week9 課業作業

(1) $H_0 = p_1 - p_2 \le 0$

$H_1 = p_1 - p_2 > 0$

(2) $\alpha = 0.05$

$n_1 = 200$, $x = 108$

$n_2 = 150$, $y = 78$

$\hat{p}_1 = 0.54$, $\hat{p}_2 = 0.52$

$$\bar{p} = \frac{x+y}{n_1+n_2} = \frac{108+78}{200+150}$$

$$= 0.531$$

→ 接受 H_0

9

Week 10 課堂作業

(1) $H_0 = \dfrac{\sigma_1^2}{\sigma_2^2} = 1$

$H_1 = \dfrac{\sigma_1}{\sigma_2} \neq 0$

(2) $\alpha = 0.1$

(3) $C = \begin{cases} F < F_{0.95}(9,7) \\ F > F_{0.05}(9,7) \end{cases}$

$\begin{cases} F < \dfrac{1}{3.29} = 0.304 \\ F > 3.68 \end{cases}$

(4) $F = \dfrac{0.653^2}{0.627^2} = \dfrac{0.426409}{0.393129} \fallingdotseq 1.08.$

Week 11 課堂作業

7-3 $H_0 = \mu = 30$

$H_1 \neq \mu \neq 30$

$\alpha = 0.05$

棄合域 C

$= \{ |Z| > Z_{0.025} \}$

$= \{ |Z| > 1.96 \}$

$$Z = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}} = \frac{30.563 - 30}{\frac{2.354}{\sqrt{64}}} = 1.913$$

7-4

P值 $= 2P(Z > 1.913)$

$\fallingdotseq 2P(Z > 1.91)$

$= 2 \times 0.0281$

$= 0.0562 > \alpha$

→ 接受 H_0.

7-5

$H_0 = \mu \leq 55$

$H_1 = \mu > 55$

$\alpha = 0.05$

$\bar{x} = 59.3125$

① $$T = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$$

$$= \frac{59.312 - 55}{\frac{13.189}{\sqrt{16}}} = 1.308$$

棄合域 C

$= \{ T > t_{0.05}(16-1) \}$ → 接受 H_0

$= \{ T > 1.753 \}$

Week12

$\bar{Y}_A = 34.75$

$\bar{Y}_B = 41$

$\bar{Y}_C = 34.33$

A	B	C
$Y_{11} = 40$	$Y_{21} = 38$	$Y_{31} = 32$
$Y_{12} = 42$	$Y_{22} = 41$	$Y_{32} = 34$
$Y_{13} = 27$	$Y_{23} = 45$	$Y_{33} = 28$
$Y_{14} = 30$	$Y_{24} = 37$	$Y_{34} = 42$
	$Y_{25} = 44$	$Y_{35} = 34$
		$Y_{36} = 36$

→ B課程有較好效果

平均數較大，變異數較小。

A107270053 黃湞喬

$$E(\hat{\theta}_1) = E\left(\frac{\Sigma(x_i - \bar{x})^2}{n}\right)$$

$$= \frac{1}{n}\Sigma(\Sigma x_i^2 - n\bar{x}^2)$$

$$= \frac{1}{n}(n\sigma^2 + \cancel{n\mu^2} - \sigma^2 - \cancel{n\mu^2}) = \frac{n-1}{n}\sigma^2 \rightarrow \text{偏誤估計量}$$

$$E(\hat{\theta}_2) = \Sigma\left(\frac{\Sigma(x_i - \bar{x})^2}{n-1}\right) = \frac{1}{n-1}E(\Sigma x_i^2 - n\bar{x}^2)$$

$$= \frac{1}{n-1}(n\sigma^2 + \cancel{n\mu^2} - \sigma^2 - \cancel{n\mu^2}) = \sigma^2$$

$\rightarrow$ 不偏估計量