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ECO 602: Analysis of Environmental Data
Frequentist Concepts Lecture Assignment
Due 10/23/2022

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? Include your answer and the R code you used to find it. Note: To receive full credit, you cannot use lower.tail = FALSE in your code.

dbinom(3, 4, 0.75)

0.421875

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? Include your answer and the R code you used to find it. Note: To receive full credit, you cannot use lower.tail = FALSE in your code.

pbinom(q = 3, size = 4, prob = 0.75, log.p = FALSE)

0.6835937

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? Include your answer and the R code you used to find it. Note: To receive full credit, you cannot use lower.tail = FALSE in your code.

1 - (pbinom(q = 3, size = 5, prob = 0.75, log.p = FALSE))

0.6328125

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? Include your answer and the R code you used to find it. Note: To receive full credit, you cannot use lower.tail = FALSE in your code.

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

0.3445783

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? Include your answer and the R code you used to find it. Note: To receive full credit, you cannot use lower.tail = FALSE in your code.

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

0.6554217

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? Include both your answer and the R code you used. Note: To receive full credit, you cannot use lower.tail = FALSE in your code.

(1 - pnorm(1.2, mean = 2, sd =2)) - (1 - pnorm(3.2, mean = 2, sd =2))

0.3811686

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

The more times I press the sample button, the more the histogram mimics the distribution of the population from which I'm sampling from.

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

The more I continue to click the sample button, the more the histogram because less skewed. The histogram starts to look more like a normal distribution with a much slighter skew.

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

As I continue to click the sample button, the histogram looks more and more normally distributed in shape.

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?

With a greater sample size comes more normalization around the mean.

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

The two main factors that determine the width of the sampling distribution of the mean are the sample size and the population standard deviation.

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

15625

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.

B = 25^1328400. This is if you were to have 410 pages, 40 rows per page, and *81* positions per row.