Outline

Setting: a population, a single variable, and an unknown parameter (for now, \(\mu\))
Assumptions: population normally distributed, sample a SRS

1. Steps in hypothesis testing:
   
   (a) Null hypothesis: \(H_0: \mu = \mu_0\)
   
   (b) Alternate hypothesis: \(H_a: \mu \neq \mu_0\) (or a one-sided hypothesis)
   
   (c) Test statistic

   \[
   t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}
   \]

   If the null hypothesis is true, \(t\) has a \(t\)-distribution with \(n - 1\) degrees of freedom.

   (d) \(P\)-value
   
   (e) Conclusion

2. Conclusions: the notion of statistical significance