DALITE Q1 - Parameters, Sampling Distributions and the Central Limit Theorem. Due September 23, 2020 by 10am.

EPIB607 - Inferential Statistics[a]

[a]Fall 2020, McGill University

This version was compiled on September 16, 2020

This DALITE quiz will cover the building blocks of statistical inference.

Parameters and statistics | Sampling distributions | Central Limit Theorem (CLT)

Marking

Completion of this DALITE exercise will be availble to us automatically through the DALITE website. Therefore **you do not need to hand anything in**. Marks will be based on the number of correct answers. For each question you will receive 0.5 marks for getting the correct answer on the first attempt and an additional 0.5 marks if you stick with the right answer or switch to the correct answer after seeing someone else's rationale.

1. Parameters and statistics

1.1. Learning Objectives.

1. Understand the difference between a parameter and a statistic.
2. A parameter is related to the population.
3. A statistic is related to the sample.

1.2. Required Readings.

1. JH section 1

2. Sampling Distributions and Central Limit Theorem

2.1. Learning Objectives.

1. Recognize that there is variability due to sampling. Repeated random samples from the same population will give variable results.
2. Understand the concept of a sampling distribution of a statistic such as a sample mean, sample median, or sample proportion.
3. Know that the sampling distributions of some common statistics are approximately normally distributed; in particular, the sample mean x of a simple random sample drawn from a normal population has a normal distribution.
4. Know that the standard deviation of the sampling distribution of x depends on both the standard deviation of the population from which the sample was drawn and the sample size n.

5. Grasp a key concept of statistical process control: Monitor the process rather than examine all of the products; all processes have variation; we want to distinguish the natural variation of the process from the added variation that shows that the process has been disturbed.
6. Make an $\bar{x}$ control chart. Use the 68-95-99.7% rule and the sampling distribution of $\bar{x}$ to help identify if a process is out of control.
7. Be familiar with the Central Limit Theorem: the sample mean $\bar{x}$ of a large number of observations has an approximately normal distribution even when the distribution of individual observations is not normal.

2.2. Videos.

1. Against All Odds Unit 22

2.3. Required Readings.

1. Against All Odds Unit 22
2. De Veaux, Velleman and Bock (DVB), Chapter 18