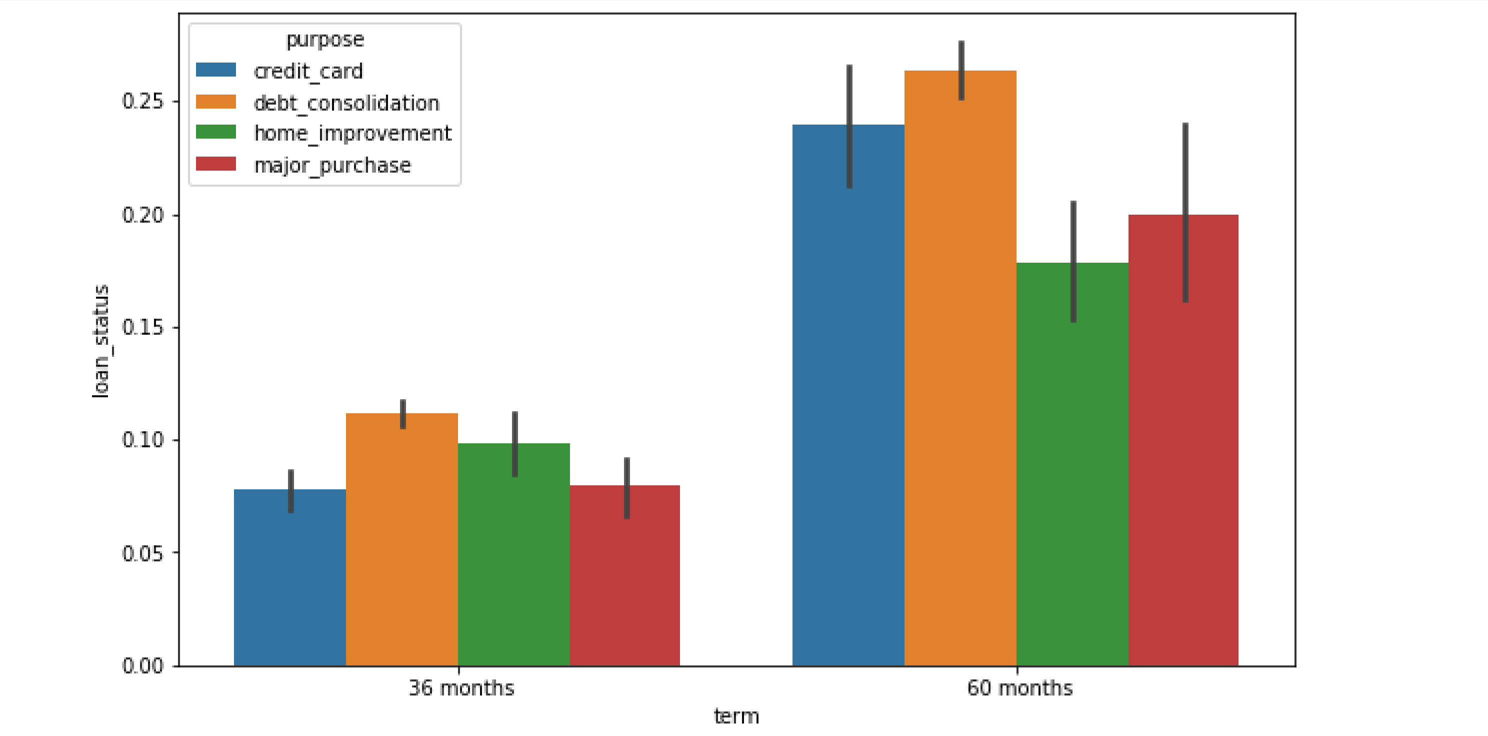


Default Rate vs Purpose of loan



Finding:-small business loans default the most. The top 4 types of loans based on purpose: consolidation, credit card, home improvement and major purchase.

Comparing Defaulter Rate vs Term with purpose as segmentation variable



Finding:-In general, debt consolidation loans have the highest default rates.

Conclusion

- Organization should increase the loan term from 36 months & at-most 60 months for increasing the profitability, however, this would come with an residual risk of little bit increase in the default rate also, thus to address that, there should be some form of incentive & penalty for the candidates who are likely to pay & ones who are more likely to default than the latter. One way to achieve this would be offering lesser interest rate to customers who are likely to pay than the one who is more likely to default.
- Organization should refrain from giving hefty loans to customers seeking loan for debt consolidation. Further, if loans are given than organization should ask for some collateral and should give the loan on higher interest rates than the other purposes.