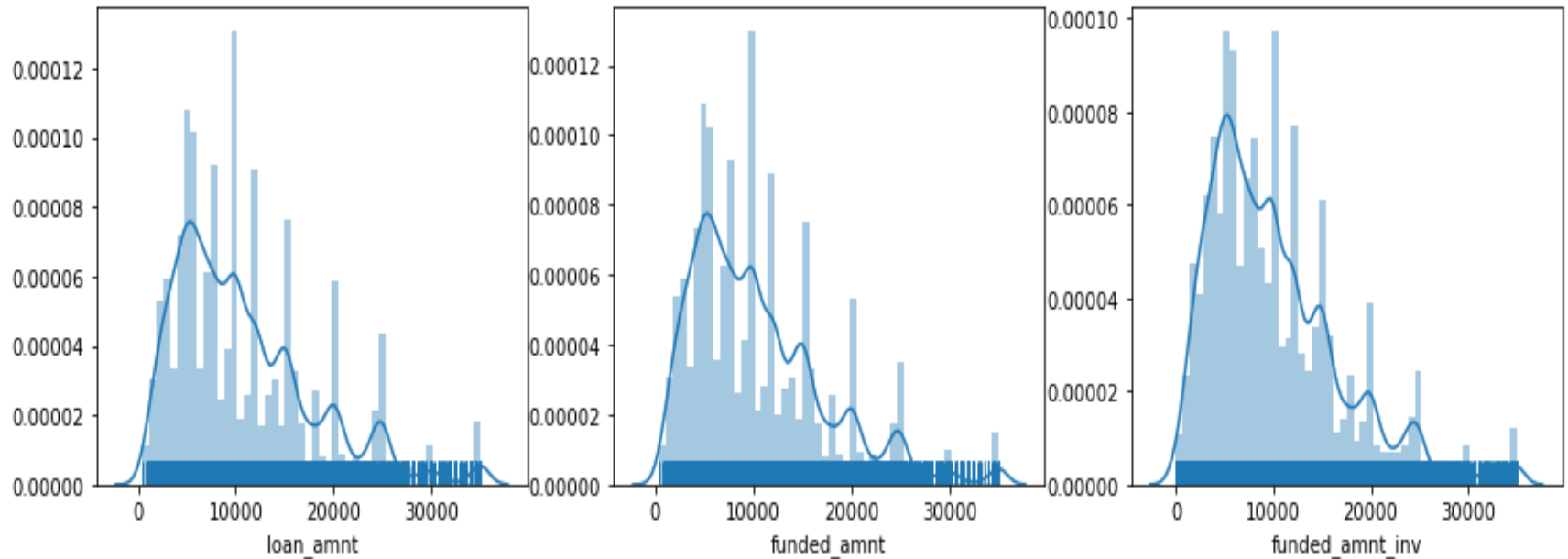


# LENDING CLUB CASE STUDY

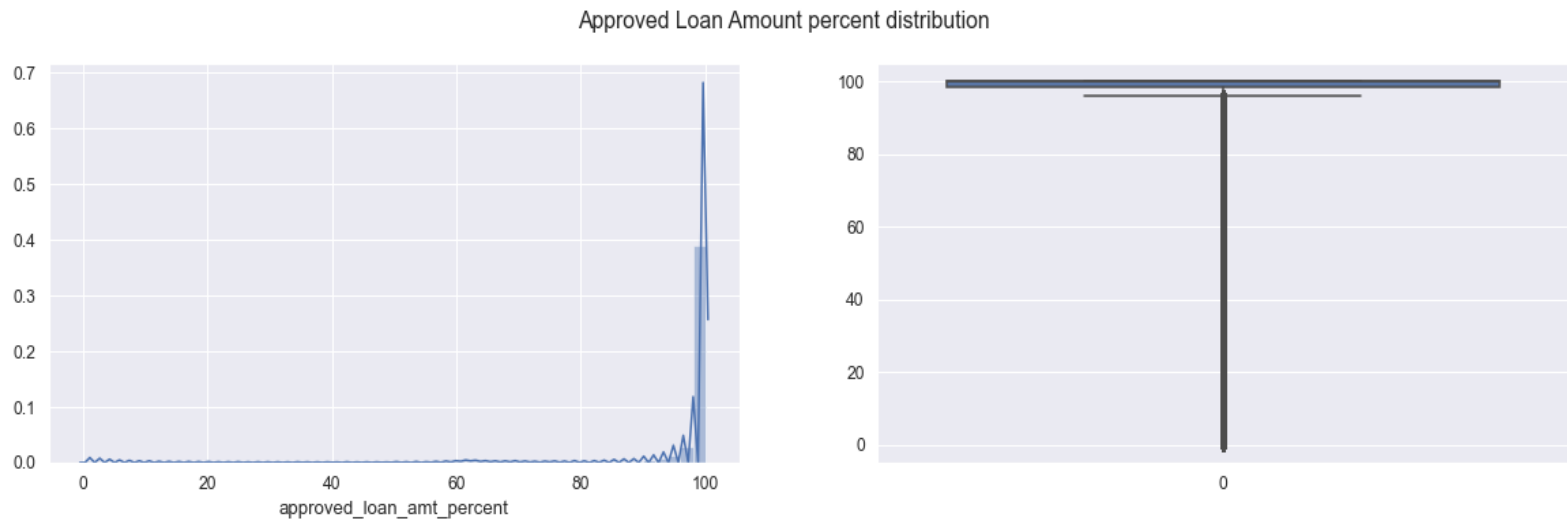
BY – Sangeet and Niharika

# Data Analysis - Univariate



- **Observation** - From above fig, we can say that amount distribution looks very similar. So we can use **loan\_amnt** for our further analysis

# Analyzing Approved Loan Amount percentage

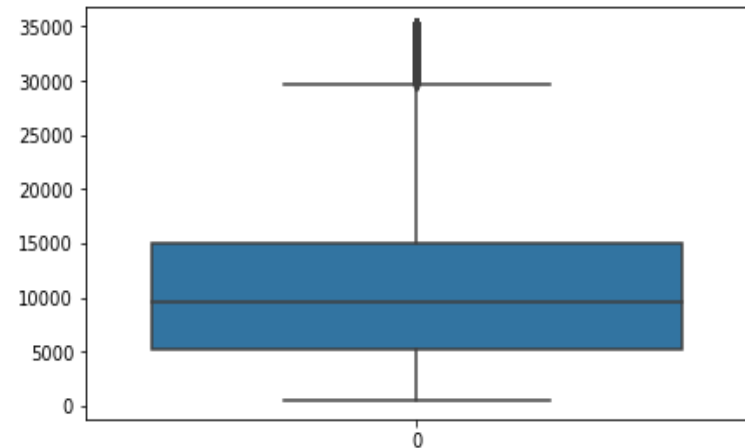
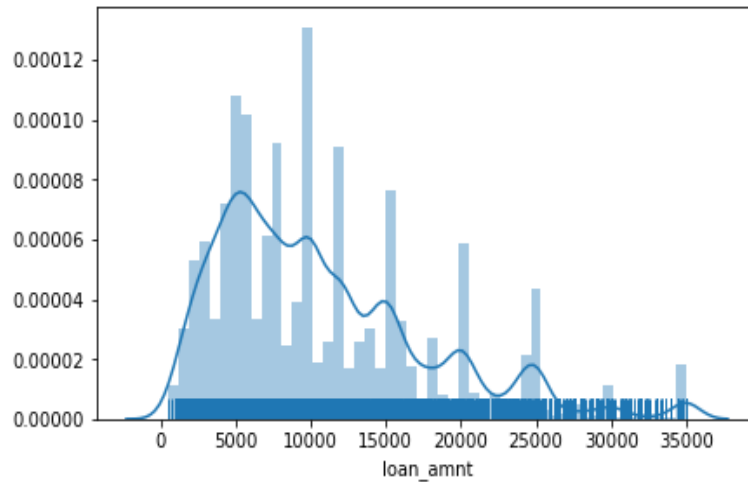


## Observations

80% of Borrowers got 100% loan amount from investors.

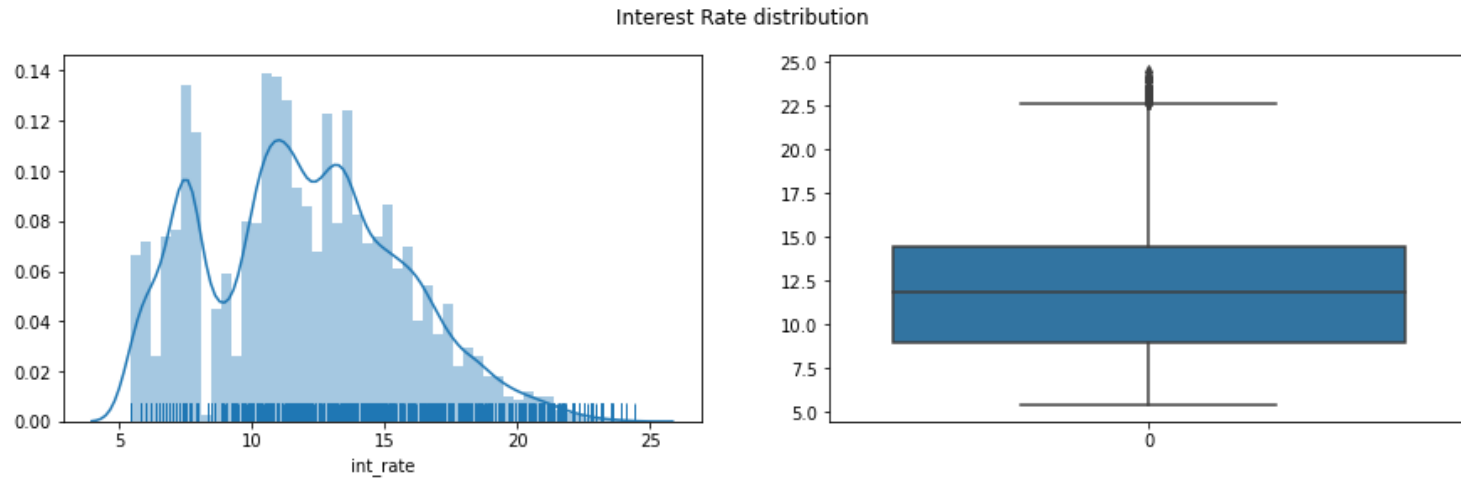
# Analyzing Loan amount

Loan Amount distribution



From loan amount data, we can say that most of them have taken their loan between 5000 and 15000.

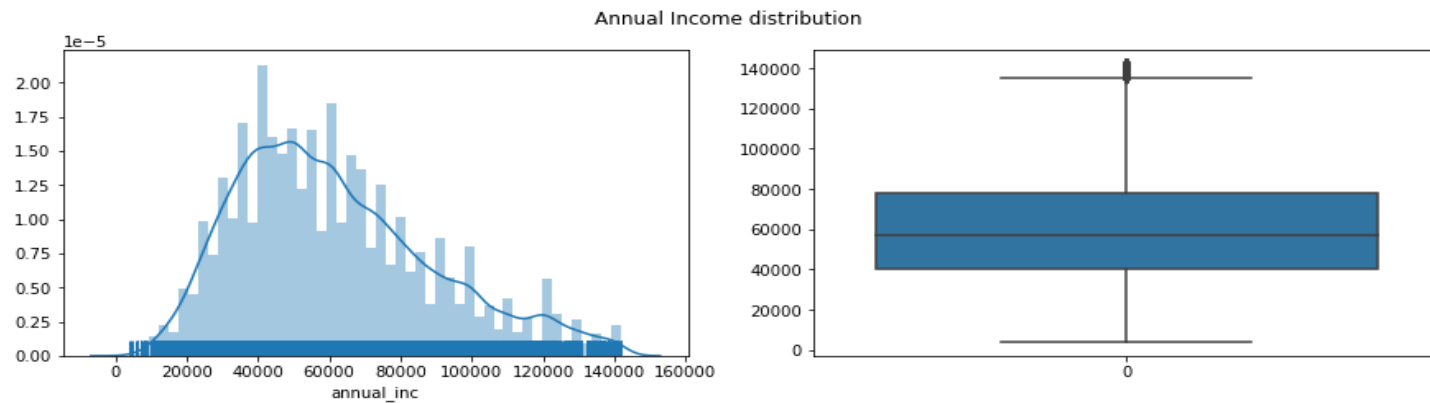
# Analyzing Interest Rate



## Observations

From interest rate data, we can say that most of the interest rate lies between 9% to 14.5%.

# Analyzing Annual Income

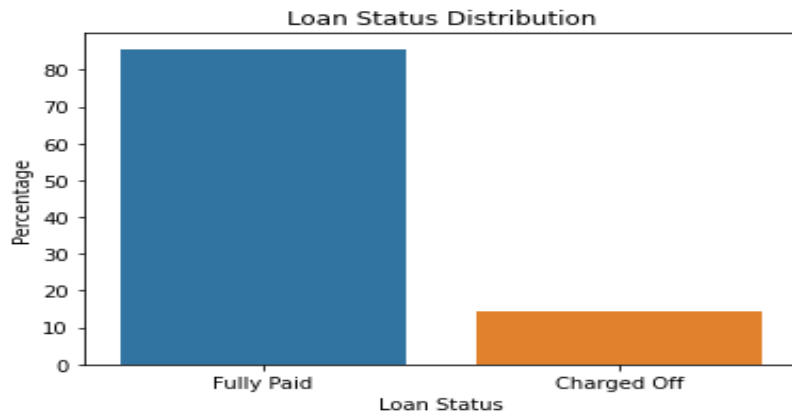


## Observations

From annual income data, we can say that most of the borrower's annual income are in range of 40k to 80k.

# Unordered Categorical Variables

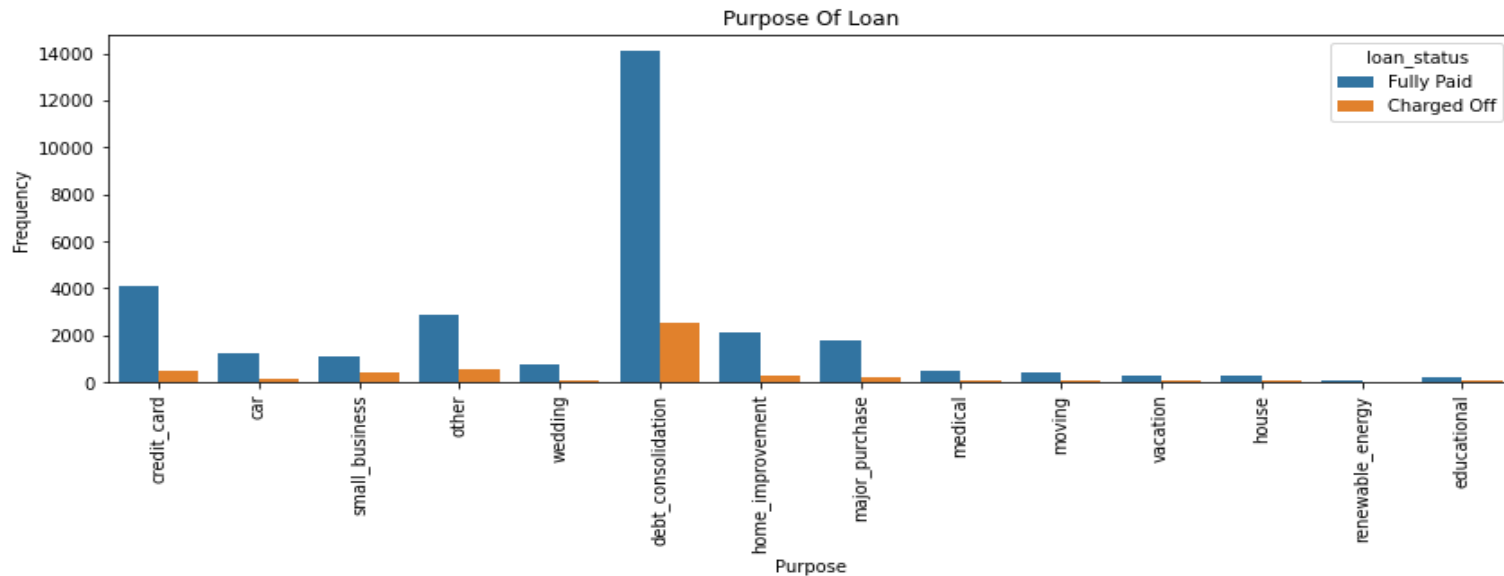
## ▣ Analyzing Loan Status



### Observations

From loan status data, we can say that 85.7% have fully paid whereas 14.3% are charged off.

## ▣ Analyzing Purpose of Loan



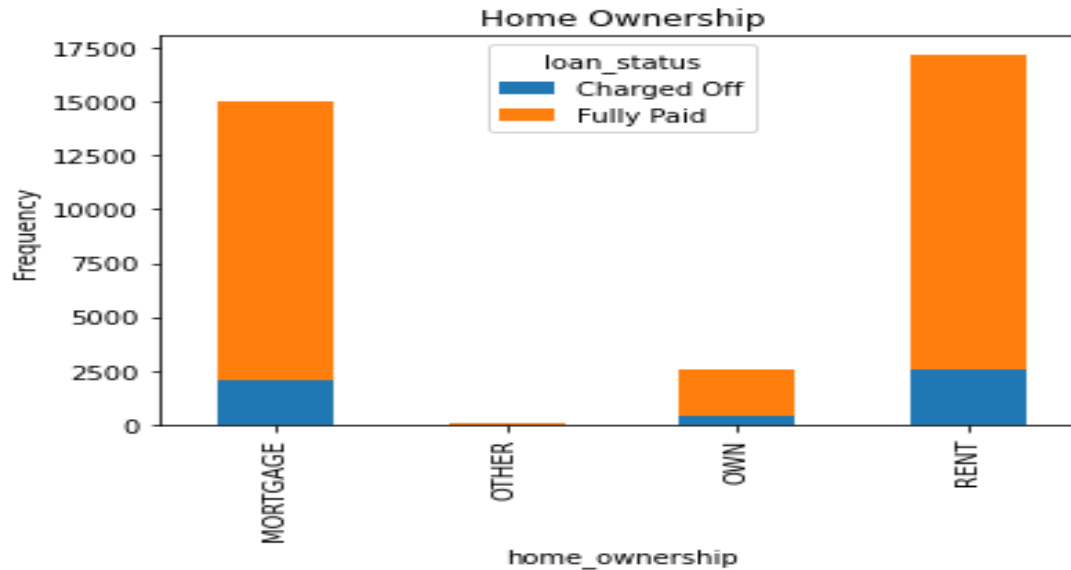
### Observations¶

From purpose data, we can say that most of them have taken loan for debt consolidation and paying credit card bills.

Charged Off loan status is also high for debt consolidation.



## ▣ Analyzing Home Ownership



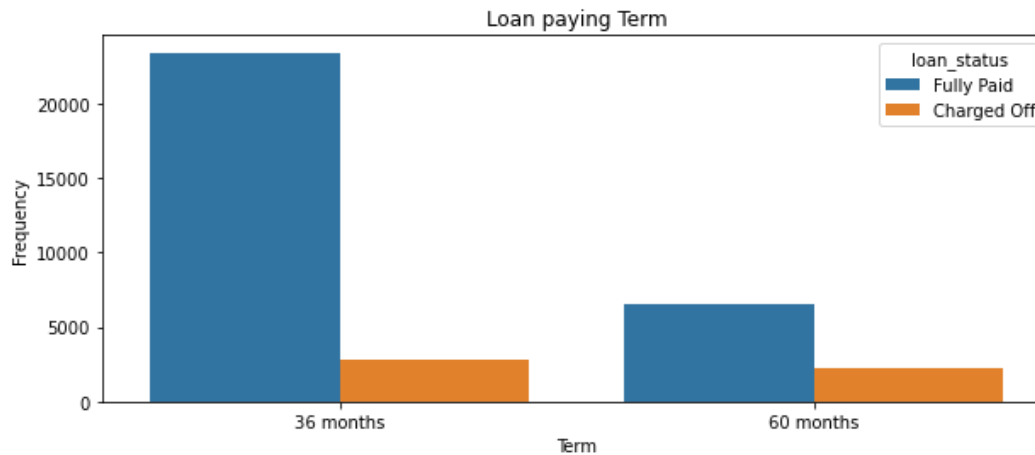
### Observations

From home ownership data, we can say that most of them have taken loan who are in rent or mortgage their home.

Charged Off loan status is also high for these two home ownership.

# Ordered Categorical Variables

## ▣ Analyzing Loan paying term

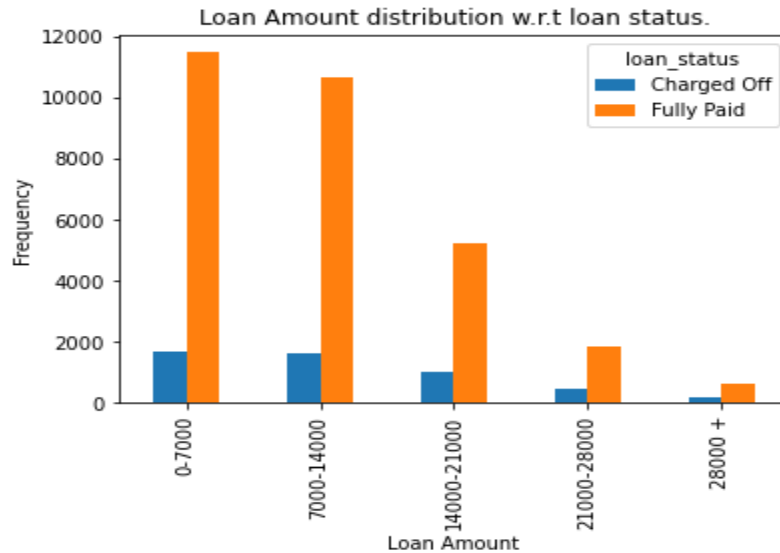


### Observations

From term data, we can say that most of them have taken loan for 36 months as compared to 60 months.

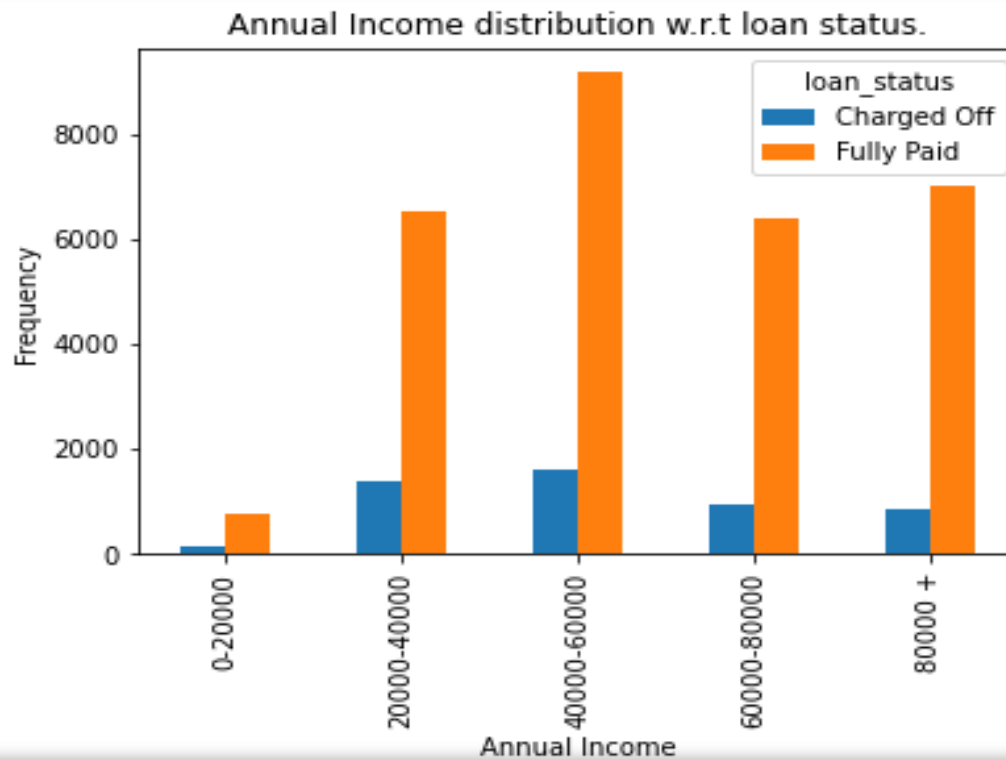
Charged Off loan status is also high for 60 months term wrt 36 months.

# Segmented Univariate Analysis



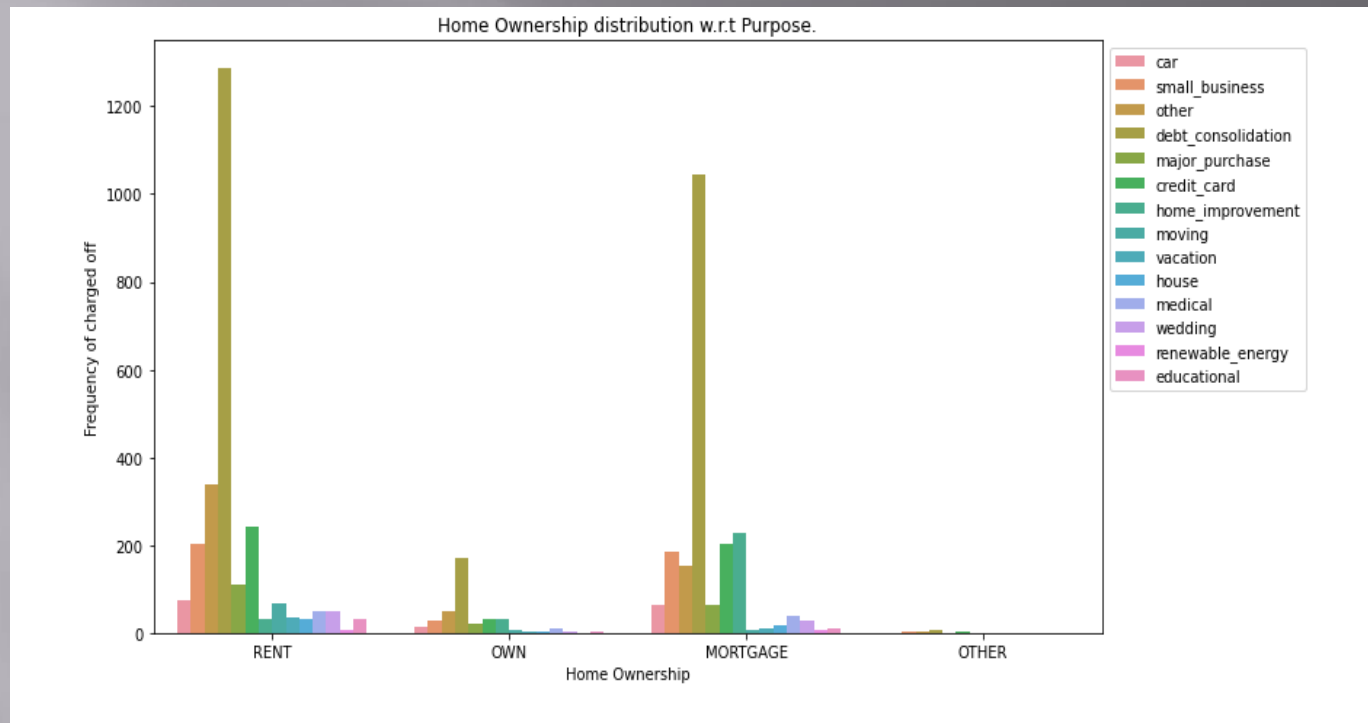
## Observations

From above we can say that, under 14k most of the borrowers take the loan amount and charged off status is also high for those amount.



## Observations

From above chart we can say that, most of the borrower's annual income is in the range of 40k to 60k.

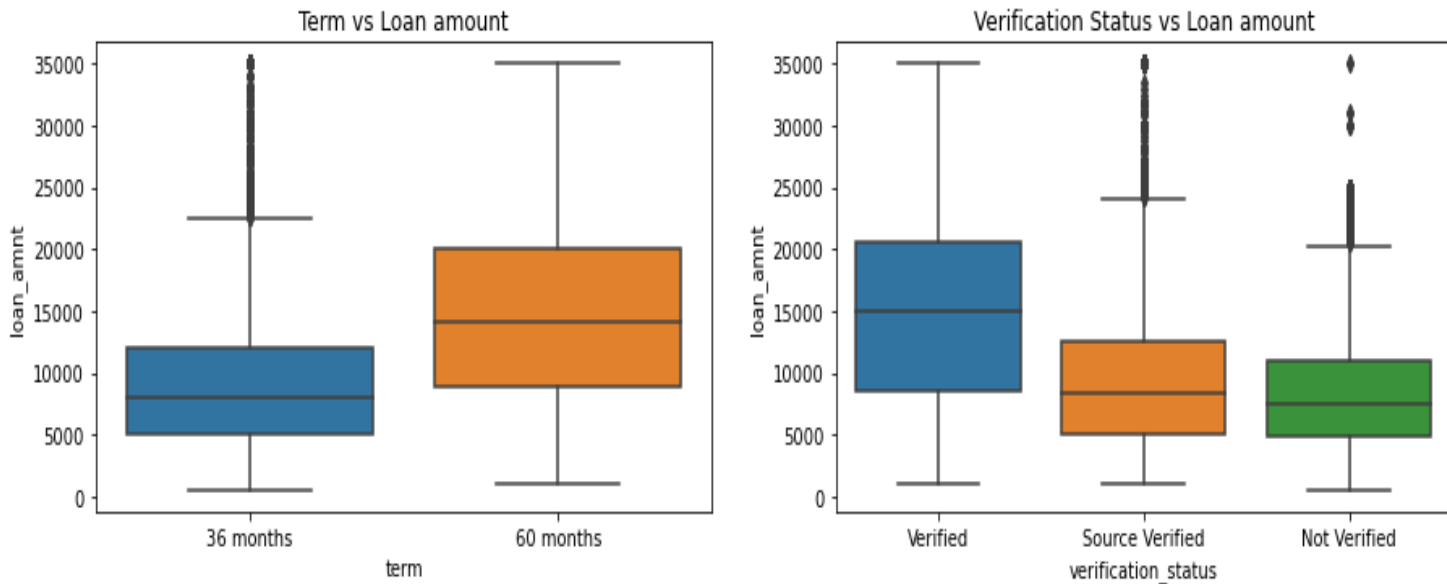


## ▣ Observations

From above chart we can say that, most of the borrower's who took loan for the purpose of debt consolidation has highest number of Charged off status and those who are in rent as the most.

# Bivariate Analysis

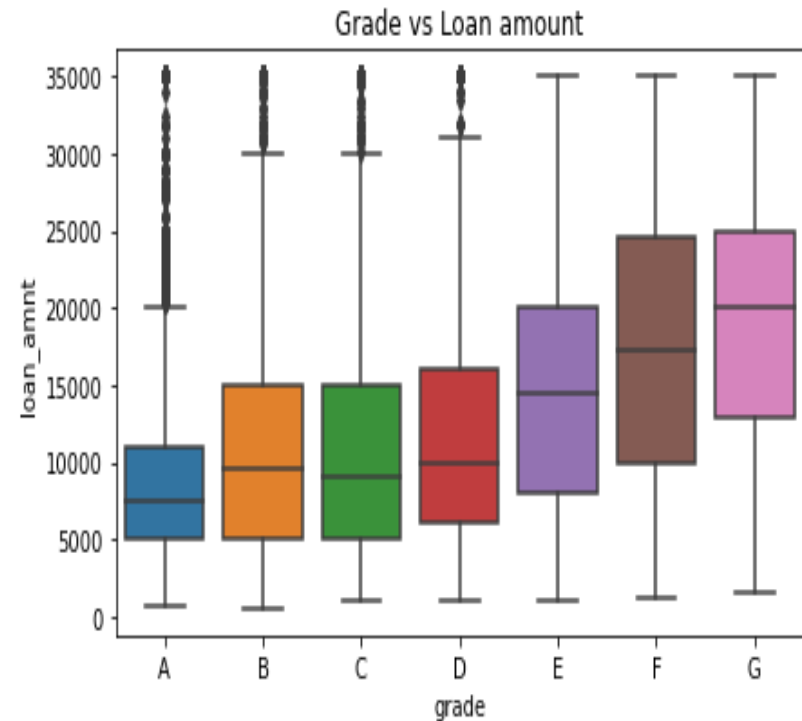
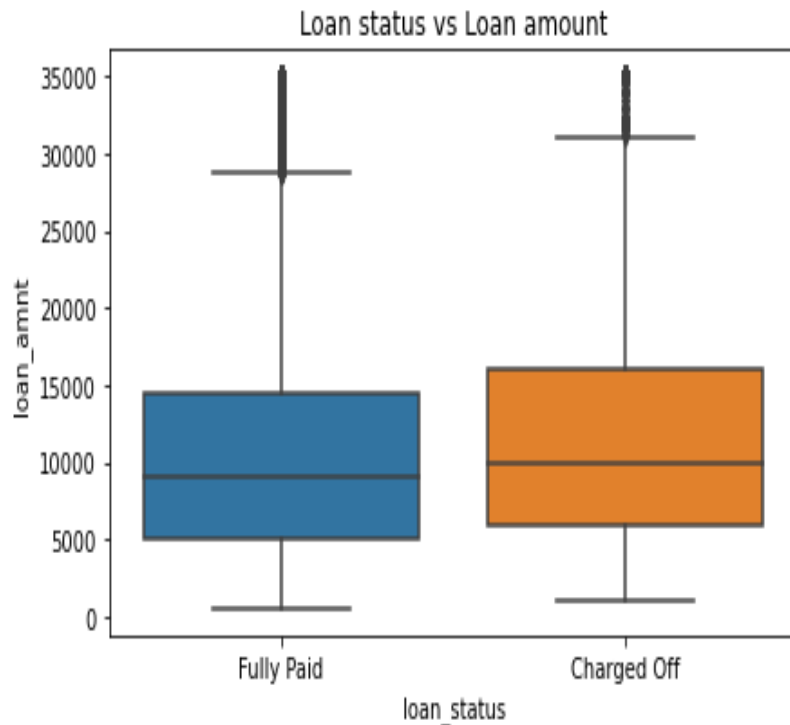
- Analysing loan amount with every variables



## Observations

In loan amount vs term variable we can say that, more the loan amount higher is the tenure i.e. 60 months. Its median is only 15k whereas the median of 36 month is 8k.

In Verification status vs loan amount we can say that, Verified borrower gets more loan amount than Non-verified and Source Verified i.e. above 10k loan amount everyone are verified.

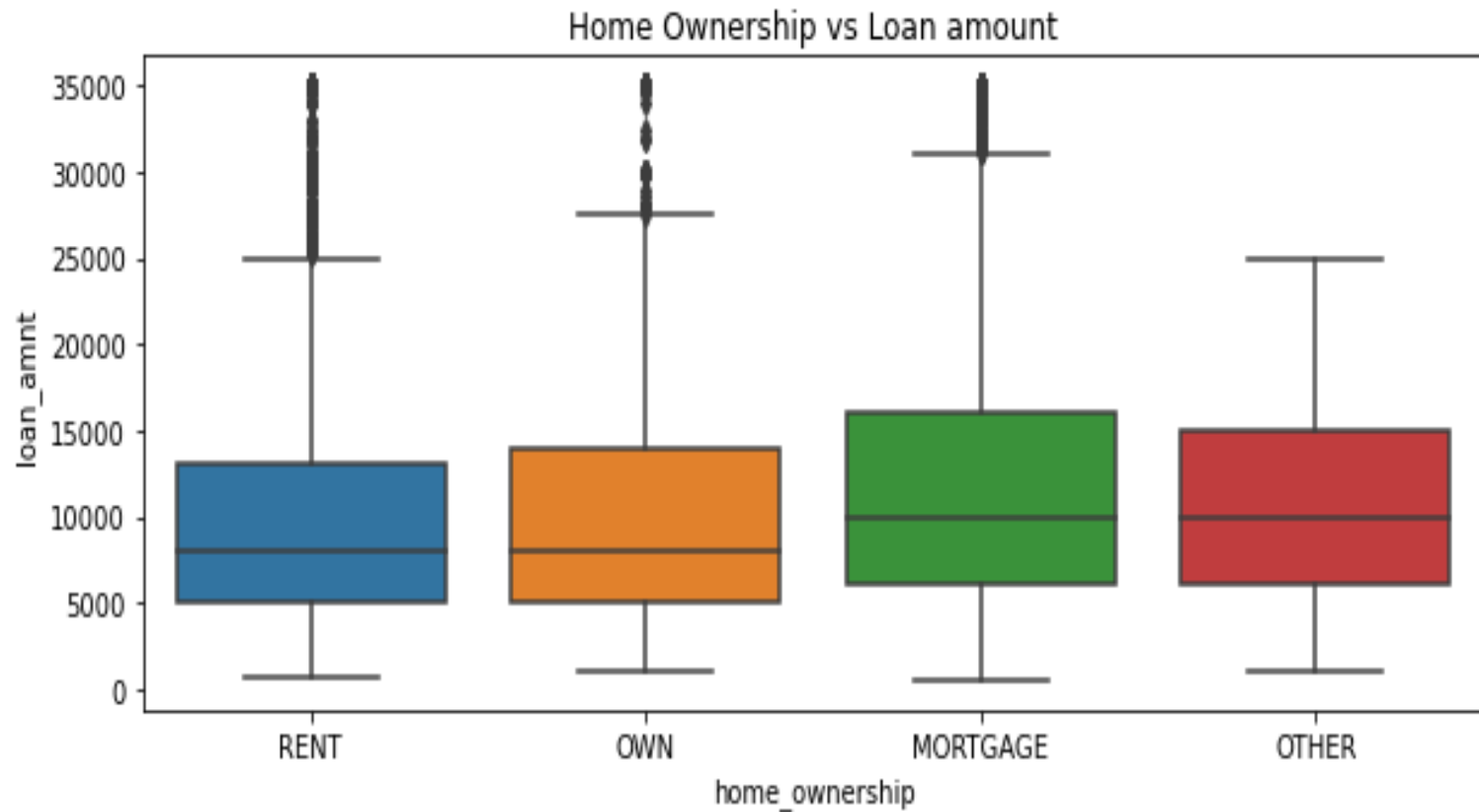


## Observations

In loan amount vs Loan status variable we can say that, charged off were having higher loan amount than fully paid.

In Grade vs loan amount we can say that, grade F & G are having max amount of loan. As the grade decreases amount of loan is increasing.

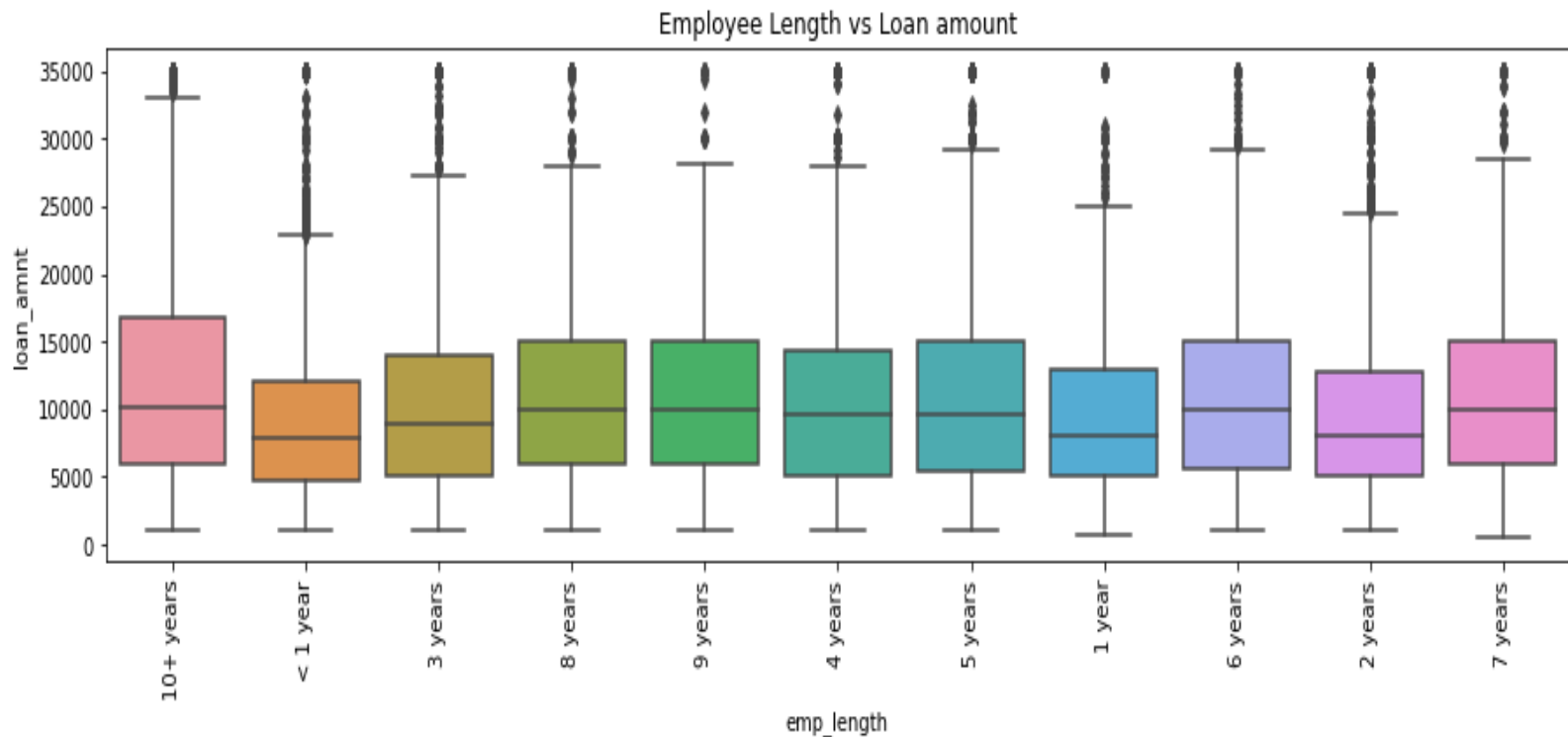
From this we can say that higher the grade more is the risk of default.



## ▣ Observations¶

In loan amount vs home ownership variable we can say that, the borrower who are from Mortgage have taken higher amount of loan then others.

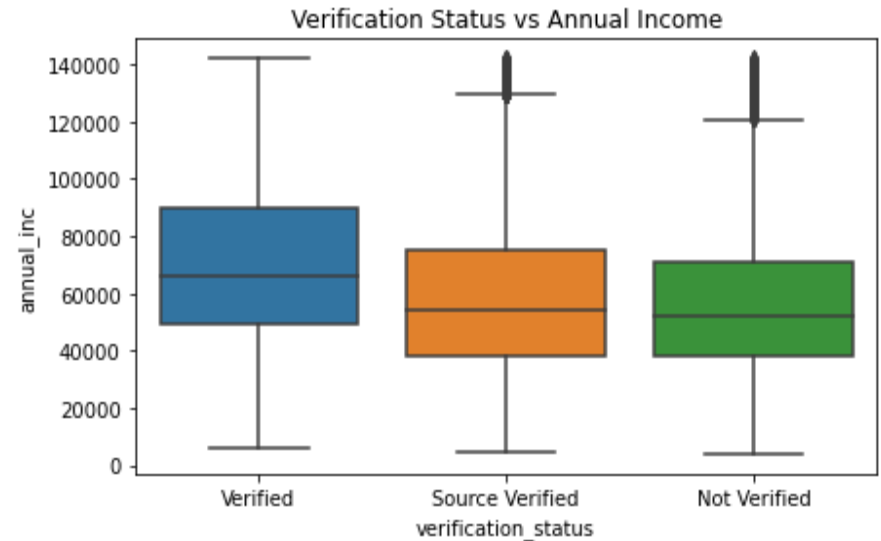
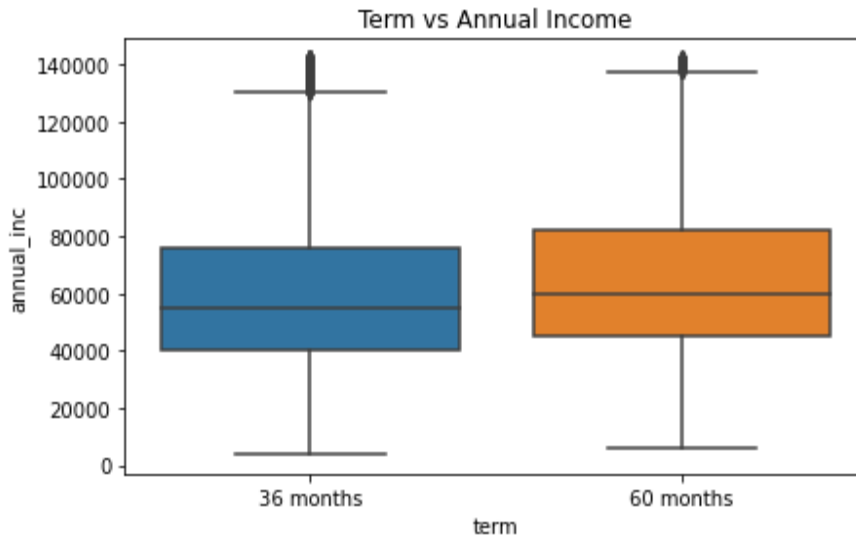




## ▣ Observations

In loan amount vs employee length variable we can say that, the borrower who has 10+ years of experience are taking high amount of loan than others and borrowers with less than 1 year of experience are taking lesser amount of loan compared to others.

# Analysing Annual Income with every variables

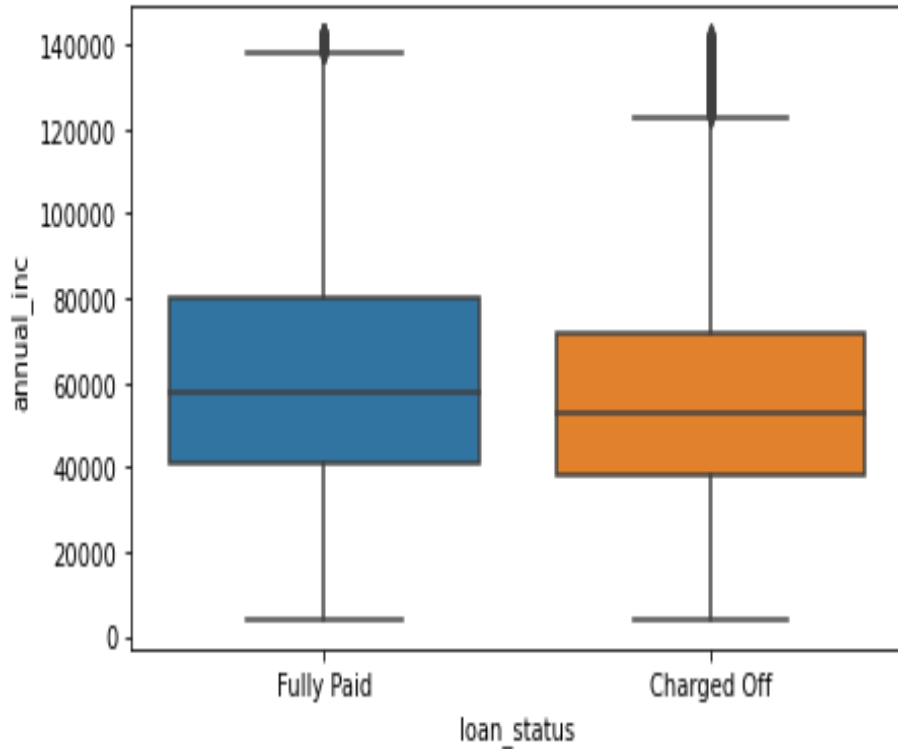


## Observations

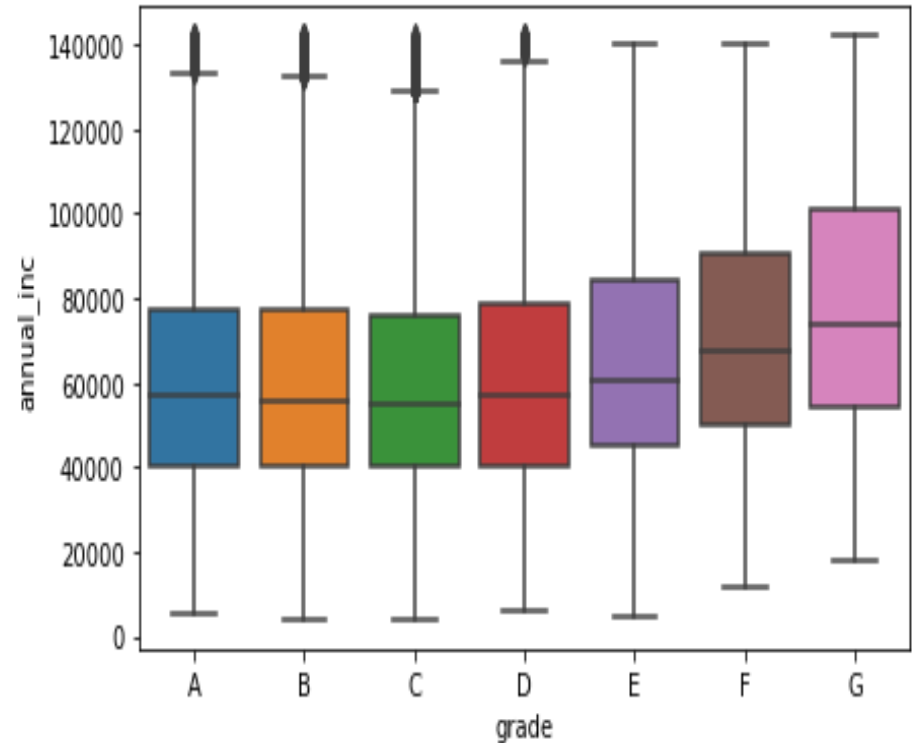
In Term vs Annual Income variable we can say that, the borrowers who have high annual income are taking loans for 60 months tenure as compared to 36 months.

In Verification status vs annual income we can say that, mostly the verified borrowers are having high annual income than others.

Loan status vs Annual Income



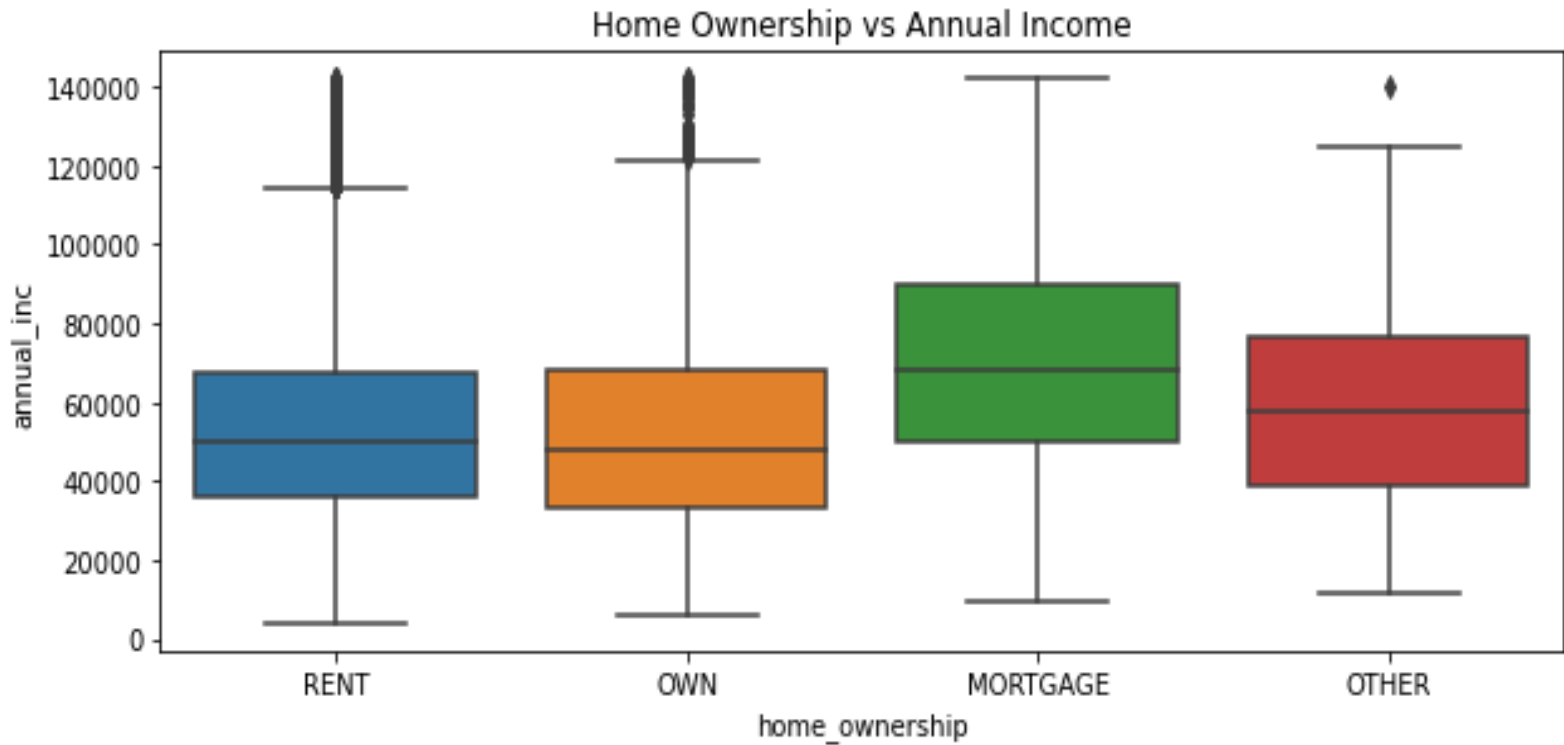
Grade vs Annual Income



## Observations¶

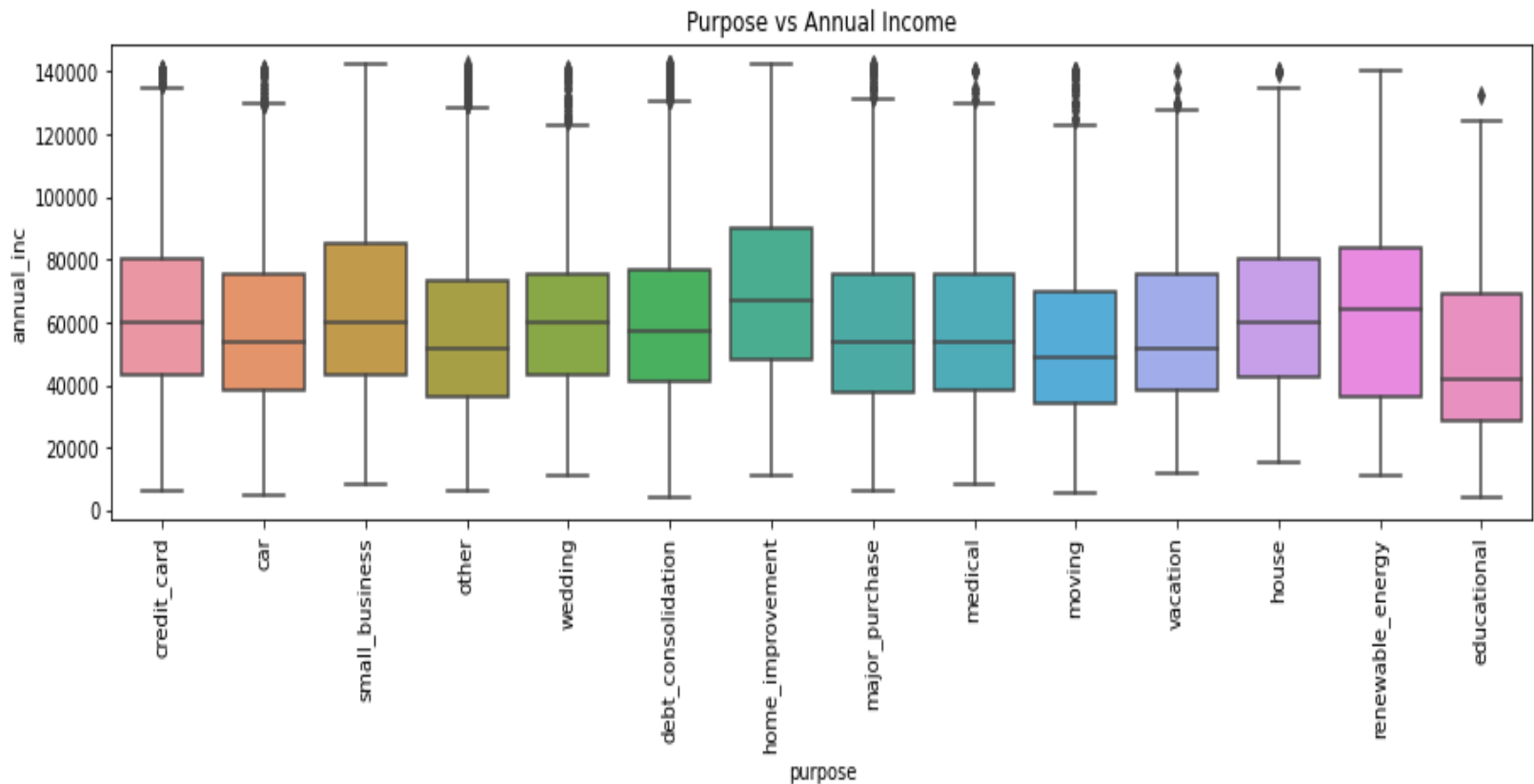
In loan amount vs term variable we can say that, more the loan amount higher is the tenure i.e. 60 months. Its median is only 15k whereas the median of 36 month is 8k.

In Verification status vs loan amount we can say that, Verified borrower gets more loan amount than Non-verified and Source Verified i.e. above 10k loan amount everyone are verified.



## Observations¶

In Annual Income vs Home Ownership variable we can say that, the borrowers who have the status as Mortgage are having high annual income than others.



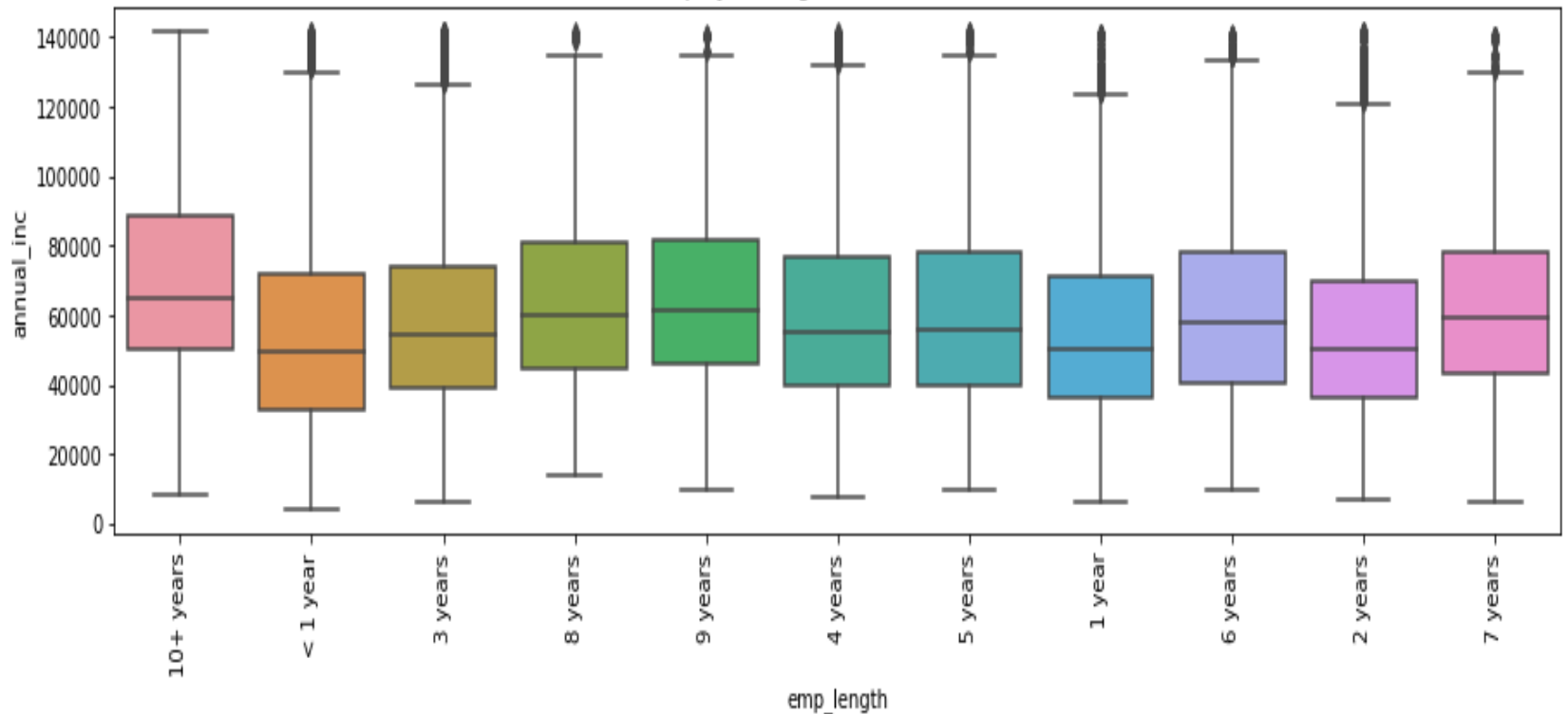
- ▣ **Observations**

- ▣ In Annual Income vs Purpose variable we can say that, the borrowers who has high annual income are taking loans mostly for home improvement and small business.

- ▣ **Observations**

- ▣ In Annual Income vs Purpose variable we can say that, the borrowers who has high annual income are taking loans mostly for home improvement and small business.

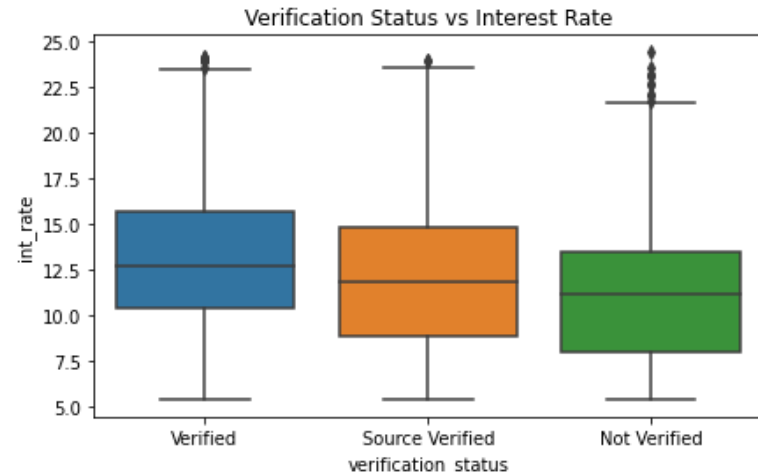
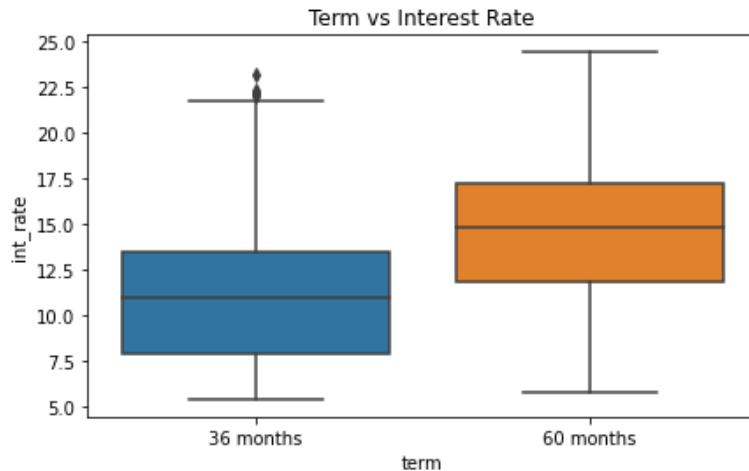
Employee Length vs Annual Income



## Observations

In Annual income vs employee length variable we can say that, as we expected the borrowers who has 10+ experience are having highest annual income than others and >1 is having least.

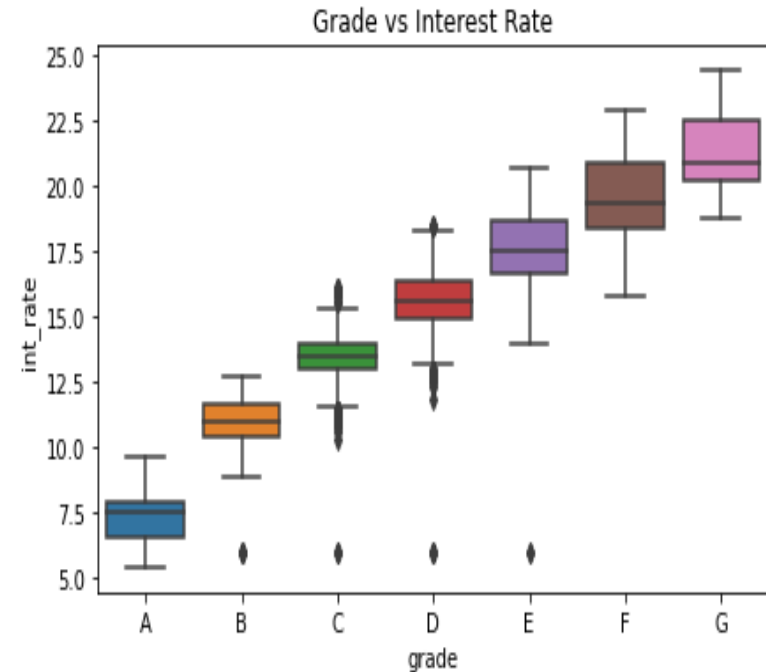
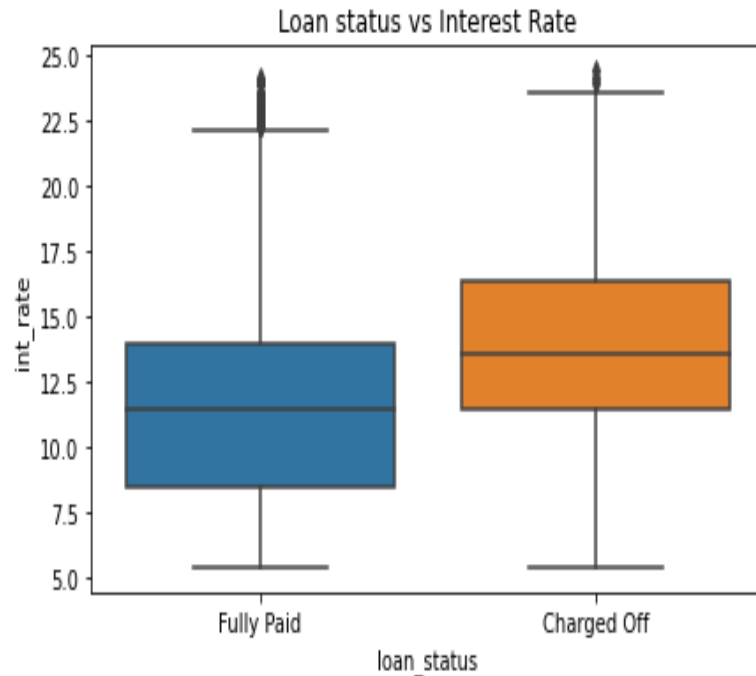
# Analysing Interest Rate with every variables



## Observations

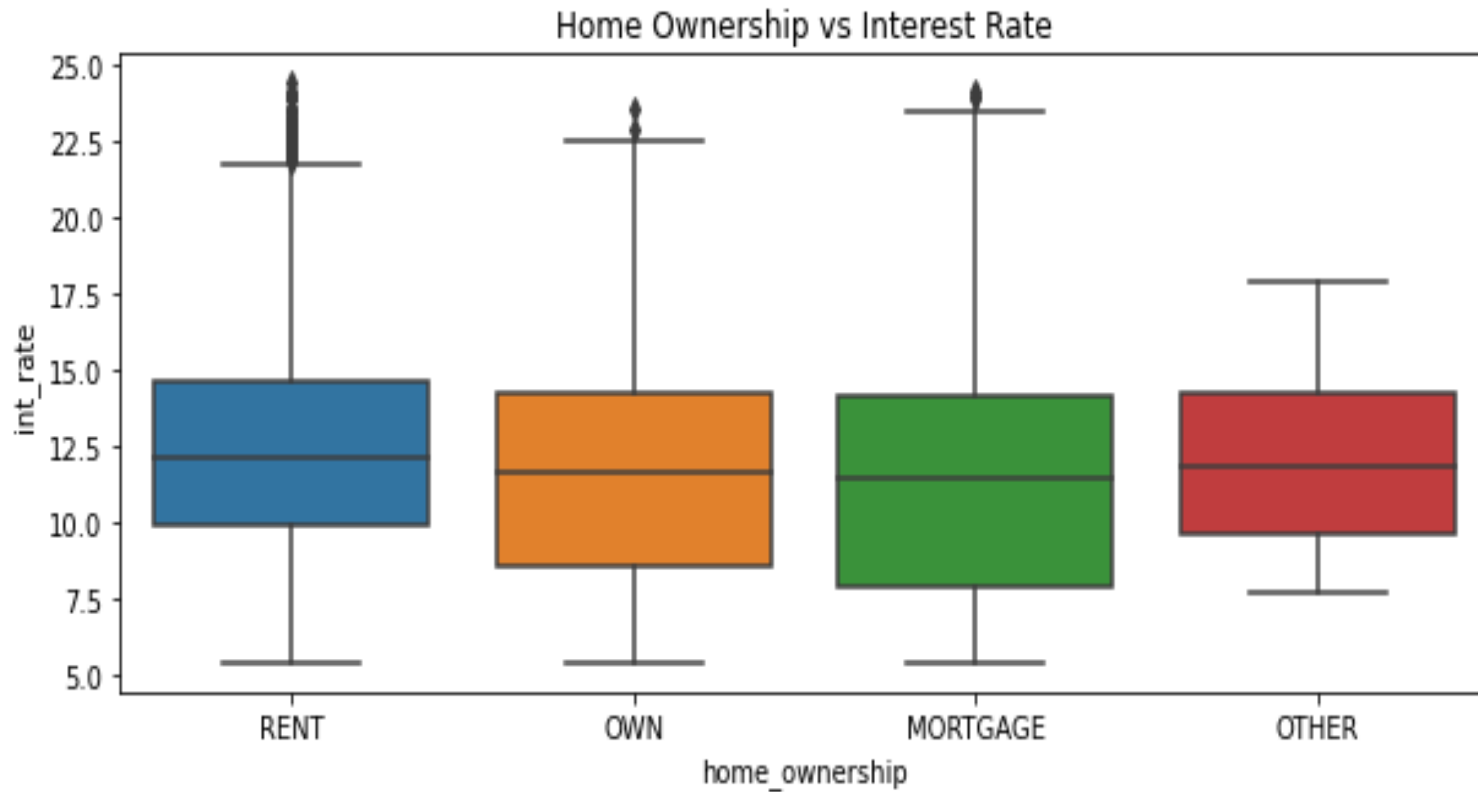
In term vs interest rate variable we can say that, interest rate is less for those who take loan for 36 months and high for 60 months.

In term vs interest rate variable we can say that, Verified borrower gets more loan at higher interest rate compared to others.



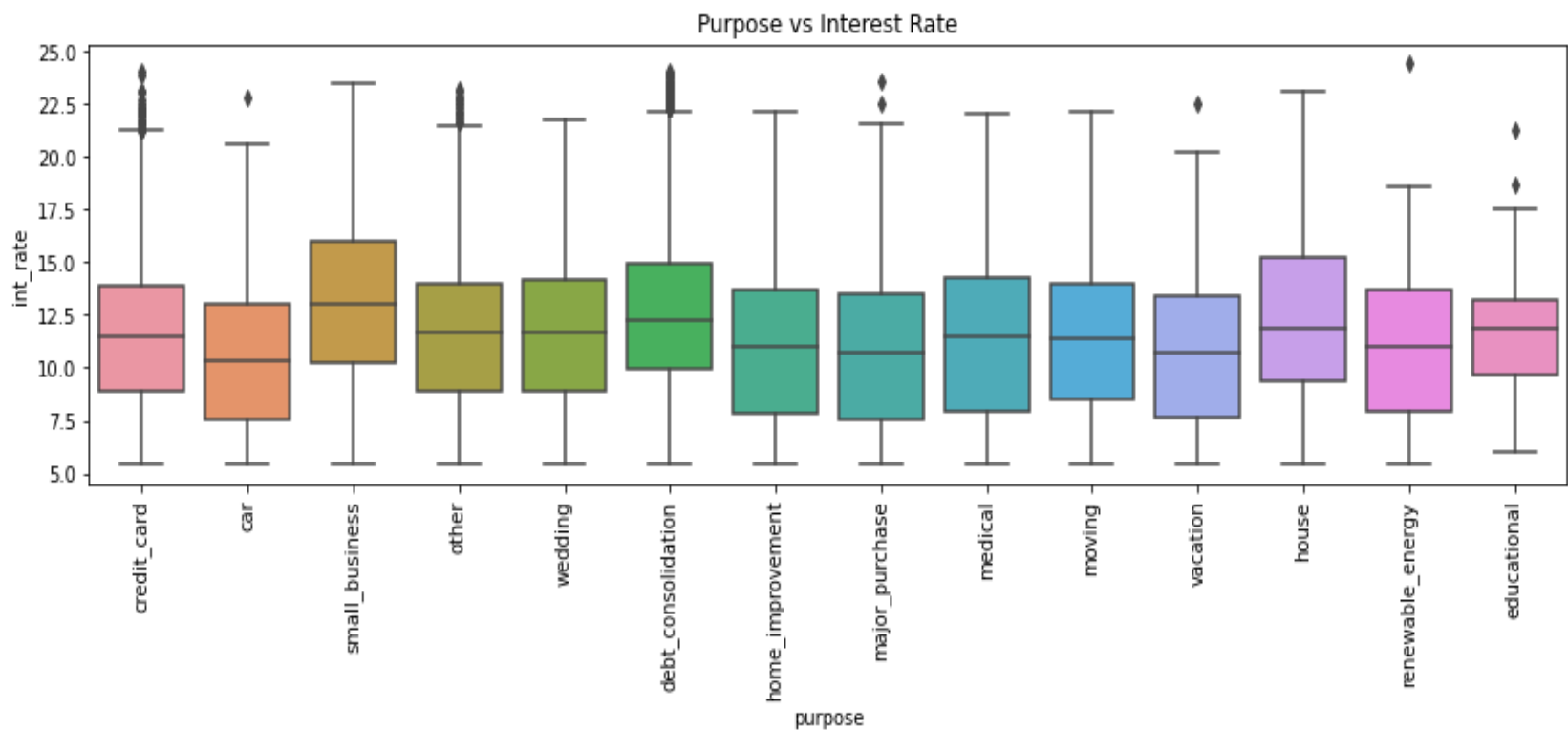
- ▣ **Observations**
- ▣ In loan status vs interest rate variable we can say that, the borrowers who has high interest rate are mostly defaulters.
- ▣ In grade vs interest rate we can say that, as the grade decreases, interest rate is also increasing.





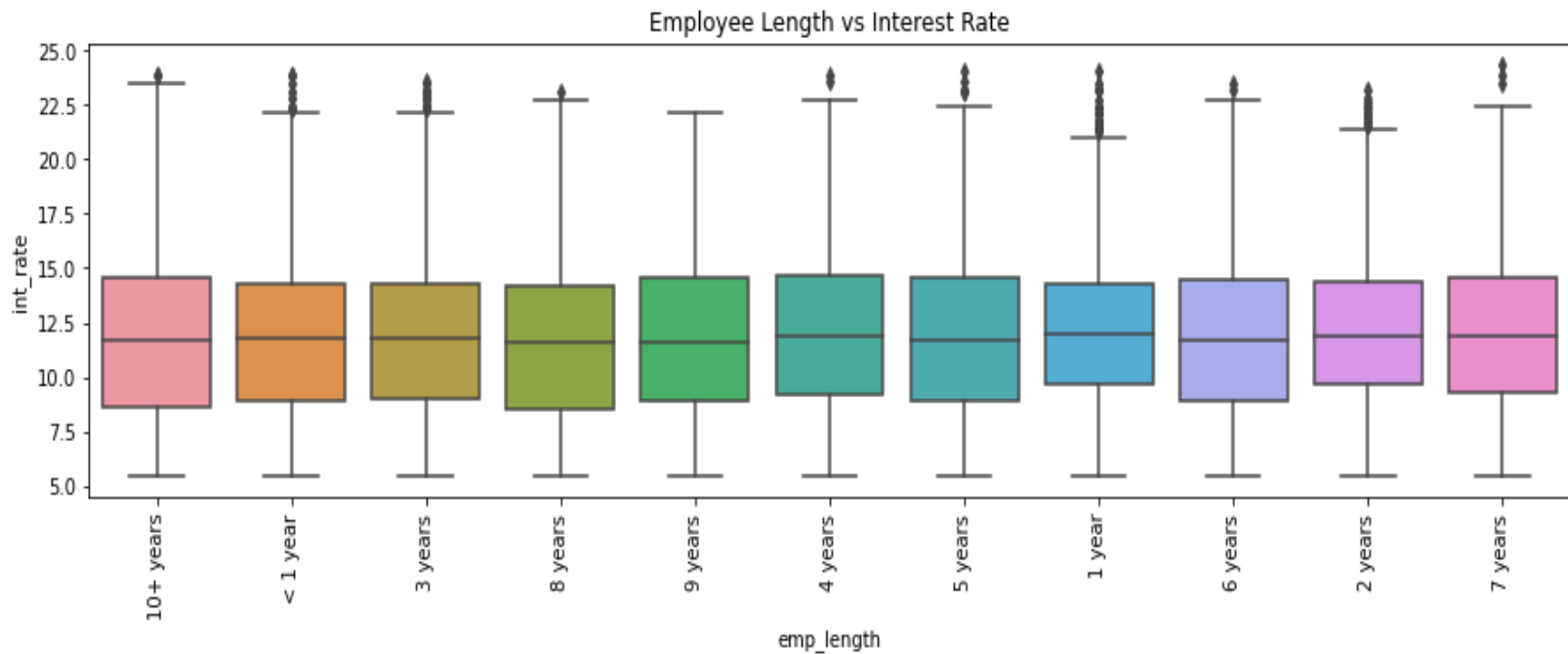
## Observations

In home ownership vs interest rate variable we can say that, the borrowers who are in rent are getting high interest rate. The borrowers with own and mortgage are getting loan with less interest rate also due to security purpose.



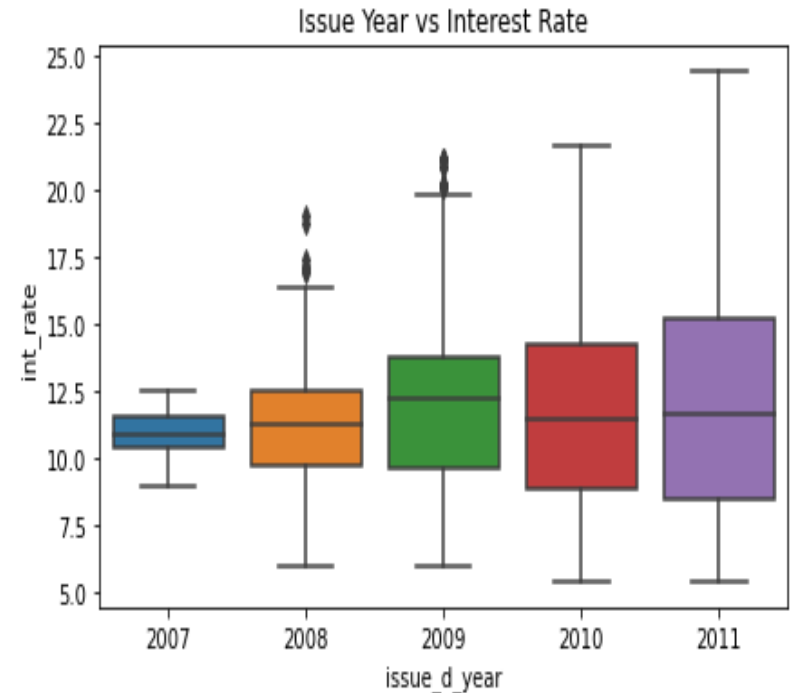
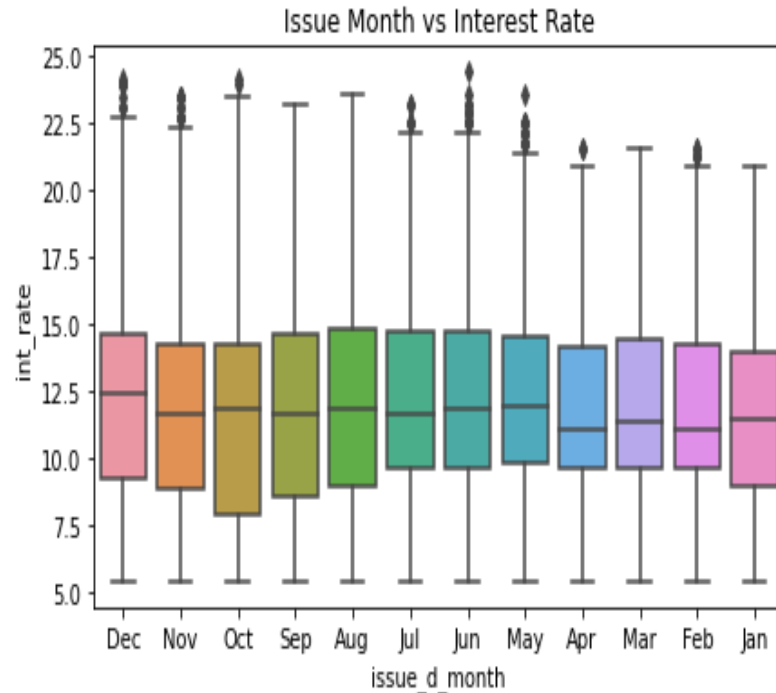
## ▣ Observations

In purpose vs interest rate variable we can say that, small business , debt consolidation and house loan are geeting loan at high interest rate than others.



## ▣ Observations

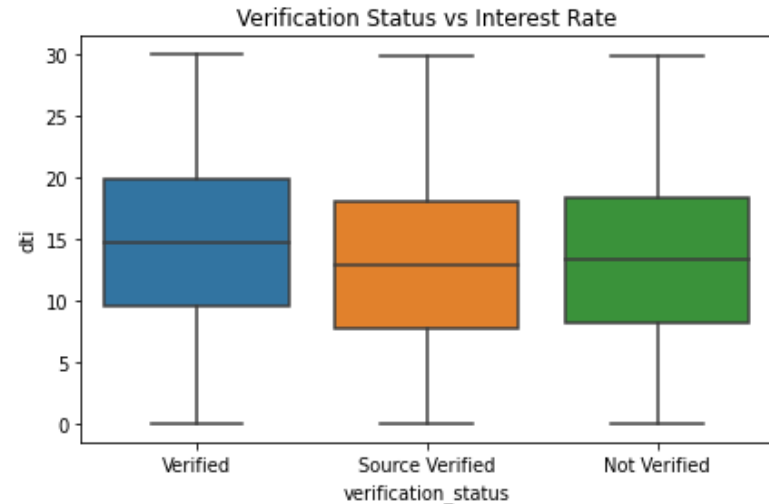
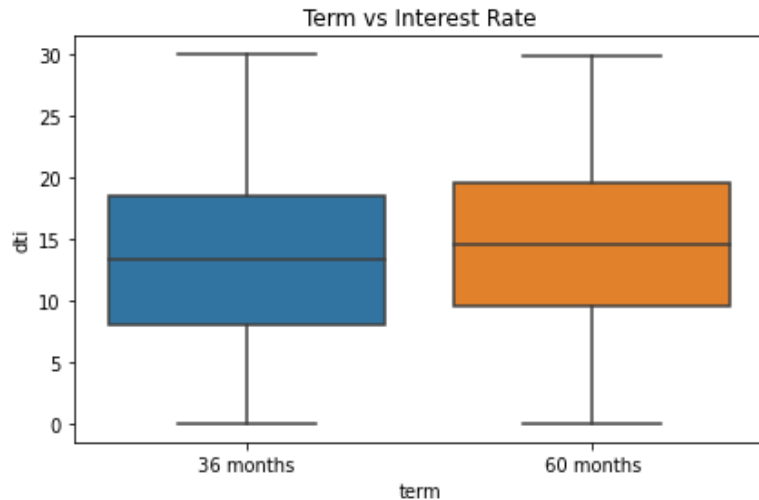
There is no much relation between Employment length and interest rate.



## ▣ Observations

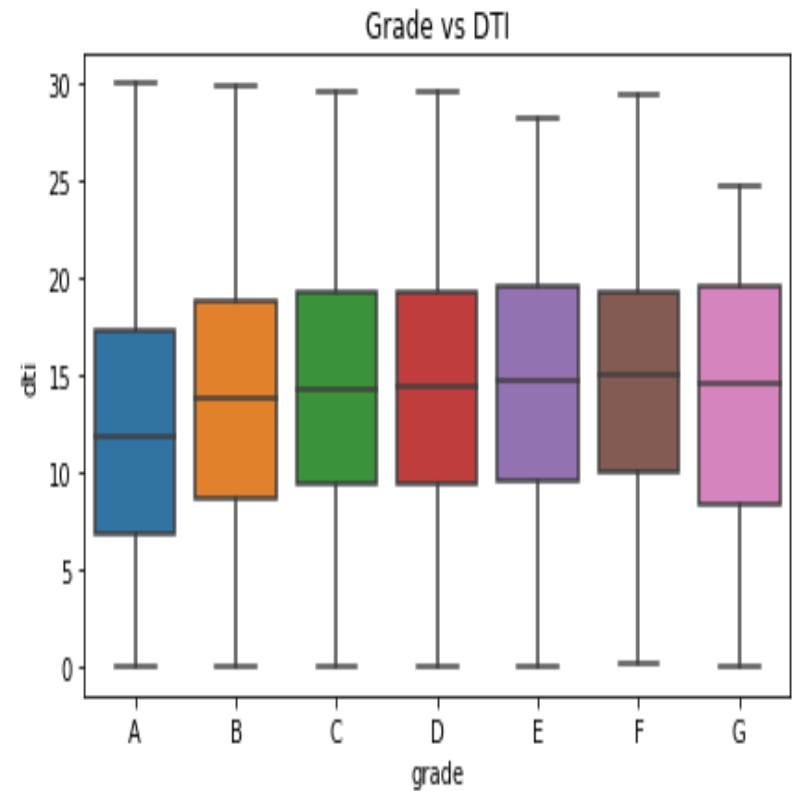
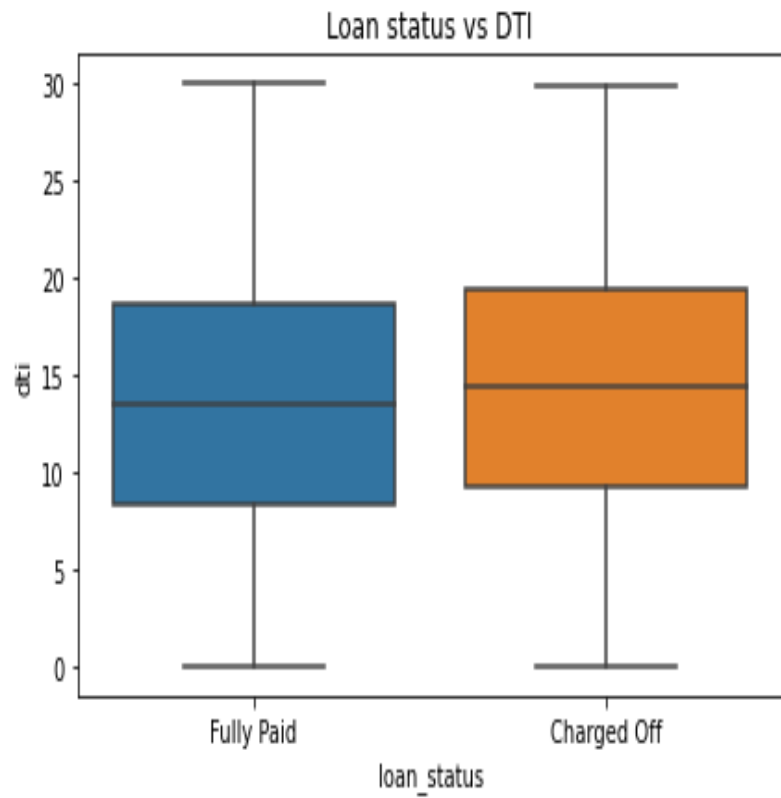
As the year goes on the rate of interest is getting diversified but the median remains same throughout the year

# Analysing Debt to income ratio with every variables



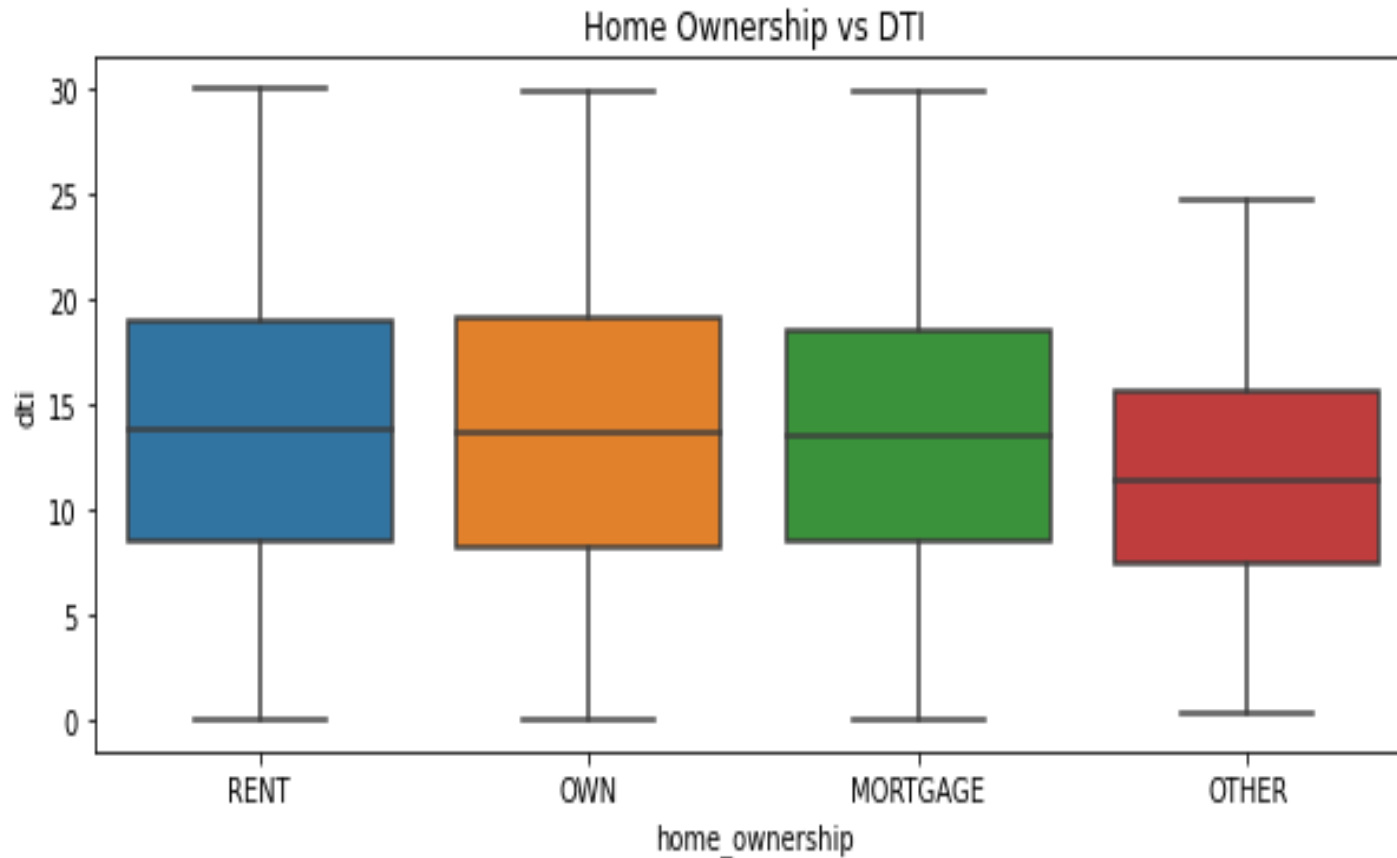
## Observations

- ❑ In interest rate vs term variable we can say that, dti ratio is high for the borrower who has 60 months tenure.
- ❑ In Verification status vs dti we can say that, verified borrowers are having high dti ratio.



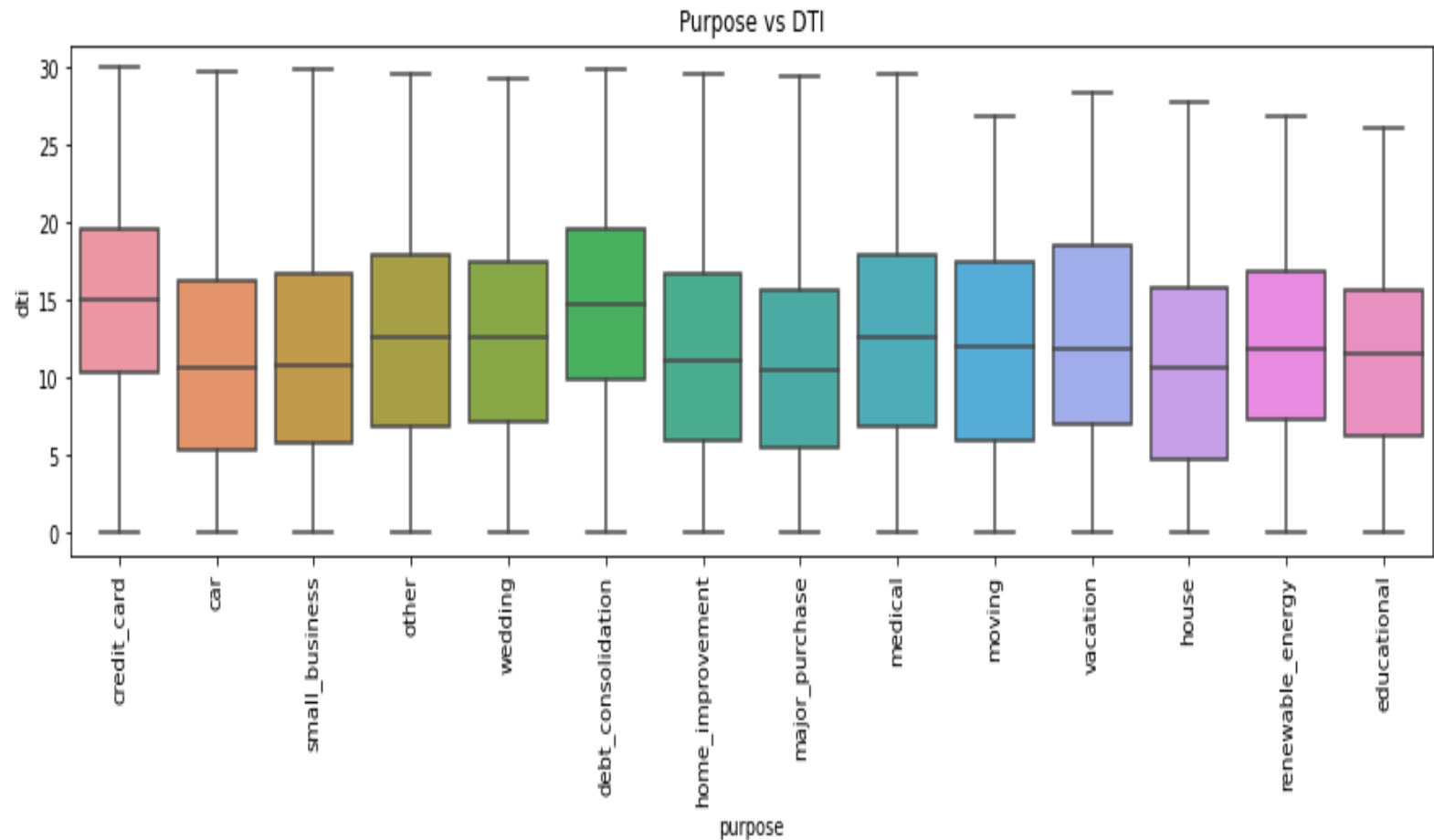
## ▣ Observations

- ▣ Most of the charged off borrowers are having high dti ratio.
- ▣ As grade decreases dti ratio is increasing.



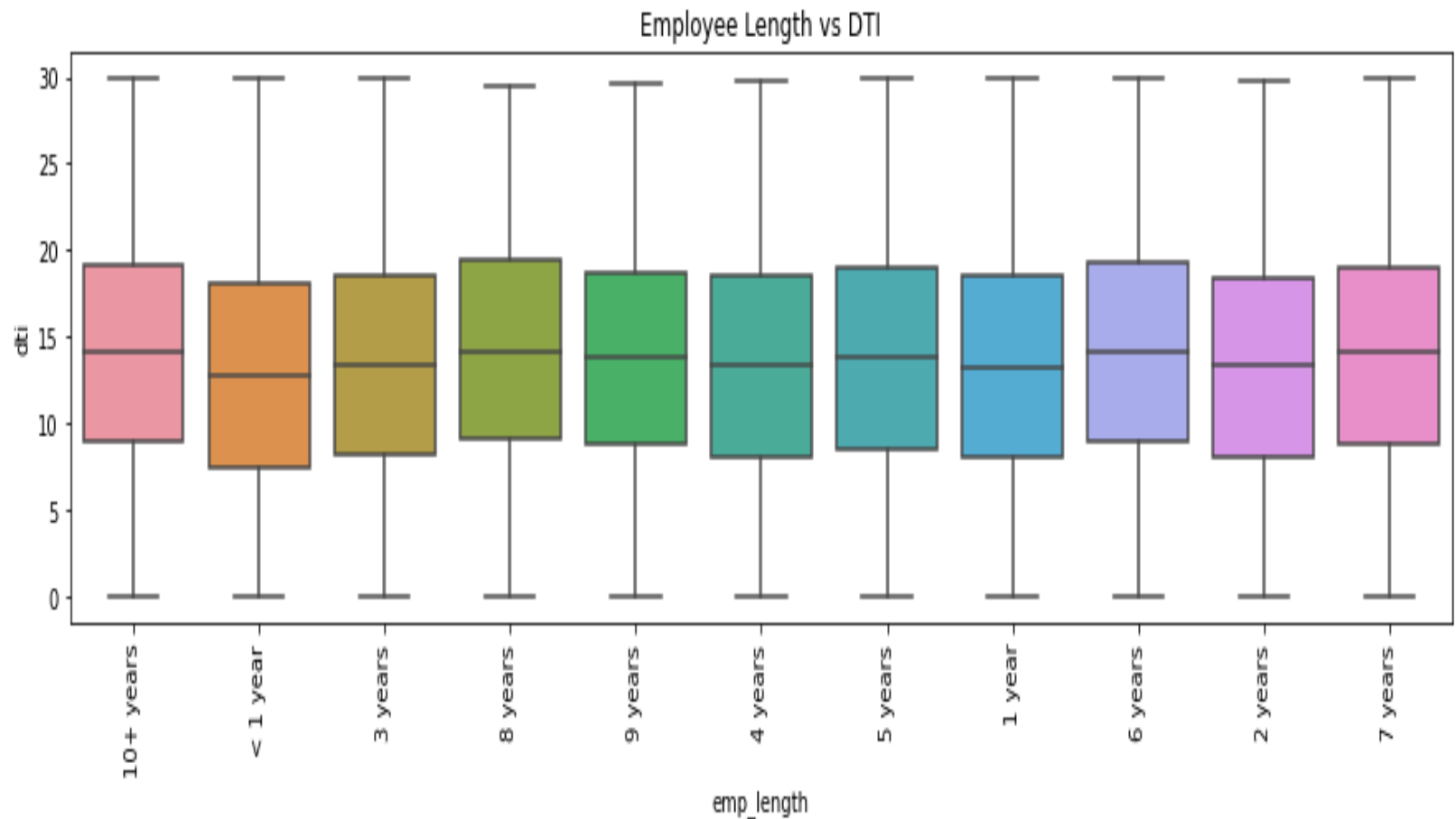
## Observations

- In dti vs home ownership variable we can say that, the borrower with own and rent home status are having high dti ratio than others.



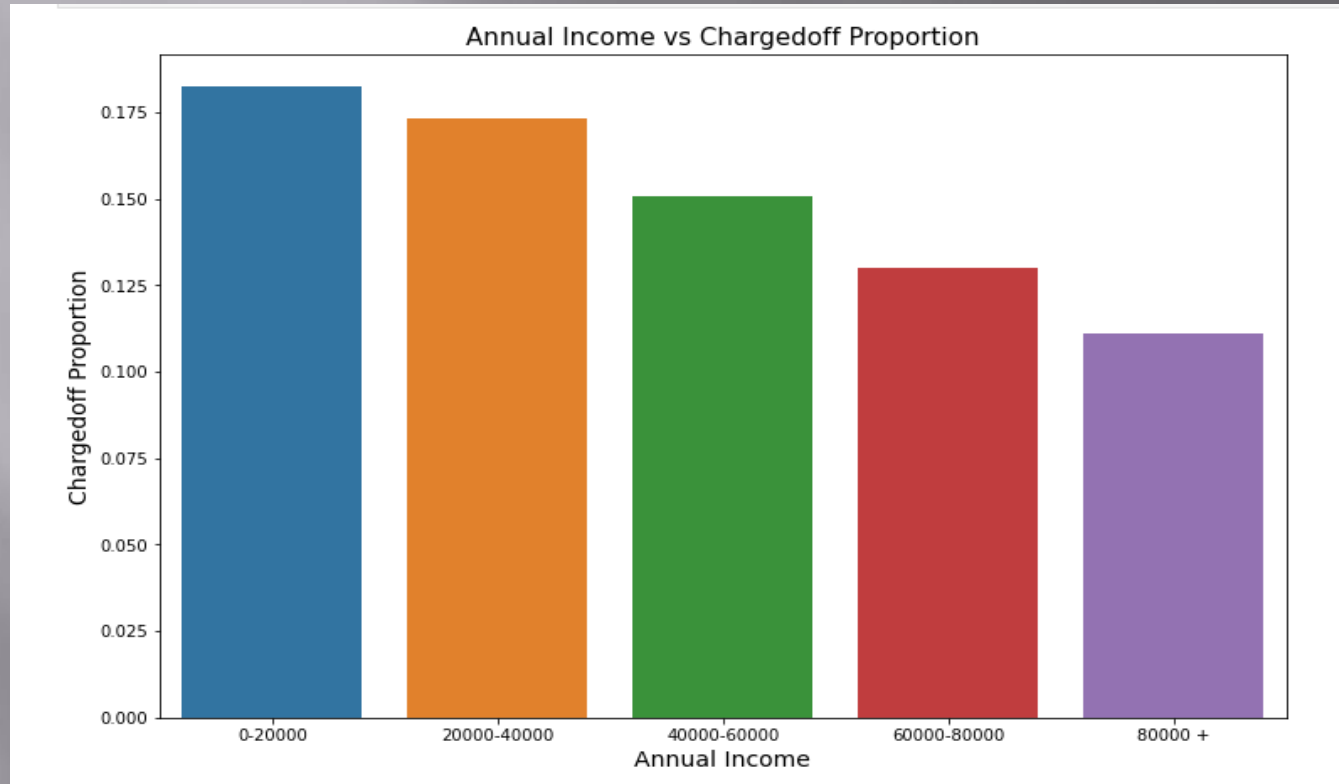
- ▣ **Observations**
- ▣ In purpose vs dti variable we can say that, the borrower who takes loan for the purpose of debt consolidation and credit card are having high dti ratio than others.





- ▣ Observations
- ▣ There is no much relation between employee length and dti ratio.

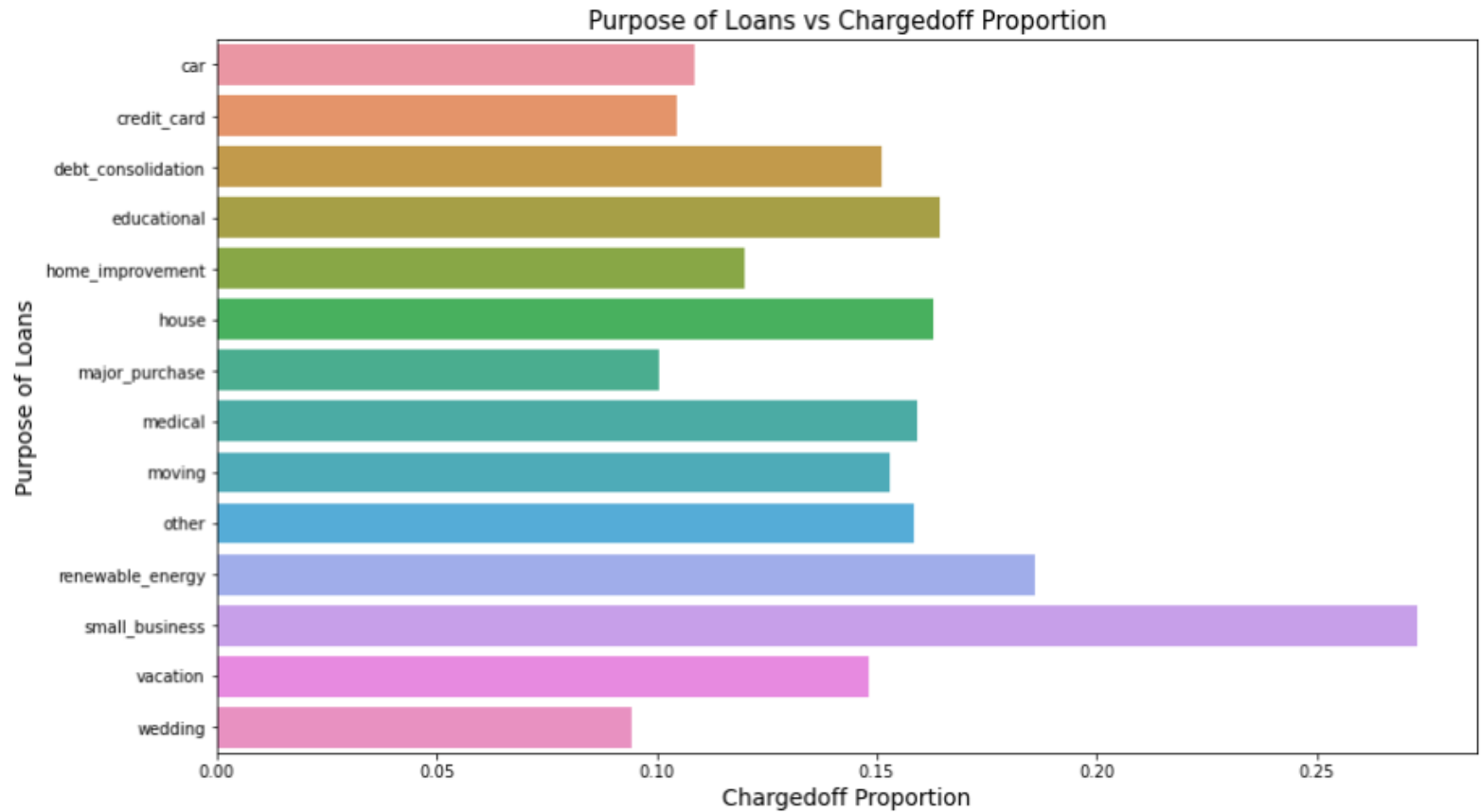
# Analysing Charged Off Proportion with each variables.



## Observations¶

From above chart we can say that, as annual income is increasing charged off proportion is decreasing.

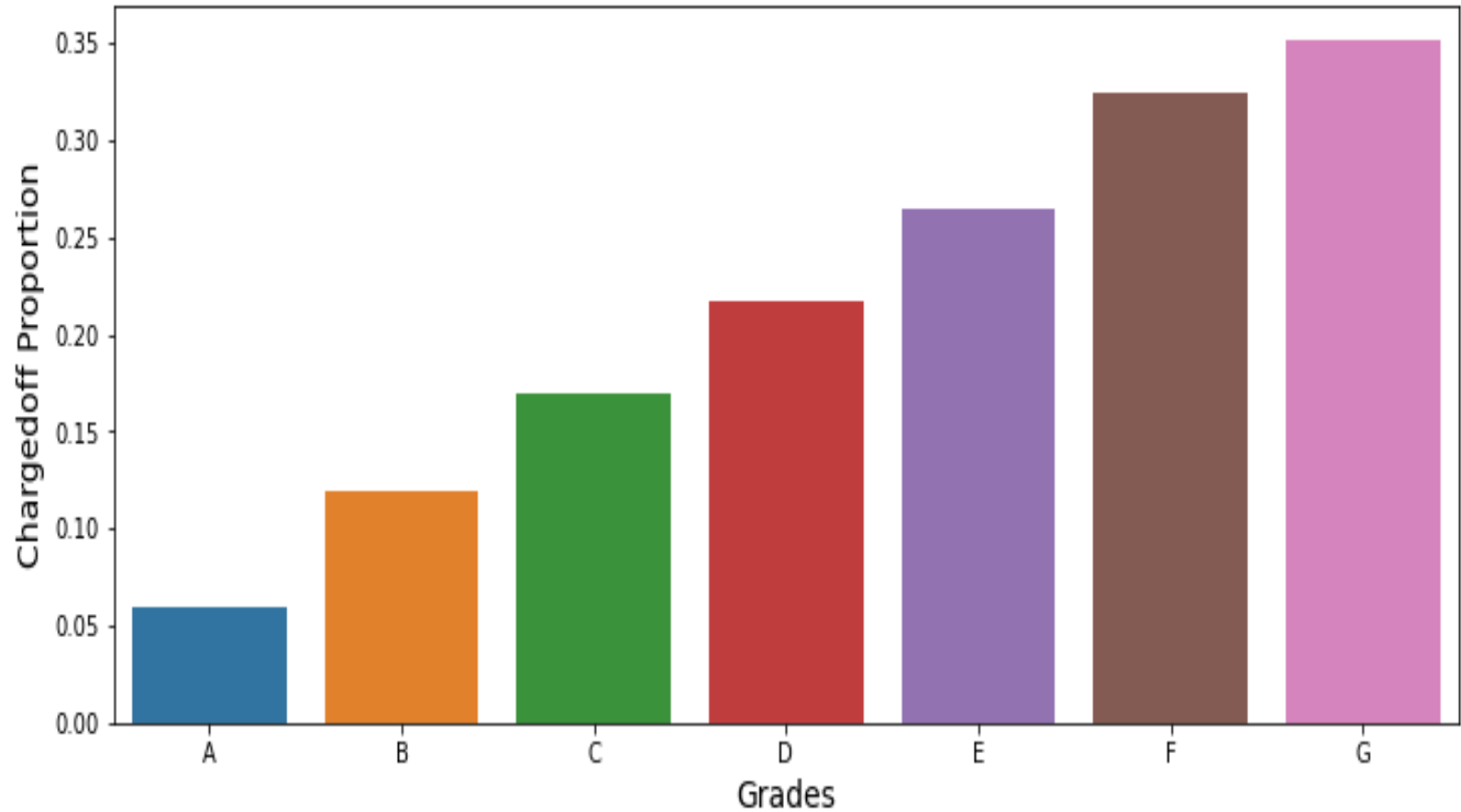
So highest charged off proportion are in the range 0 to 20k annual income.



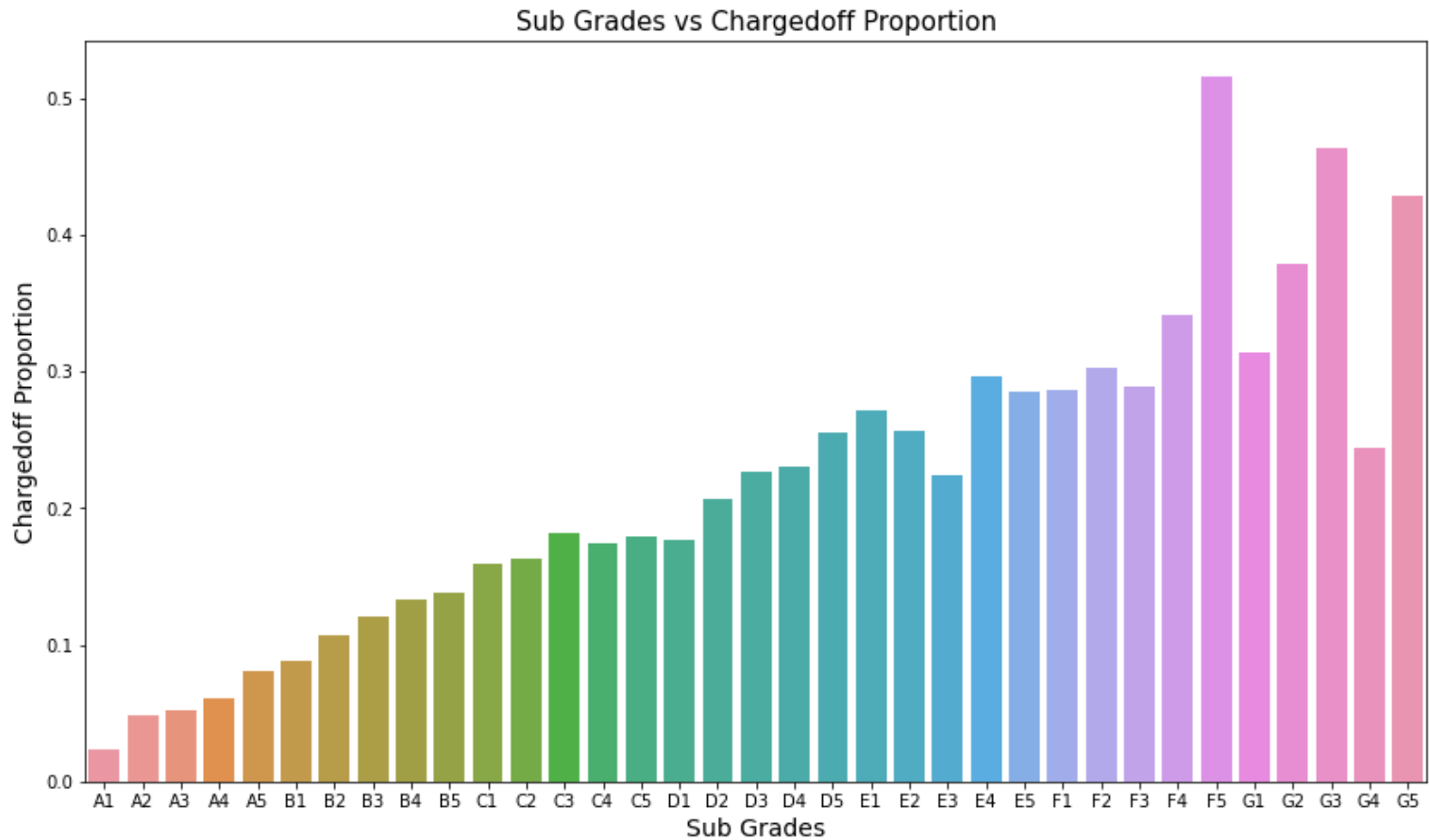
## ▣ Observations

- ▣ From above we can say that, the borrower who take loan for the purpose of small-business has the maximum charged off proportion.

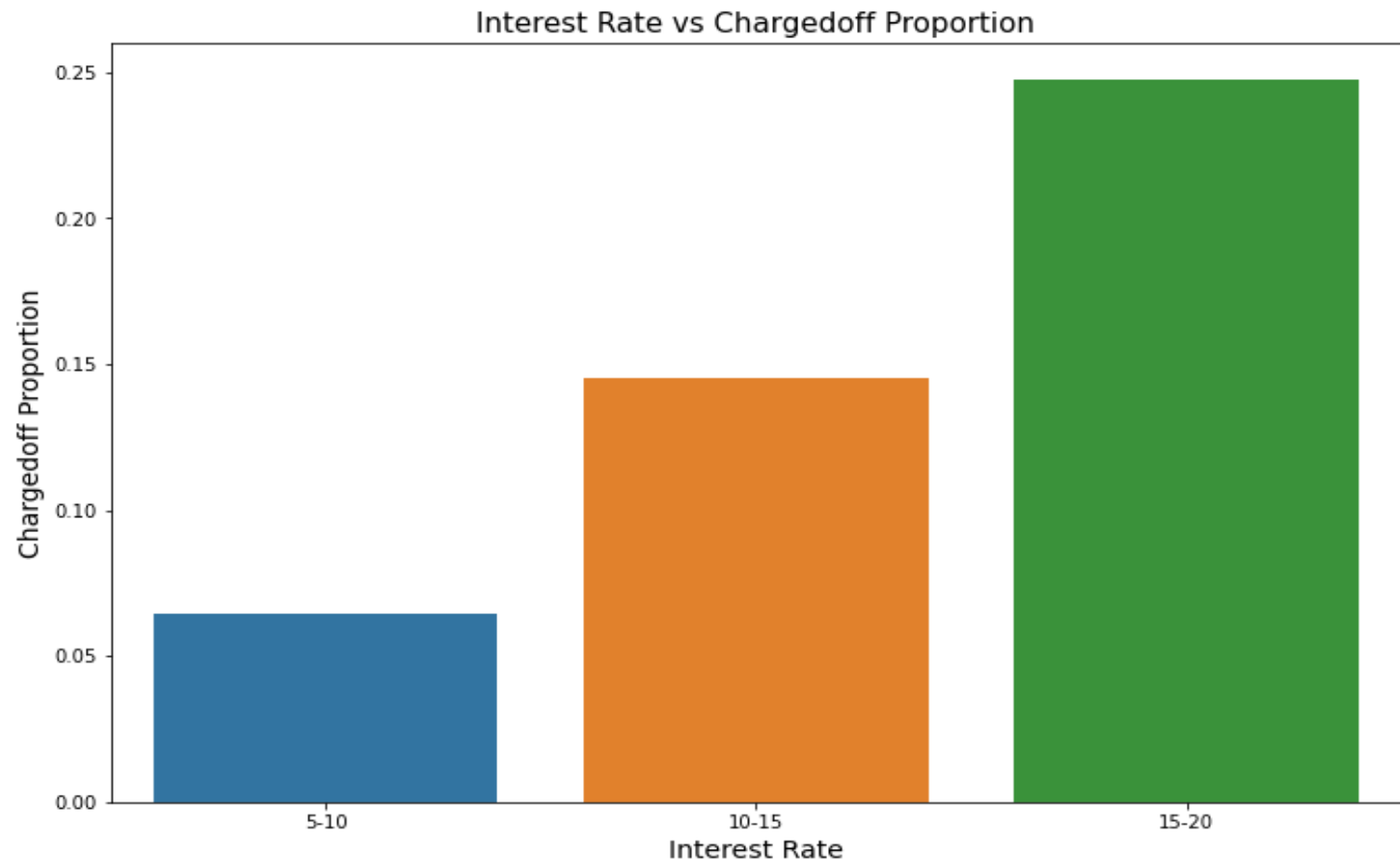
Grades vs Chargedoff Proportion



- ▣ **Observations**
- ▣ From above chart we can say that, as grades are decreasing charged off proportion is increasing.

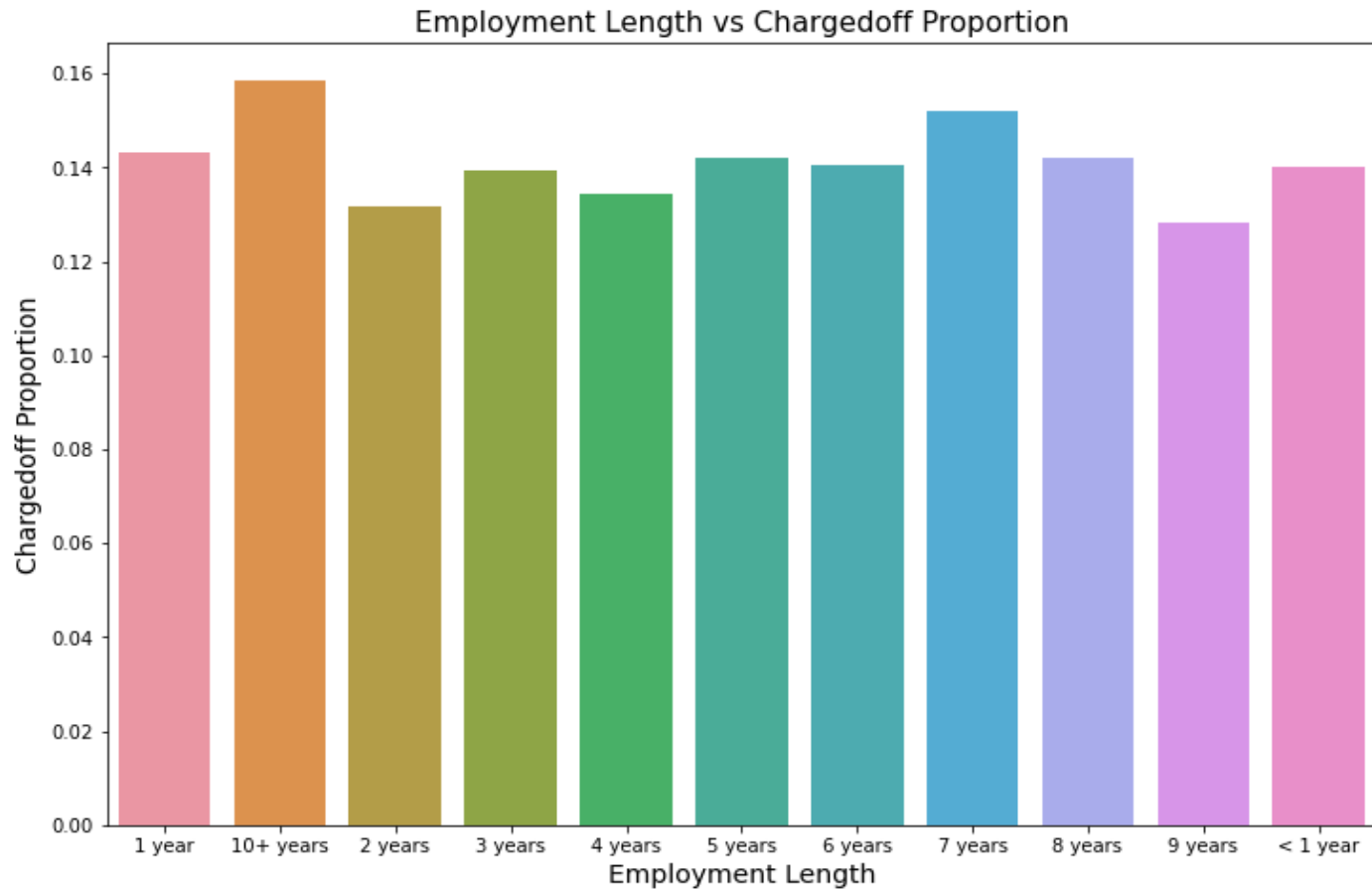


- ▣ Observations
- ▣ Subgrade F5, G3 and G5 are having maximum charged off proportion.



#### ▣ Observations

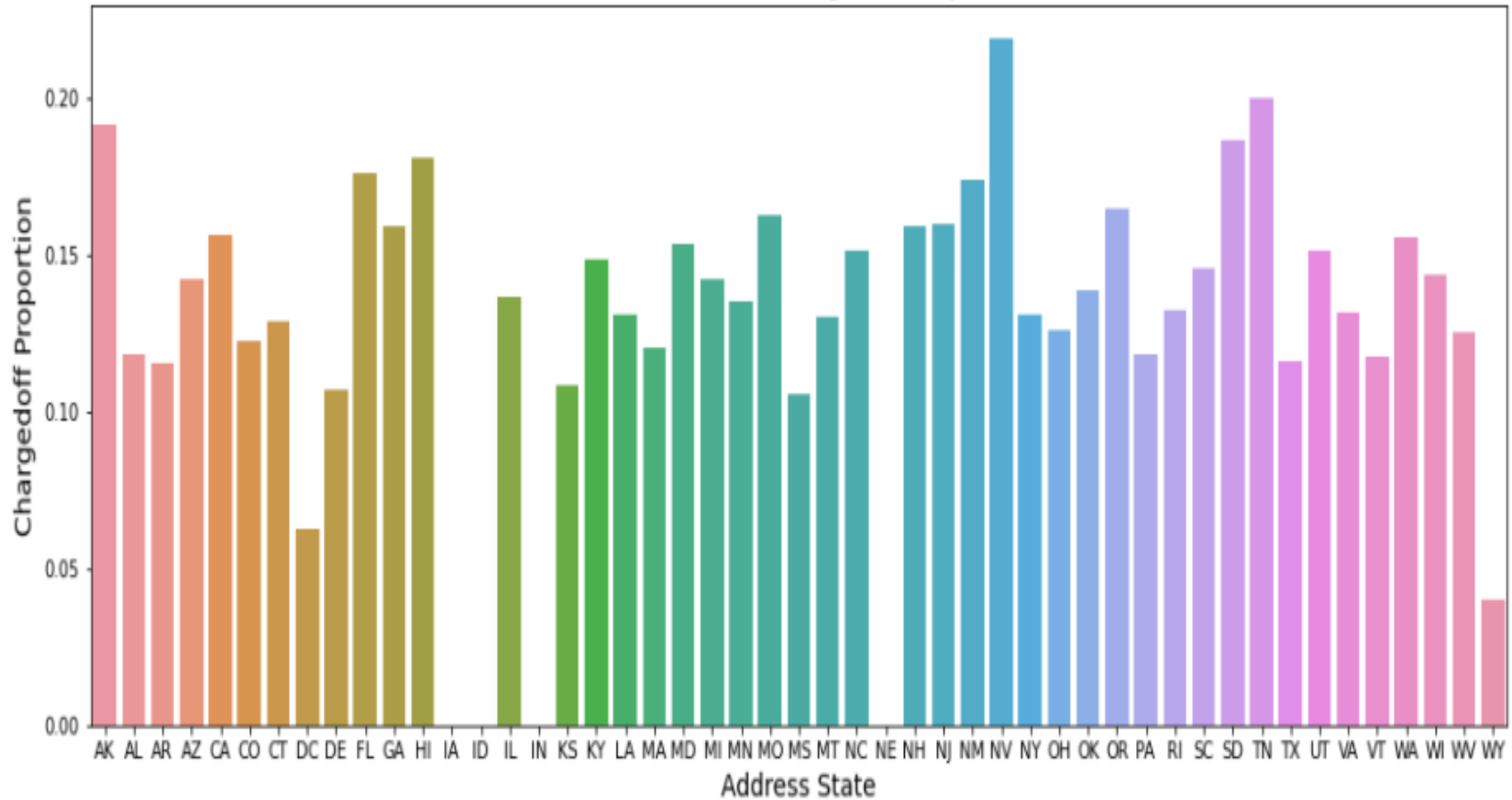
- ▣ As interest rate are increasing, charged off proportion is also increasing.
- ▣ The borrower who takes loan at the interest rate of 15 to 20 are getting mostly charged off.



## ▣ Observations

- ▣ The borrowers whose employee length is less than 1 year, 1 year and 10+ year are mostly getting charged off.

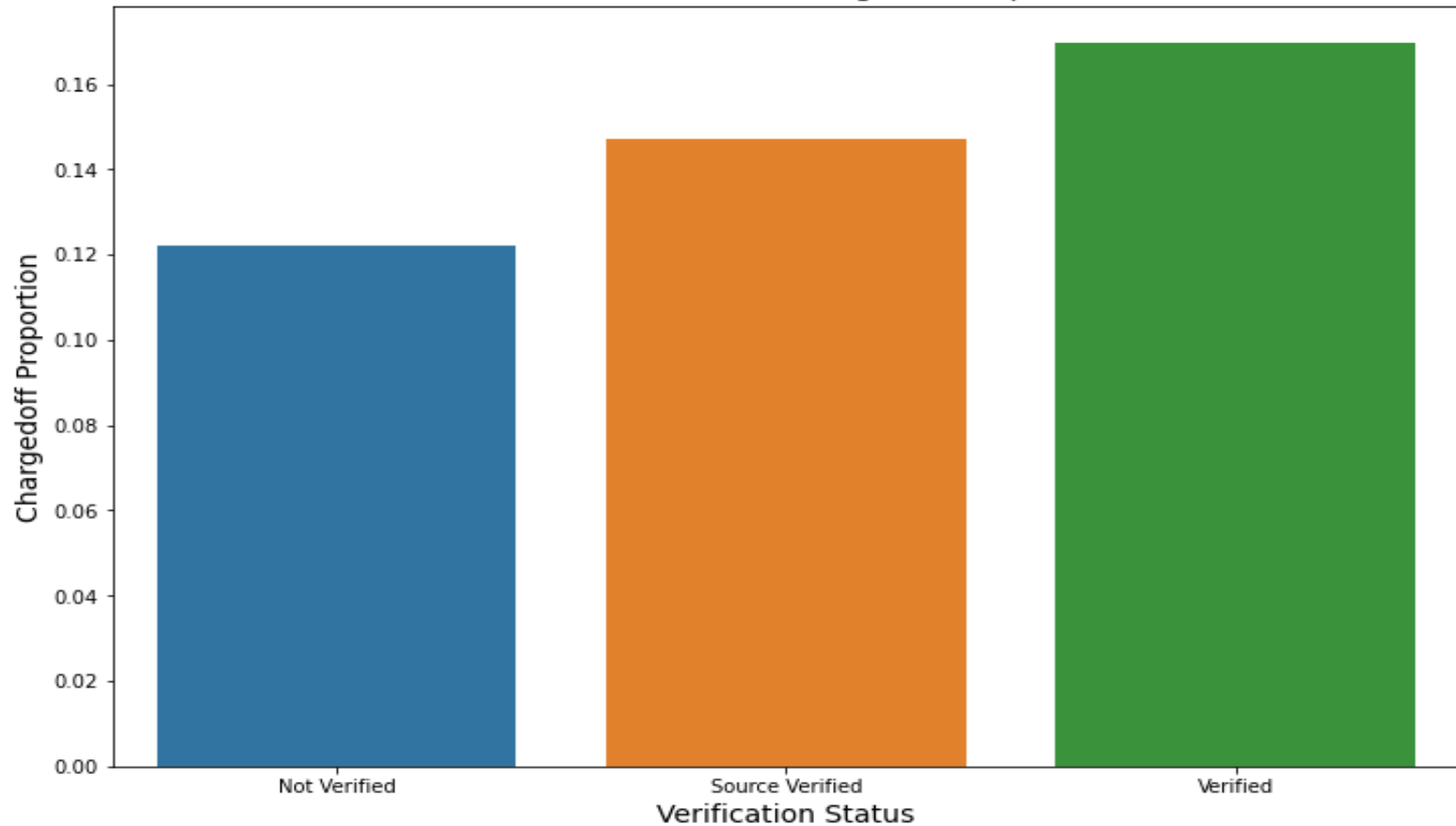
Address State vs Chargedoff Proportion



- ▣ **Observations**
- ▣ The borrowers who are from NV, AK, TN state are mostly getting charged off.



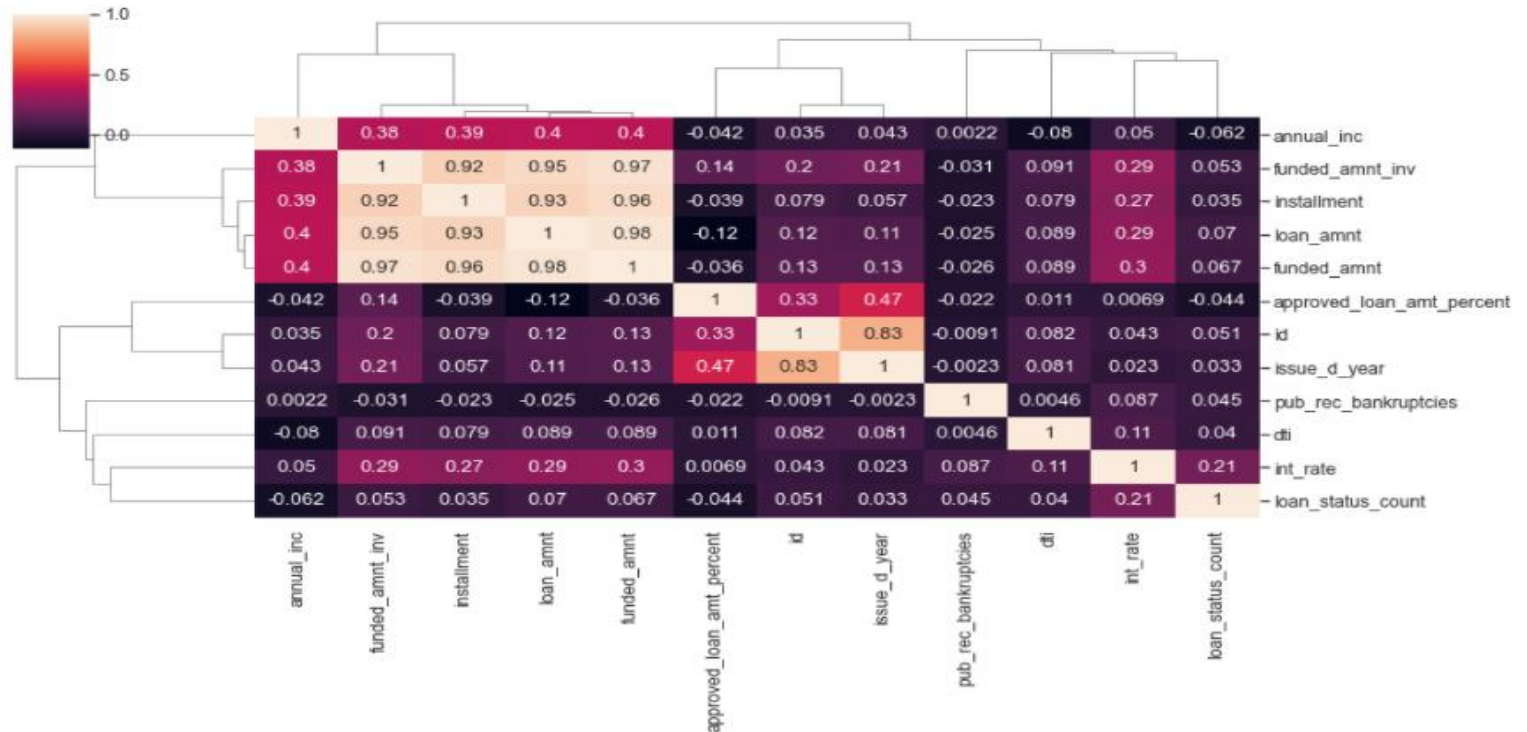
Verification Status vs Chargedoff Proportion



- ▣ **Observations**
- ▣ Most of the verified borrowers are getting charged off then others.

# Multivariate Analysis

Correlation between Columns



## Observations

- loan\_amnt , funded\_amnt , funded\_amnt\_inv , installment are strongly correlated.
- annual\_inc and dti is negatively correlated.
- Debt income ratio is the percentage of a borrower's monthly gross income that goes toward paying debts.
- Which means when annual\_inc is low, debt is high and vice versa.

# Recommendation

- ❑ After analysing purpose of loan data we can conclude that loans taken for medical vacation , house , education are fully paid but charge off loan is high for debt consolidation.
- ❑ After analysing home ownership most have taken loan who are in rent or mortgage their home. Loan defaulter probability for people living in rented house is high. n loan amount vs purpose variable we can say that, to startup with small business borrowers are taking high loan than others. Then comes debt\_consolidation.
- ❑ From data we can analyse that loan is taken mostly for 36 months as compared to 60 months. Charged Off loan status is also high for 60 months term wrt 36 months.
- ❑ From above we can say that, under 14k most of the borrowers take the loan amount and charged off status is also high for those amount.

- ❑ From above chart we can say that, most of the borrower's who took loan for the purpose of debt consolidation has highest number of Charged off status and those who are in rent as the most.
- ❑ In loan amount vs Loan status variable we can say that, charged off were having higher loan amount than fully paid.
- ❑ Loan taken for small buissness have higher Charged Off loan status .
- ❑ In purpose vs dti variable we can say that, the borrower who takes loan for the purpose of debt consolidation and credit card are having high dti ratio than others. And higher the dti ratio shows then Charged off status is also high.
- ❑ Data shows when employee income increases charged off status deacreases.
- ❑ The borrowers who are from NV, AK, TN state are mostly getting charged off.
- ❑ Most of the verified borrowers are getting charged off then others.

# Conclusion

- ▣ Annual Income and Verification process is the main deriving factors behind loan default.
- ▣ Providing loan for small businesses or people who lives in rented house also shows strong indicators of default.