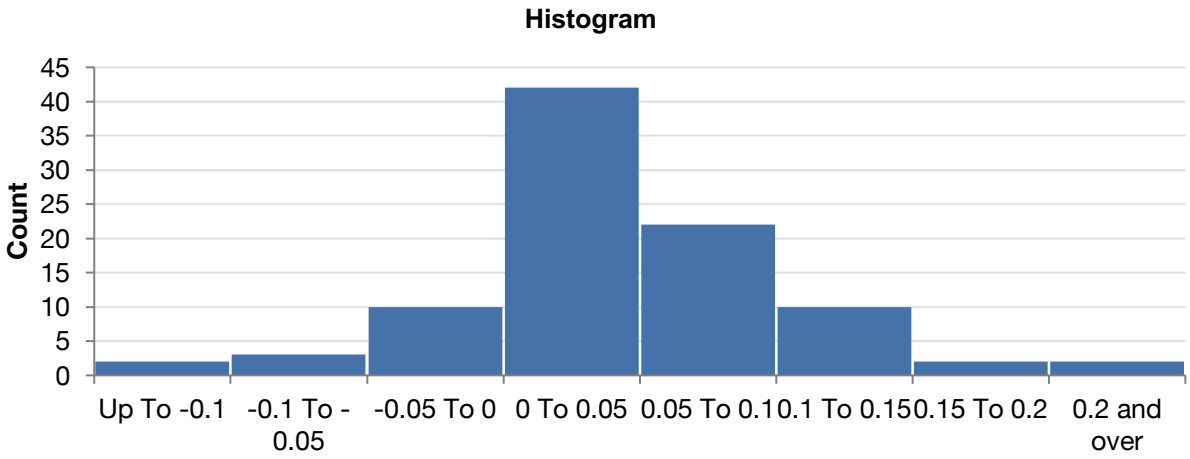
Session 4: Post Class Test Solutions

1. The histogram is below:



   Real estate annual returns, between 1928-2020, were clustered around 5%, with returns in most years falling just below 5%. Double digit returns on real estate are not common, especially when compared to stocks. The very best years were a little better than the very worst years, suggesting some positive skewness, and there are very few extreme outliers.
2. e. All of the above. Normal distributions are symmetric, and the mean will be equal to the median and the skewness is zero. In addition, 68% of the sample values should fall within one standard deviation and 95% withing two standard deviations of the average, and outliers should be rare, resulting in a kurtosis of close to three.
3.
   a. I would use the t distribution, which resembles a normal distribution, albeit with a more pronounced peak, for smaller samples.
   b. I would use the triangular distribution, if my data is symmetric, has expected values that peak in the middle of the range, but are bounded on both sides (values cannot exceed an upper limit and cannot fall below a lower limit).
   c. I would use a uniform distribution, if I know the upper and lower limits on value, but have diffuse priors (one number within the range is just as likely as any other number in the range).
4. d. There will be more extreme outliers (data that is more than two or three standard deviations from the average) than you would expect to see in a normal distribution.
5. b. As the standard deviation in a log normal distribution goes up, the skewness will become more positive.