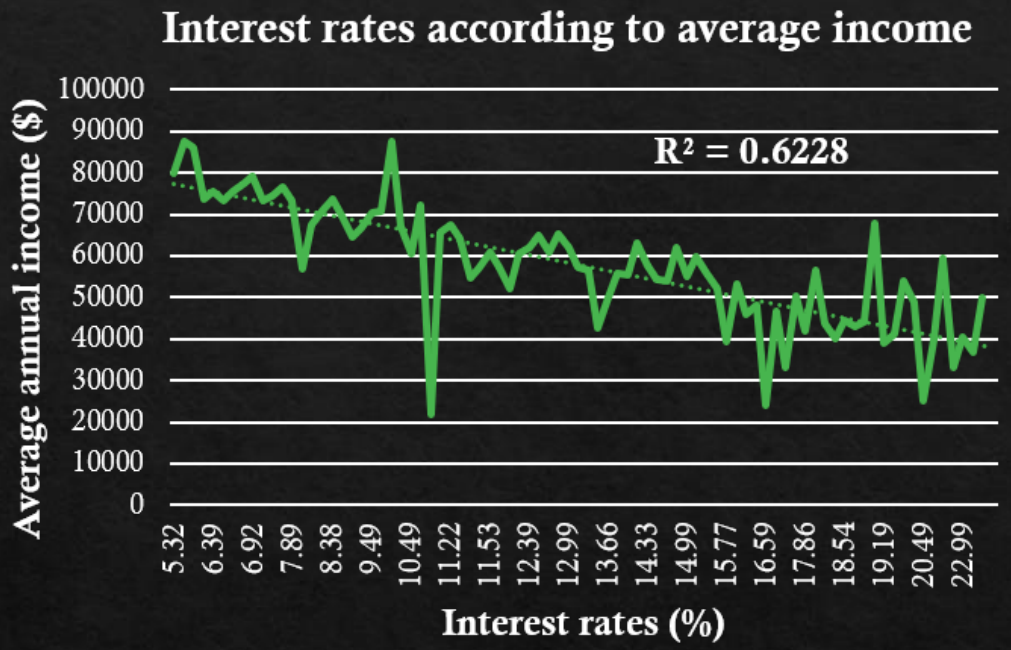
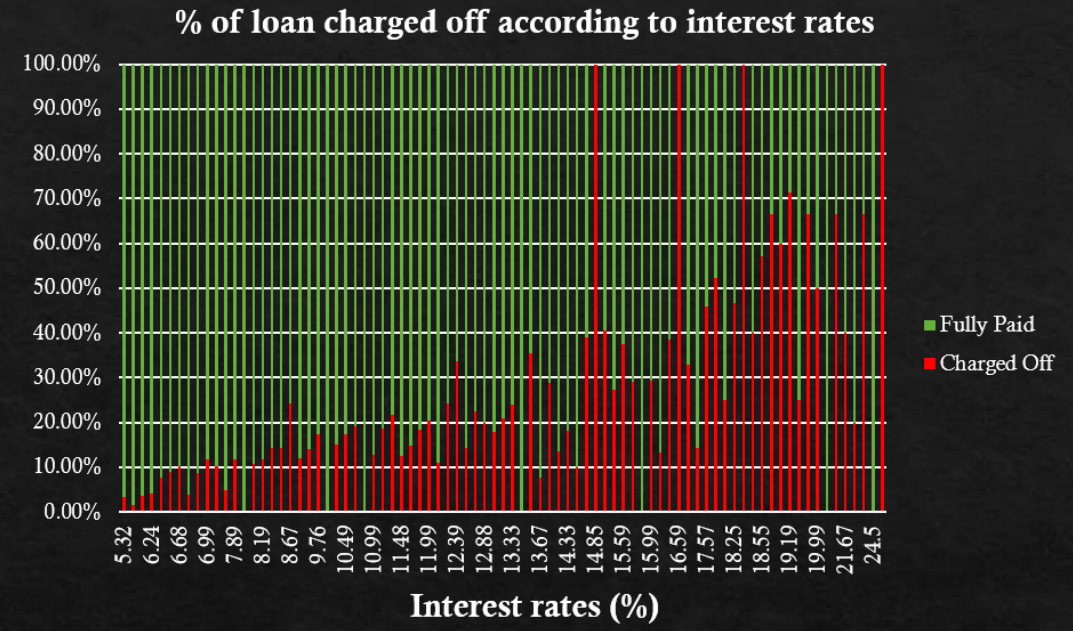
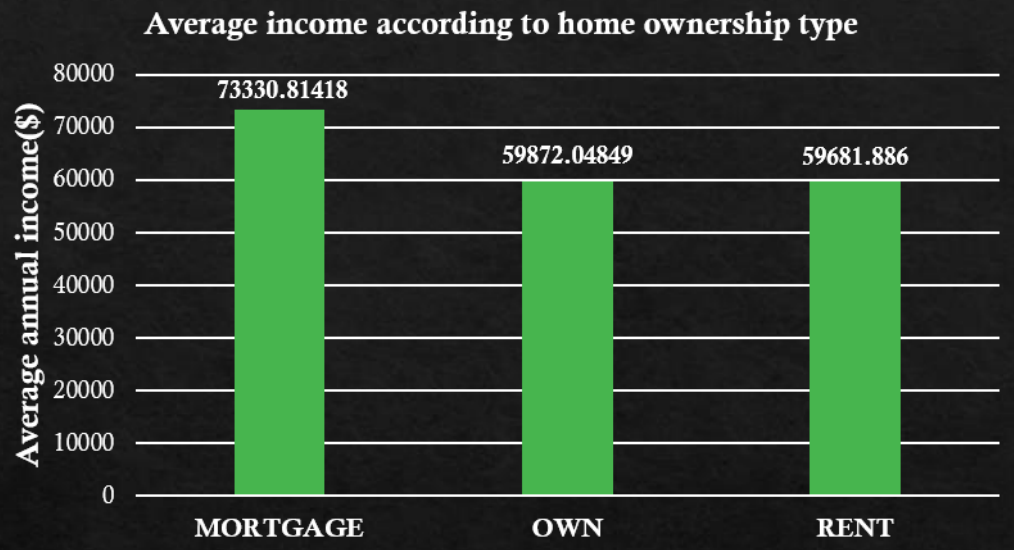
Should you invest in Lending Club?

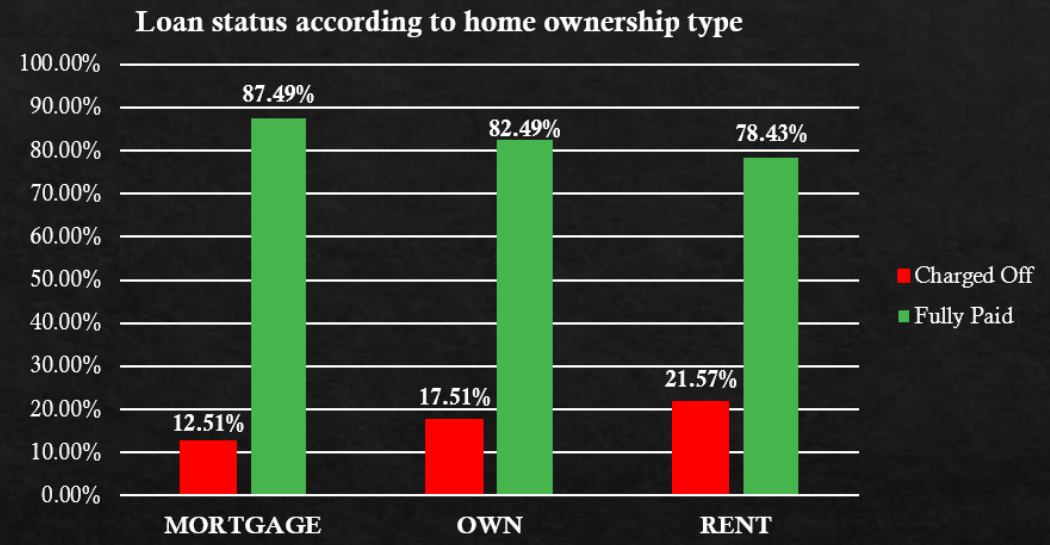




Initial exploratory analysis of data

- The lower the average income the higher the interest rates were on loans.
- And loans with higher interest rates tended to lead to larger % of them being charged off





Initial exploratory analysis of data

- Renters had the smallest average income and were most likely to have loans charged off

Predictive analytics revealed

- Most important features in determining whether a loan would be charged off was the interest rate on loan and annual income
- The most important feature in determining amount of loss was the amount of monthly installments paid on loan
- Predictive model for whether a loan would be charged off yielded AUC = 0.7039 which is considered an acceptable value for model prediction performance
- Predictive model for losses was obtained by minimizing RMSE

Types of loans

Cluster	Interest Rate	Annual income	Installments	Loan_fully paid
#1	-0.19	0.94	1.53	0.40
#2	0.02	-0.28	-0.44	0.46
#3	-0.04	-0.24	-0.22	0.46
#4	-0.25	0.026	-0.30	0.49
#5	0.58	-0.35	0.002	-2.19

People who have higher than average interest rates, lower than average annual income and pay average amount in installments most likely to have their loans charged off

Investment Simulation

- Running a simulation optimization model using interest rate (lognormal distribution), default rate (normal distribution), loss fraction (beta distribution) on the 5 clusters with a $10 million investment and maximizing Sharpe ratio

- Expected return was found to be $ 245 223, or 2.45 %

- 20% chance return is greater than $1 million or 20% chance return is greater than 10%

Summary

- The model built can predict the loans that will be charged off with acceptable confidence
- As well as the loss with good confidence
- Using those parameters and the most important feature interest rate in a simulation model, yielded an expected return of 2.45% and a 20% chance of a 10% or greater return. Typically a good return on investment is at least 5%
- Recommendation : not to invest the as the likeliest outcome leads to the firm obtaining a very low return on investment for their investment.