

**HT's and CI's for Independent Means**

**CREDIT:** The questions on this document were written by Erik Packard, PhD, Associate Professor of Mathematics at Colorado Mesa University.

- Problem 4
  - Can we prove that Corn A has a higher yield on average than Corn B? Assume acres were divided up randomly between the corn types and use a significance level of 10%.

	Corn A	Corn B
Sample Size	41	123
Sample Mean Yield (Bushels per Acre)	531	521
Sample Standard Deviation	55	44

- A) What is the chance that we will conclude Corn A has a higher yield on average when it doesn't?
- B) What is the chance that we won't conclude Corn A has a higher yield on average when it actually does?
- C) Give the critical values(s) (from the appropriate table).
- D) Give the value of the test statistic (from the data).
- E) Is the answer Yes or No?
- F) What is the  $p$ -value?
- G) Describe the meaning of the  $p$ -value in everyday terms.
- H) Give a 95% CI for the mean difference (Corn A – Corn B) for the population.

- Problem 9

- Can we prove that the “Both-Eye” method is any different than the “Left-Eye” method for the mean shooting accuracy of beginning shooters? Assume beginning shooters were divided up randomly and the populations of shooting scores are Normal. Use a significance level of 1%.

	Both Eye	Left Eye
Shooting accuracy scores after training	18, 16, 18, 13, 22, 23	12, 19, 18, 15

- A) What is the chance that we won’t conclude a difference when there actually is?
- B) What is the chance that we will conclude a difference by mistake?
- C) Give the critical values(s) (from the appropriate table).
- D) Give the value of the test statistic (from the data).
- E) Is the answer Yes or No?
- F) What is the  $p$ -value?
- G) Describe the meaning of the  $p$ -value in everyday terms.
- H) Give a 95% CI for the mean difference (Both Eye – Left Eye) for the populations.