ECON 0150 | Fall 2025 | Homework 3.2

Due: Friday, Oct 24, 5PM

Homework is designed to both test your knowledge and challenge you to apply familiar concepts in new applications. Answer clearly and completely. You are welcomed and encouraged to work in groups so long as your work is your own. Use the provided datasets to answer the following questions. Then submit your figures and answers to Gradescope.

Q1. Sample Variation: Known Random Variable

The wait times (in minutes) at a restaurant location follows a normal distribution with mean (μ) = 12 minutes and standard deviation (σ) = 2.5 minutes. Start each question with a rouch sketch of your answer, then find the number using code.

a) Take a sample of 10,000 from the distribution and create a histogram of this sample.

b) Compute the difference between your sample mean ($\bar{x}$) and the theoretical mean (μ) wait time.

c) Compute the difference between the sample standard deviation (S) and the theoretical standard deviation (σ).

d) Compute the difference between the 77th percentile for the sample and the random variable.

Q2. Sample Variation: Unknown Random Variable

Using the provided dataset of customer wait times (in minutes) from two different restaurant locations.

a) Create a histogram of sample wait times for Location A.

b) What is the sample mean ($\bar{x}$) wait time for Location A?

c) What is the sample standard deviation (S) for the wait time for Location A?

d) What is the sample size (n) for the sample wait times for Location A?

e) What is the 77th percentile for the sample wait times for Location A?

f) What can we say about the mean of the unknown random variable?