Review of Parts V & VI

Math 2200

What we have learned

- Central Limit Theorem
- Confidence interval
  - Critical value
  - Margin of error = critical value * standard error
- Hypothesis testing
  - Null versus alternative (one-sided / two-sided)
  - Type I & Type II error
  - Significance level & Power
  - P-value
- One-proportion z-interval (test)
- Two-proportion z-interval (test)
- One-sample t-interval (test)
- Two-sample t-interval (test) (pool or not?)
- Paired t-interval (test)
- Chi-squared test (GOF or Independence/Homogeneity)

Sampling distribution

- Property of normal distribution
  - Let X1,X2,…Xn be a random sample from a normal distribution.
    - Distribution of the sample mean: t distribution
    - The probability that the sample mean > c: tcdf

Confidence interval

- The critical value: invNorm, invT
- The standard error
- The relationship among sample size, margin of error, and confidence level
- Interpretation of the confidence interval

Hypothesis testing

- Type I & Type II errors
  - The relation between Type I and Type II
  - The relation to sample size
- The significance level & the power
- Interpret the p-value
- Find the p-value

How to find p-value?

- One-sided versus two-sided
- TI-83
  - DISTR (2ND+VARS)
  - 2: NORMALCDF(left,right,mean,stddev)
  - 5: TCDF(left,right,df)
  - 7: χ^2CDF(left,right,df)

Conditions

- Independence (except for paired methods)
- Randomization
- 10% condition
- for one/two sample t-type methods
  - Nearly Normal
- For one/two proportion z-type methods
  - Sample size condition
  - Success failure condition
- For goodness-of-fit test
  - Expected cell frequency condition

How to use TI-83?

- STAT > TESTS
  - 2: One-sample t-test
  - 4: Two-sample t-test
  - 5: One-proportion z-test
  - 6: Two-proportion z-test
  - 8: One-sample t-interval
  - 0: Two-sample t-interval
  - A: One-proportion z-interval
  - B: Two-proportion z-interval
  - C: χ^2-test

Options in TI-83

- Input:
  - Data or Stats
- Alternative hypothesis
  - Two-sided or one-sided (left tail or right tail)
- Equal variances assumption
  - Pooled: Yes or No

Sample size

- For a given margin of error, find the sample size