STAT 120 HW 6

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Section 6.2-D

6.75

n = 30: 4.56

n = 200: 1.77

n = 1000: 0.79

As the size of n increases, the standard error decreases. Since the standard error decreases, the accuracy increases

6.78

Yes, it is appropriate. The degrees of freedom would be 75 - 1 = 74; The standard errr would be approximately 1.1662

6.79

Not appropriate

Section 6.2-CI

6.86

$\mu = \overline{x} = 88.3$

Margin of Error = 14.8

Confidence Interval: 73.2, 102.8

6.90

n = 417

6.91

1.856 to 2.944

Section 6.2-HT

6.123

Yes, t = -3.67, p-value= 0.0018

6.124

a.

$H_0 : \mu = 12.5; H_a : \mu < 12.5$

Test Statistic: -11.608

Degrees of Freedom: 10

P-value ≈ 0

Since p-value is so low, we can reject the null hypothesis and support that the footballs had less than 12.5 psi.

b.

Yes, its fair

Section 6.3-D

6.132

a.

SE = 0.0310

b.

It is large enough for Central limit Theorem

Section 6.3-CI

6.145

0.301 to 0.335. No, it is not plausible that there is a difference

6.148

-0.3049, -0.0151

Section 6.3-HT

6.160 (write out the 5 steps for hypotheses tests for part b)

a.

$\hat{p}_1 = 0.2157$

$\hat{p}_2 = 0.174$

$p = 0.1983$

b.

$H_0 : p_1 = p_2; H_a : p_1 \neq p_2$

$\hat{p}_1 = 0.2157$

$\hat{p}_2 = 0.174$

$p = 0.1983$

$z = 1.7866$

Less than 1.96; Can not reject the H_0; No significant evidence for difference

6.172 (write out the 5 steps)

$H_0 : p_1 \geq p_2; H_a : p_1 < p_2$

Sample Proportion: $p_1 = 0.0333; p_2 = 0.3; p_1 - p_2 = -0.267$

$z = -2.77$

p-value = 0.003

Reject H_0. We can conclude that green tea reduces the risk of cancer

6.4-CI

6.196

0.50 to 0.70; We are 90% confident that difference lies between the values 0.50 and 0.70

6.206

a.

Males watch more tv by 2.383 hrs a week

b.

-3.83, -0.93

c.

They are the approximately the same

d.

We are 99% sure that the difference lies between -3.83 and -.93

6.4-HT

6.214

a.

$H_0 : \mu_1 = \mu_2; H_a : \mu_1 > \mu_2$

b.

$\mu = 9.9 - 7.5 = 2.4$

c.

t-statistics: 1.744

d.

p-value = 0.045

e.

Since we have a smaller p-value, we can reject the null hypothesis

f.

We have evidence that supports the fact that statistical inference is intuitive for babies

6.219 (write out the 5 steps for hypothesis tests. Include the sample means and sample standard deviations, as well as the t-statistic in step 2. To determine the means and standard deviations, you can either load the dataset, or just type the numbers into a list using c(...))

$H_0 : \mu_1 = \mu_2; H_a : \mu_1 < \mu_2$

Sample Means: 231.7, 438.7

Sample SDs: 71.2, 37.7

t-statistic: -6.80

p-value ≈ 0

Since we have such a low p-value, we can reject the null hypothesis. Thus, we can conclude that mice who experience exercise are less stressed then those who do not.