Lesson 11
Hypothesis Testing with a Sample of Values

We have looked at the basics of hypothesis testing using the z-formula we had already learned. However, we never test a hypothesis based on one individual from a population. Instead, we will want to have a sample of values to test against the population. The formula we will want to use has a minor change from the one we have been using.

$$z = \frac{\overline{X} - \mu}{\sigma_{\bar{x}}}, \text{ where } \sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$$

Notice that there is sample mean now in the numerator instead of just a single x-value. Often this will be given just like the x-value in prior problems, but now you may also have to compute it from the sample. Compute $\sigma_{\bar{x}}$ first for the denominator by dividing the standard deviation by the square root of the given sample size (n). Once you get that number plug it in as the denominator in the z-score formula.

The rest of this lesson is devoted to the theory behind the changes we make when moving from tests with a single x-value to tests with samples of x-values. There are no computational additions for the exam other than the formula change above. However, you should be concerned with understanding the conceptual meaning of this lesson. At a minimum you should be able to recognize the rules of the Central Limit Theorem for the exam (detailed below).

The lesson continues on the web page. Take notes on the sampling distribution page, the standard error page, and the standard error with hypothesis testing page. Links to these pages are provided below. It is important to review each one. Again, these lessons contain conceptual information for the most part, however, the last page is devoted to the computations you will perform for the exams.

Sampling Distributions

Standard Error

Standard Error and Z-score Hypothesis Testing