Excel Program: Shifting Hypotheses\(^i\) (basic instructions)

The curves in the Excel example depict the hypotheses in test \( T^+ \), the one-sided Normal test of

\[ H_0: \mu \leq \mu_0: \text{(blue curve)} \text{ against } H_1: \mu > \mu_0: \text{(red curve)}. \]

**Null (or test) hypothesis** \( H_0: \bar{X} \) is Normal \((\mu, \sigma / \sqrt{n})\), \( \mu \leq \mu_0. \)

**Alternative** \( H_1: \bar{X} \) is Normal \((\mu, \sigma / \sqrt{n})\), \( \mu > \mu_0. \)

A specific example for which this was designed is \( H_0: \mu \leq 12 \) (blue curve) against \( H_1: \mu > 12: \) (red curve), but it can be changed.

The computations and areas under curves can be used for different purposes (severity and confidence intervals a shown below the curves). Here I just give the standard computations.

To change an entry, click on the relevant box, write in the change, and then click someplace else outside the box until it works.

**Turquoise box**
In the turquoise box, you can set the population SD, \( \sigma \), which we imagine is known and fixed under the null and alternative. Below that, sample size \( n \).

**Grey box**
You can change the sample mean \( \bar{X} \).
The grey box also shows the corresponding \( p \) value.

**Orange box**
In the orange box you can set different point values for \( \mu_1 \) under the alternative hypothesis \( H_1 \).

**Green box:** shows power

Note how the curves and shaded areas change.

\(^i\) The program was made by Geoffrey Cummings in relation to a presentation by D. Mayo and A. Spanos, as part of our workshop one afternoon at the National Center for Ecological Analysis and Synthesis over a decade ago. I'd like to update it: ideas?