Lecture 32, Mar 31, 2023

Hypothesis Testing Continued

- Continuing the example from the last lecture:
    - To find β, i.e. the chance of concluding $\mu \in [990, 1010]$ when this is not the case, we first have to assume some value of μ outside this interval; this becomes somewhat arbitrary
        * Unlike in the case of α where we have a single set value of μ, now μ can be in a range and the choice of μ will affect the result
    - Assume $\mu = 1020$ then $z_U = \dfrac{1010 - 1020}{10} = -1, z_L = \dfrac{990 - 1020}{10} = -3$
    - $\beta = P(-3 \leq Z \leq -1) = \Phi(-1) - \Phi(-3) \approx 0.15$
    - To decrease β, we can again increase n, move our assumption of μ, or shrinking the interval
    - There is a fundamental tradeoff between α and β – changing the interval will decrease one but increase the other
    - Again, the choice of assumption of μ is very ad-hoc, but the important thing is consistency; do many tests with the same critical region and assumption of μ, then the results can be compared