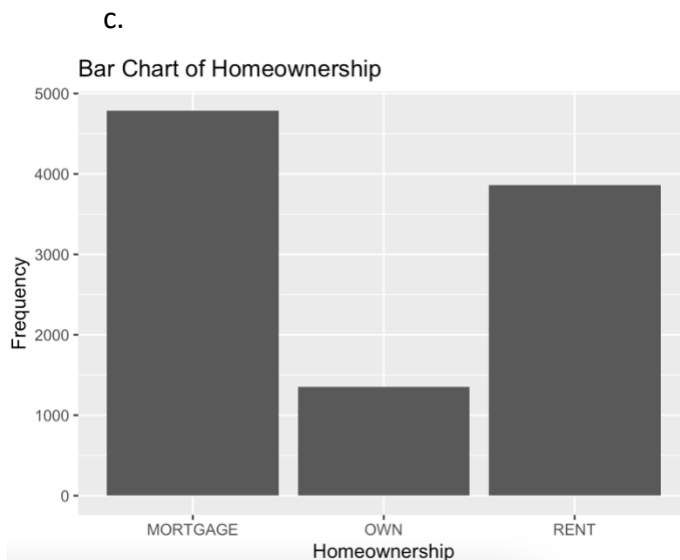Ethan, Nick, Minh

EM 150

Activity 2: Individual Answers

1. Categories of variable Homeownership
   a. Mortgage, Rent, and Own
   b.

Type of Home Ownership	Mortgage	Own	Rent
Frequency	4,789	1,353	3,858
Relative Frequency	47.89%	13.53%	38.58%

c.

Bar Chart of Homeownership

d. Homeowners with a mortgage is the most common type of homeownership in this sample accounting for 47.89% (4,789). Followed by renters at 38.58% (3,858) of homeowners, and the least common type of homeownership in this data set is owners accounting for 13.53% (1,353) of homeowners.

2. Bivariate relationship between loan grade and Homeownership
   a. I would expect loan grade for renters to be lower, as typically people who rent have less wealth, or have poor credit history where they can't obtain feasible loans and rates. While I would expect most owners with a mortgage to be higher grade, given they were able to obtain a mortgage, which most likely means they have a good credit score. But that could also vary, depending on if there were any subprime mortgages issued. Most people who own their home have enough money where

they were able to pay off their mortgages, so I'm sure they have higher loan grades and better credit score.

Bar Charts for Loan Grade Between Types of Homeownership

b.
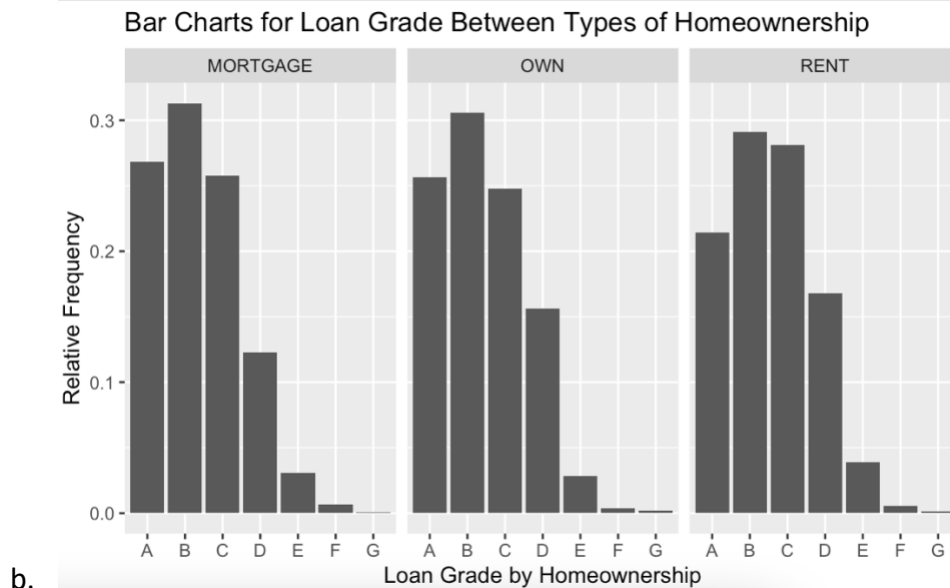
The bar charts for all 3 types of homeownerships are largely similar, as they're all unimodal, and have slight skews to the right. The most common loan grade is a B for all 3 types of homeowners, around 32% for mortgage owners, 31% for owners, and 29% for renters. However, mortgage and homeowners have, on average, higher loan grades, as their second most frequent loan grade is an A with roughly 27% and 26%, and C grades of 26% and 25%, respectfully. While Renters second most frequent grade is a C with approximately 28% and have an A grade of about 22%. Loan grades D, E, F, and G, rank in that order for all 3 homeowners. Mortgage owners have the least amount of representation of loan grades D-G at roughly 18%, Owners at 20%, and renters at 24%. While there isn't a very significant difference, it is clear that homeowners with the best ranking of loan grades are those with a mortgage, followed by owners, and renters seem to have the worst distribution of the three types.

3. Looking at variable Loan Amount
    a.

|	Mean	SD	Min	Q1	Median	Q3	Max	Missing
Loan Amount (Thousands)	16,361.92	10,301.96	1,000	8,000	14,500	24,000	40,000	0

b.

Histogram for Loan Amount
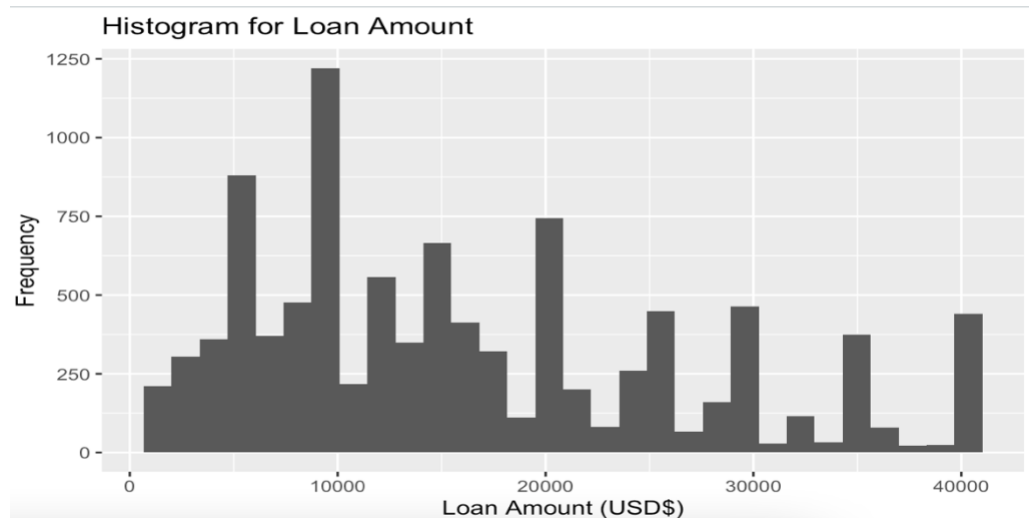
c. The distribution for loan amounts is unimodal and skewed to the right, with other apparent peaks around $20,000, $25,000, $30,000, $35,000, and the $40,000 loan amount. The representative measure of center (median) and spread of the distribution (IQR) are $14,500 and $16,000 ($8,000-$24,000), respectfully. The distribution is skewed, due to the possible outliers, the most extreme of which at $40,000 loan amount.

4. Bivariate relationship between Homeowner status and Loan Amount
   a. It would be more expensive to finance a home, so it would make sense that homeowners and those with a mortgage may have a higher loan amount, since they would be purchasing a home, and would require a higher up-front payment. While renting wouldn't require such a high upfront payment, so I would expect renters on average to have smaller loan amounts.

Histogram for Loan Amount by Homeownership
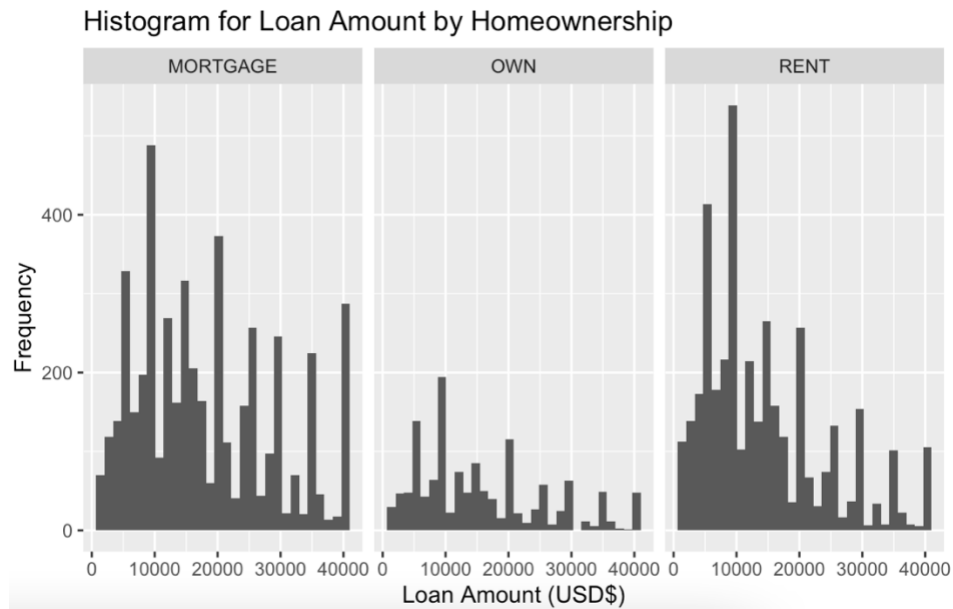
b.
The distributions for all 3 homeownerships appear to be very similar. They're all multimodal, with a skew to the right, with a peak around the $10,000 loan amount. However, the tails for all three distributions differ slightly. Mortgage owners and owners seem to have a similar relative frequency around the $20,000 loan amount compared to the distribution of renters. While Mortgage owners have a higher relative frequency at the $40,000 loan amount compared to the other two distributions. But generally, the distributions for loan amounts are the same for all three types of owners, with those obvious exceptions.