PSYC 2317: Statistical Methods for Psychology

Tarleton State University | Homework 4 | Fall 2019

1. Suppose you have a collection of scores that is normally distributed with $\mu = 50$ and $\sigma = 18$, and suppose we draw samples of size $N = 36$.
   (a) What proportion of the samples will have means greater than 53?
   (b) What proportion of the samples will have means less than 44?
   (c) What is the probability that the sample will have a mean between 49 and 51?
2. For a normal population with $\mu = 200$ and $\sigma = 20$,
   (a) What is the probability of obtaining a sample mean greater than 210 for a sample of $N = 4$ scores?
   (b) What is the probability of obtaining a sample mean greater than 210 for a sample of $N = 16$ scores?
   (c) For a sample of $N = 25$ scores, what is the probability that the sample mean will be within 5 points of the population mean?
3. Suppose we are sampling from a population that is known to be normal with standard deviation $\sigma = 10$. However, the mean μ is unknown, so we'll have to estimate it.
   (a) A sample of $N = 10$ is drawn and is found to have mean $\overline{X} = 25$. Compute a 95% confidence interval for μ.
   (b) A sample of $N = 20$ is drawn and is also found to have mean $\overline{X} = 25$. Compute a 95% confidence interval for μ.
   (c) How are the answers to (a) and (b) related? What can you say about the relationship between sample size and the width of the confidence interval?
4. (JASP exercise) For this exercise, you'll need to download the "`ADD.csv`" file from Canvas.
   (a) Compute a 95% confidence interval for the mean of the `ADDSC` variable.
   (b) Compute a 95% confidence interval for the mean of the `IQ` variable.
   (c) Compute a 95% confidence interval for the mean of the `GPA` variable.