Math 155: Choosing a Hypothesis Test

Choose your column according to the study design. Then use the "highest" test possible in that column. Tests at the top of a column have the most conditions that must be satisfied so have high "power" (high ability to correctly reject a false null hypothesis). As you move down a column, the tests become more and more likely to commit a Type II error (are more likely to fail to reject a false null hypothesis).

One Sample Tests

z-Test

- σ known
- n large or population normal

t-Test

- σ unknown
- n large or population normal

Wilcoxon Signed Rank Test (Minitab: 1 Sample Wilcoxon)

- σ not needed
- Evidence of a symmetric population (but not necessarily normal)

Sign Test

- σ not needed
- No requirement on shape of population

Matched Pairs Design

(Test run on the paired differences)

Paired z-test

- σ_d known
- n_d large or population of differences normal

paired t-test

- σ_d unknown
- n_d large or population of differences normal

Paired Wilcoxon Signed Rank Test (Minitab: Run 1 sample Wilcoxon on paired differences)

- σ not needed
- population of differences only needs to be symmetric

Paired Sign Test (Minitab: Run 1 sample Sign on Paired differences

- σ not needed
- No requirement on shape of population of differences

Two Independent Samples

Independent Samples z-test

- σ_1 and σ_2 known
- n_1 and n_2 large or both populations normal

Independent Samples t-test (Minitab: 2-sample t)

- σ_1 and σ_2 unknown
- n_1 and n_2 large or both populations normal

Mann-Whitney (or Wilcoxon Rank Sum Test)

- σ_1 and σ_2 not needed
- Populations should have similar shapes and variances (but need not be normal)