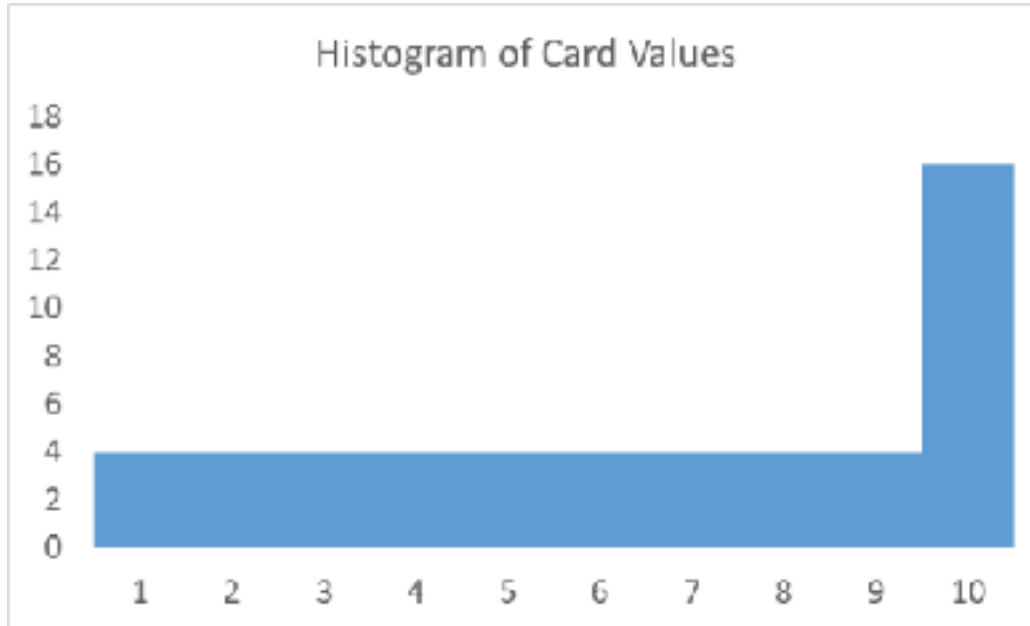


Compute Statistics from Card Draws

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Question 1: Plotting a histogram of card values

Q1: A histogram is provided that accurately reflects the card values' relative frequency distribution.



Question 2: Obtain samples from a deck of cards

Q2: *At least thirty samples have been performed and the summed values from each sample have been reported in a supplemental file.*

Card Sums	$(x-u)^2$
7	163.84
8	139.24
10	96.04
11	77.44
14	33.64
15	23.04
15	23.04
16	14.44
17	7.84
18	3.24
19	0.64
19	0.64
19	0.64
20	0.04
20	0.04
21	1.44
21	1.44
22	4.84
22	4.84
22	4.84
22	4.84
23	10.24
24	17.64
25	27.04
26	38.44
26	38.44
27	51.84
28	67.24
28	67.24
29	84.64

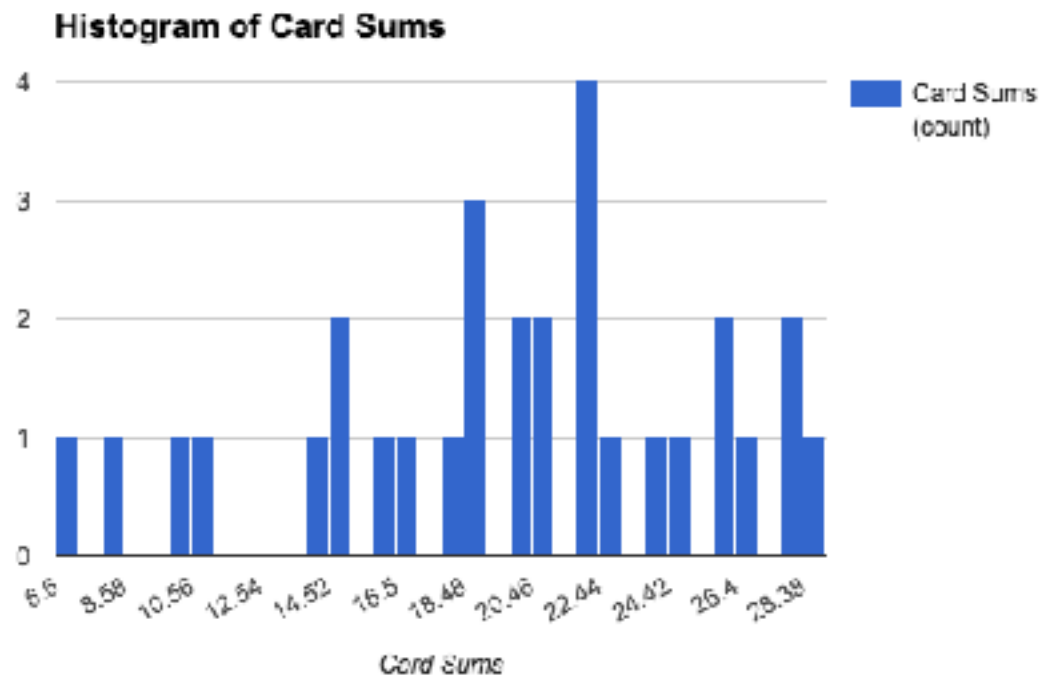
Question 3: Report descriptive statistics regarding sample taken

Q3: At least two measures of central tendency and two measures of variability are accurately reported to summarize and describe the samples taken for Question 2.

Median	20.50
Mean	19.80
Variance	33.63
Standard Deviation	5.80

Question 4: Plotting a histogram of sampled values

Q4: A histogram accurately reflecting the sampled data is provided. Discussion of the shape is provided, including a comparison to that of the histogram of the original card values.



The shape of this histogram reflects values falling around the mean of 19.8. The values of the original cards reflect a heavy skew towards the 10 value. 31% of the cards (just shy of 1/3) have a value of 10, making it likely that one of the three drawn cards is a 10.

As it is probable that one in three cards is a 10, when three cards are drawn and any other two values below 10 are added to that one card, the values approach or surpass the mean. Two cards with a 10 value puts the sum at or above the mean, no matter the value of the third card. I would expect that with a larger sample, the histogram would reflect a similar, but higher mean and median.

Question 5: Making estimates based on the sampled distribution

Estimates are made for the prompted questions that reflect the samples taken and their distribution.

Make some estimates about values you would get on future draws.

I estimate that future draws would increase the frequency of sums around the mean and median values, given how many cards in the deck have a 10 value.

Within what range will you expect approximately 90% of your draw values to fall?

The z-scores of -1.65 and 1.65 represent the 'middle 90%' of all values. To find the range I used this formula:

$$(x-u)/SE=\pm 1.96$$

$$(x-19.8)/1.06=\pm 1.96$$

$$x-19.8=\pm 2.08$$

$$x_1=17.72$$

$$x_2=21.88$$

The range is 17.72 to 21.88 for 90% of all values.

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.

The approximate probability of getting at least 20 is .5753. This was found using the following values:

mean	19.80
std dev	5.80
n	30
x	20
z	0.1888698474
SE	1.058930278
Probability	0.5753

Using the mean, standard deviation and n values, the standard error (SE) can be calculated. From there, subtract the mean from 20, then divide by the SE. This provides the z-score of 1.89. I used a z-value of 1.9 in the z-table to find the approximate probability of .5753.