

# LENDING CLUB CASE STUDY

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**Solution By**

EDWIN MATHEW

ISHKHAN MARZOOK

# Outline

- Introduction
- Analysis Methods
- Univariate Analysis
- Bivariate Analysis
- Recommendation/Observations
- Lending Performance Summary

# Introduction

- Lending Club specializes in lending various loan types to urban customers, these loans can vary across different areas of people's personal life (i.e. medical emergency to weddings).
- Two of the biggest risk faced by the company includes
  - 1.Rejection of loan when the customer is less risky of defaulting
  - 2.Approval of loan when the customer is highly likely to defaulting
- **Aim of this data analysis is to understand customer and loan attributes defaulting to avoid rejecting less risky customer and approving high risk customers.**

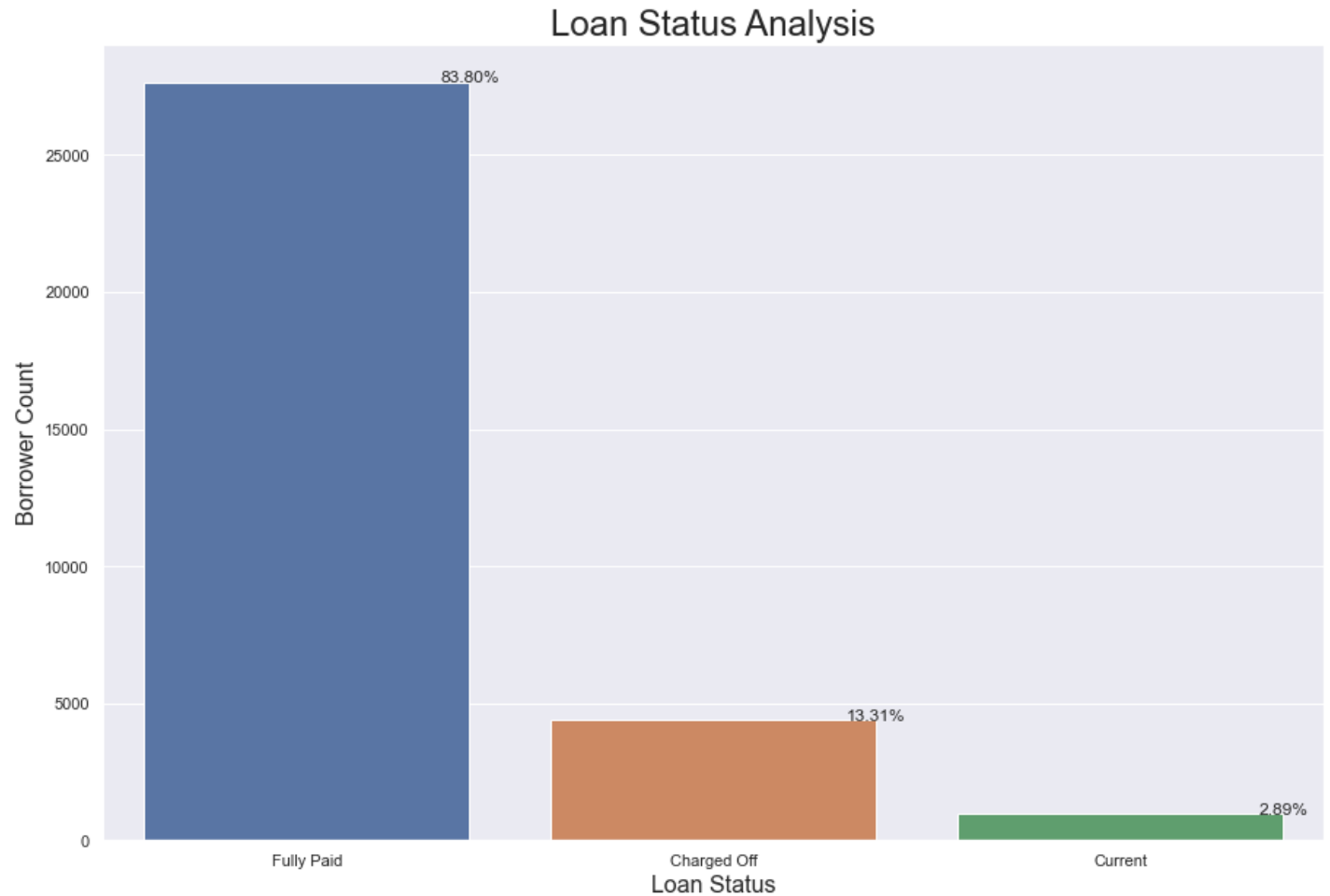
# Analysis Methods

- Following analysis methods are used to analyze the Lending Case Study Dataset
  - 1.Univariate Analysis – Analyzing of one variable at a time
  - 2.Bivariate Analysis – Analyzing of two variable against each other

# Univariate Analysis

- Following Univariate Analysis performed on Lending Case Study Dataset
  - Loan Status Analysis
  - Interest Rate Distribution Analysis
  - Loan Amount Distribution Analysis
  - Annual Income Distribution Analysis
  - Loan Term Analysis
  - Home Ownership Analysis
  - Employment Length Analysis
  - Application Type Analysis
  - State Analysis
  - Loan Issued Year Analysis

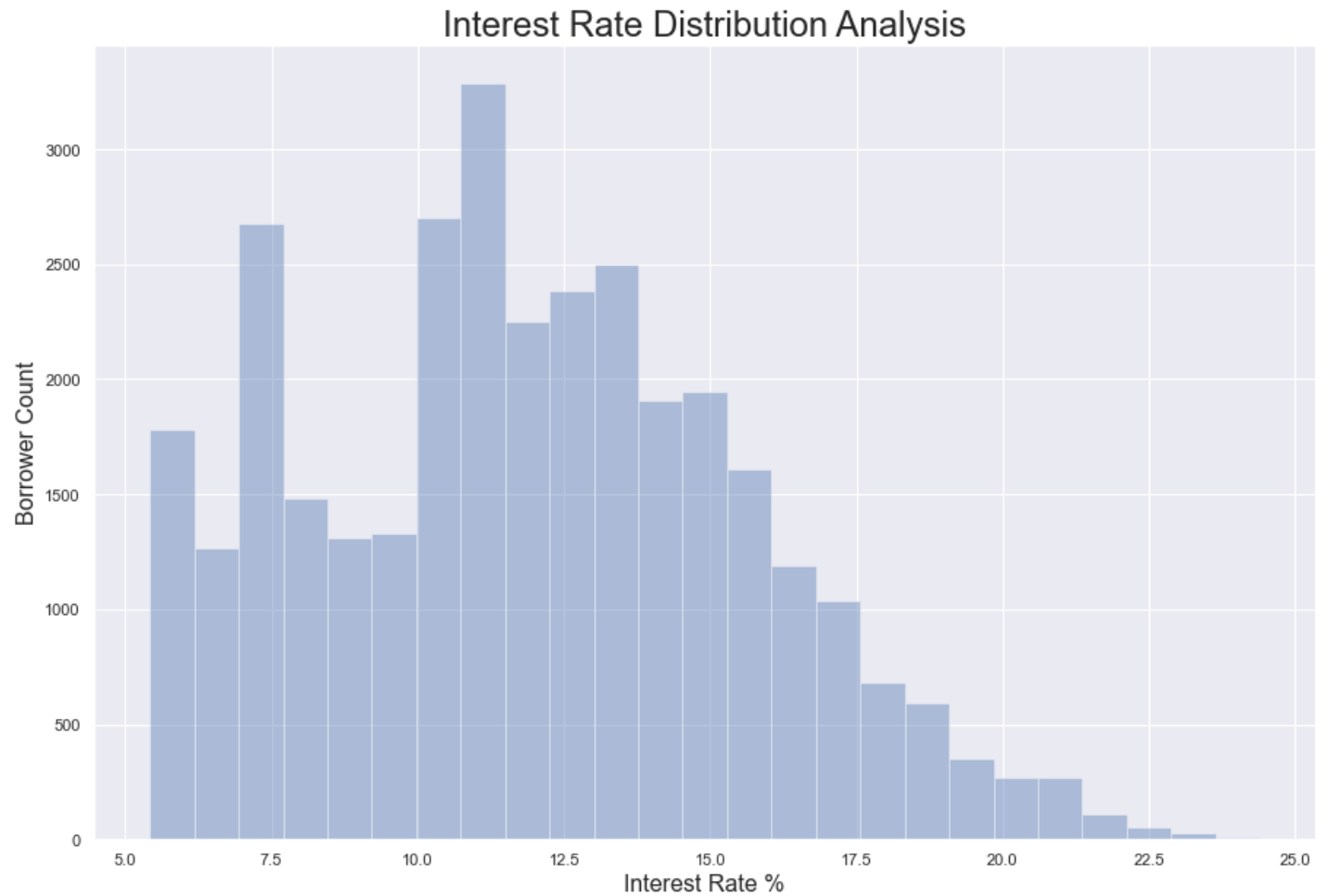
# Loan Status Analysis



According to the **Loan Status Analysis**, we can conclude the following,

- **83.80%** of the borrowers **Fully Paid** the loan
- **13.31%** of the borrowers **Charged Off** (which means defaulted)
- **2.89%** of the borrowers are **Current** (which means in the process of paying the installments)

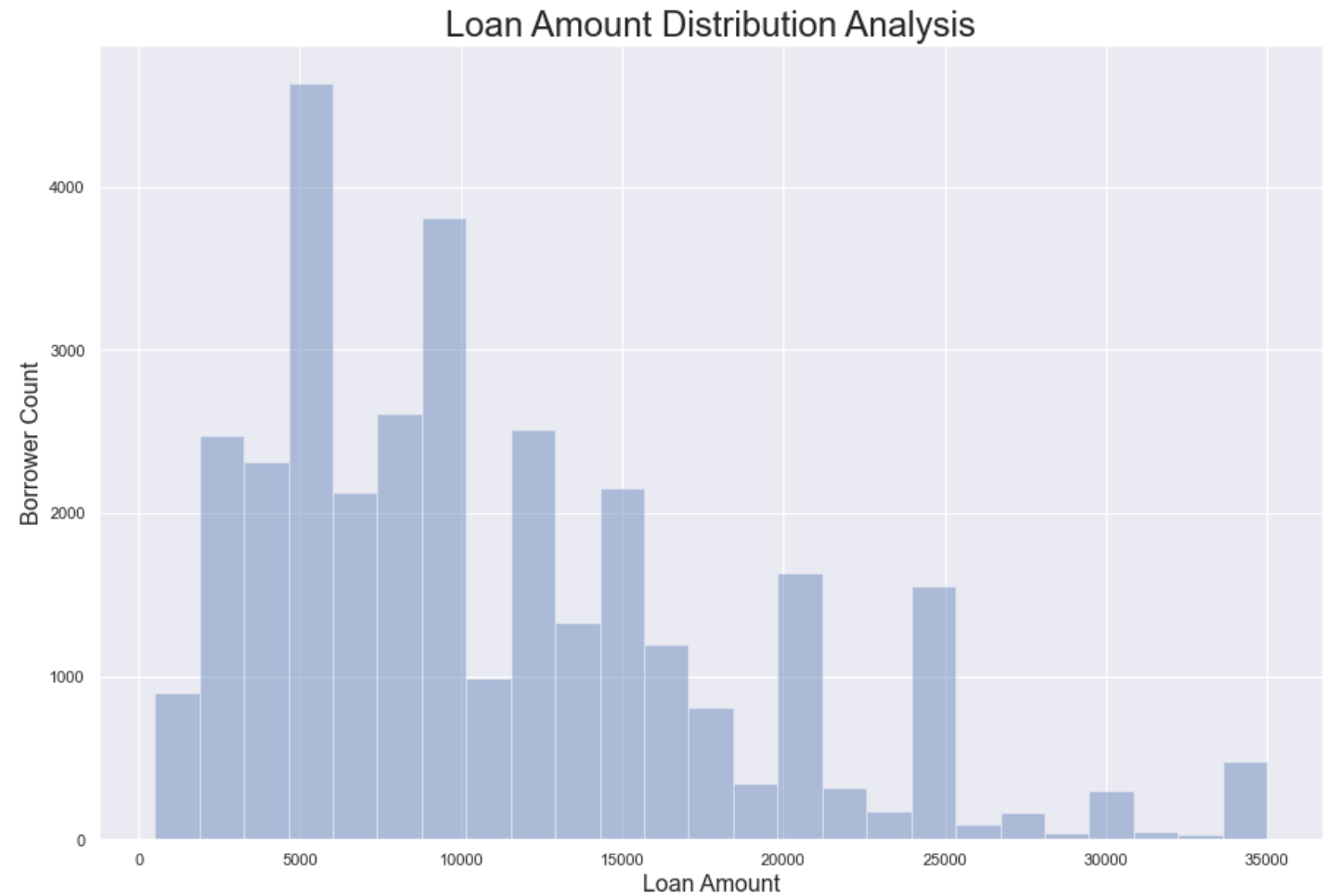
# Interest Rate Distribution Analysis



According to the **Interest Rate Distribution Analysis**, we can conclude the following,

- Higher number of loans falling under interest rates between **10% to 15%**
- **Number of borrowers gradually getting reduced when the interest rate is higher than 15%**

# Loan Amount Distribution Analysis

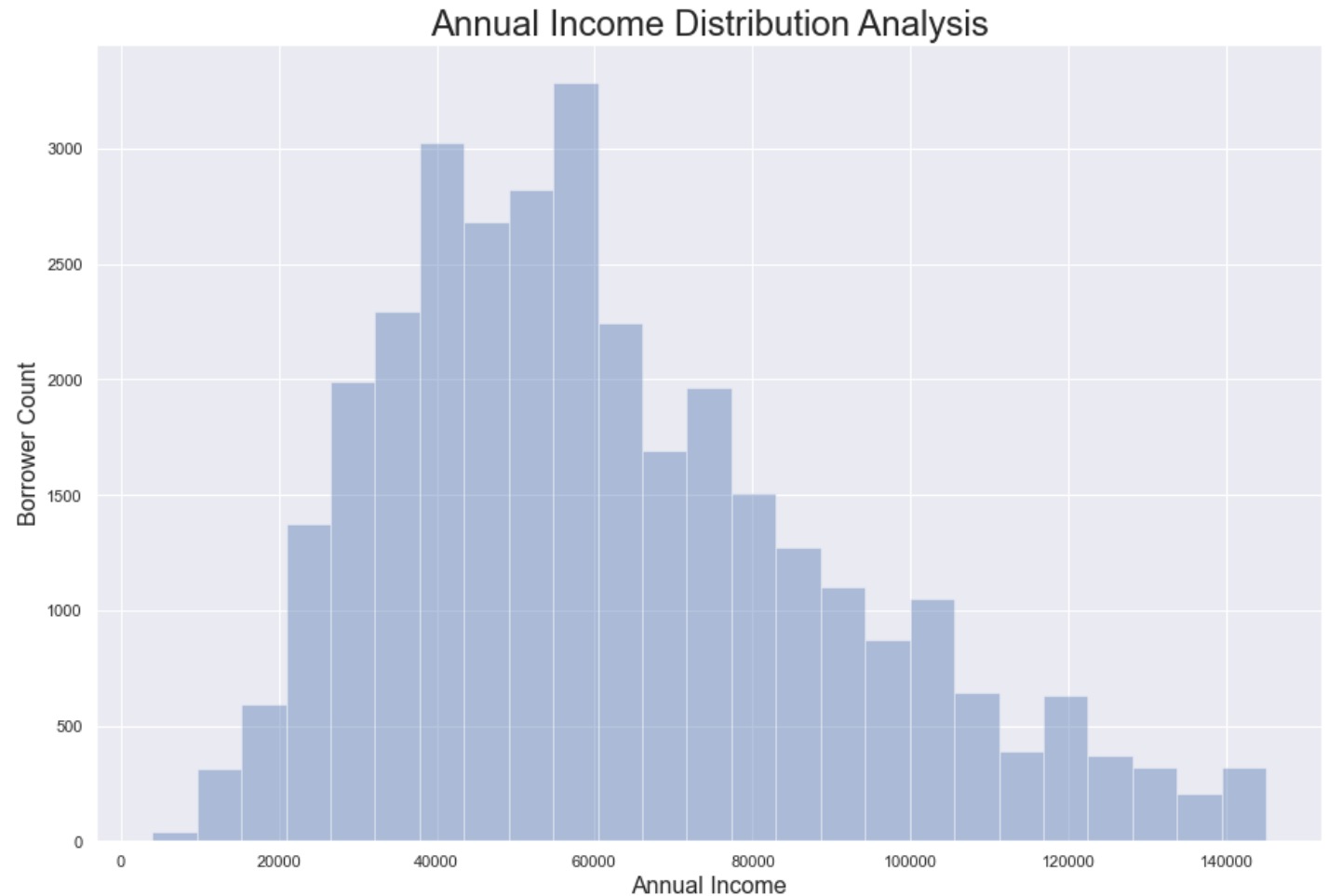


According to the **Loan Amount Distribution Analysis**, we can conclude the following,

- Most of the loan amount falls between **5000** to **10000**



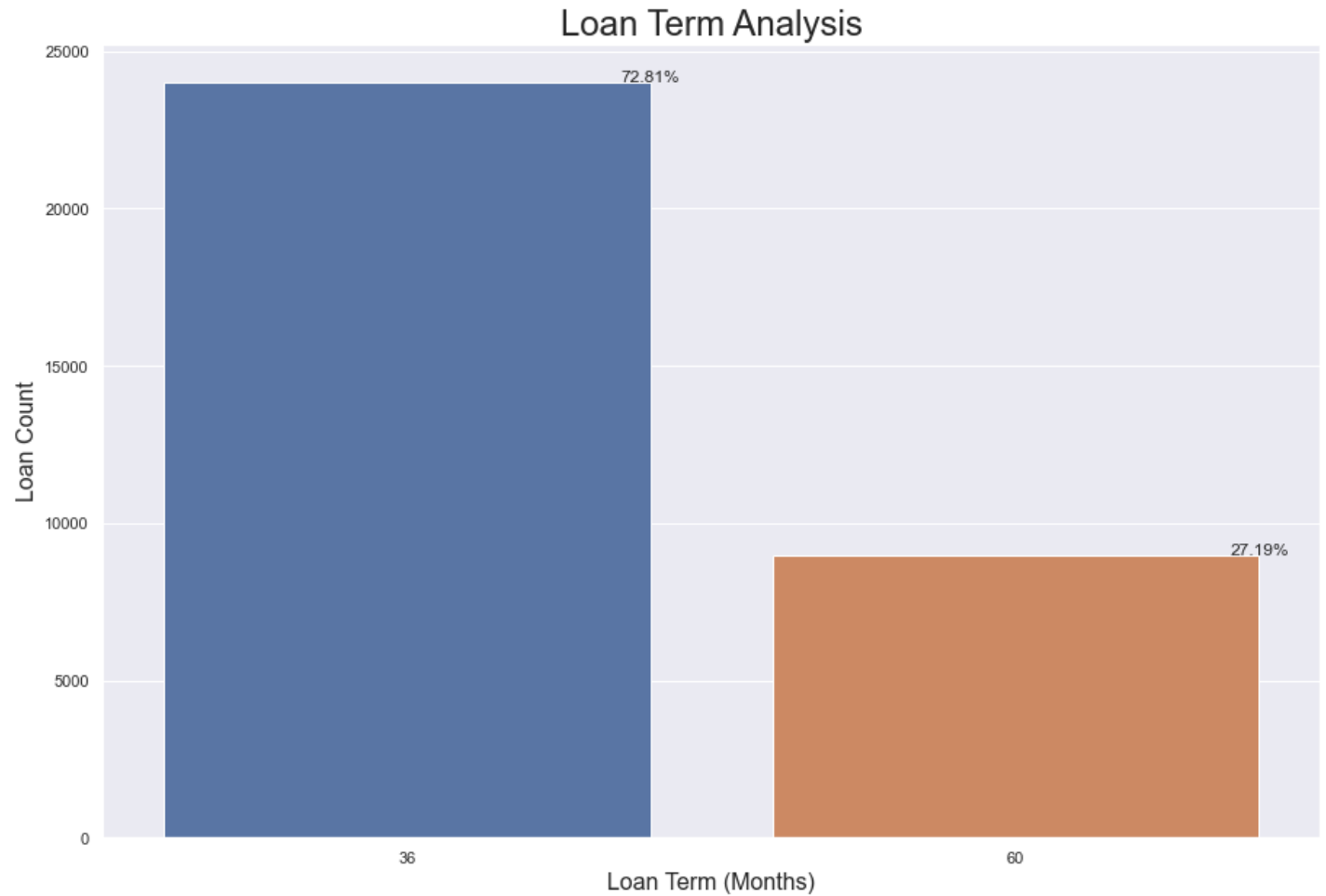
# Annual Income Distribution Analysis



According to the **Annual Income Distribution Analysis**, we can conclude the following,

- Most of the borrowers annual income falls between **40000** to **60000**
- **Borrower count gradually increases for annual income between 5000 to 50000** and decreases for annual income between **60000** to **145000**

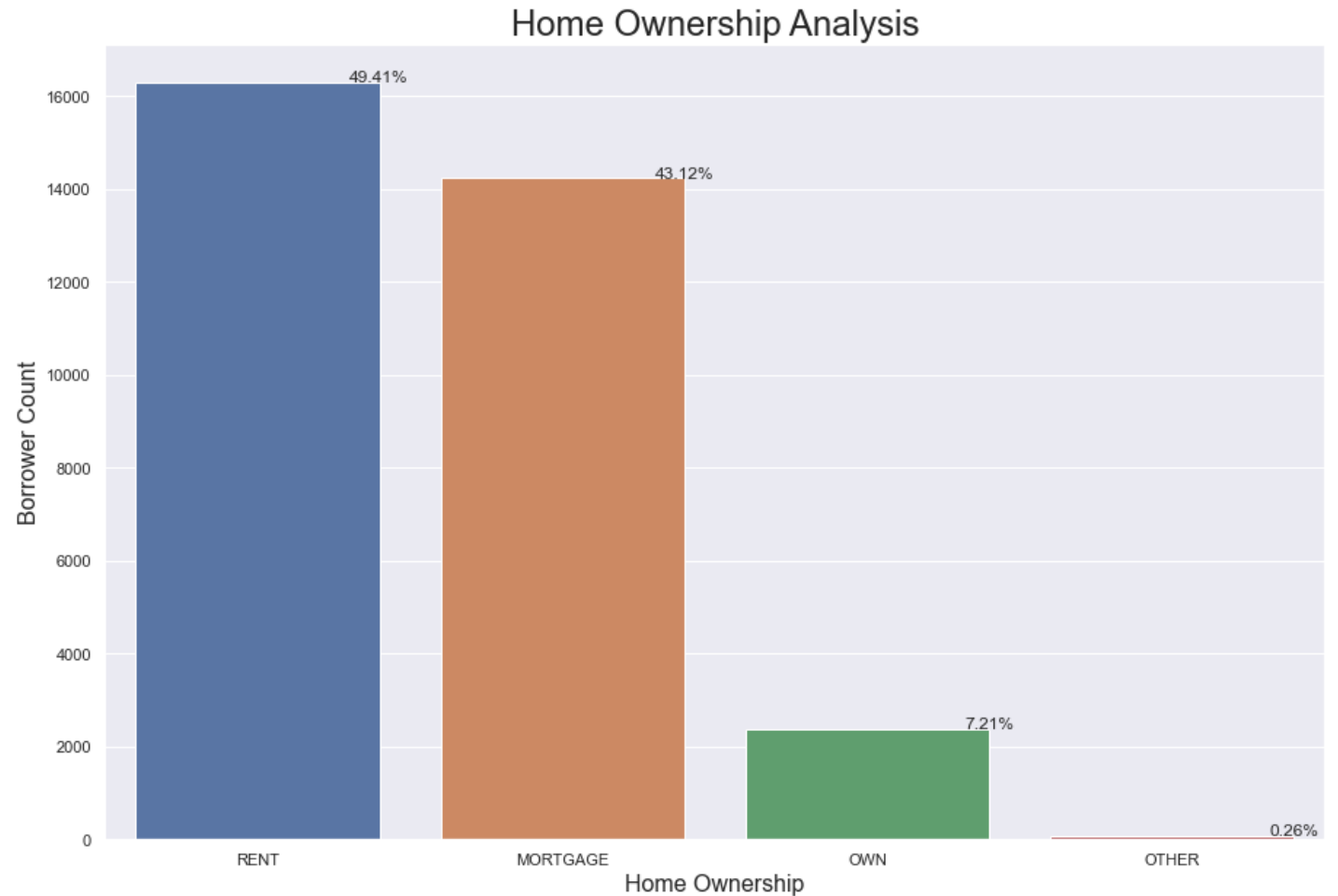
# Loan Term Analysis



According to the **Loan Term Analysis**, we can conclude the following,

- **72.81%** loans are termed for 36 months
- **27.19%** loans are termed for 60 months

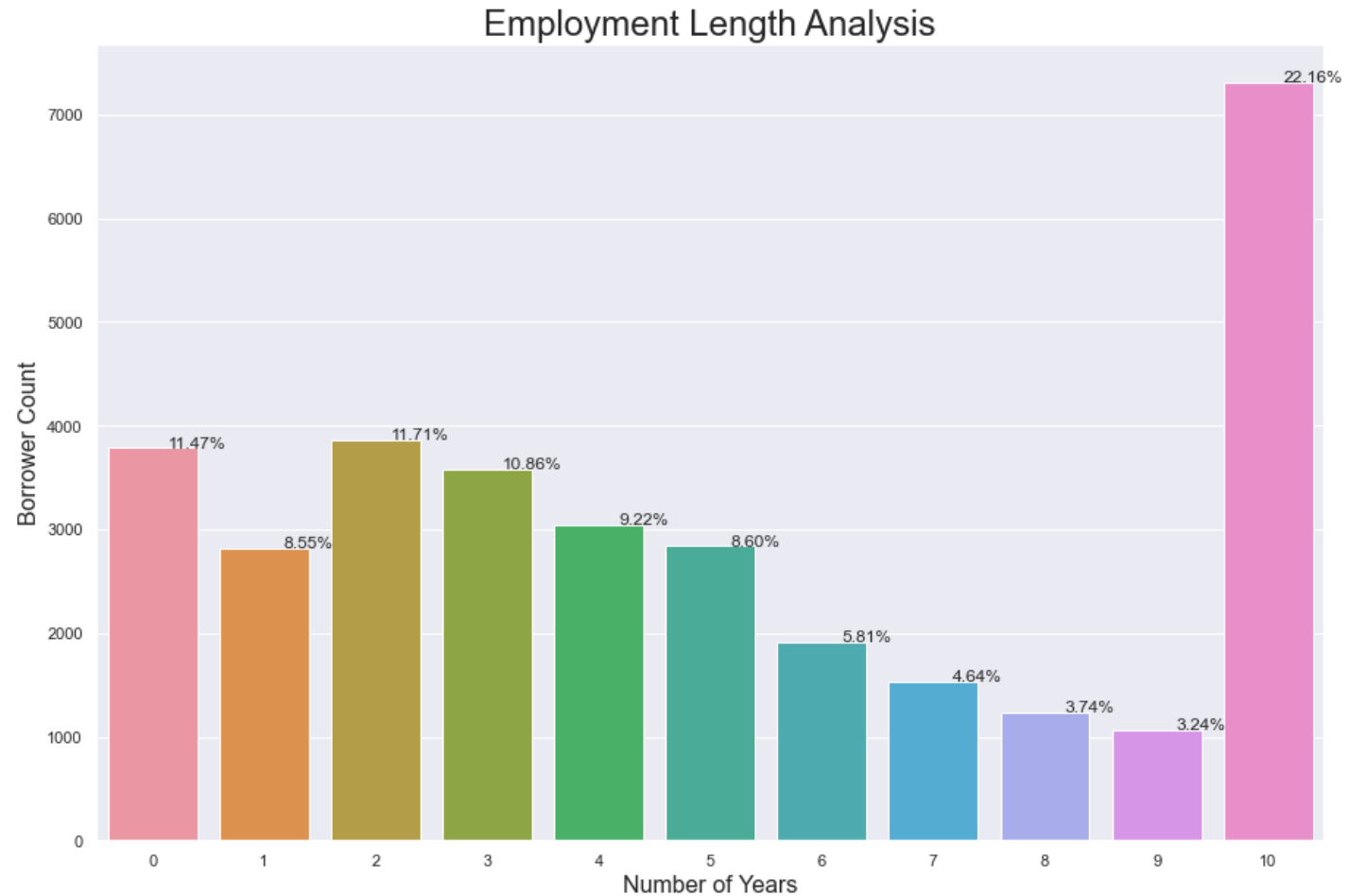
# Home Ownership Analysis



According to the **Home Ownership Analysis**, we can conclude the following,

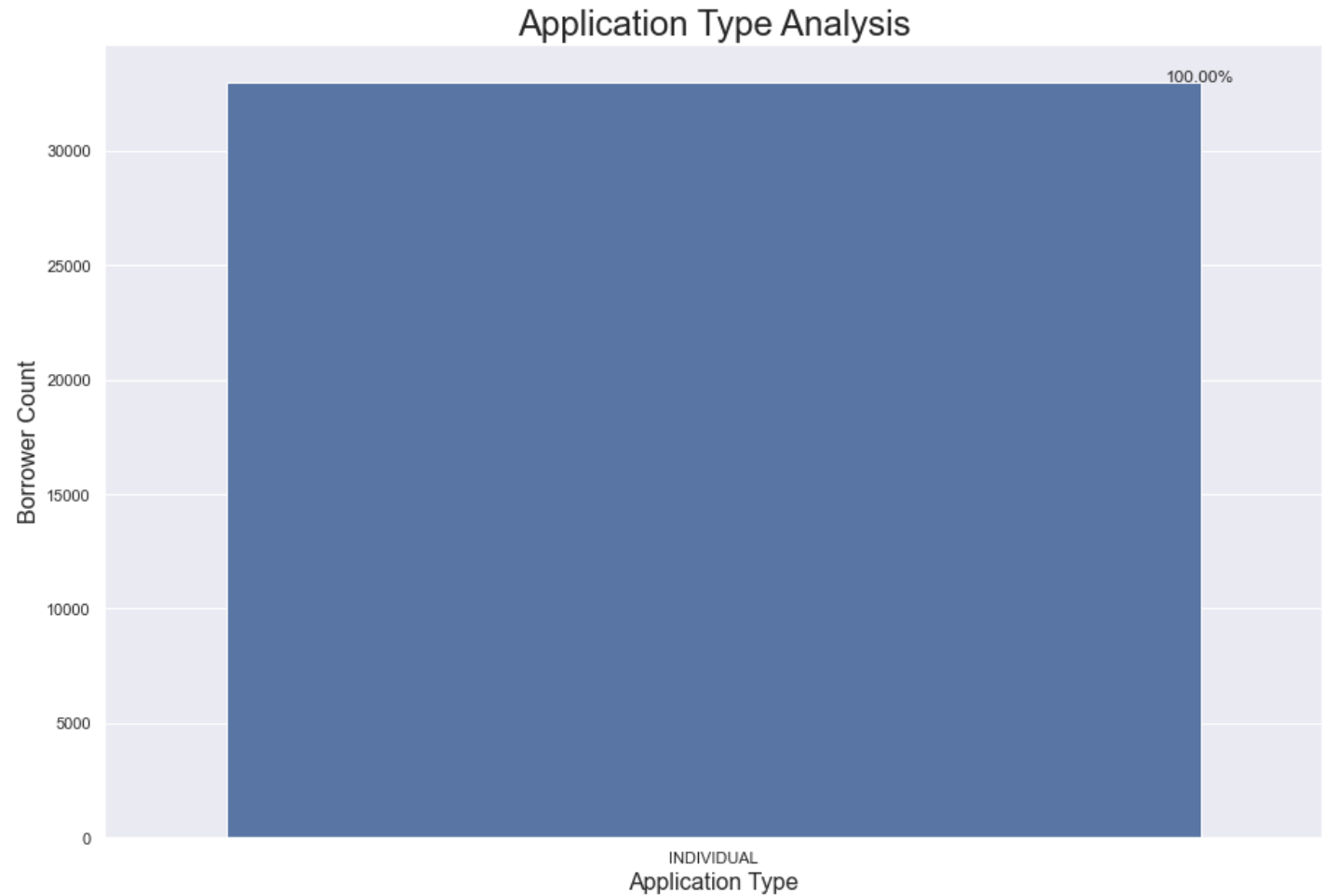
- **49.41%** of the borrowers have **rent** house
- **43.12%** of the borrowers have **mortgage** house
- **7.21%** of the borrowers have **own** house

# Employment Length Analysis



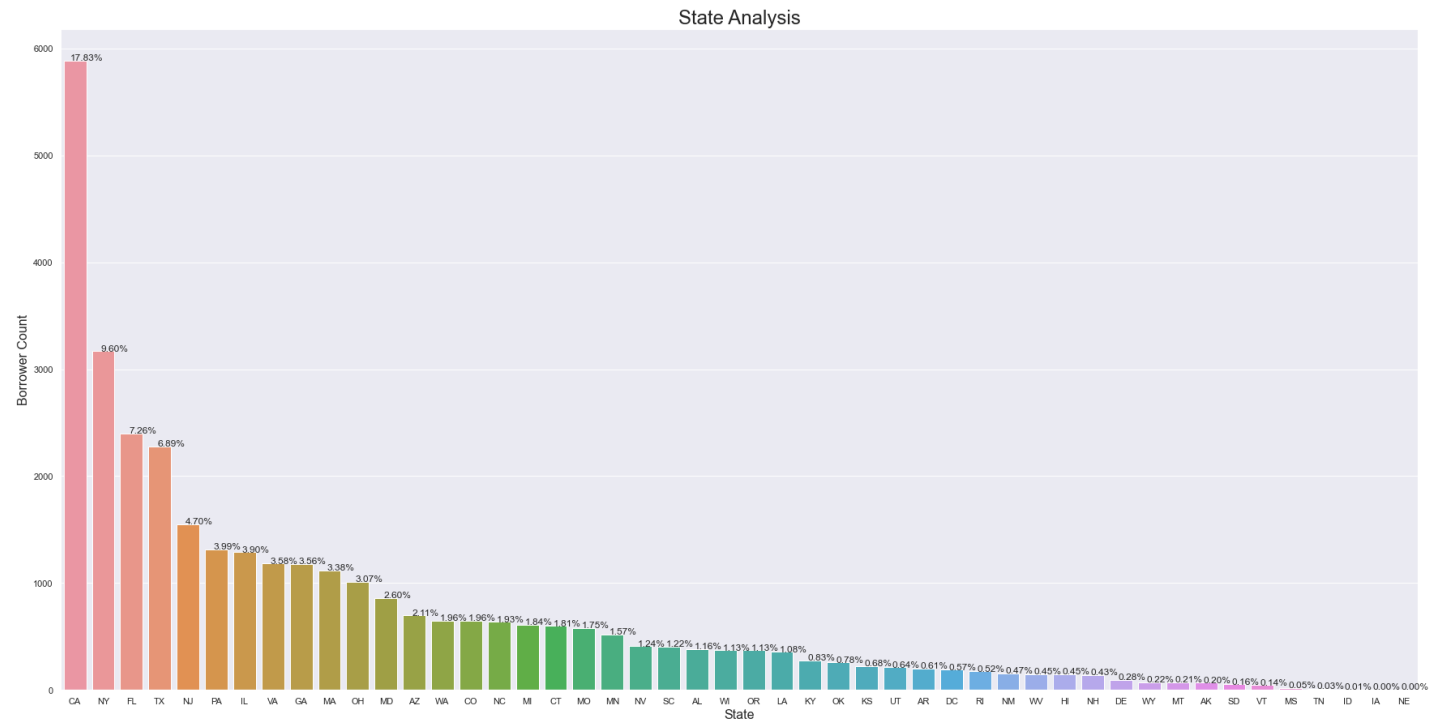
According to the **Employment Length Analysis**, we can conclude the following,  
- Most of the borrowers are employed for **10 or more** years

# Application Type Analysis



According to the **Application Type Analysis**, we can conclude the following,  
- **100%** of the borrowers are **individual** applicants

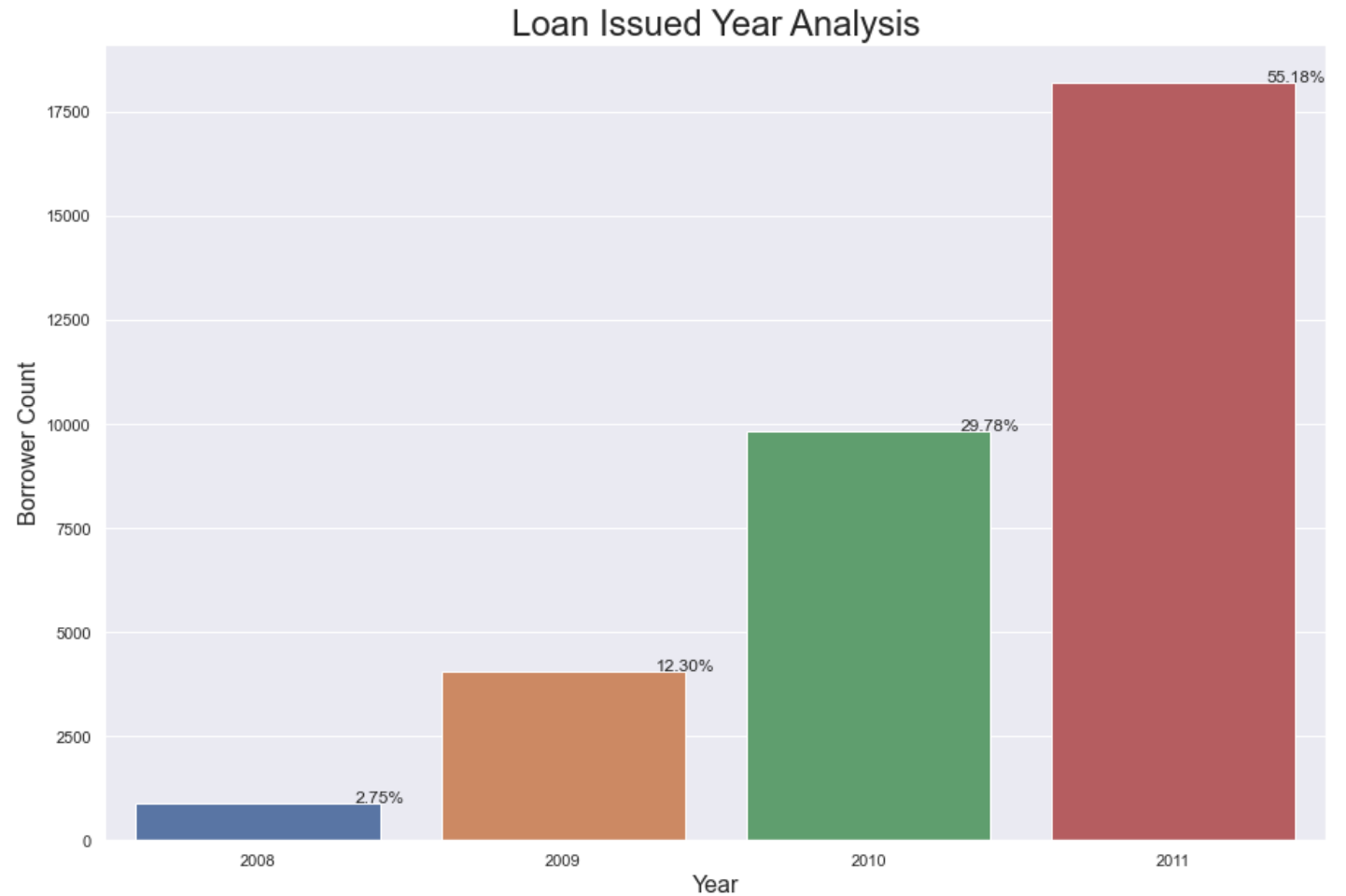
# State Analysis



According to the **State Analysis**, we can conclude the following,

- The state **CA** has the highest number of borrowers and the state **NE** has the least number of borrowers

# Loan Issued Year Analysis



According to the **Loan Issued Year Analysis**, we can conclude the following,

- Least number of loans issued in **2008** which is **2.75%** and the highest number of loans issued in **2011** which is **55.18%**
- **From 2008 to 2011** number of issued loans gradually getting **increased**

# Bivariate Analysis

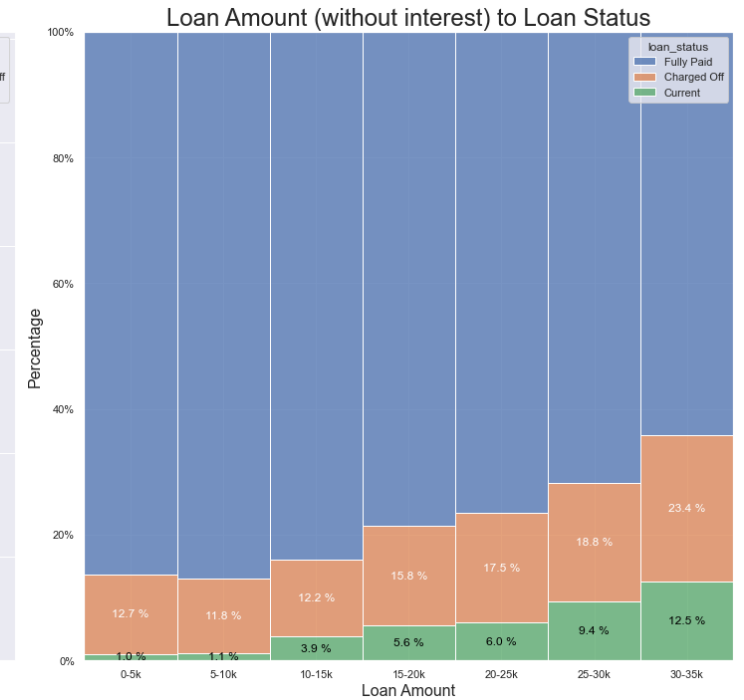
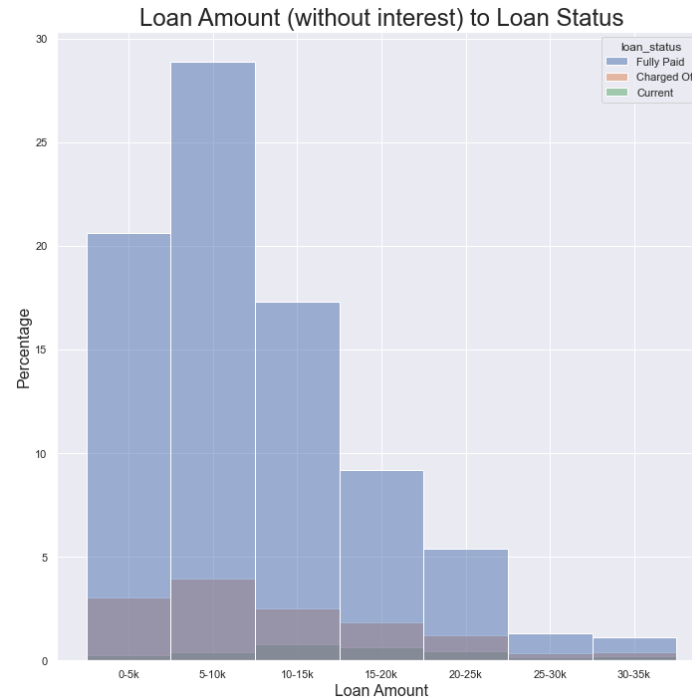
- Following Bivariate Analysis performed on Lending Case Study Dataset
  - Analyzing Interest Rate to Loan Status
  - Analyzing Loan Amount to Loan Status
  - Analyzing Annual Income to Loan Status
  - Analyzing Loan Term to Loan Status
  - Analyzing Home Ownership to Loan Status
  - Analyzing Employment Length to Loan Status
  - Analyzing Loan Issued Year to Loan Status
  - Analyzing Open Credit Lines to Loan Status



# Bivariate Analysis (Continued.)

- Following Bivariate Analysis performed on Lending Case Study Dataset
  - Analyzing Monthly Installment to Loan Status
  - Analyzing Loan Grade to Loan Status
  - Analyzing Payback to Loan Status
  - Analyzing Loan Purpose to Loan Status
  - Analyzing Revolving Line Utilization Rate to Loan Status
  - Loan State Wise Distribution

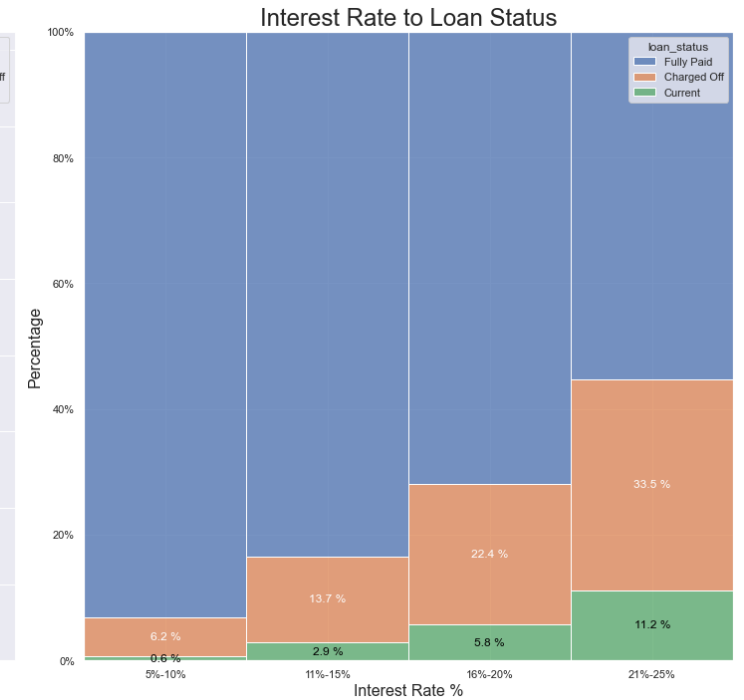
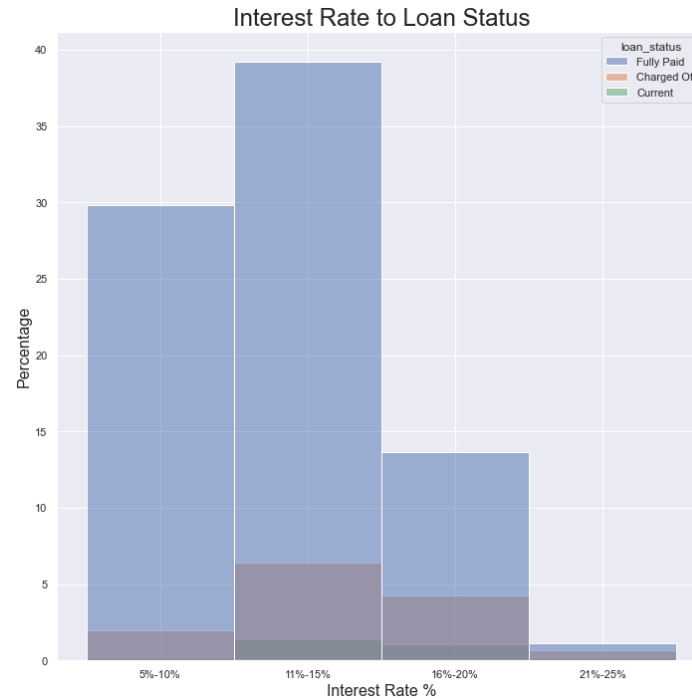
# Analyzing Loan Amount to Loan Status



According to the **Loan Amount to Loan Status Analysis**, we can conclude the following,

- When the **Loan Amount** is increasing, loan **Charged Off** percentage get increases

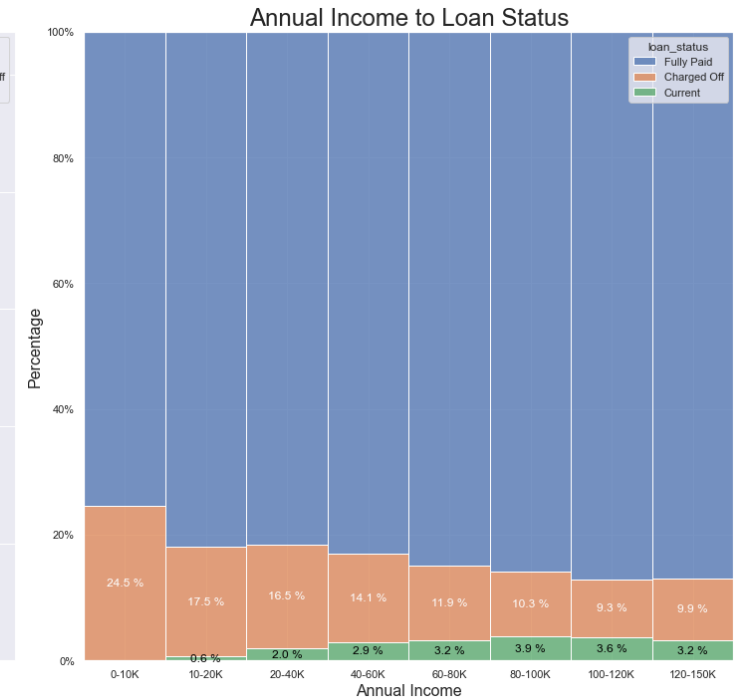
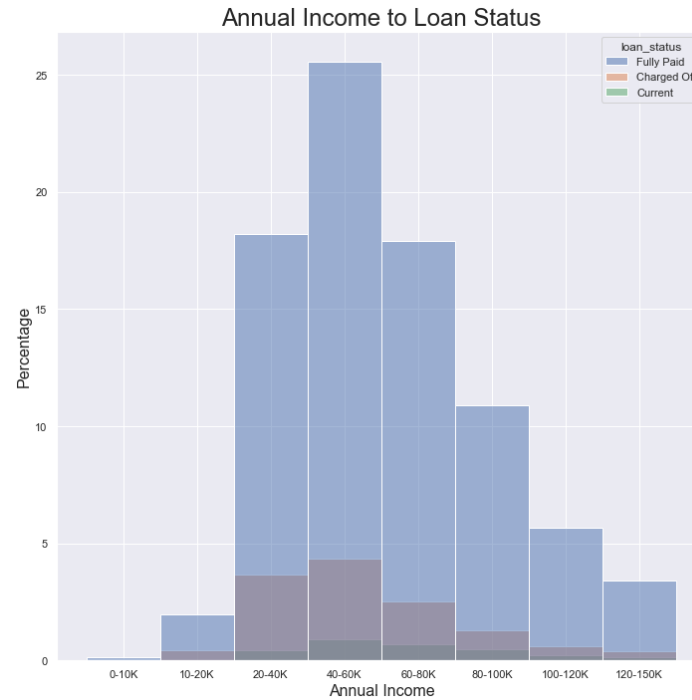
# Analyzing Interest Rate to Loan Status



According to the **Interest Rate to Loan Status Analysis**, we can conclude the following,

- When the loan **Interest Rate** is increasing, loan **Charged Off** percentage get increases

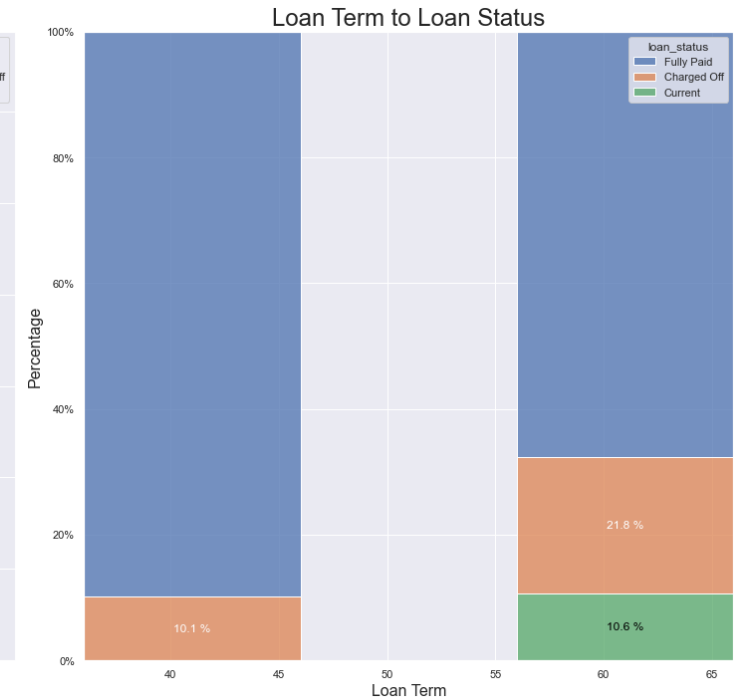
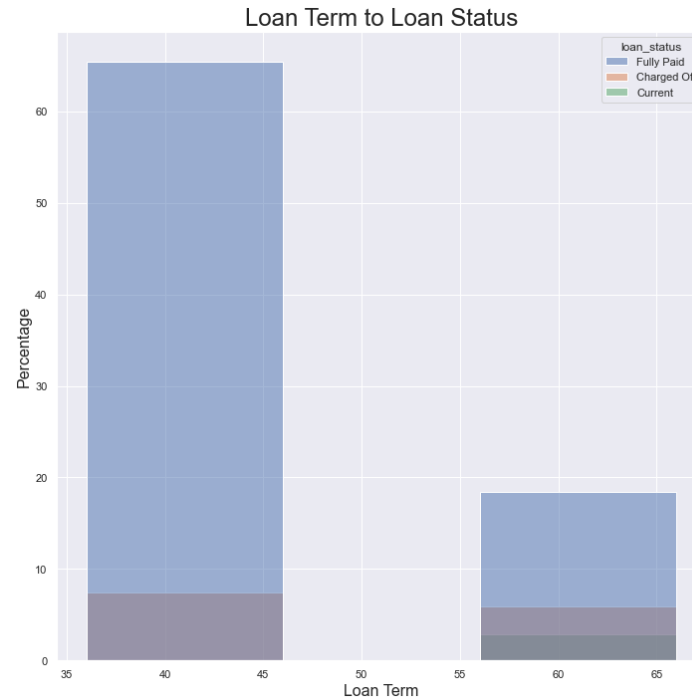
# Analyzing Annual Income to Loan Status



According to the **Annual Income to Loan Status Analysis**, we can conclude the following,

- When the **Annual Income** is increasing, loan **Charged Off** percentage get decreases

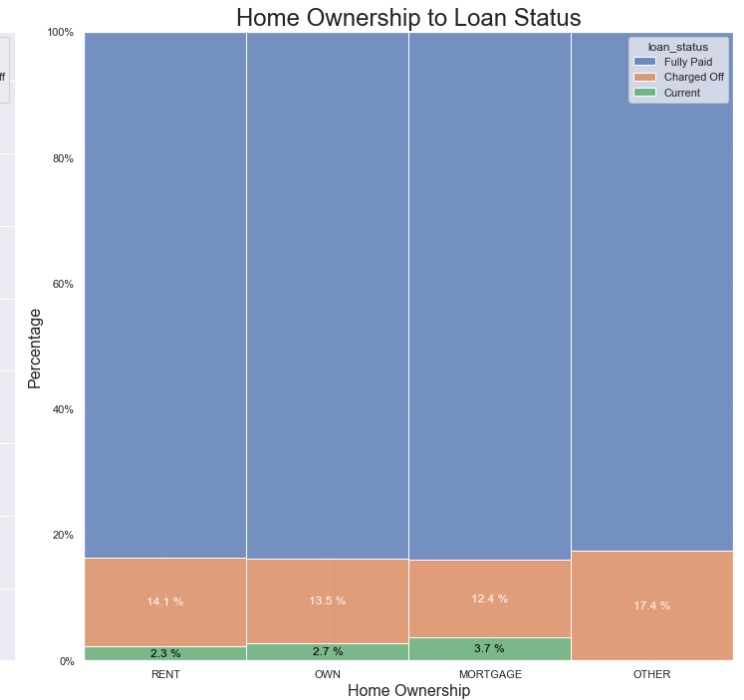
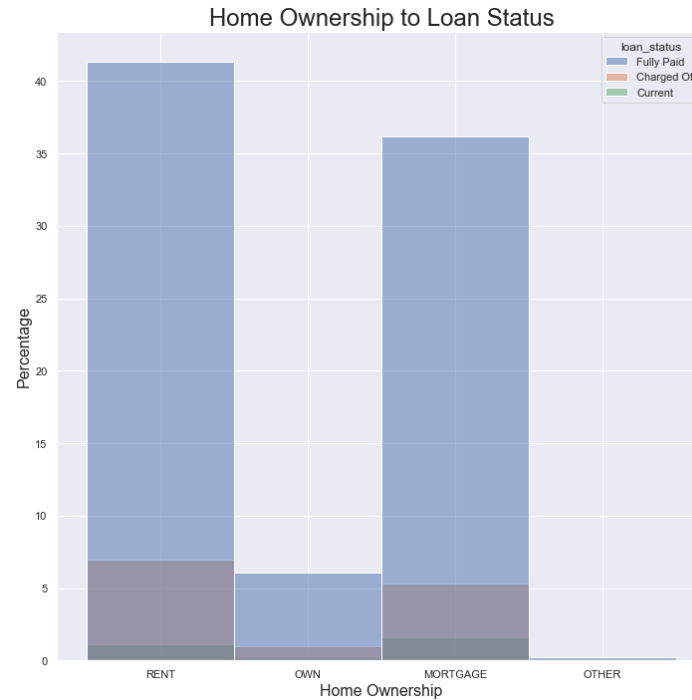
# Analyzing Loan Term to Loan Status



According to the **Loan Term to Loan Status Analysis**, we can conclude the following,

- When the **Loan Term** is increasing, loan **Charged Off** percentage get increases

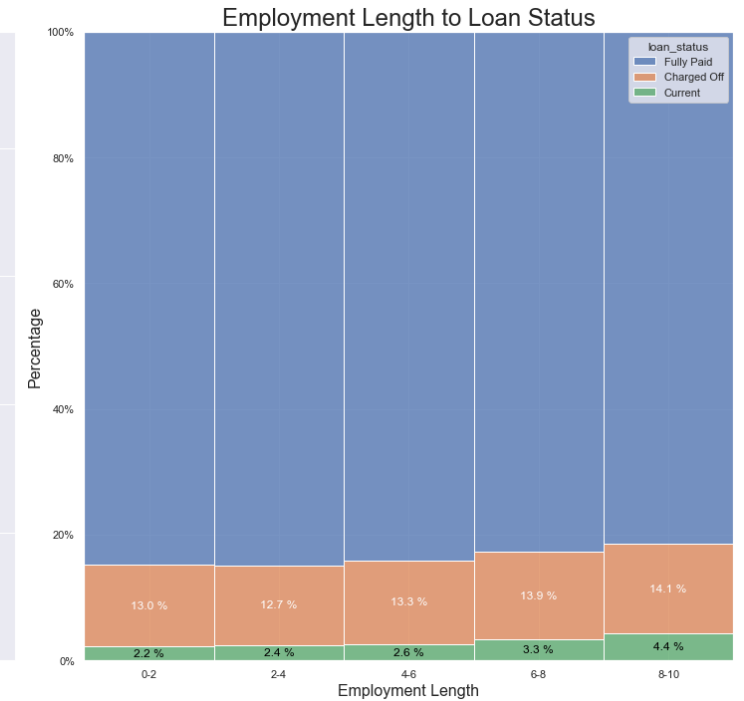
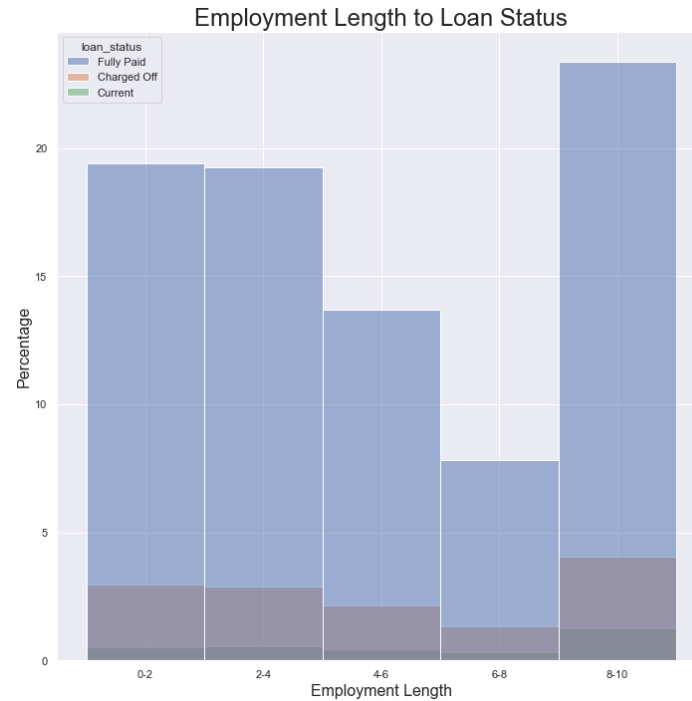
# Analyzing Home Ownership to Loan Status



According to the **Home Ownership to Loan Status Analysis**, we can conclude the following,

- When the borrower **Home Ownership** is other than **Rent, Mortgage or Own**, loan **Charged Off** percentage get increases

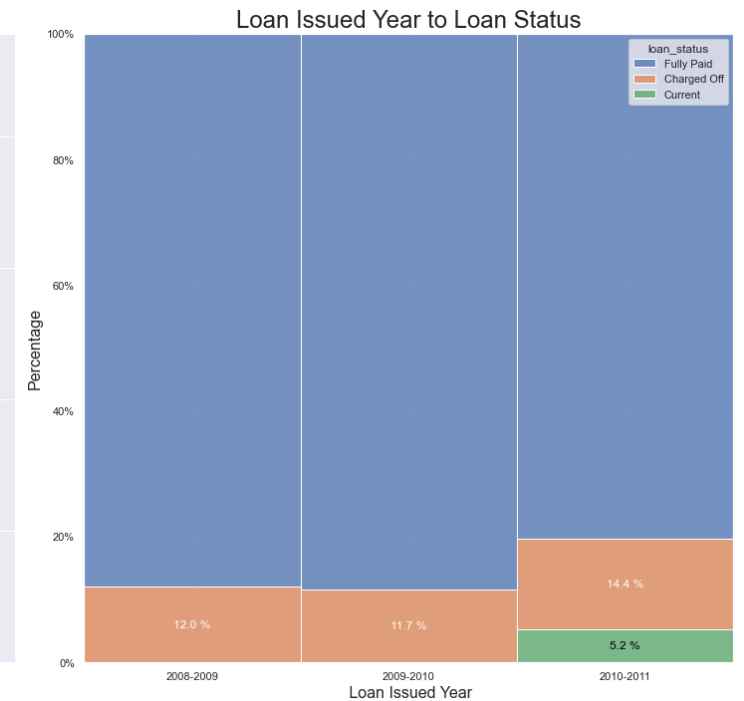
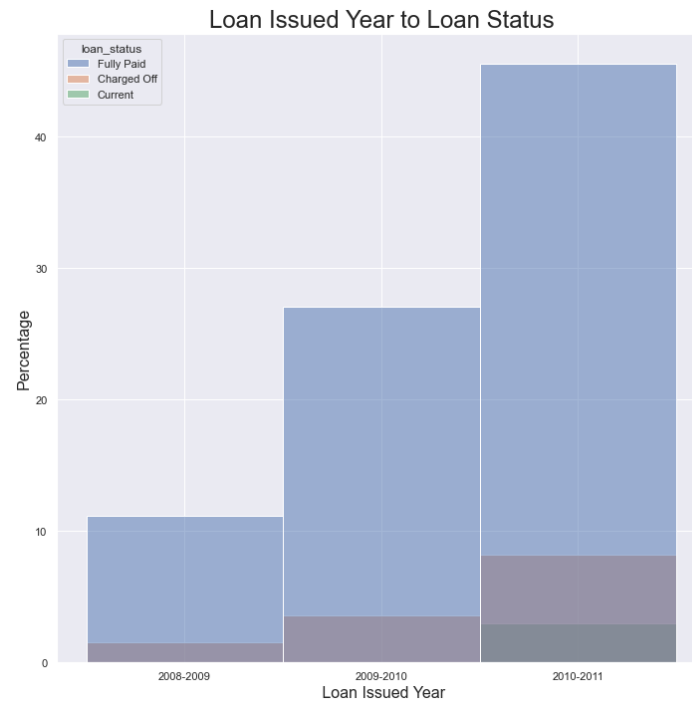
# Analyzing Employment Length to Loan Status



According to the **Employment Length to Loan Status Analysis**, we can conclude the following,

- When the **Employment Length** is increasing, loan **Charged Off** percentage get increases

# Analyzing Loan Issued Year to Loan Status

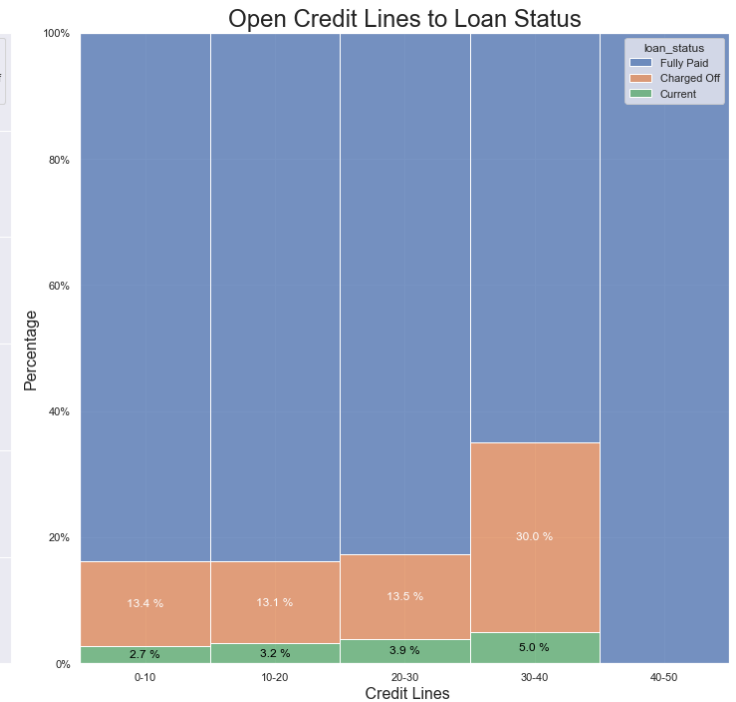
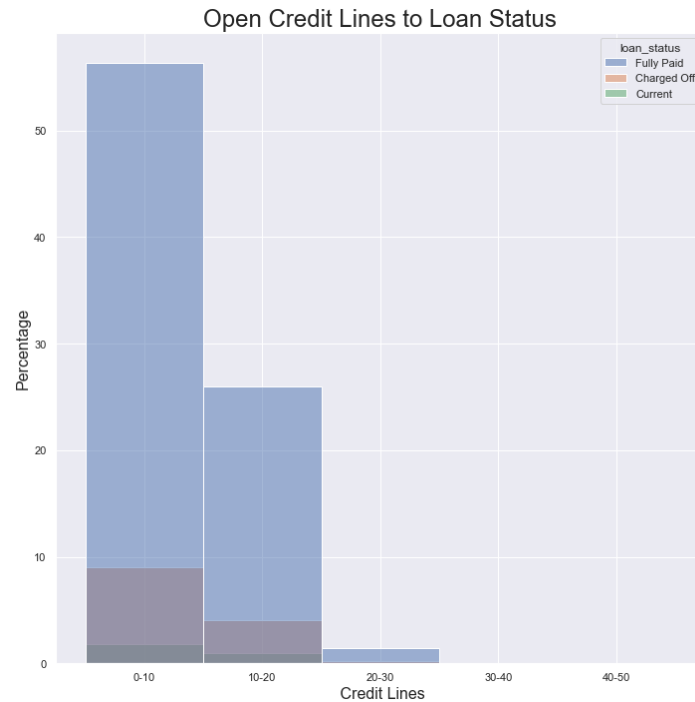


According to the **Loan Issued Year to Loan Status Analysis**, we can conclude the following,

- Most of the loans got **Charged Off**, issued between year **2010 - 2011**



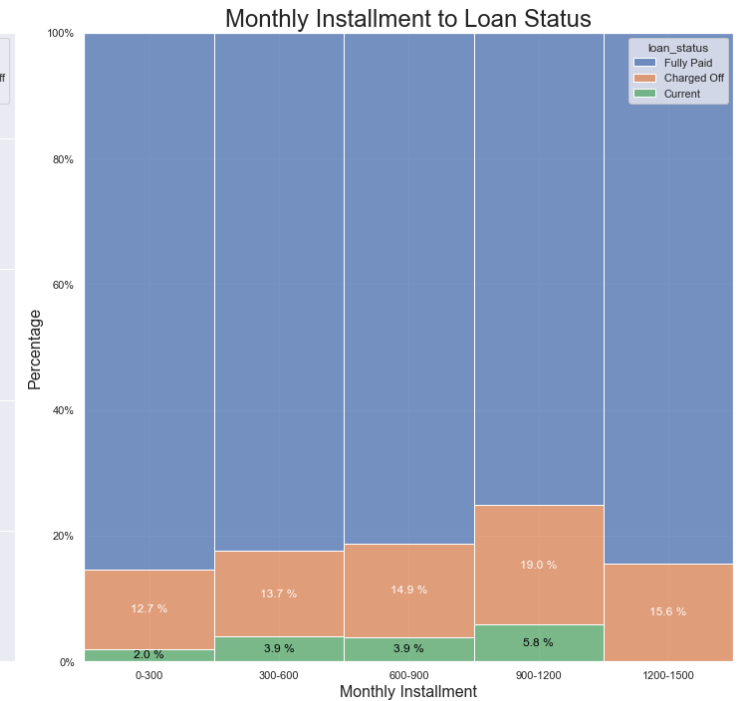
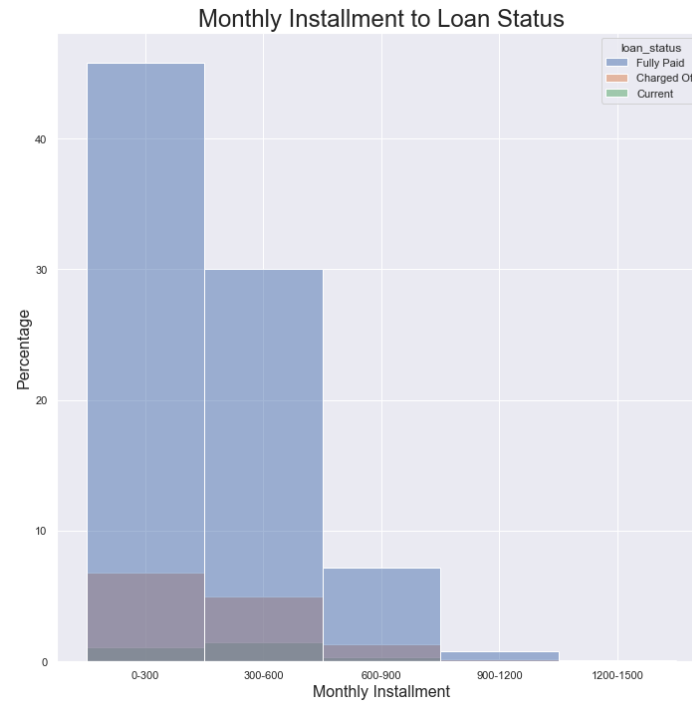
# Analyzing Open Credit Lines to Loan Status



According to the **Open Credit Lines to Loan Status**, we can conclude the following,

- When the **Open Credit Lines** is increasing, loan **Charged Off** percentage get increases

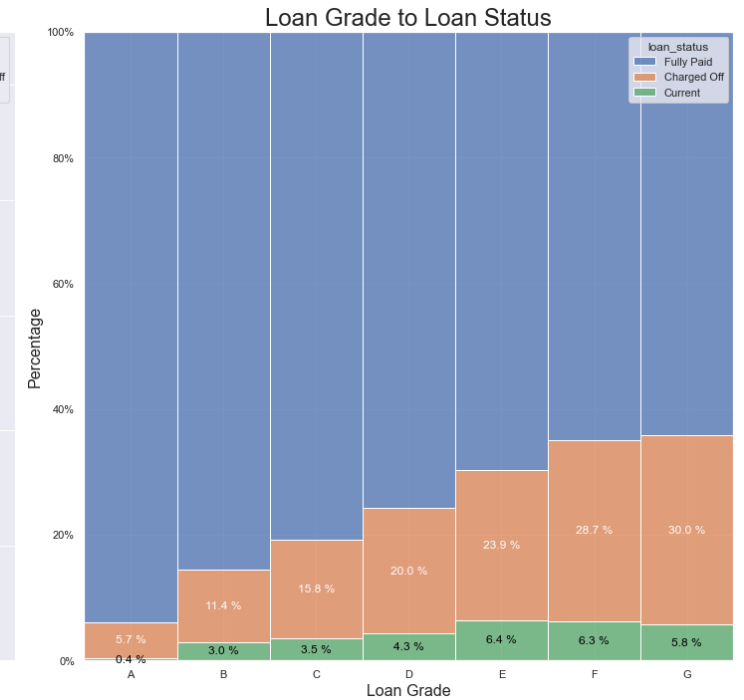
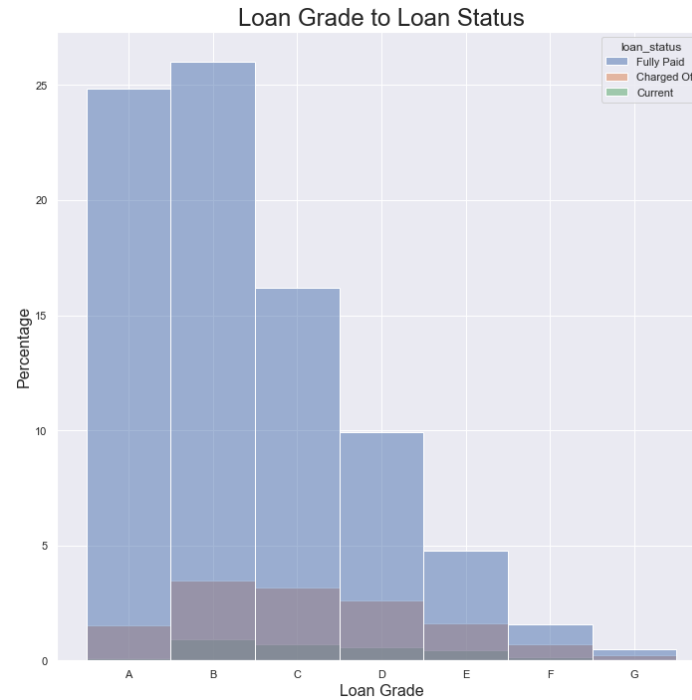
# Analyzing Monthly Installment to Loan Status



According to the **Monthly Installment to Loan Status**, we can conclude the following,

- When the **Monthly Installment** is increasing from **0** to **1200**, loan **Charged Off** percentage get increases

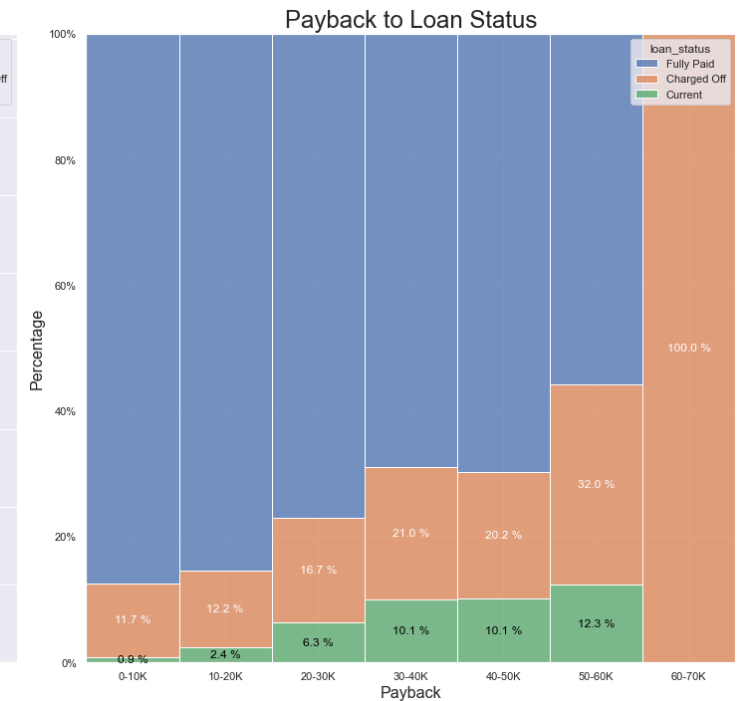
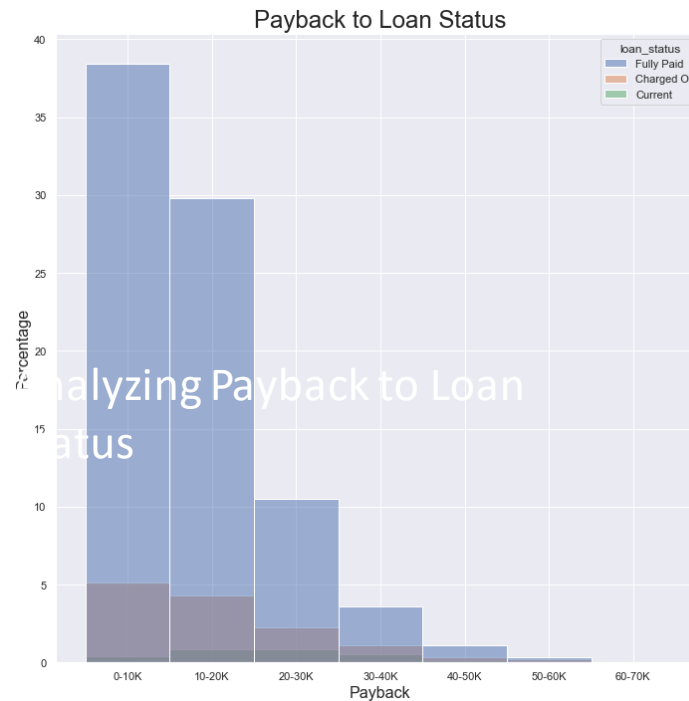
# Analyzing Loan Grade to Loan Status



According to the **Loan Grade to Loan Status Analysis**, we can conclude the following,

- When moving from grade **A** to **G**, loan **Charged Off** percentage get increases

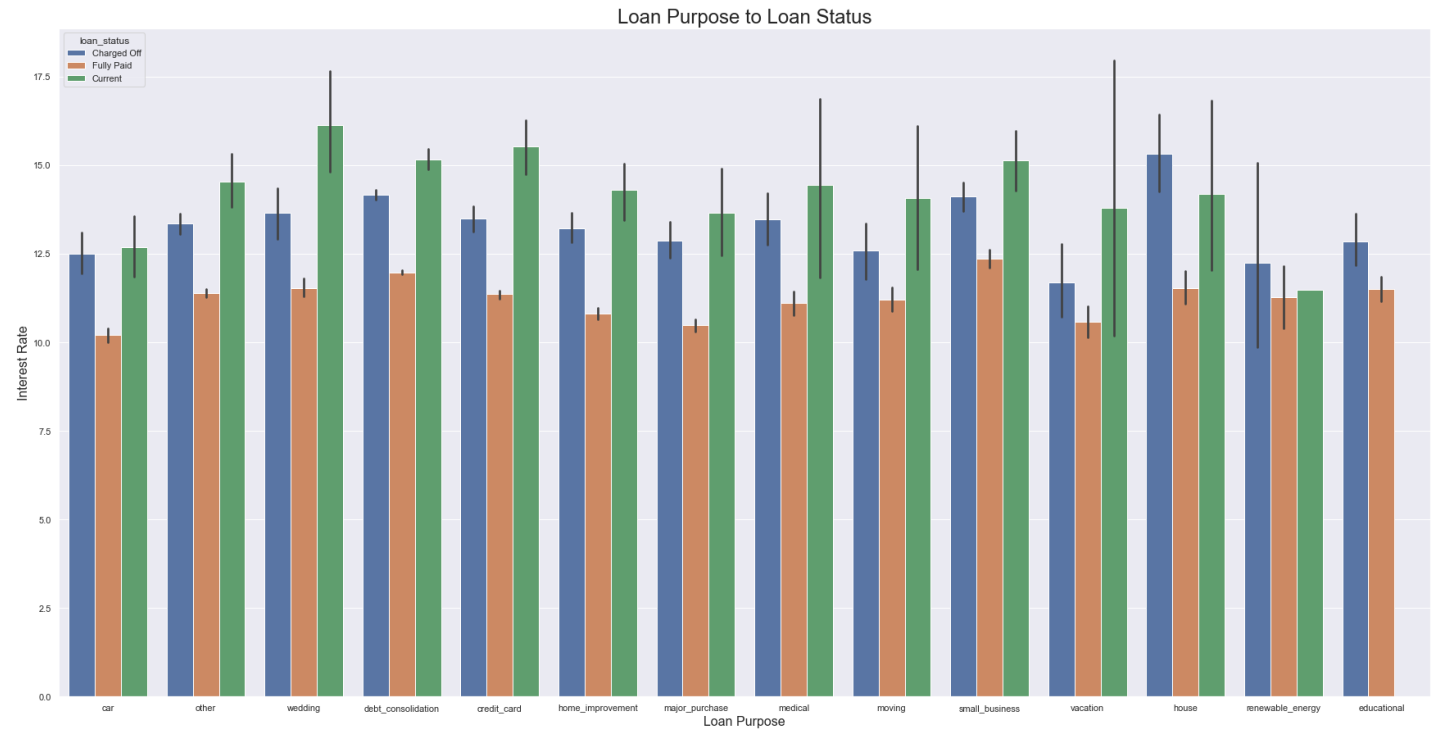
# Analyzing Payback to Loan Status



According to the **Payback to Loan Status Analysis**, we can conclude the following,

- When the **Payback** is increasing, loan **Charged Off** percentage get increases

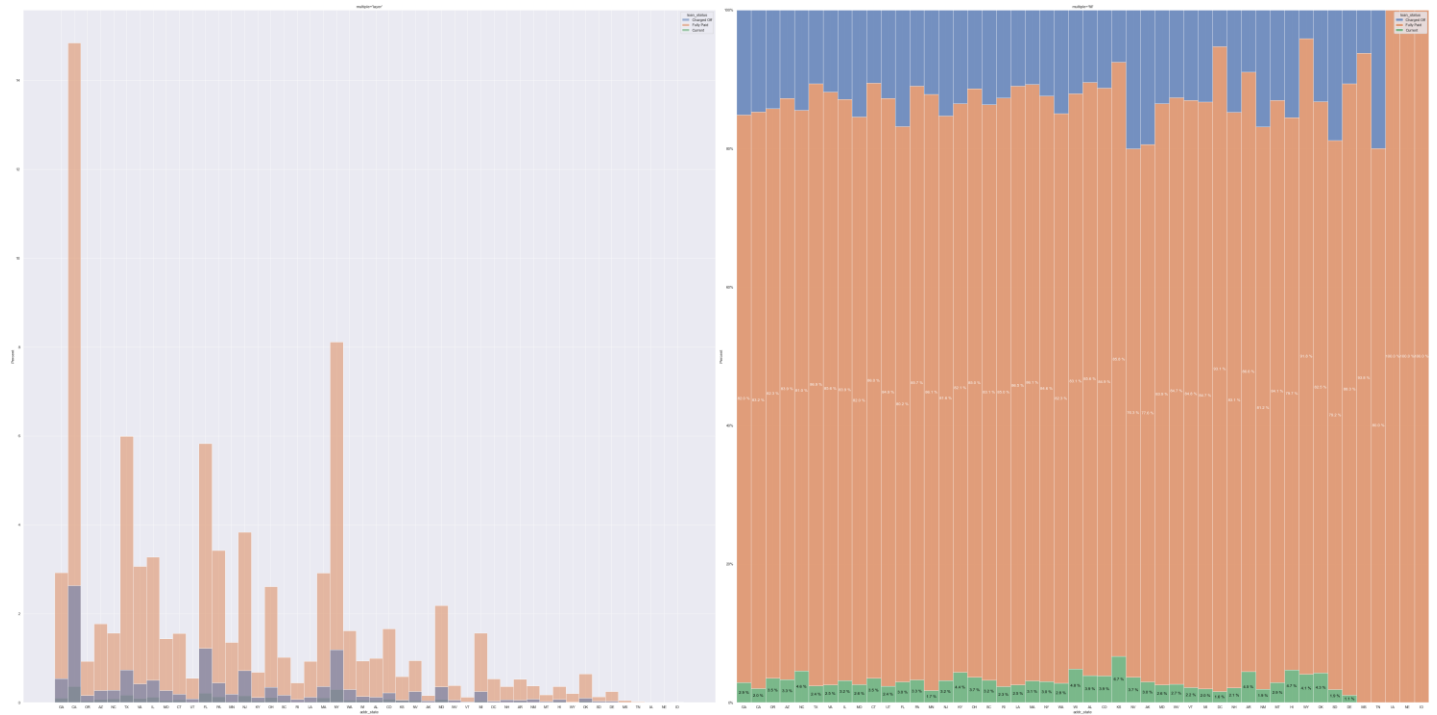
# Analyzing Loan Purpose to Loan Status



According to the **Loan Purpose to Loan Status**, we can conclude the following,

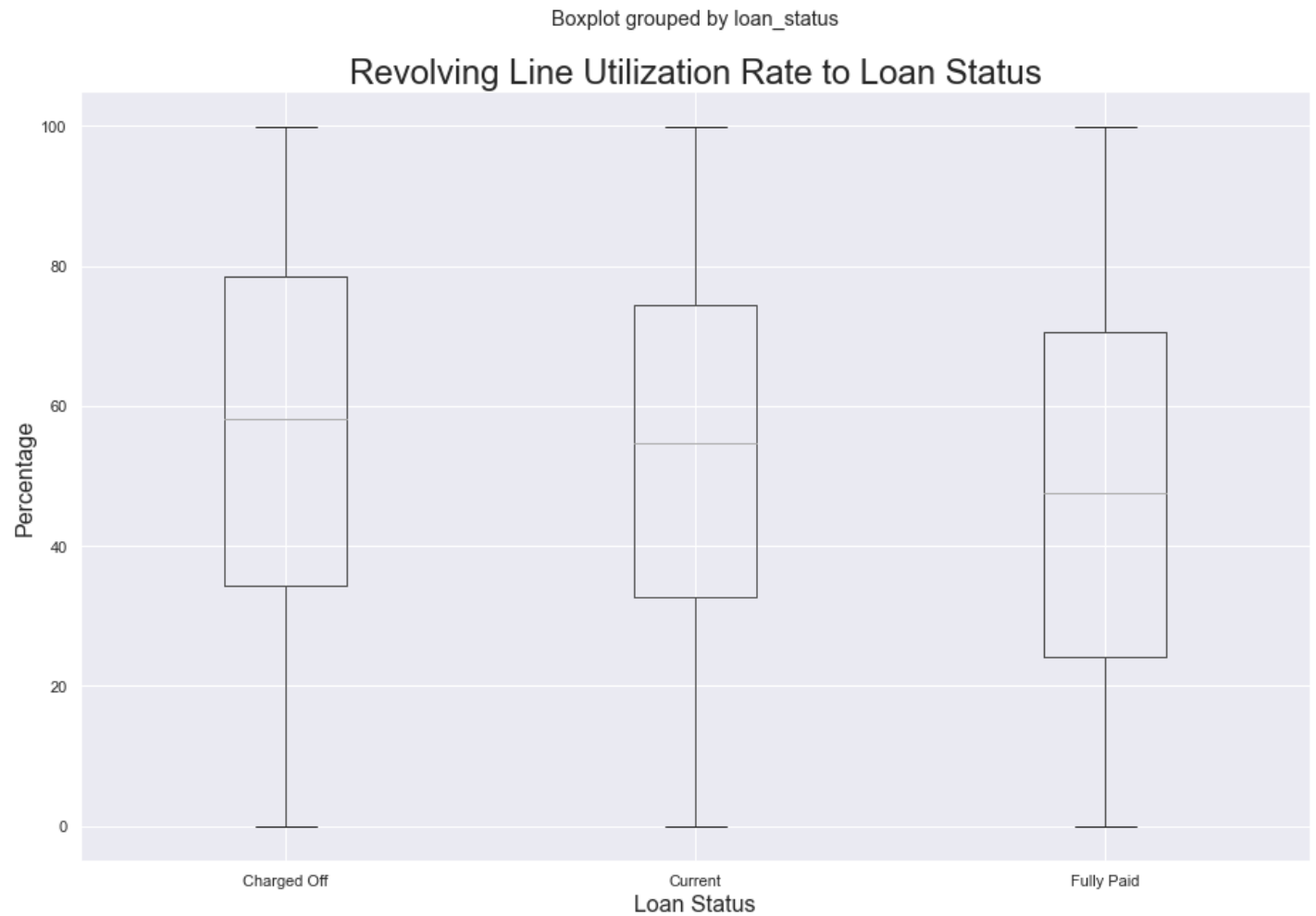
- Most of the loans **Charged Off** were borrowed for small business purposes

# Analyzing State to Loan Status



According to the **State to Loan Status**, we can conclude the following,  
- State **TN** is the highest **Charged Off** state

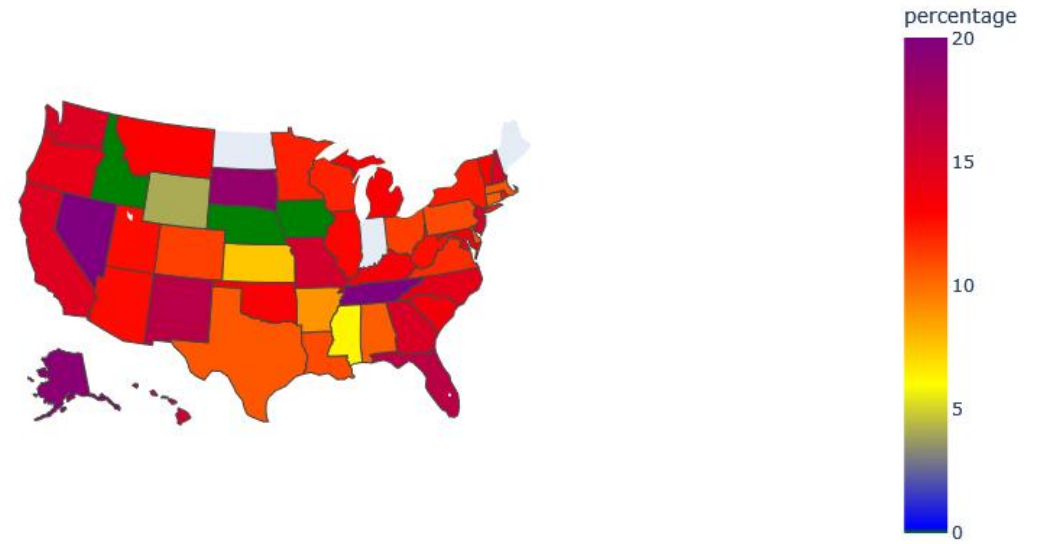
## Analyzing Revolving Line Utilization Rate to Loan Status



According to the **Revolving Line Utilization Rate to Loan Status**, we can conclude the following,

- When the **Revolving Line Utilization Rate** is increasing, loan **Charged Off** percentage get increases

# Loan State Wise Distribution





# Recommendation

- Annual income less than 20K at higher risk of defaulting
- Loan amount higher than 25K at risk of defaulting
- Higher the interest rate, higher the risk of defaulting
- People who pick longer loan term is slightly higher risk than the lower term people
- People on the Home Ownership status 'Other' is at slightly higher risk than other
- Overall loan(including interest) : As the loan gets higher the risk increases people are higher than 50K overall payback is at high risk.

## Recommendation (Continued.)

- People with open credit lines of 30-40 are at higher risk
- Smaller business is at higher risk of defaulting
- As the revolving line utilization increases the risk of defaulting increases
- As the ratio of income to debt gets closer the risk of defaulting gets higher.
- It's recommended to introduce an point based system to assess the risk of being defaulted

# Lending Performance Summary

Payment Expected with Interest: **454,362,431.76**

Payment Expected without Interest: **364,618,850.00**

Payment Received: **396,578,430.16**

Expected Profit: **89,743,581.76**

Loss Due to Defaulting: **57,784,001.60**

Actual profit: **31,959,580.16**

Profit Achieved to Expected: **35.61%**

Company Profit to investment: **8.77%**

Expected Company Profit to investment: **24.61%**

Thank You

