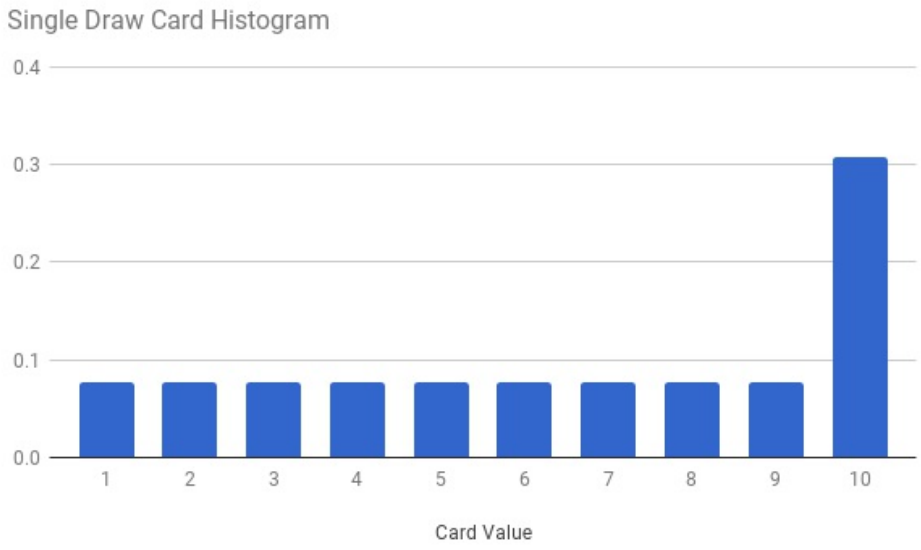
P1 - Descriptive Statistics for drawing Cards

Single draw from a standard deck

1. First, create a histogram depicting the relative frequencies of the card values for a single draw. Report the mean, median, and standard deviation of the value distribution. (Ace = 1, all face cards = 10)

Mean	Median	Standard Deviation
6.54	7	3.15



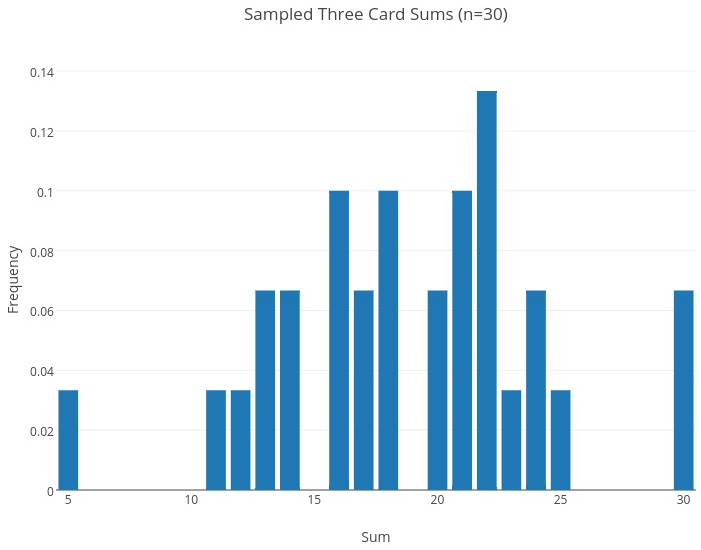
Three card samples

2. Take a look at the distribution of the three-card sums from the samples that you obtained, either from Generate Data, or from your own collection. Report descriptive statistics for the samples you have drawn. Include at least two measures of central tendency and two measures of variability.

I used the provided Generate Data function with seed 2222.

Sample Mean	Sample Median	Sample Variance	Sample Standard Deviation
18.83	19	29.73	5.45

3. Create a histogram of the sampled three-card sums. Compare its shape to that of the original distribution. How are they different, and can you explain why this is the case?



While the distribution of the original population of single cards is skewed to the right, now we are drawing three cards from that population and summing them. While we are summing rather than taking the average, we can still apply the Central Limit Theorem to know the shape of this distribution should be normal. (Our distribution still appears a bit skewed, but n=30 is on the small side.)

4. Make some estimates about values you would get on future draws. Within what range will you expect approximately 90% of your draw values to fall? What is the approximate probability that you will get a draw value of at least 20? Make sure you justify how you obtained your values.

Given that the distribution of sums is normal and the sample mean can be taken as an approximation of the actual mean due to the Central Limit Theorem, then future three card draws might have values like 20, 18, 16, 19, 17.

Using the Z Table, 90% of values in a normal distribution have z values between -1.65 and 1.65. In this case, that means sums between 9.84 and 27.82, so for discrete values, 10 to 28.

18.83 +/- 5.45*1.65 --> (9.84, 27.82)

A sum of at least 20 is a z value of +0.2147, which corresponds to a probability of 0.4207.

20-18.83 / 5.45 = .2147