

(١) مُنْهَج

$$\bar{X} = \frac{5+7+8+10}{4} = \frac{30}{4} = 7,5$$

$$S^2 = \frac{1}{n-1} \sum (x - \bar{x})^2 = \frac{1}{3} (2,5^2 + 0,5^2 + 0,5^2 + 2,5^2) = \frac{13}{3}$$

$$\frac{\bar{X} - \mu}{\frac{s}{\sqrt{n}}} \sim T_{n-1} \Rightarrow \frac{7,5 - \mu}{\sqrt{\frac{13}{12}}} \sim T_{n-1}$$

الافتراض: $H_0: \mu = \mu_0$ \rightarrow مُنْهَج

$H_1: \mu \neq \mu_0$

$$1 - \alpha = 0,95 \Rightarrow \frac{\alpha}{2} = 0,025$$

$$\left| \frac{7,5 - \mu}{\sqrt{\frac{13}{12}}} \right| \leq t_{\frac{\alpha}{2}, n-1} = t_{0,025, 3} = 3,182$$

$$\Rightarrow P(-3,182 \leq \frac{7,5 - \mu}{\sqrt{\frac{13}{12}}} \leq 3,182) \geq 95\% \quad \textcircled{*}$$

$$P\left(-\sqrt{\frac{13}{12}}(3,182) - 7,5 \leq -\mu \leq \sqrt{\frac{13}{12}}(3,182) - 7,5\right) \geq 95\%$$

$$P(-4,18807 \leq \mu \leq 10,8119) \geq 95\%.$$

(ب)

$$\frac{7,5 - 4}{\sqrt{\frac{13}{12}}} \approx 3,362 > 3,182 \Rightarrow \text{مُنْهَج} \rightarrow H_0$$

- ٤ < ٤,٤١٨٨ \rightarrow مُنْهَج

(2)

نبار دیناب کردم

$$H_0: \theta = \frac{1}{2}$$

$$H_1: \theta \neq \frac{1}{2}$$

$$\frac{X - n\theta}{\sqrt{n\theta(1-\theta)}} \sim N(0,1)$$

$$n = 81$$

و

$$\frac{X - \frac{81}{2}}{\sqrt{\frac{81}{4}}} \sim N(0,1)$$

$$\text{اگر} \Rightarrow P\left(\left|\frac{X - \frac{81}{2}}{\frac{9}{2}}\right| \leq Z_{\alpha/2}\right) \geq 95\%. \quad (9 - 1,96) \frac{9}{2} \quad (9 + 1,96) \frac{9}{2}$$

$$\Rightarrow P\left(\left|\frac{2X - 9}{9}\right| \leq Z_{\alpha/2}\right) \geq 95\%. \rightarrow 31,68 \leq X \leq 49,32$$

$$* 0,5 = 2 - 2\phi(z) \Rightarrow z = \phi^{-1}(0,975) = 1,96 \Rightarrow$$

$$X = 27 \Rightarrow \left|\frac{2X - 9}{9}\right| = |6 - 9| = 3 \quad 3 > 1,96 \Rightarrow$$

من اینجا می خواهم

(.)

$$\frac{X - 8}{\sqrt{\frac{16}{4}}} = \frac{X - 8}{2}$$

$$\left|\frac{X - 8}{2}\right| \leq Z_{\alpha/2} = 1,96$$

$$\Rightarrow -1,96 \leq \frac{X - 8}{2} \leq 1,96 \Rightarrow -3,92 \leq X - 8 \leq 3,92$$

$$\Rightarrow 4,08 \leq X \leq 11,92$$

$$\stackrel{\text{آنچه}}{\Rightarrow} \boxed{5 \leq X \leq 11} \\ k_1 \quad \quad \quad k_2$$

$$(2-1) \times \frac{70}{100} + 1 = 3,8$$

ادعای اسد حادل سره بـ ۳۸ امت
الذ) X هـرات و X فیلانس امت.

$$H_0: \mu = 3,8$$

$$H_1: \mu < 3,8$$

سین میطمہ بی وا سر

$$\frac{\bar{X} - \mu}{\frac{s_p}{\sqrt{n}}} \sim T_{n-1}$$

$$\bar{x} = (180 + 200 + 900 + 1280 + 700) / 1000 = \frac{3226}{1000} = 3.226$$

$$S_D^2 = \frac{1}{999} \left(12 \cdot (1,22-1)^2 + 100(3,22+2)^2 + 300(3,22-3)^2 + 20(3,22-4)^2 + 140(3,22-5)^2 \right) = \frac{14916}{999}$$

$$Z = \frac{\bar{X} - \mu}{\frac{s_D}{\sqrt{n}}} = \frac{3,22 - 3,8}{\sqrt{\frac{14916}{999000}}} = -15,010$$

$$P(t \leq -15, 100) \approx 2,23 \times 10^{-46}$$

$$t \sim T_{999}$$

(C)

$$t = -1,64$$

o 105,999

$$-15,010 < -1,64 \Rightarrow \text{است راجح}$$

• رسالة H_0 رسالة

آنکه μ رسالة 70% رسالة $\omega *$

$$H_0: \mu \geq 3,5 \quad \rightarrow \text{رسالة} 3,5 > 70\%$$

$$H_1: \mu < 3,5$$

$$z = \frac{3,22 - 3,5}{\sqrt{\frac{1491,6}{999000}}} \approx -7,24$$

$$P(t \leq -7,24) \approx 4,47 \times 10^{-13}$$

فیصلہ (C)

$$-7,24 < -1,64 \Rightarrow \text{رسالة} H_0$$

$$H_0 \in \Theta = \left\{ \frac{1}{6} \geq j \geq \bar{j} \right\}$$

$H_1: \theta \neq \frac{1}{6}$. Using χ^2 ;/ 16

$$S = \sum_{i=0}^3 \frac{(A_i - E(A_i))^2}{E(A_i)} \sim \chi^2_3$$

$$A_3 f_2 f_1 A_0$$

لـ A_1 مـ i دـ 6 هـ 16 مـ 15 سـ 35 مـ 3 لـ A_0

$$E(A_o) : \left(\frac{5}{6}\right)^3 \times 100 = 57,87$$

$\overbrace{\quad\quad\quad}^{\approx 6}$

$$E(A_1) = 3 \left(\frac{1}{6}\right) \left(\frac{5}{6}\right)^2 \times 100 \approx 34.72$$

$$E(A_2) = 3 \left(\frac{5}{6}\right) \left(\frac{1}{6}\right)^2 \times 100 \approx 6,94$$

$$E(A_3) = 3 \left(\frac{1}{6}\right)^3 \times 100 = 0.46$$

$$S \simeq 25, 4 \sim \chi^2_3 \quad \text{P-value}$$

$$P(X \geq 25, 4) \approx 13 \times 10^{-6}$$

$$13 \times 10^{-6} \text{ لتر} = 13 \text{ مللي لتر}$$