Chap. 9 Test Review

Note Title 3/29/2016

1)

	Surgery	Splinting
Success	$x_1 = 67$	$x_2 = 60$
Total	$n_1 = 73$	$n_2 = 83$

Req. Ck.

Simple Random Sample

indept.

$67,\ 60,\ 6,\ 23 \geq 5$

$H_0: p_1 = p_2, \quad H_1: p_1 > p_2$

$$\bar{p} = \frac{67 + 60}{73 + 83} = \frac{127}{156} = 0.8141$$

$\hat{p}$ from 2-Prop Z Test

$\alpha = 0.01$

2 - Prop Z Test

$$z = \frac{\hat{p}_1 - \hat{p}_2 - (p_1 - p_2)}{\sqrt{\bar{p}\bar{q}\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} = 3.1226$$

p-Value $= 0.0008965 < 0.01$

Reject H_0

There is sufficient evidence to support the claim that treatment with open carpal tunnel release surgery result in better outcome than wrist splinting.

2) Req. ck.

190, 186 > 30, simple random sample indept.

$H_0: \mu_1 = \mu_2$, $H_1: \mu_1 < \mu_2$

$\alpha = 0.05$

2-SampTTest

$$t = \frac{\bar{x}_1 - \bar{x}_2 - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} = -2.9084$$

P-Value $= 0.001925 < 0.05$

Reject H_0

There is sufficient evidence to support the claim that the prenatal cocaine exposure is associated with lower scores of 4-yr-old children on the test of object assembly.

3) Req. Ck.

Normal Distribution

2 paired dependent population

$H_0: \mu_1 = \mu_2 \qquad H_1: \mu_1 \neq \mu_2$

$\Downarrow$

$H_0: \mu_d = 0, \qquad H_1: \mu_d \neq 0$

$\alpha = 0.05$

T-Test

$$t = \sqrt{n}\,\frac{\bar{d} - \mu_d}{s_d} = 1.5319,$$

P-Value = 0.1565 > 0.05

Fail to reject H_0

There is sufficient evidence to support the claim that there is no different between the yields from the two types of seed.

4) Req. ck.

Normal Distribution, 2 indept. populations

$H_0: \sigma_1^2 = \sigma_2^2$, $H_1: \sigma_1^2 \neq \sigma_2^2$

$\alpha = 0.05$

$$F = \frac{S_1^2}{S_2^2} = \frac{0.03910^2}{0.01648^2} = 5.6291$$ 2-SampF Test

P-Value $= 0.000001293 < 0.05$

Reject H_0

There is sufficient evidence to reject the claim that pre-1983 and post-1983 pennies have the same amount of variation in weight.

5)

	Blind Eval.	Non-Blind
Accept	26.7% 3525	29% 3896
Total	13200	13433

$13200\,(26.7\%) = 3524.4 \rightarrow 3525$

$13433\,(29\%) = 3895.57 \rightarrow 3896$

$x_1 = 3525, \quad n_1 = 13200$

$x_2 = 3896, \quad n_2 = 13433$

Req. ck:

2 indept populations

all success # and failure # are ≥ 5

simple random samples.

$H_0: \quad p_1 = p_2, \qquad H_1: \quad p_1 \neq p_2$

$\alpha = 0.01$

2 - Prop z Test

$$z = \frac{\hat{p}_1 - \hat{p}_2 - (p_1 - p_2)}{\sqrt{\bar{p}\bar{q}\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} = -4.1835$$

$P\text{-Value} = 0.00002872 < 0.01$

Reject H_0

There is sufficient evidence to reject the claim that the acceptance rate is the same with or without blinding.

6) Req. Ck.

Normal Distribution

2 indep. populations

Simple Random Sample

$H_0: \mu_1 = \mu_2$, $H_1: \mu_1 > \mu_2$

$\alpha = 0.02$

2 - SampTTest

$$t = \frac{\bar{x}_1 - \bar{x}_2 - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} = 5.5294$$

P-Value $= 0.000001518 < 0.02$

Reject H_0

There is sufficient evidence to support the claim that "Harry Potter" is easier to read than "War and Peace".

7) Req. ck:

2 dependent paired population

Difference data is approximately normal

(only 1 outlier)

$H_0: \mu_d = 0, \quad H_1: \mu_d < 0$

$\alpha = 0.01$

T-Test

$$t = \sqrt{n}\,\frac{\bar{d} - \mu_d}{s_d} = -3.1560$$

p-Value $= 0.006738 < 0.01$

Reject H_0

There is sufficient evidence to support the claim that diet is effective in losing weight.

8) Req. Ck:

Normal Distribution

2 indept. popnlations

simple random samples

$H_0: \sigma_1 = \sigma_2$ $\quad$ $H_1: \sigma_1 \neq \sigma_2$

$\alpha = 0.05$

taking $s_1 = 4.5$, $\quad s_2 = 3.6$

$n_1 = 65$, $\quad n_2 = 64$

2-SampFTest

$$F = \frac{s_1^2}{s_2^2} = \frac{4.5^2}{3.6^2} = 1.5625$$

P-Value = 0.07804 > 0.05

Fail to reject H_0

There is sufficient evidence to support the claim that the standard deviation of heavy marijuana users and that of light users is about the same.