# Lending Club Case Study

PROBLEM STATEMENT

On the given loan dataset we have to find and recommend driver variables to the Lending Club, so that they can decide which request they have to approve to minimize the loan defaulter rate.

SEGMENTED UNIVARIATE ANALYSIS

Segmented Univariate analysis can be used to find summary of a single data variable in form of segments. The dataset variable is divided into subsets and patterns can be observed across the segments.

Loan Amount with Loan Status

Loan Amount v/s Loan Status
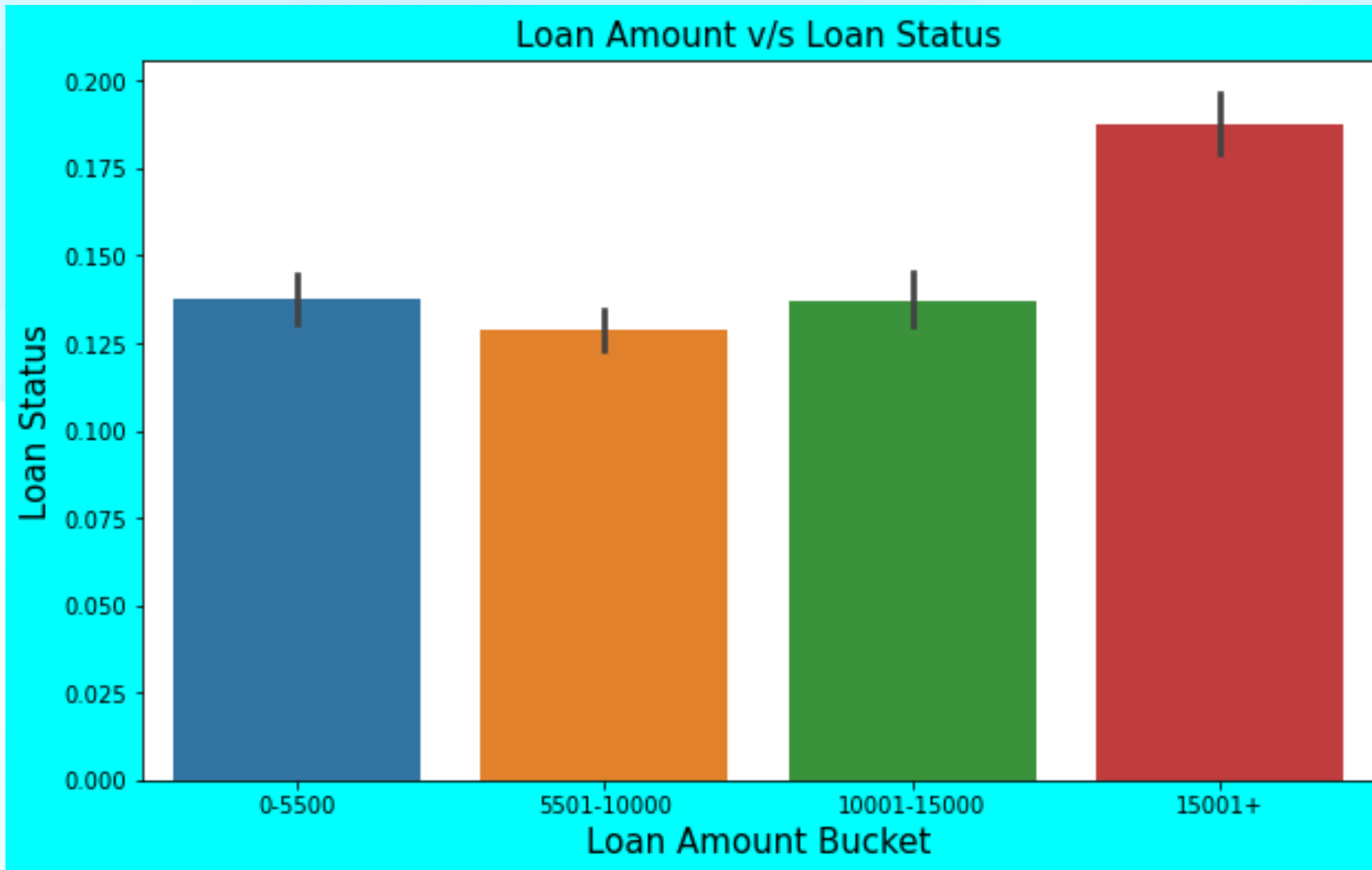
Recommendation:

- It is clearly visualise that if customer took loan amount >15000 then their chances to be defaulter is high as compare to loan amount <15000, so for recommendation bank should not approve loan amount >15000 without doing thoroughly check the documents of the customer.

Loan Status with Term
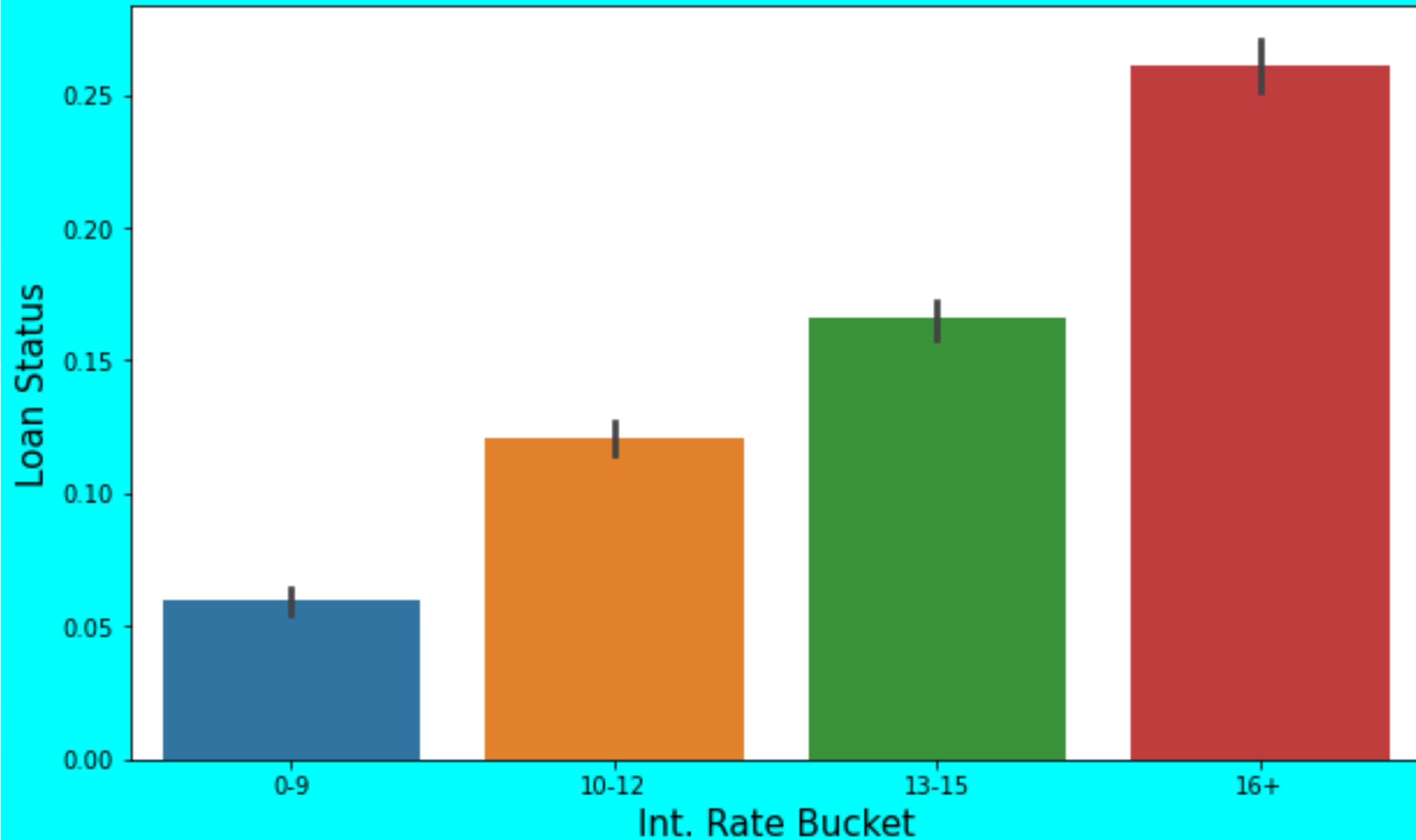

Term v/s Loan Status
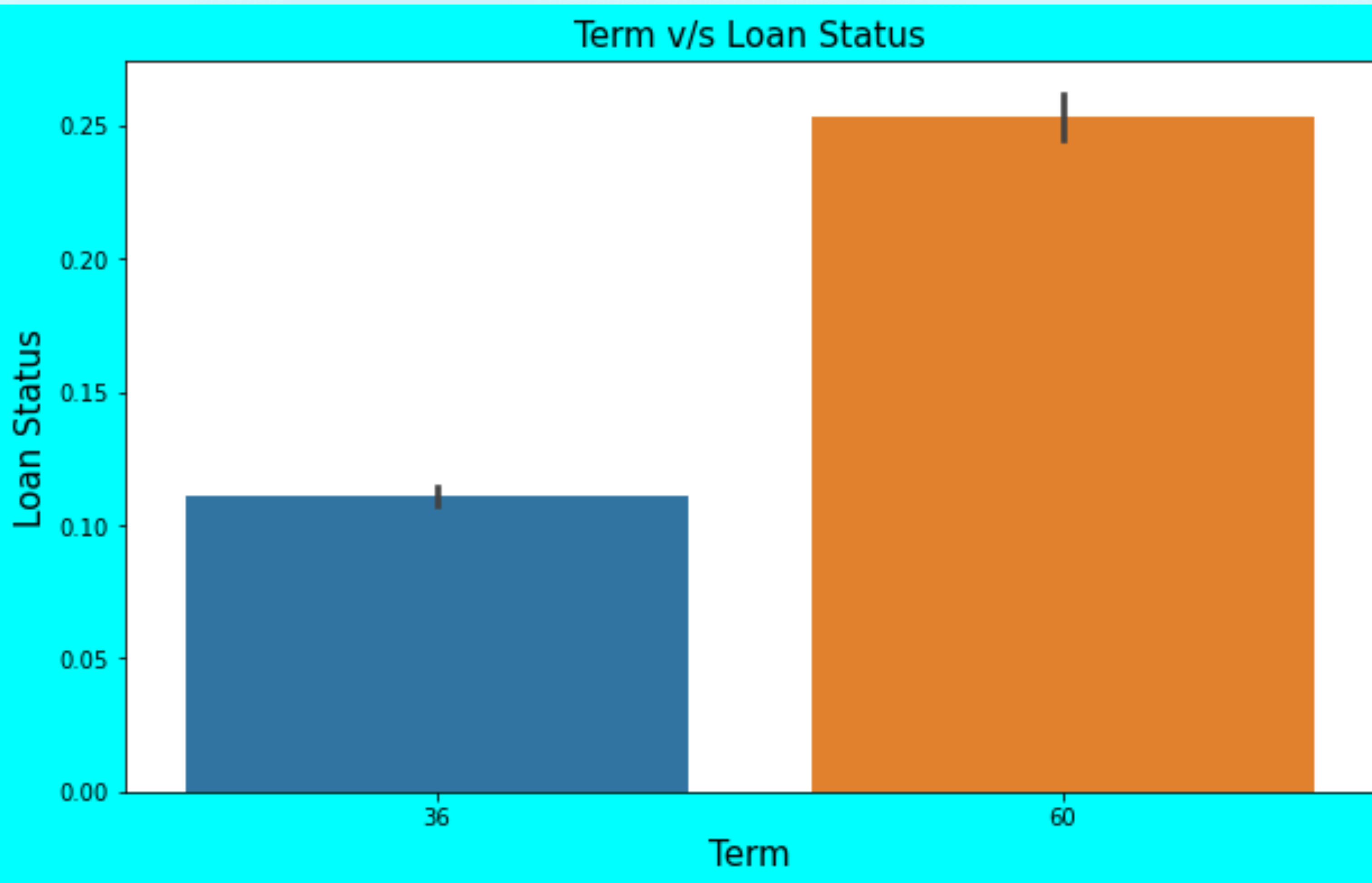
Recommendation:

- We found that customers are more likely to be defaulter if they take loan for long period (60 months), so to reduce the risk of loss, company should not provide loan for maximum time period to the customer. Better to encourage customer to take loan for shorter period.
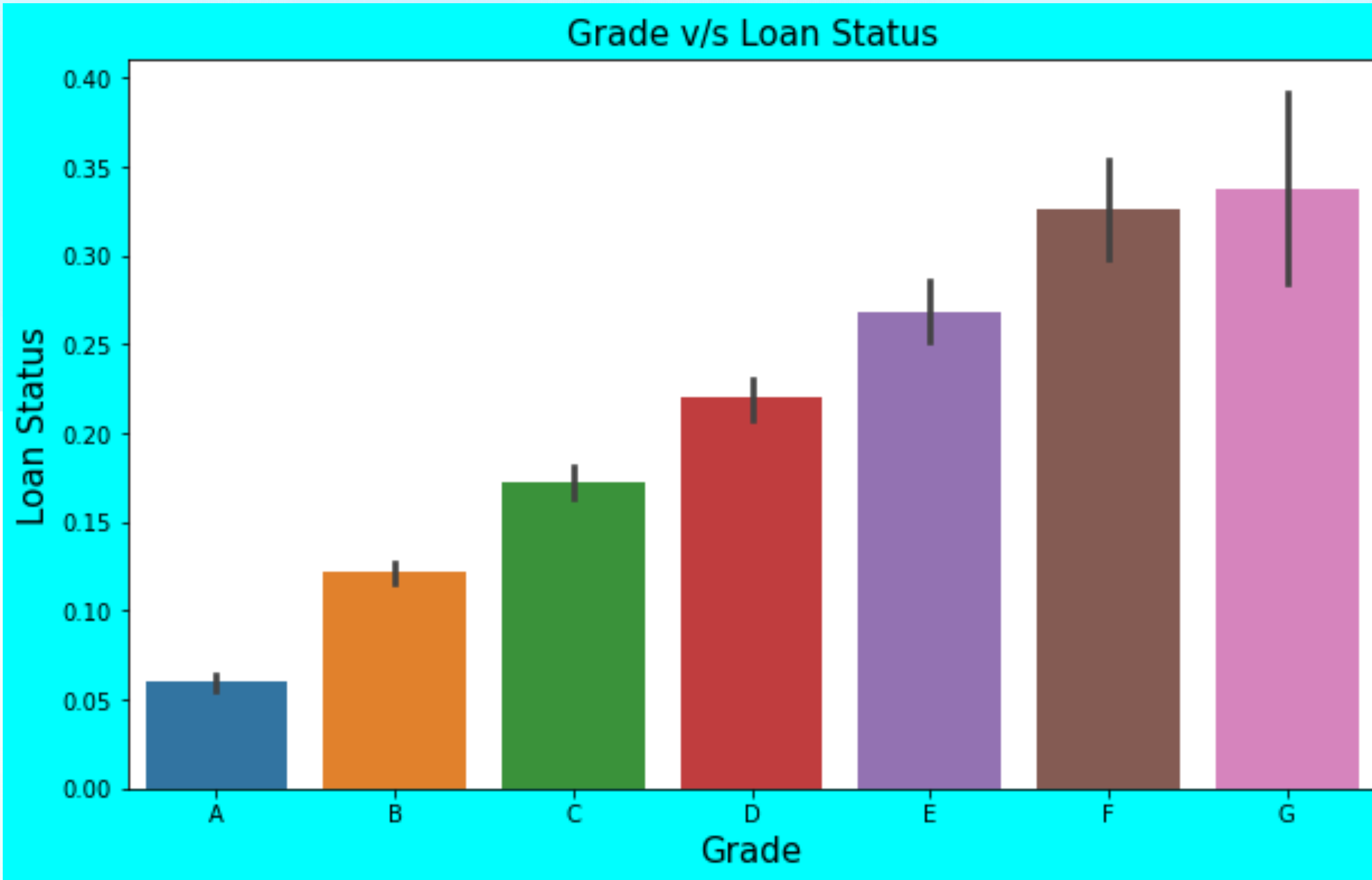
Loan Status with Interest Rate Bucket

Recommendation:

- It is clearly showing that if bank gives loan to customer with high interest rate (>16%) then chances to be defaulter of that customer is high. So for recommendation Bank can offer loan to the customer upto 15% interest rate.

Loan Status with Grade

Grade v/s Loan Status

Recommendation:

- As for this analysis we can see that if bank gives loan to the customer who has high grade, here we can say A and B, then chances to be defaulter of that customer is less. And as we move towards the lower grade then chances become high. So better to avoid to give loan to lower graded customers.

Loan Status with Home Ownership

Home Ownership v/s Loan Status
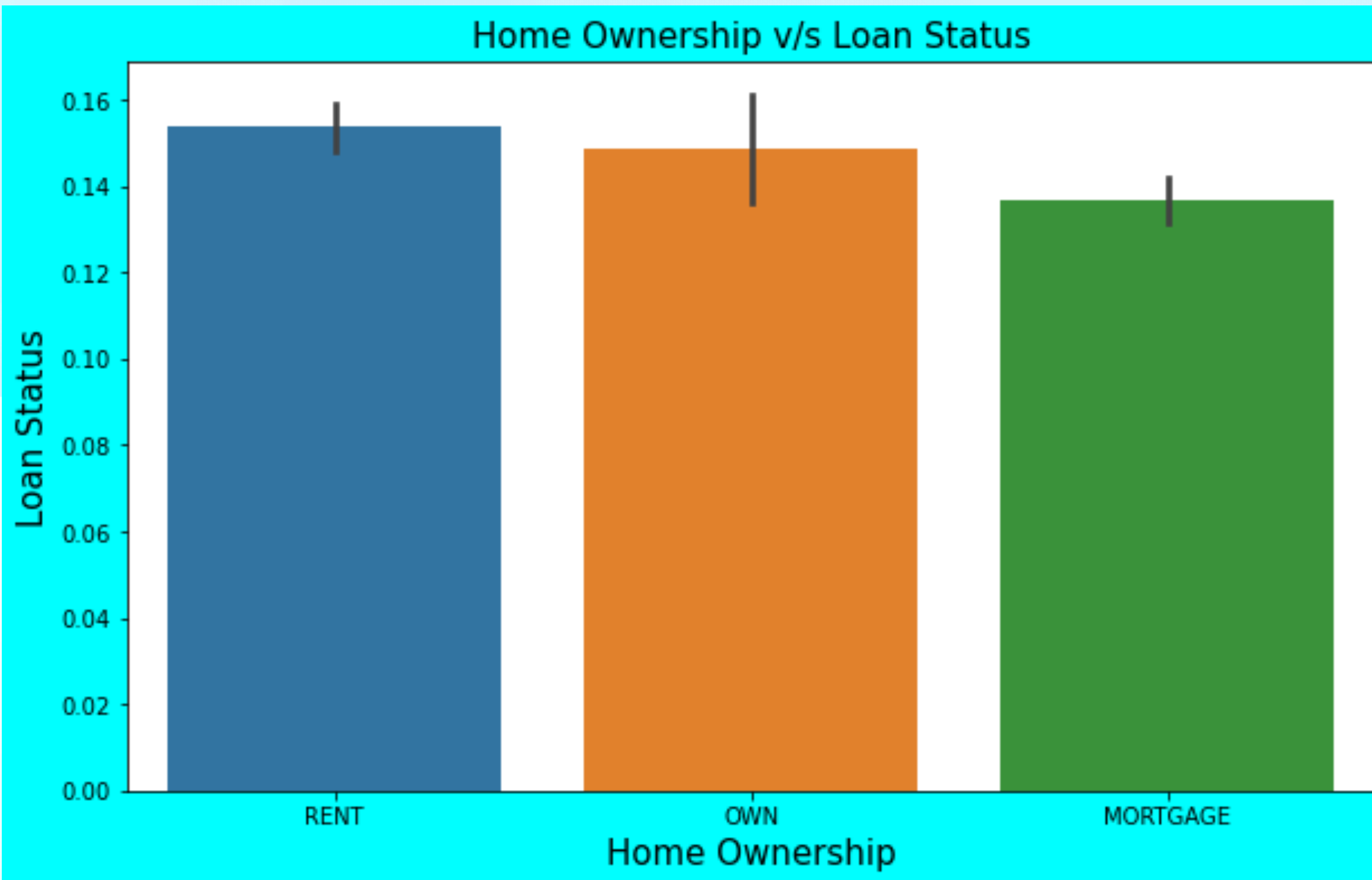
Recommendation:

- When bank gives loan to the customers who comes under Other category means they didn't provide their home ownership detail, their chances to be defaulter is high because bank doesn't have exact information of their home ownership. They might not have better place to live or they may be living at very poor place. So bank should avoid to give loan to Others Category.

Loan Status with Annual Income Bucket
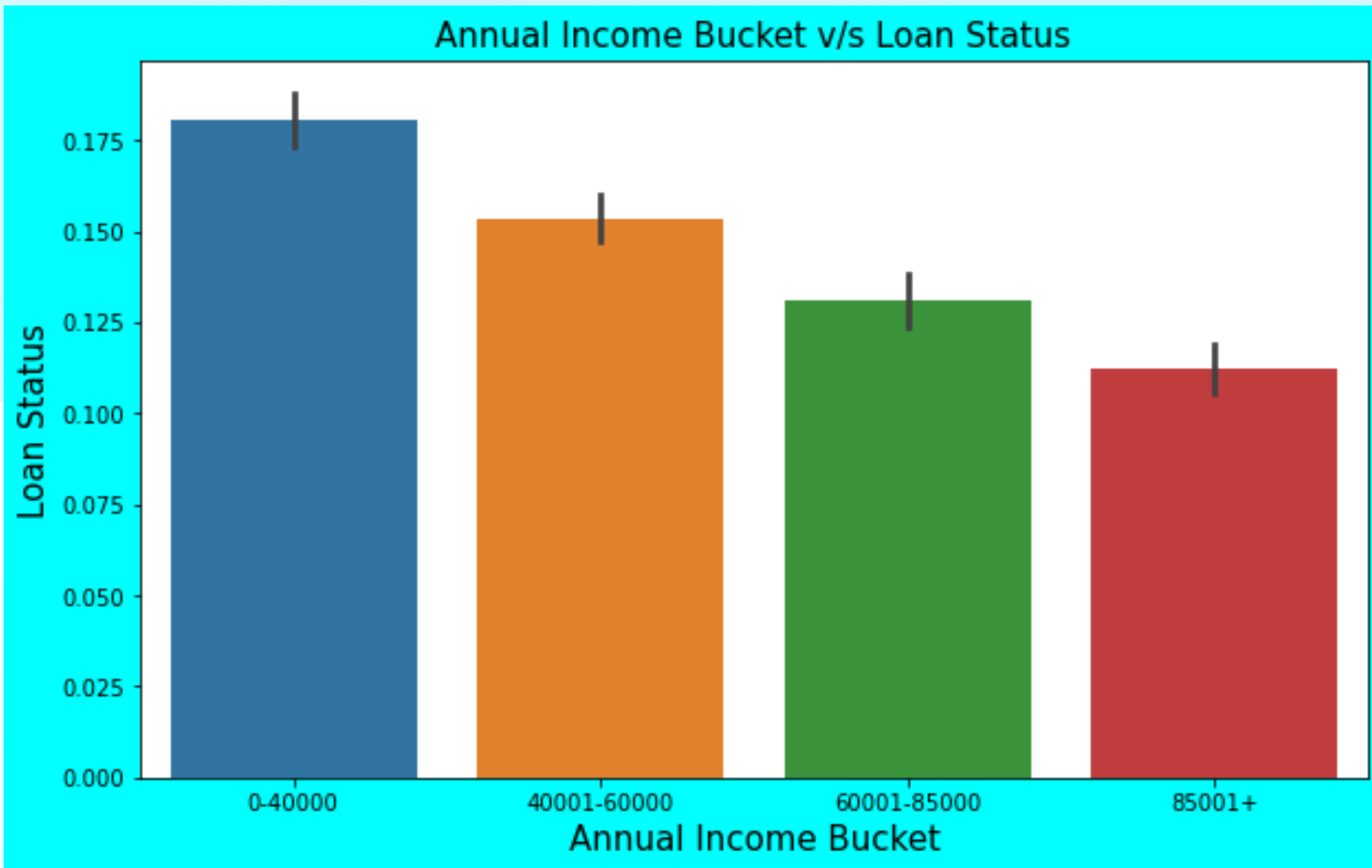
Recommendation:

- Customers having annual income upto 40,000 might have chances to be defaulter and also as we move from (0-40000) to (85001+) annual salary bucket then chances are less. So for suggestion Bank can provide less loan amount to customers having less annual income that is below 40000.

Loan Status with Verification Status
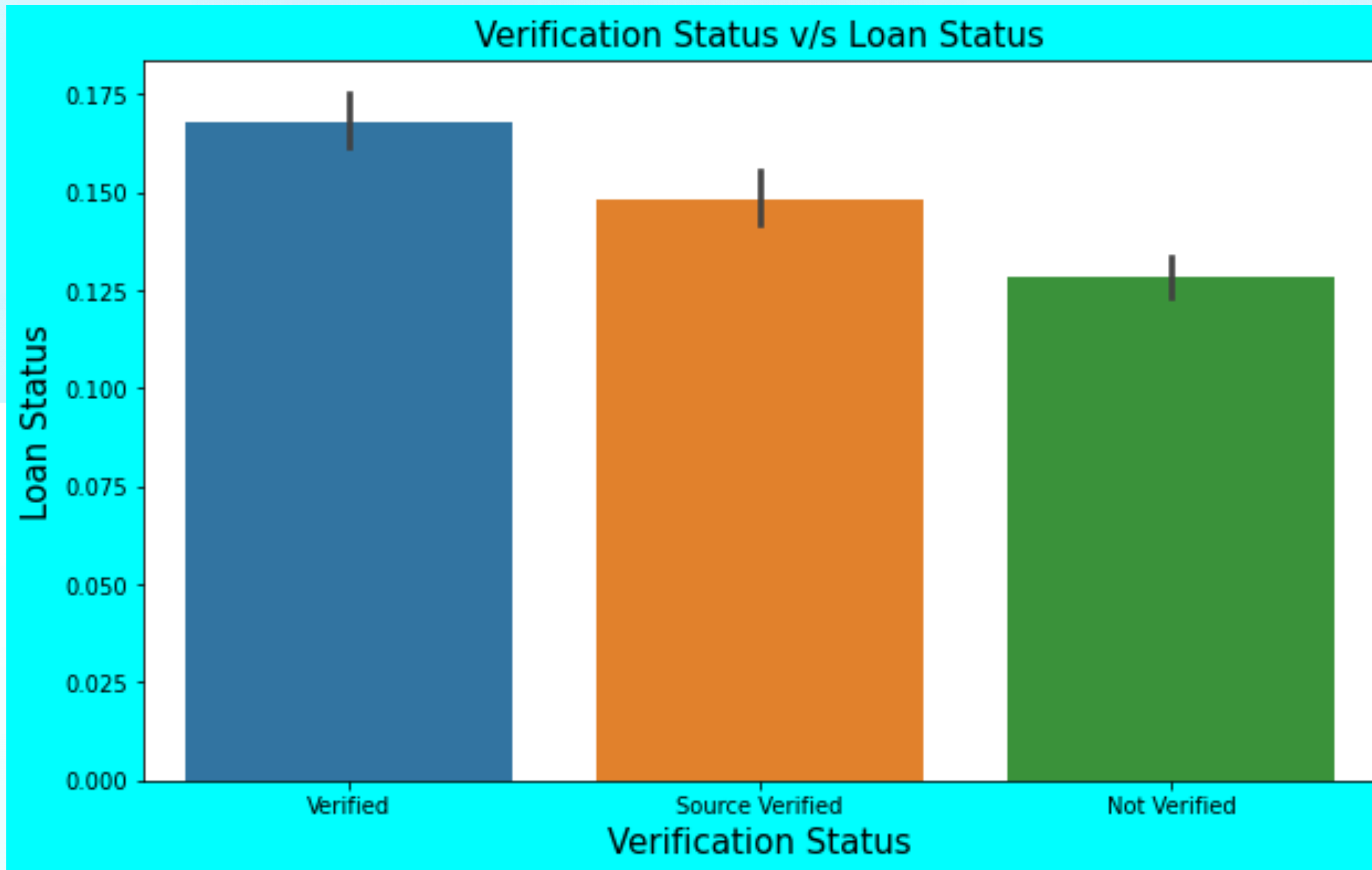
Recommendation:

- It is totally unbelievable - Loan given to not verified customers are showing loyal as compare to verified and source verified. So when an applicant requests for loan then bank should thoroughly inspect all required details whatever they provided to reduce the risk of financial loss.But again although "Not verified" customers are less defaulter still bank should not provide loan to these customers as well blindly.

Loan Status with Purpose

Purpose vs LoanStatus
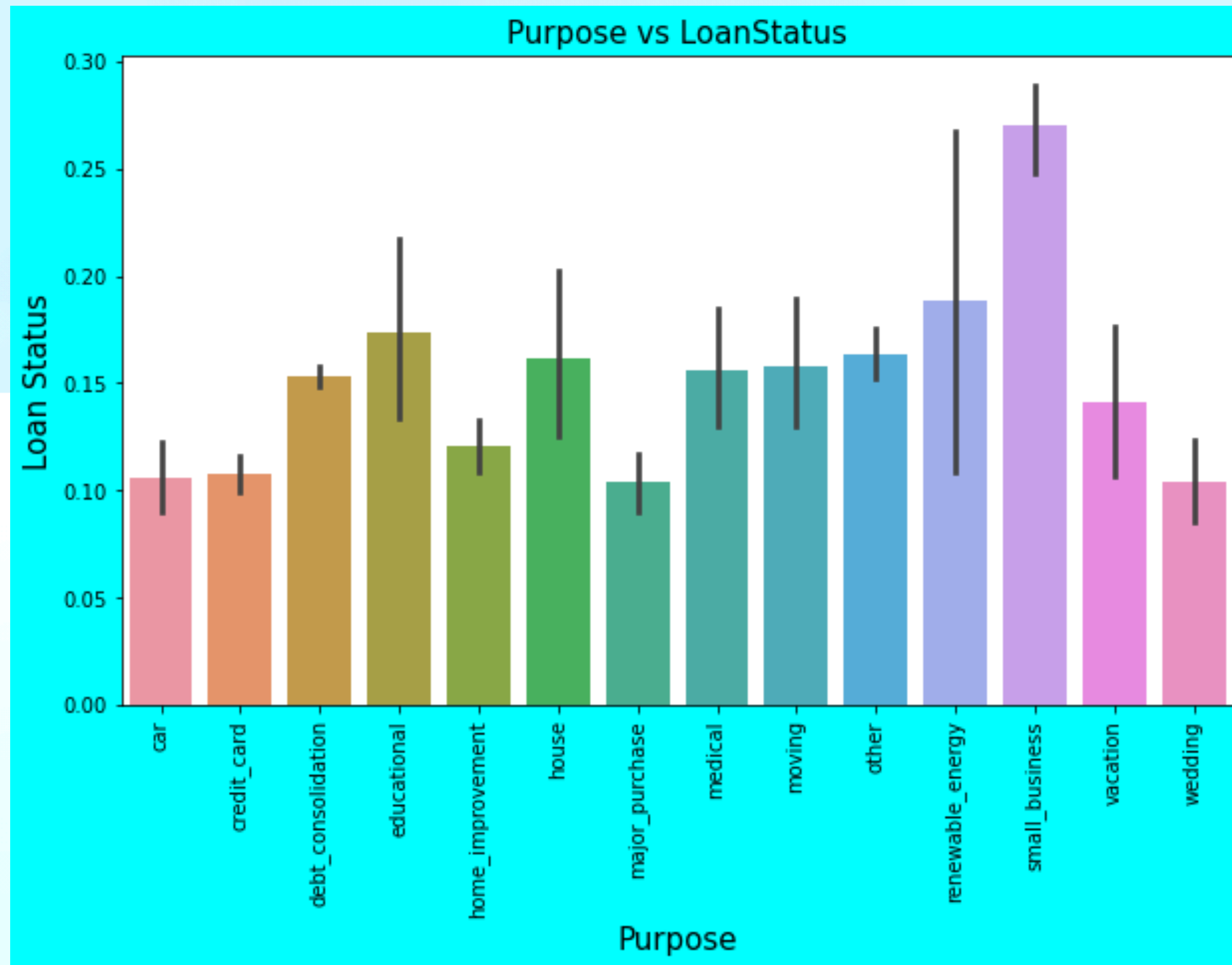
Recommendation:

- It is clearly showing that loan given to customers who want to start their small business are more defaulter, so may be the reason to be defaulter is **failure or loss in the business**. So we can recommend to bank when customer wants loan for any small business then bank should get complete necessary details of customer's business like business type, how it will behave in a long term and other factors as well.

Loan Status with DTI Bucket

DTI Bucket v/s Loan Status
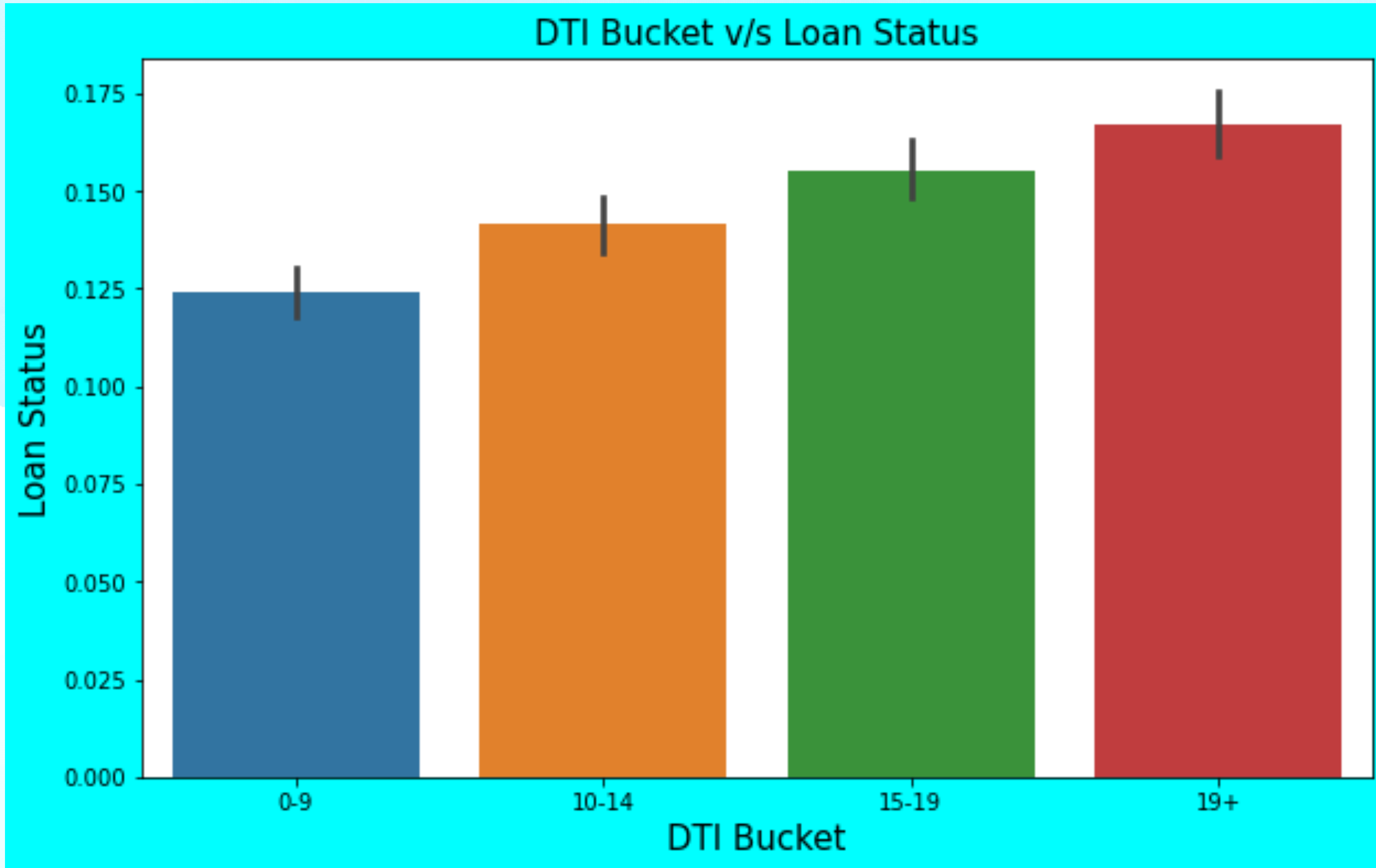
Recommendation:

- DTI is very important factor, it is Debt-to-Income ratio, through this ratio we can get data about the customer's expenses against their income. So after doing analysis it's clear that having high DTI ratio (> 19) chances to be defaulter more. And when moving from dti bucket (0 - 8) to (19+), chances are also become more. So better to avoid give loan to customer having high dti ratio that is (> 19).

Loan Status with Public Record
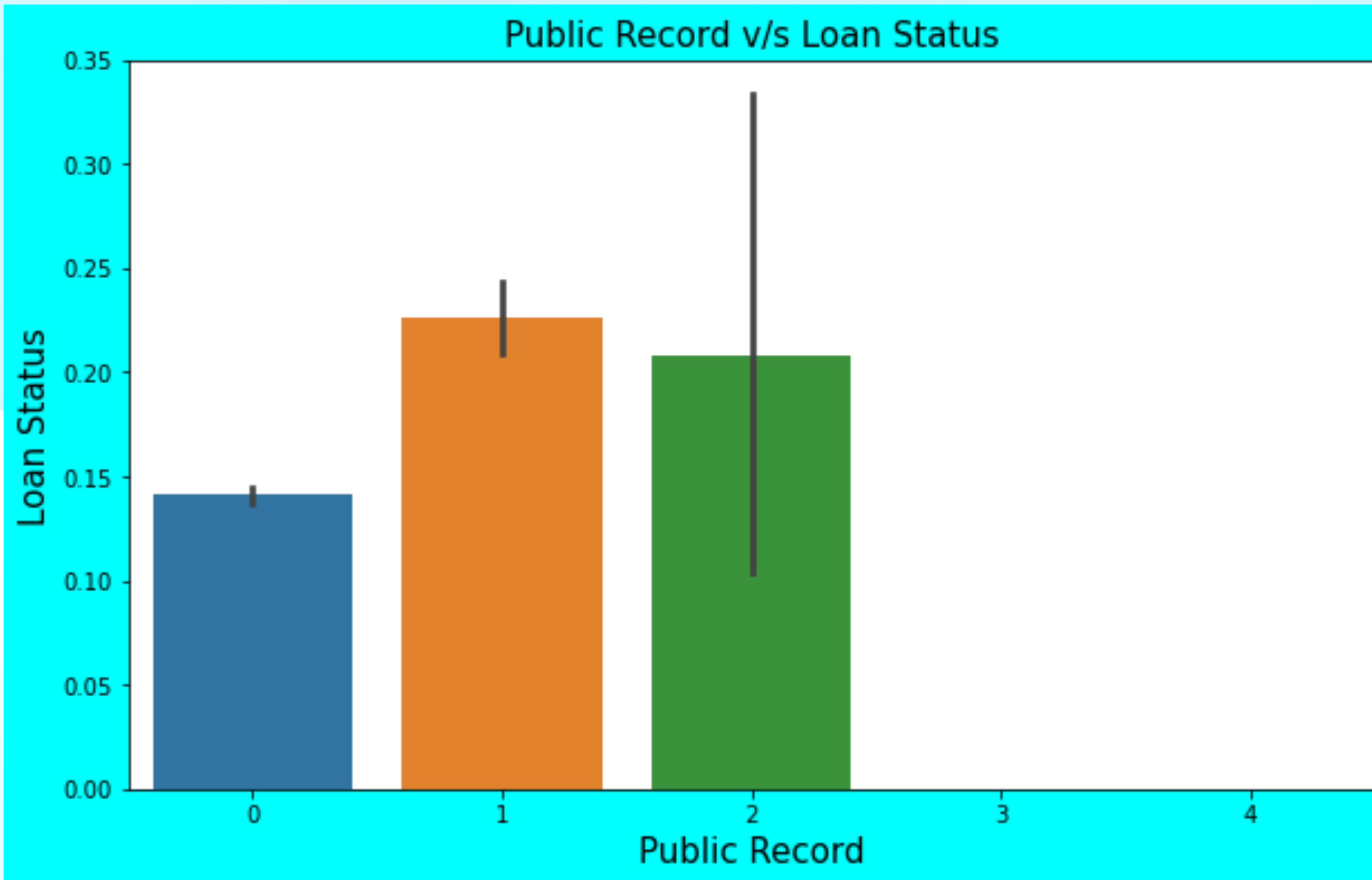
Recommendation:

- Public records means customer having derogatory record or not, so from analysis it is clear that chances to be defaulter for a customer having minimum public record is less as compare to customer having maximum public record. So bank can avoid or deny to provide loan to customer having maximum public records.

Loan Status with Public Record Bankruptcies

Public Record Bankruptcies v/s Loan Status
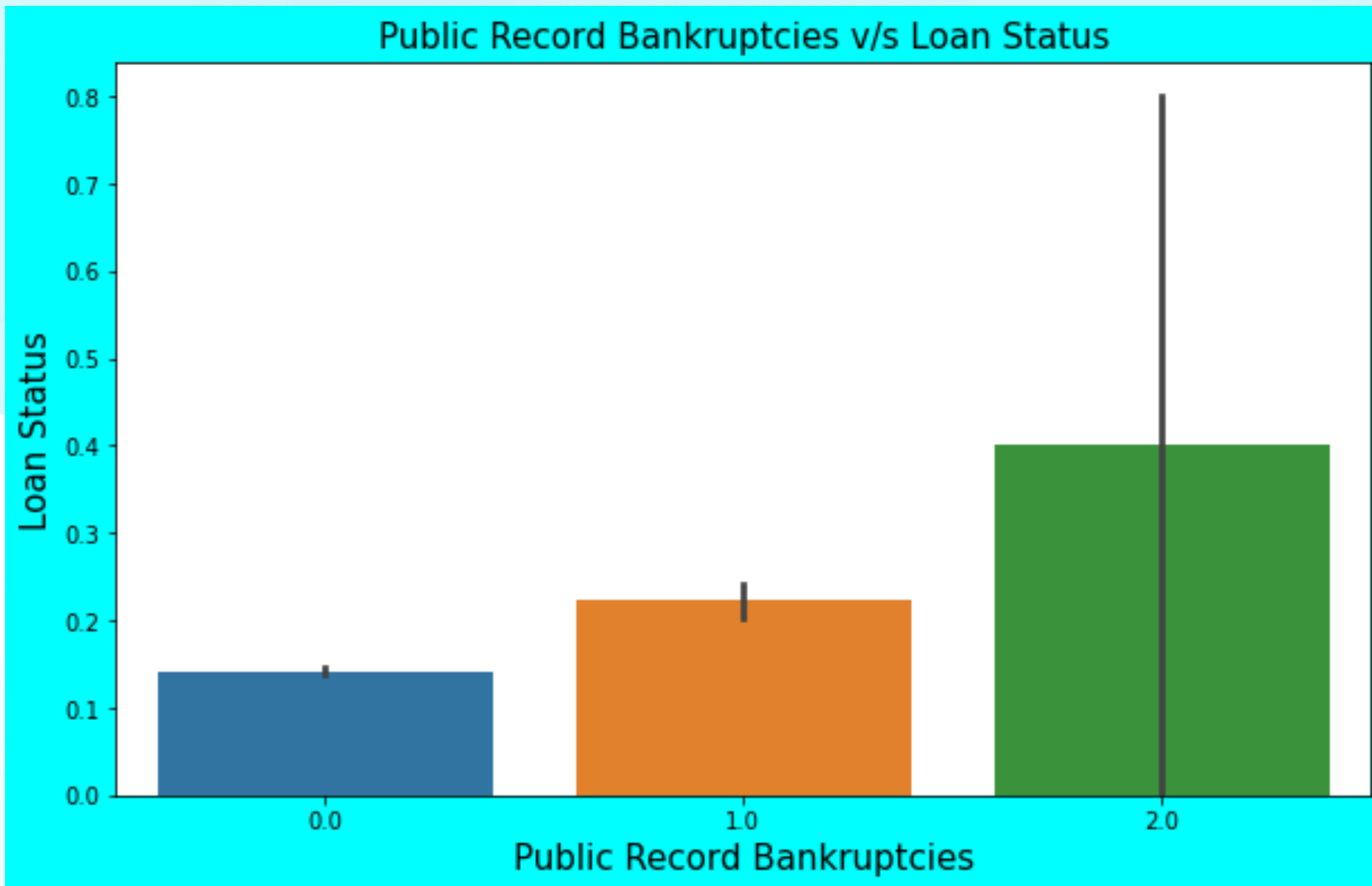
Recommendation:

- Customers having maximum number of public record bankruptcies are likely to be defaulter more if we compare this with customers having 0 or very less (only 1) public record bankruptcies. So for recommendation to bank, they should completely deny the customers with high number of public record bankruptcies to reduce their **financial or business loss.**

BIVARIATE ANALYSIS

It is a methodical statistical technique applied to a pair of variables (features/ attributes) of data to determine the empirical relationship between them.
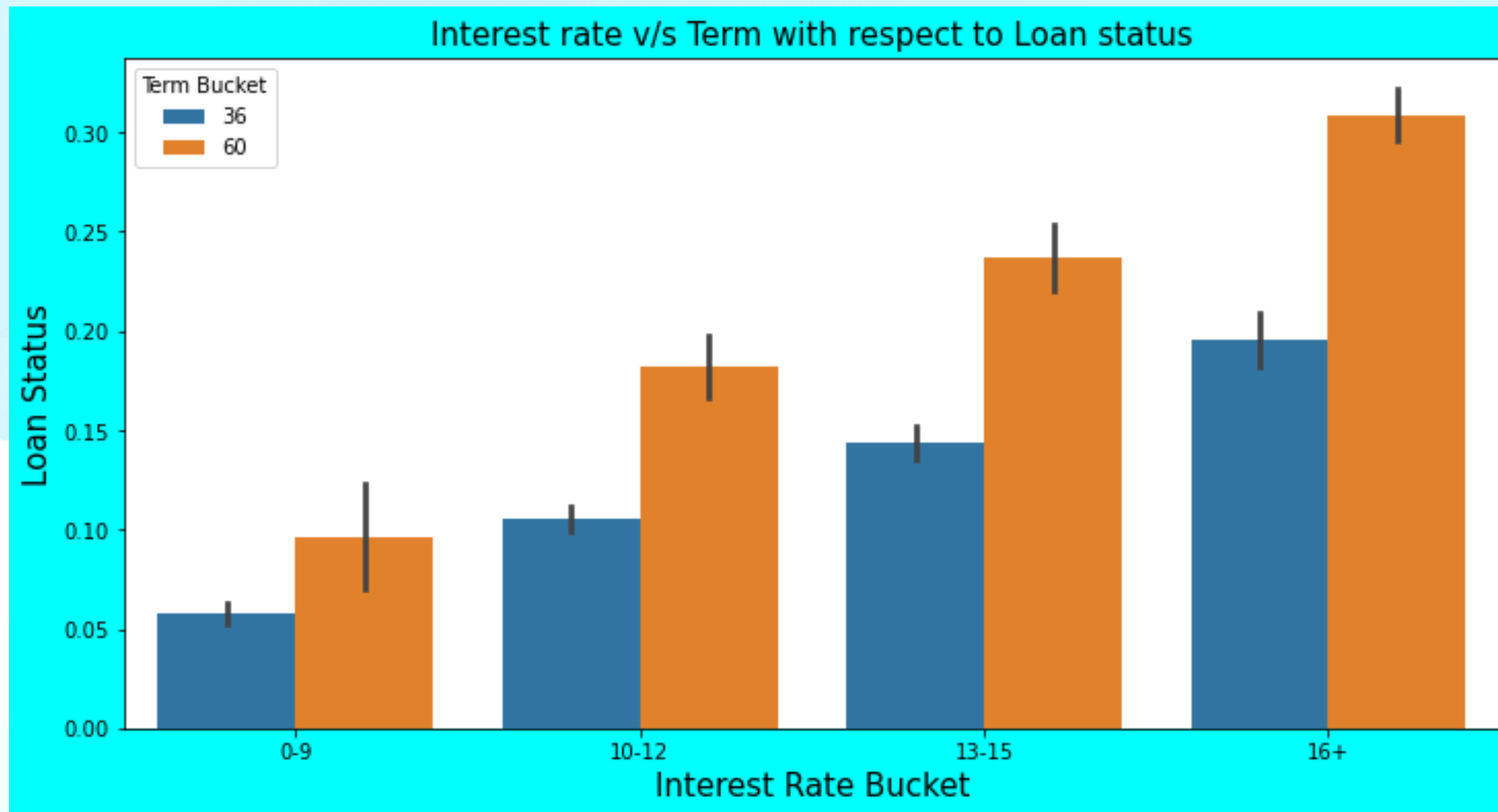
Loan amount v/s Interest rate with respect to Loan status
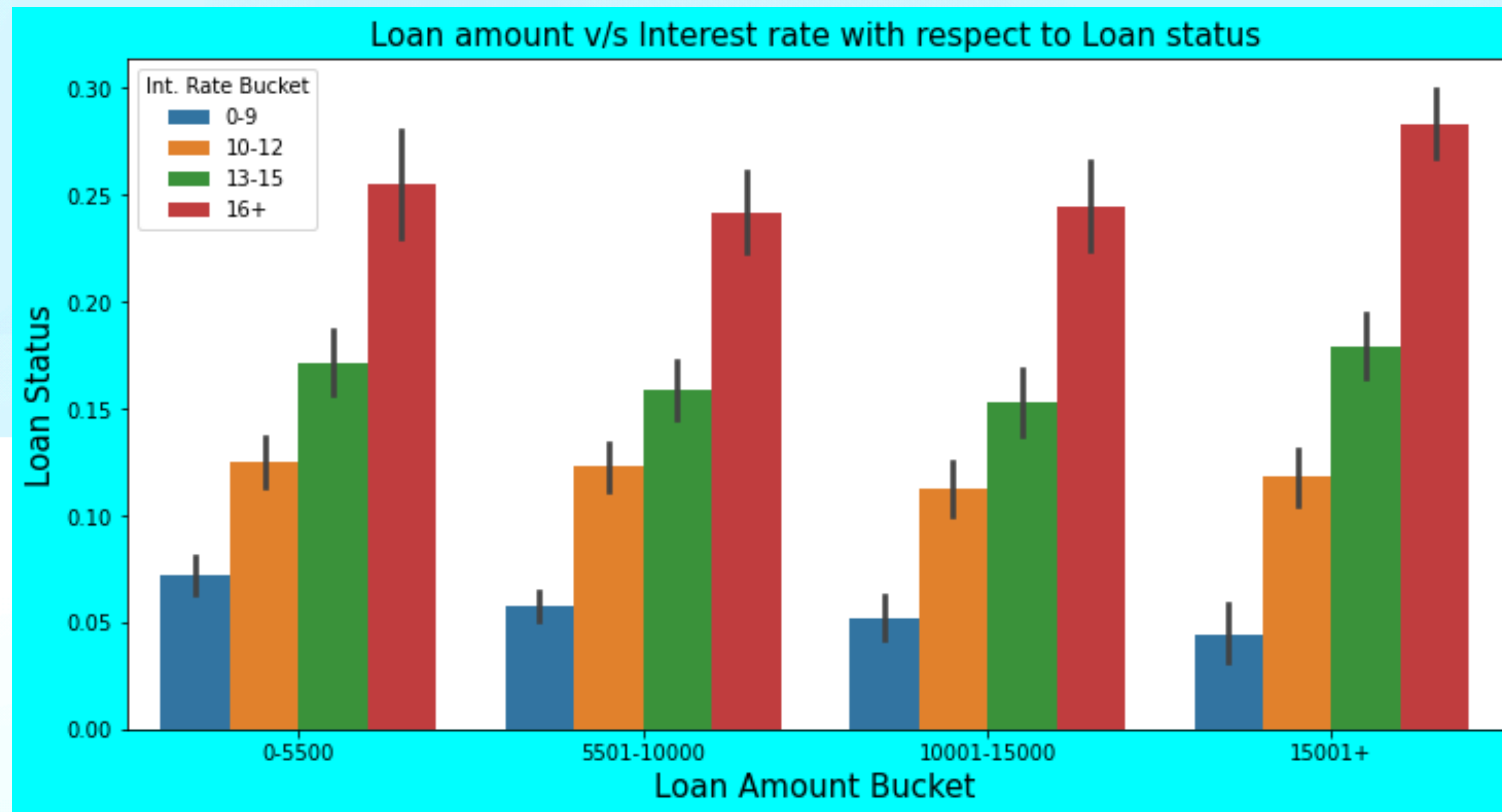
Recommendation:

- Customers who's borrowing loan more than 16% interest rate whether they are applying loan for amount 5000 or 15000+, their chances to be defaulter high. So our recommendation to bank is, they can provide loan upto 15% interest rate to their customers.

Interest rate v/s Term with respect to Loan status

Recommendation:

- Customers who's borrowing loan for a longer term that is for 60 months and if we compare it with Interest rate bucket then it is clearly visible that as we are moving from bucket (0-9) to bucket (16+) interest rate, then chances of customers to be defaulter is more who took loan for longer period. So better to ask customer to apply loan for short period of time with minimum interest rate like upto 12%.

Emp length v/s Loan amount with respect to Loan status
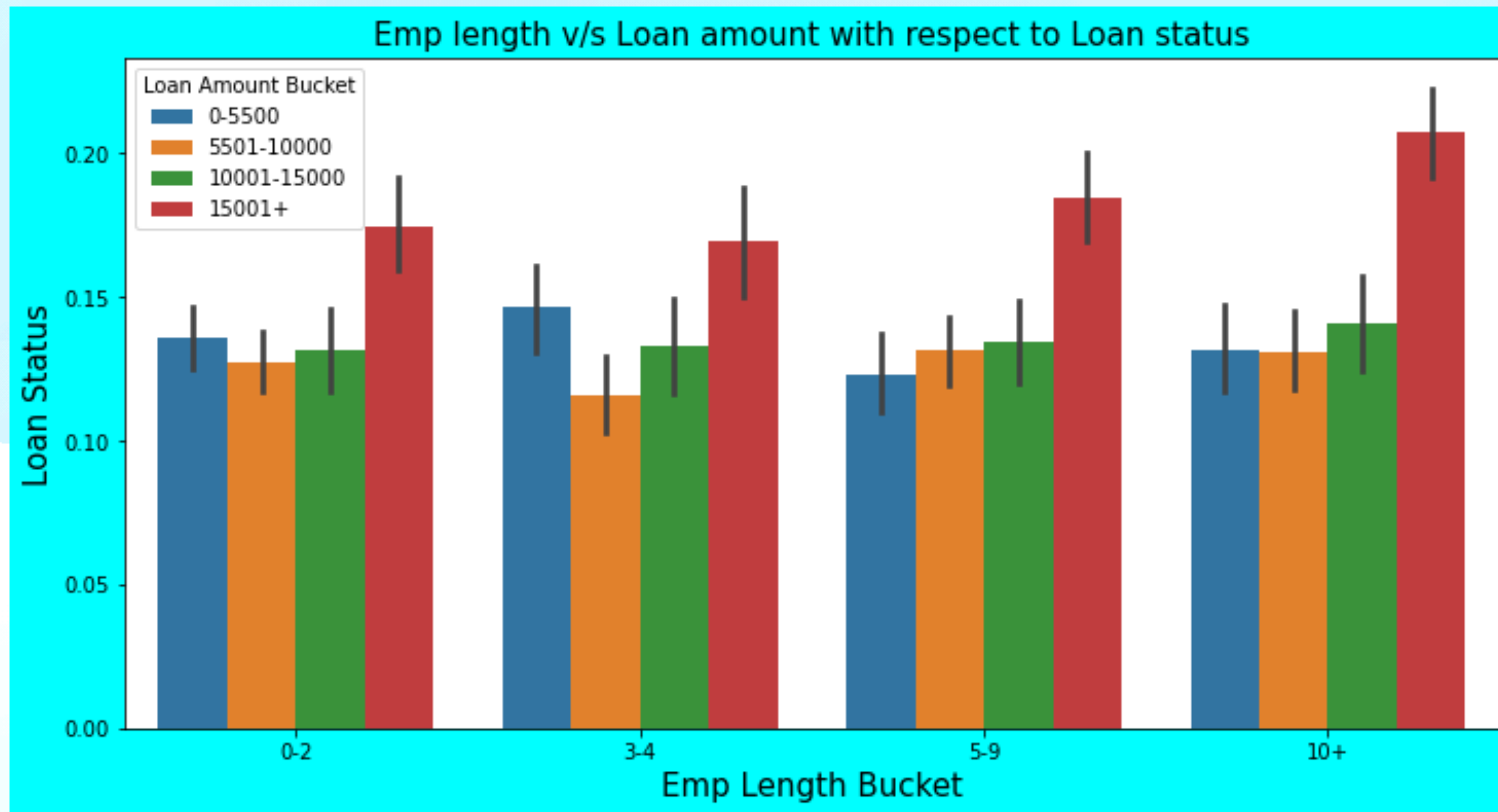
Recommendation:

- Customers who's borrowing loan amount more than 15000+ for each category of employee's length(experience), there chances to be defaulter high as compare to other loan amount < 15000. So recommendation to bank, they should try to approve loan request of their customers below 15000.
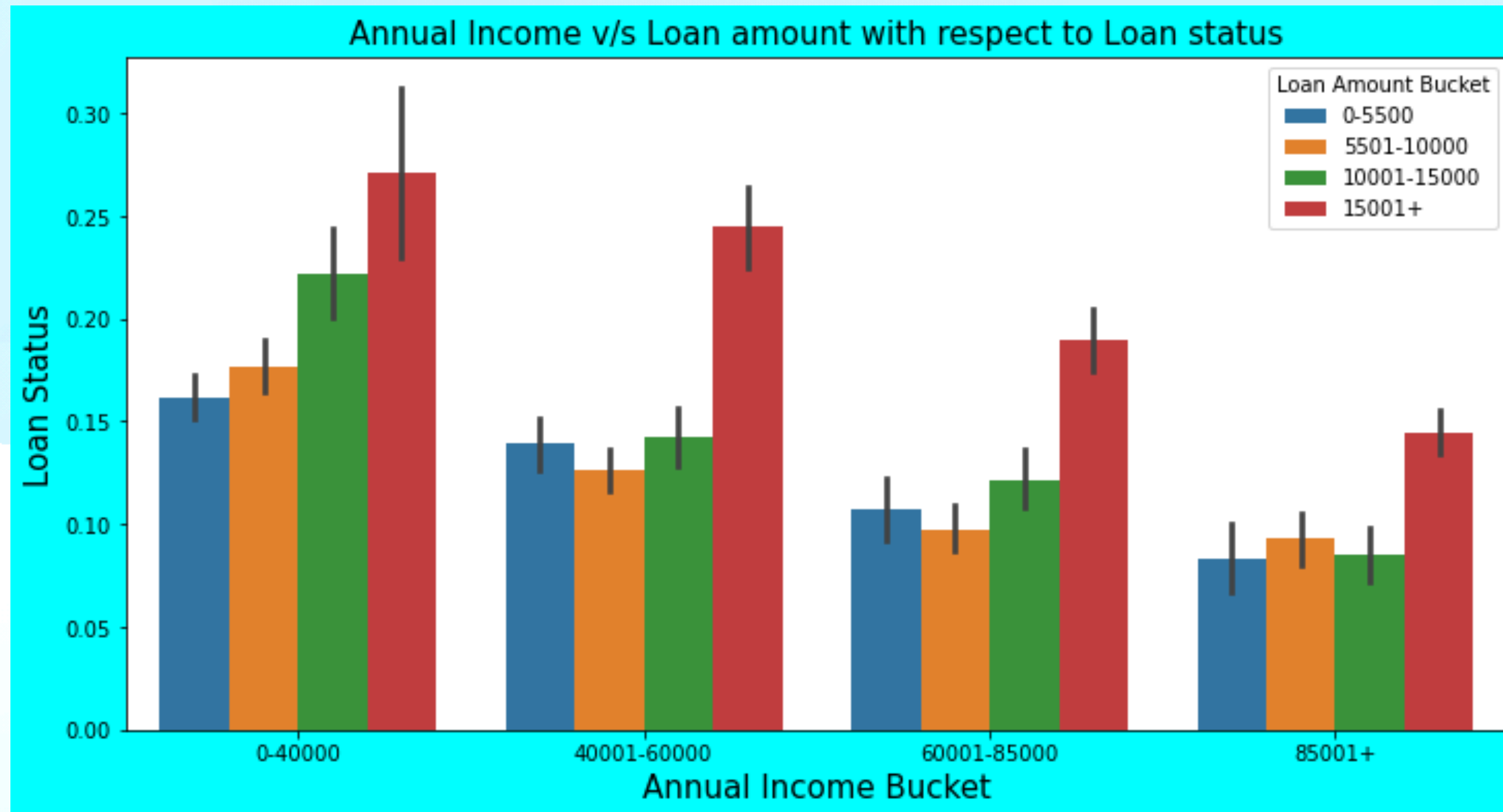
DTI v/s Annual Income with respect to Loan status

DTI v/s Annual Income with respect to Loan status
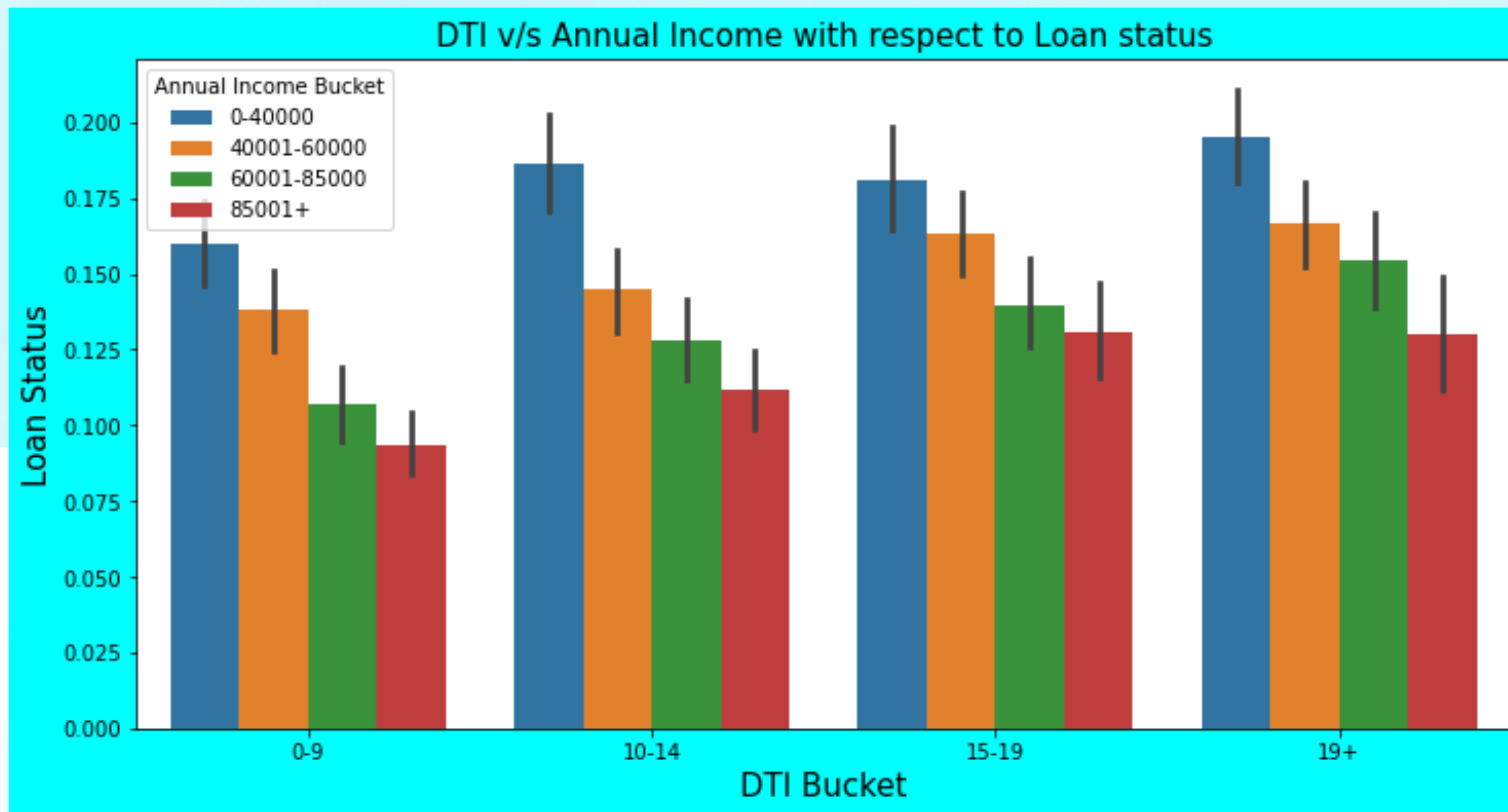
Recommendation:

- Customers who's annual income is < 40000 in each DTI ratio bucket, there chances to be defaulter high. Therefore our recommendation to the bank, they should avoid to approve loan request of the customers who's having low annual income < 40000, in whatever dti bucket they come.
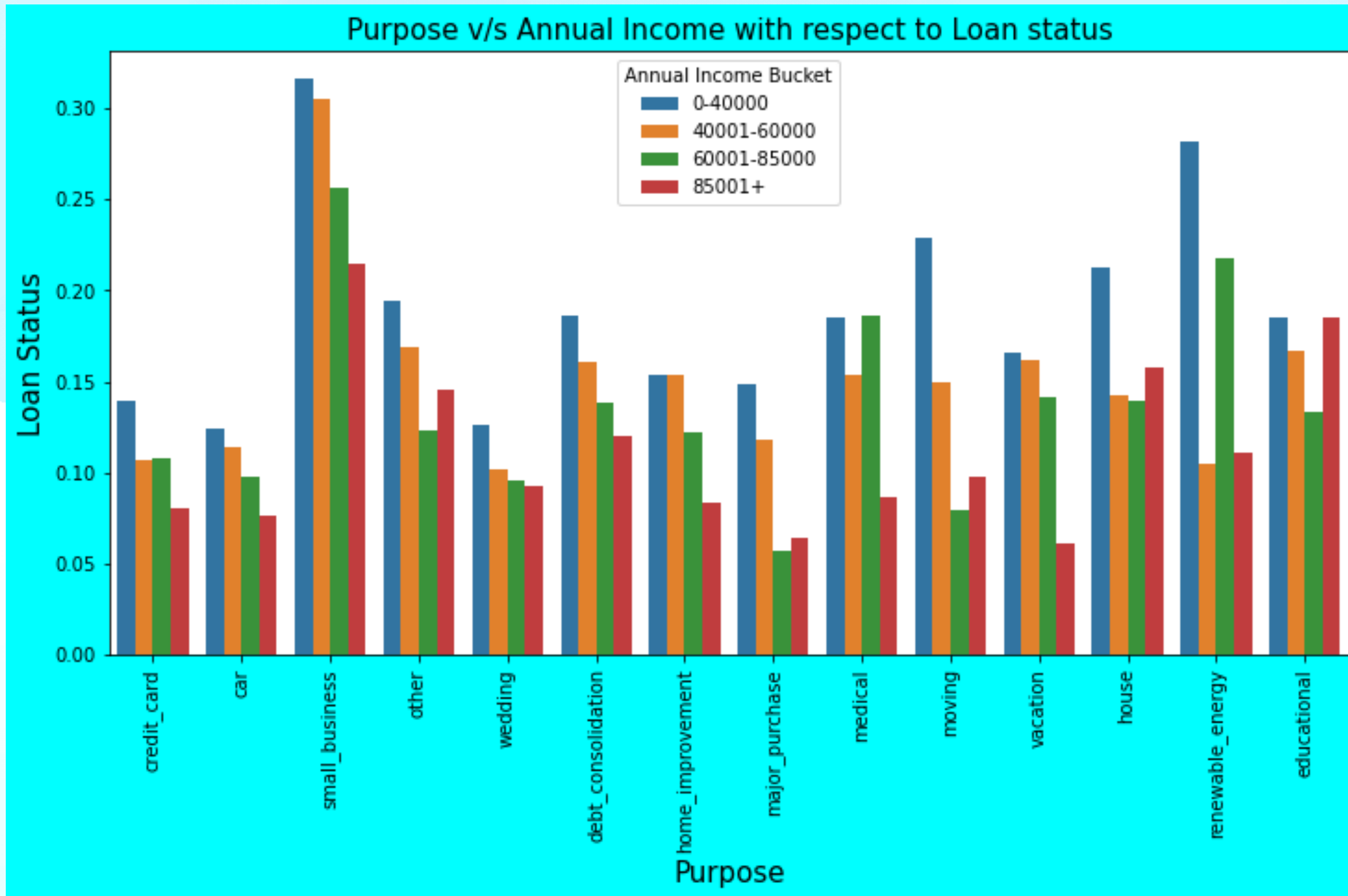
Annual Income v/s Loan amount with respect to Loan status

Annual Income v/s Loan amount with respect to Loan status

Recommendation:

- Customers who took loan amount >15000 are more likely to be defaulter for each category of Annual Income bucket, but it is very high for range (<40000) and (40001 to 60000). Therefore our recommendation to bank, they should provide loan amount <15000 to all the customers come under each annual income bucket, If loan amount > 15000 then bank should thoroughly check all the details of the customer before giving loan to them.

# Purpose v/s Annual Income with respect to Loan status

Recommendation:

- Small Business applicants have high chances to be defaulter. Further customers having annual income upto 40000 apply loan for renewable energy, they also have high chance to be defaulter. Therefore our recommendation to the bank, try to avoid those applicant who's applied loan for small business, renewable energy having annual income below 40000.
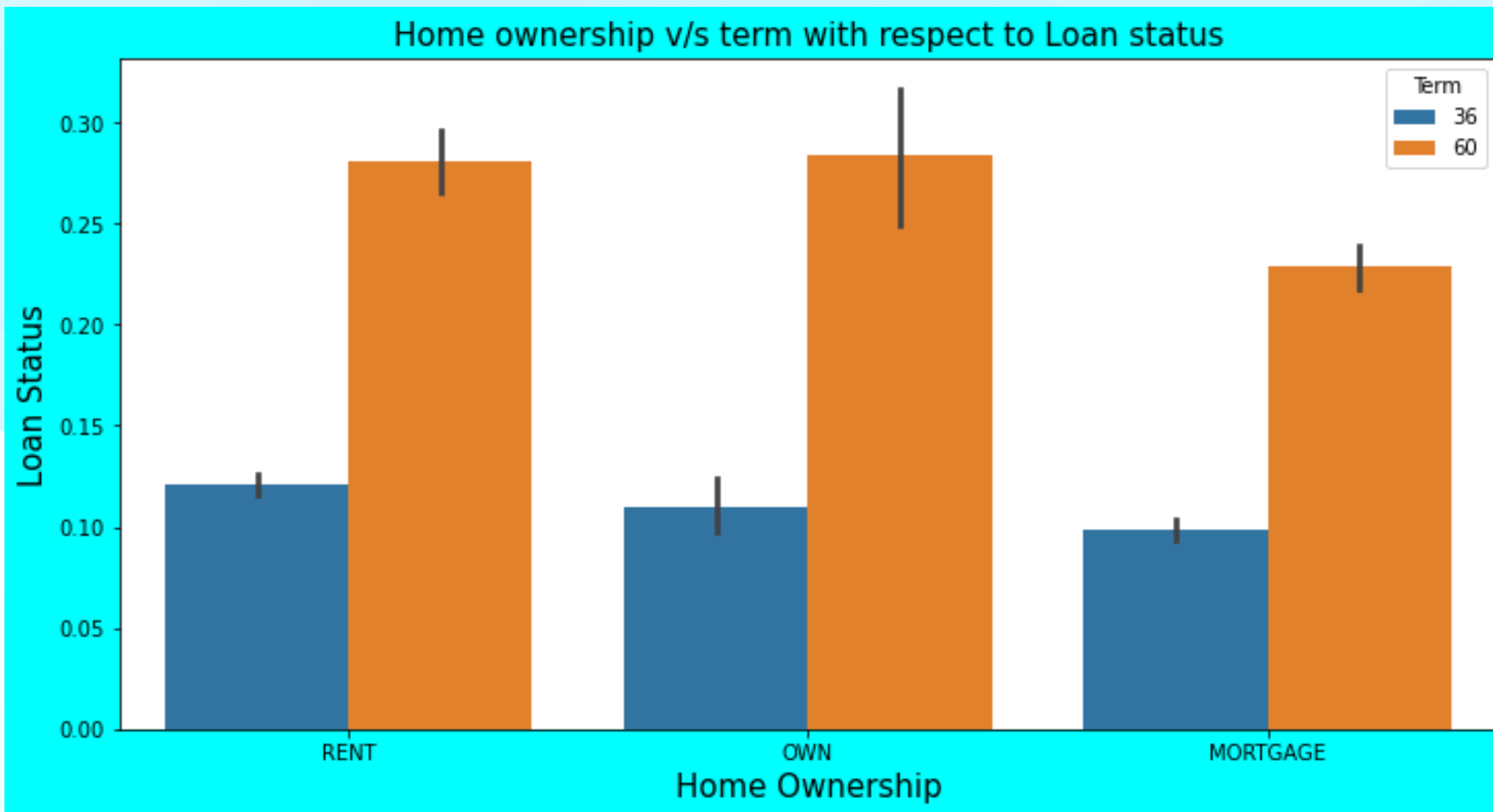
Record Bankruptcies v/s Loan amount with respect to Loan status

Public record bankruptcies v/s Loan amount with respect to Loan status

Recommendation:

- For the customers having number of public record bankruptcies are 2 their chances to be defaulter is very high if they apply loan amount more than 10000 and if number of records are equal to 1 then their might chance to be defaulter for loan amount >10000.Therefore our recommendation to the bank, they should completely deny the customers apply loan amount >10000 and having public record bankruptcies 2 and for 1 bank should avoid to approve loan amount >10000.
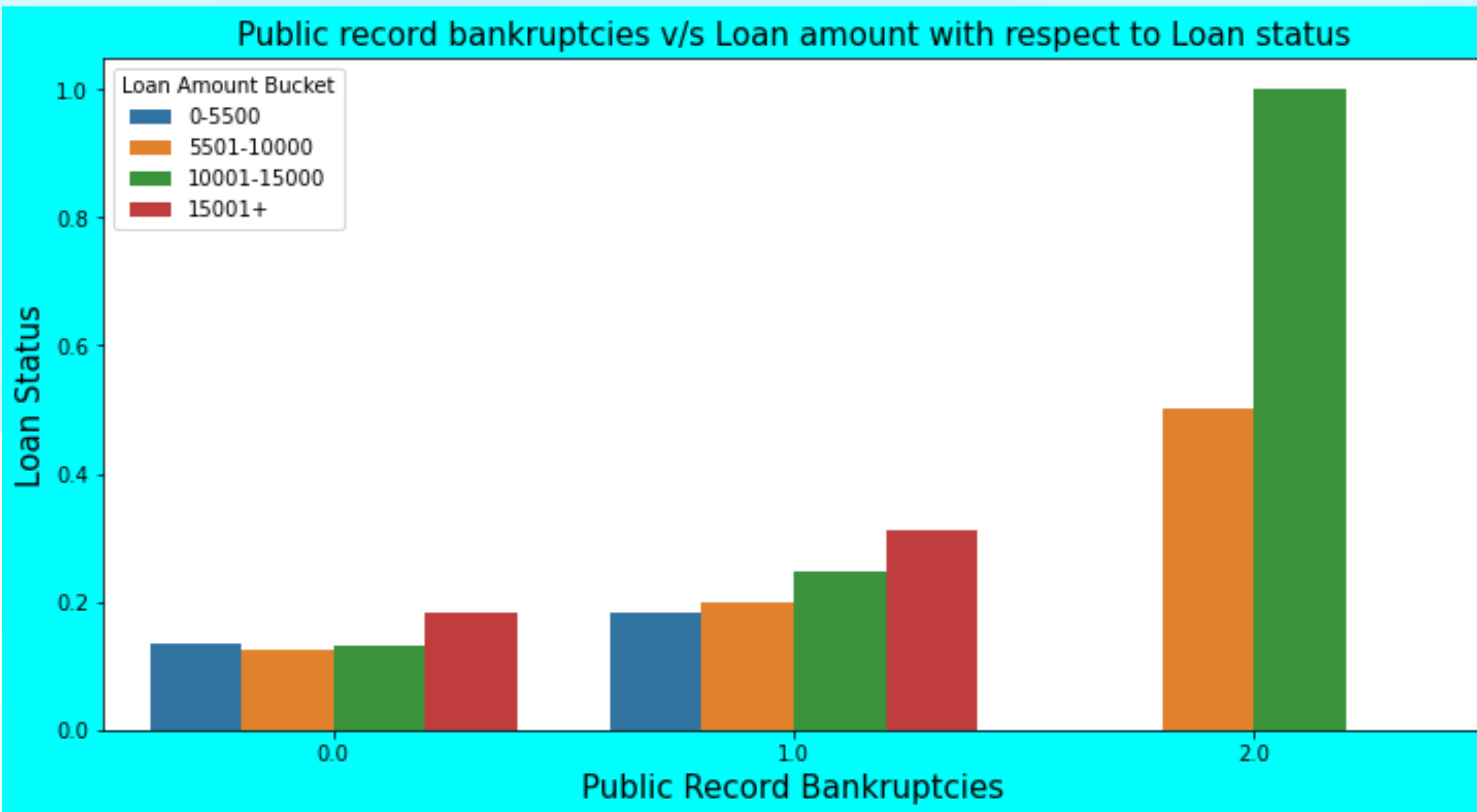
Home ownership v/s term with respect to Loan status

Recommendation:

- Customers who come under Rent, Own, Mortgage category are applied loan for longer term, their chances to be defaulter high. So our recommendation for bank, to insist their customers take loan for short duration whether they come under any category of home-ownership.

Grade vs Loan amount with respect to Loan status
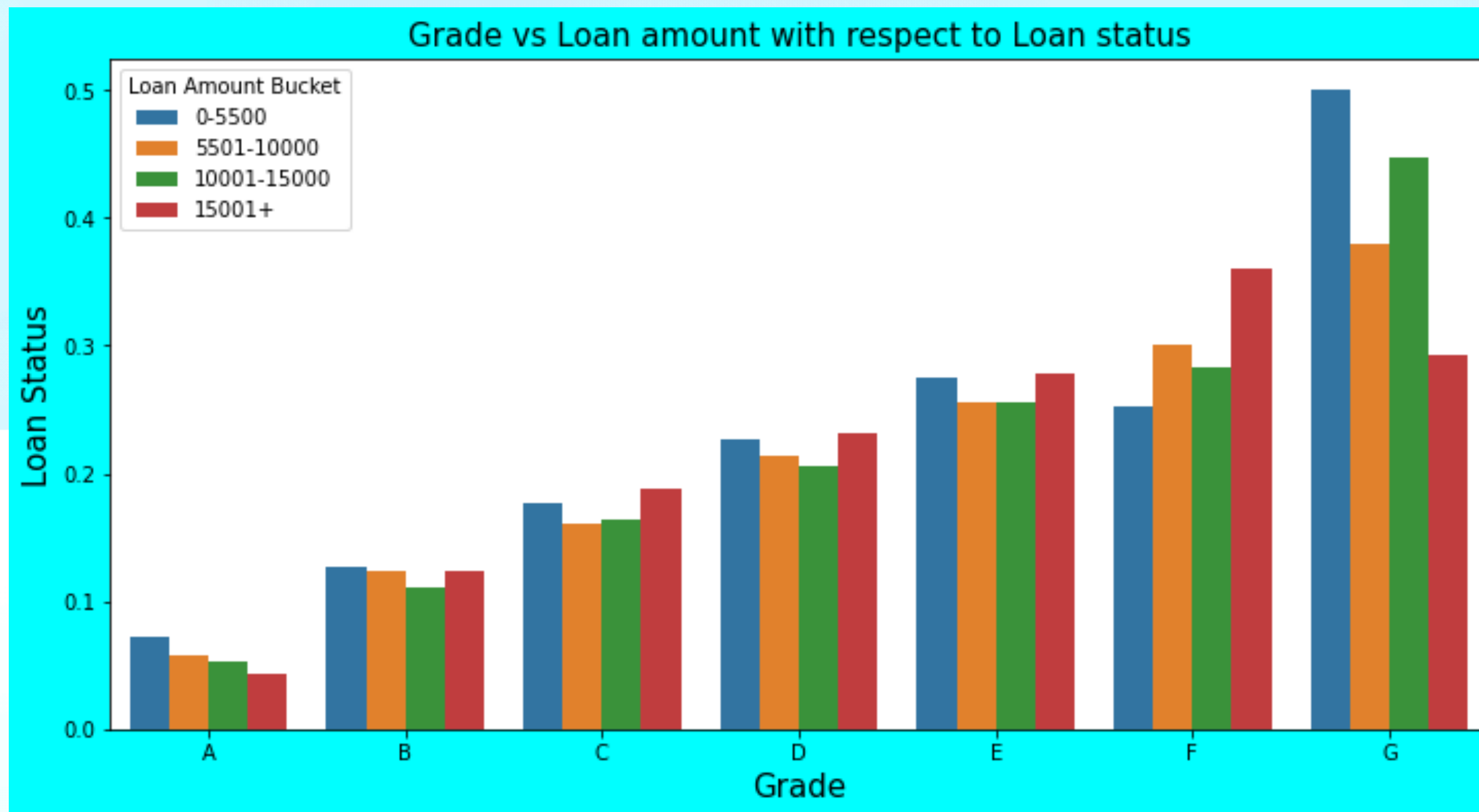
Recommendation:

- Customers having grade D and below towards G are more likely to be defaulter, whatever loan amount they apply and it is getting worst moving towards grade F and G. So our recommendation to bank, they should check all the necessary details required before approve the loan amount for Grade D to G and need to check proper documents to approve loan for grade F and G.

Thank You

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