Chapter 10 FRAPPY!  
Sample #1

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

Will using name-brand microwave popcorn result in a greater percentage of popped kernels than using store-brand microwave popcorn? To find out, Briana and Maggie randomly selected 10 bags of name-brand microwave popcorn and 10 bags of store-brand microwave popcorn. The chosen bags were arranged in a random order. Then each bag was popped for 3.5 minutes, and the percentage of popped kernels was calculated. The results are displayed in the following table.

<table>
<thead>
<tr>
<th>Name-brand</th>
<th>95</th>
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<th>81</th>
<th>90</th>
<th>97</th>
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Do the data provide convincing evidence that using name-brand microwave popcorn will result in a greater mean percentage of popped kernels?

\[ H_0: \mu_N = \mu_S \quad \text{Ha: } \mu_N > \mu_S \]

\[ \alpha = 0.05 \]

where \( \mu_N \) is the true mean \( \% \) of popped name-brand kernels and \( \mu_S \) is the true mean \( \% \) of popped store-brand kernels.

Random? Two independent random samples \( \checkmark \)

10 \( \% \)? 10 \( \% \) of name brand bags of popcorn \( \checkmark \)
10 \( \% \) of store brand bags of popcorn

Normal? \( \checkmark \)

Neither has outliers or strong skewness. OK to believe populations are approx Normal \( \checkmark \)

\[ t = 2.43 \quad \text{df} = 17.93 \quad P = 0.013 \]

Because \( p\text{-value} = 0.013 < \alpha = 0.05 \), I reject \( H_0 \).

There is convincing evidence that the true mean \( \% \) of popped kernels is higher for the name brand.

There is only a 0.013 probability of getting results like these.
Chapter 10 FRAPPY!

Sample #2

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

Will using name-brand microwave popcorn result in a greater percentage of popped kernels than using store-brand microwave popcorn? To find out, Briana and Maggie randomly selected 10 bags of name-brand microwave popcorn and 10 bags of store-brand microwave popcorn. The chosen bags were arranged in a random order. Then each bag was popped for 3.5 minutes, and the percentage of popped kernels was calculated. The results are displayed in the following table.

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Do the data provide convincing evidence that using name-brand microwave popcorn will result in a greater mean percentage of popped kernels?

State: $H_0: \mu_N - \mu_S = 0$

$\mu_N =$ name brand

$\mu_S =$ store brand

Ha: $\mu_N - \mu_S > 0$

Plan: a sample t test

Random? $\checkmark$ given Normal? $\checkmark$

Both distributions are approximately normal.

Do:

$$t = \frac{\bar{x}_1 - \bar{x}_2} {\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} = \frac{(89.9 - 84.5) - 0} {\sqrt{\frac{5.13^2}{10} + \frac{4.81^2}{10}}} = 2.43$$

$df = 10 - 1 = 9$

$.01 < p-value < .02$

Conclude: Reject Ho. The mean percentage for name-brand is higher than the mean percentage for store brand.