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I didn't work with other students.

ECO 602 – Frequentist Concepts Assignment

Q1 (2 pts.): What is the probability of observing a count of exactly 3 successes in a binomial distribution with parameters n = 4 and p = 0.75?

#Probability mass function - dbinom

dbinom(3, 4, 0.75)

#probability = 0.42, or 42% probability of observing a count of exactly 3 successes in a binomial distribution with these parameters.

Q2 (2 pts.): What is the probability of observing a count of 3 successes or fewer in a binomial distribution with parameters n = 4 and p = 0.75?

#Cumulative mass function - pbinom

pbinom(3, 4, 0.75)

#probability = 0.68, or 68% probability of observing a count of 3 successes or fewer in a binomial distribution with these parameters.

Q3 (2 pts.): What is the probability of observing more than 3 successes in a binomial distribution with parameters n = 5 and p = 0.75?

#Cumulative mass function - pbinom

1-pbinom(3, 5, 0.75)

#probability = 0.63, or 63% probability of observing more than 3 successes in a minomial distribution with these parameters.

Q4 (2 pts.): - What is the probability of observing a value of less than 1.2 from a normally-distributed population with mean = 2 and standard deviation = 2?

#Cumulative density function - pnorm

pnorm(1.2, mean = 2, sd = 2)

#probability = 0.34, 34% probability of observing a value of less than 1.2 from a normally-distributed population with these parameters.

Q5 (2 pts.): - What is the probability of observing a value of greater than 1.2 from a normally-distributed population with mean = 2 and standard deviation = 2?

#Cumulative density function - pnorm

1-pnorm(1.2, mean = 2, sd = 2)

#probability = 0.66, 66% probability of observing a value of greater than 1.2 from a normally-distributed population with these parameters.

Q6 (4 pts.): - What is the probability of observing a value between 1.2 and 3.2 from a normally-distributed population with mean = 2 and standard deviation = 2?

#Cumulative density function - pnorm

pnorm(3.2, mean = 2, sd = 2) - pnorm(1.2, mean = 2, sd = 2)

#probability = 0.38, or 38% probability of observing a value between 1.2 and 3.2 from a normally-distributed population with these parameters.

Q7 (2 pts.): Describe how the shape of the histogram changes as you continue to press the *sample* button.

As I continue to hit the sample button, the sample mostly fills in the histogram for the skewed part of the distribution with the peak. However, as I add more samples there is gradually a little more filled in for the tail of the histogram, making the overall sampling distribution wider.

Q8 (2 pts.): Describe how the shape of the histogram changes as you continue to press the *sample* button.

As I continue to hit the sample button, the histogram fills in mostly in the skewed part of the distribution with the peak. However, I notice that with a sample size of 2 the histogram is filling in the larger part of the tail more than just the few scattered 1% bins that I saw for the sample size of 1. The shape of the histogram isn't as wide as with the sample size of 1.

Q9 (2 pts.): Describe how the shape of the histogram changes as you continue to press the *sample* button.

As I continue to hit the sample button, the histogram fills in significantly in the skewed portion of the distribution. I notice that with a sample size of 15 the sampling distribution is focused on the part of the distribution with the mean.

Q10 (2 pts.): Why is there such a drastic change in the shape of the sampling distribution when you change the sample size from 1 to 2?

Changing the sample size from 1 to 2 doubles the sample size. With a larger sample size the sampling distribution becomes narrower.

Q11 (2 pts.): What are the two main factors that determine the width of the sampling distribution of the mean?

The width of the sampling distribution of the mean is determined by the sample size and the population standard deviation.

Q12 (2 pts.): How many 3-character words are possible?

25^3 = 15,625 possible 3-character words

Q13 (2 pts.): How many books would the Library contain if you added *one* additional position to the book size (i.e. one extra letter on the last page)? Express your answer in terms of B.

$25^{1{,}312{,}000 + 1 \text{ additional position}}$ = **B + 25 books**