Inference using the t distribution
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Example 0.1. You are a brewer at Guinness breweries. You've invented a new brewing technique that you hypothesize will reduce the bitterness of Guinness beer. You know the mean bitterness of the current brewing technique. You've also brewed 10 batches with your new technique and measured their bitterness.

Techniques:
Confidence interval for a sample mean,
1 sided 1-sample t-test

H_0 :

H_A :

What is being compared?

Assumptions:

Example 0.2. In 1990, researchers reported the results of a study that examined pairs of monozygotic twins, where one of the twins was schizophrenic and the other was not. They hypothesized that there were structural differences between the brains of the schizophrenic and the normal populations. They took a head MRI of each subject and measured the differences in volume of the left hippocampus between twins.

Technique:
2 sided paired 2 sample t-test

H_0 :

H_A :

What is being compared?

Assumptions:

Example 0.3. In the late 1900's, biologists Peter and Rosemary Grant studied finches on one of the Galapagos islands in search of evidence supporting Darwin's theory of natural selection. In 1977 there was a severe drought on the island that caused vegetation to whither. The only remaining food source for the finches was a large tough seed that the finches usually didn't eat. The Grants hypothesized that the drought had selected for large beak depth in the finch population. They measured the beak depth of the entire finch population before the drought in 1976, and after the drought in 1978.

Technique:
1 sided unpaired 2-sample t-test

H_0 :

H_A :

What is being compared?

Assumptions: