長庚大學期中、期末考試答案用紙

_____學年度 第___學期___考 __乂 1__ 系 姓名 __張陽予__ 學號 __B0729022__

1.

(a)
```
import numpy as np
import scipy.stats as st
import pandas as pd
st.norm.sf(73, loc=70, scale=8/5)
=> 0.03303
```

$H_0: \mu \leq 70$
$H_1: \mu > 70$

$Z = \frac{73-70}{8/\sqrt{25}} = 1.875$

$P("\bar{x} \geq 73" / M = 70) = 0.03096 < 0.6$

贊同 H_1 的證據比 5% 顯著水平強，
不推翻 #

(b) $S = 9$

$Z = \frac{71.8-70}{9/\sqrt{25}} = \frac{1.8}{\frac{9}{5}} = 1.667$

$P = (P > 1) = 0.0478$ $p > \alpha$ 接受   不推翻 #

比 5% 的顯著水平所驗示的弱

2. (a) $E(\hat{p}) = E(\frac{x}{n}) = \frac{1}{n} E(x) = \frac{1}{n} \cdot n \cdot p = p$ #

(b) $Var(\hat{p}) = Var(\frac{x}{n}) = \frac{1}{n^2} Var(x) = \frac{1}{n^2} \cdot npq$

$\sqrt{\frac{pq}{n}} = std(\hat{p})$ #

(c) $0.6 - 1.96 \left(\frac{\sqrt{0.6 \cdot 0.4}}{\sqrt{100}}\right) < \mu < 0.6 + 1.96 \cdot \left(\frac{\sqrt{0.6 \cdot 0.4}}{\sqrt{100}}\right)$ $[50.4\%, 69.6\%]$ #

$= 50.4\% < \mu < 69.6\%$

(d) 60% : C值為 1.64 抽樣誤差為 8.06 $[51.9\%, 68.1\%]$ #

$0.6 - 1.645 \sqrt{\frac{0.6 \cdot 0.4}{100}} < \mu < 0.6 + 1.645 \sqrt{\frac{0.6 \cdot 0.4}{100}}$

3. (a) $0.10087 > 5 0.4$

(b)

(c)

(d) 拒絕虛至 H_0