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MA331

I pledge my honor that I have abided by the Stevens Honor System.

Homework 4

7.71

a) These distributions, while looking kind of abnormal, are not skewed and do not have any glaring outliers.

b) Neutral: Sample size: 14, Mean: 0.571, Standard deviation: 0.73005

Sad: Sample Size: 17, Mean: 2.118, Standard Deviation: 1.2441

c) $H_0: \mu_N = \mu_S \quad H_A: \mu_N < \mu_S$

d) t = -4.303; P < 0.0005 (degrees of freedom = 13)

e) [-2.3225, -0.7699] (degrees of freedom = 13)

7.89

a) Tests: $H_0: \mu_B = \mu_F$ vs $H_A: \mu_B > \mu_F$

t = 1.654, P = 0.058

P > 0.05; we fail to reject the null hypothesis.

b) [-0.2, 2]

c) We are assuming both μ_B and μ_F are Simple Random Samples (SRSs) from Normal populations; if this is not true, *t* testing isn't a good method of testing.

7.102

a) F-distribution Test Statistic: $Stdev_{(big)}/Stdev_{(small)} = 9.1/3.5 = 2.6$

b) F = 2.84501653 from F-distribution table with alpha = 0.05

c) P for (df1 = 15, df2 = 10, f = 2.84501653) is 0.05000036 which is > 0.05, so we fail to reject the null hypothesis and cannot assume the two population standard deviations are equal.

7.122

a) Group 1: Sample Mean = 49.692, Variance = 2.317

Group 2: Sample Mean = 51.545, Variance = 3.163

2-Sample T test:

T = -1.49

Df = 18

P = 0.153

We fail to reject the null hypothesis.

b)

Mean = 50.1185

Variance = 2.119

Df = 19

T = -1.729

P = .100024

We fail to reject the null hypothesis.

c) When combined we get a lower p value and higher T value, though both times we fail to reject the null hypothesis.

8.71

a) Female proportion = 48/60 = 0.8, Standard Error: 0.0516

Male proportion = 52/132 = 0.3939, Standard Error: 0.0425

b) [0.296, 0.516]

c) z = 5.220477, p = 0.0000001788

With p almost = 0, we can confidently reject the null hypothesis and accept the alternate hypothesis, saying that the two proportions are equal.