Charles Hwang – CJC 206

Pages 181-182 – Hypothesis Test Based on a Single Sample $\bar{x}$ With σ Known

1.

a. $H_0: \mu = 6.88$ $\alpha = .05$

b. $\sigma_{\bar{x}} = \dfrac{\sigma}{\sqrt{n}} = \dfrac{1.19}{\sqrt{15}} \approx \dfrac{1.19}{3.873} \approx \underline{0.31}$

$Z = \dfrac{\bar{x} - \mu}{\sigma_{\bar{x}}} = \dfrac{8.130 - 6.880}{\underline{0.31}} = \dfrac{1.25}{0.31} \approx 4.03;$ $|4.03| > 1.96$

c. We reject H_0 at the $\alpha = .05$ level.

2.

a. $H_0: \mu = 72.55$ $\alpha = .05$

b. $\sigma_{\bar{x}} = \dfrac{\sigma}{\sqrt{n}} = \dfrac{12.62}{\sqrt{25}} = \dfrac{12.62}{5} = \underline{2.524}$

$Z = \dfrac{\bar{x} - \mu}{\sigma_{\bar{x}}} = \dfrac{79.53 - 72.55}{\underline{2.52}} = \dfrac{6.98}{2.52} \approx 2.77;$ $|2.77| > 1.96$

c. We reject H_0 at the $\alpha = .05$ level.

3.

a. $H_0: \mu = 61$ $\alpha = .05$

b. $\sigma_{\bar{x}} = \dfrac{\sigma}{\sqrt{n}} = \dfrac{12}{\sqrt{50}} \approx \dfrac{12}{7.07} \approx \underline{1.70}$

$Z = \dfrac{\bar{x} - \mu}{\sigma_{\bar{x}}} = \dfrac{56.00 - 61.00}{\underline{1.70}} = \dfrac{-5}{1.70} \approx -2.94;$ $|-2.94| > 1.96$

c. We reject H_0 at the $\alpha = .05$ level.

Pages 183-184 – Hypothesis Test Based on a Single Sample Mean With σ Unknown

1.

a. $H_0: \mu = 8.45$ $\alpha = .05$

b. $s_{\bar{X}} = \frac{s}{\sqrt{n}} = \frac{2.56}{\sqrt{30}} \approx \frac{2.56}{5.48} \approx \underline{0.47}$

$t = \frac{\bar{X} - \mu}{s_{\bar{X}}} = \frac{6.790 - 8.450}{\underline{0.47}} = \frac{-1.66}{0.47} \approx -3.53;$ $|-3.53| > 2.045$

c. 2.045

d. We reject H_0 at the $\alpha = .05$ level.

5.

a. $H_0: \mu = 12.16$ $\alpha = .05$

b. $s_{\bar{X}} = \frac{s}{\sqrt{n}} = \frac{3.11}{\sqrt{25}} = \frac{3.11}{5} = \underline{0.622}$

$t = \frac{\bar{X} - \mu}{s_{\bar{X}}} = \frac{11.24 - 12.16}{\underline{0.62}} = \frac{-0.92}{0.62} \approx -1.48;$ $|-1.48| < 2.064$

c. 2.064

d. We fail to reject H_0 at the $\alpha = .05$ level.

6.

a. $H_0: \mu = 12.56$ $\alpha = .05$

b. $s_{\bar{X}} = \frac{s}{\sqrt{n}} = \frac{3.88}{\sqrt{30}} \approx \frac{3.88}{5.48} \approx \underline{0.71}$

$t = \frac{\bar{X} - \mu}{s_{\bar{X}}} = \frac{11.21 - 12.56}{\underline{0.71}} = \frac{-1.35}{0.71} \approx -1.90;$ $|-1.90| < 2.045$

c. 2.045

d. We fail to reject H_0 at the $\alpha = .05$ level.