

Corrección 1er control - 1ª Evaluación Matemáticas U.G. 2 09-10-18

1) leyenda

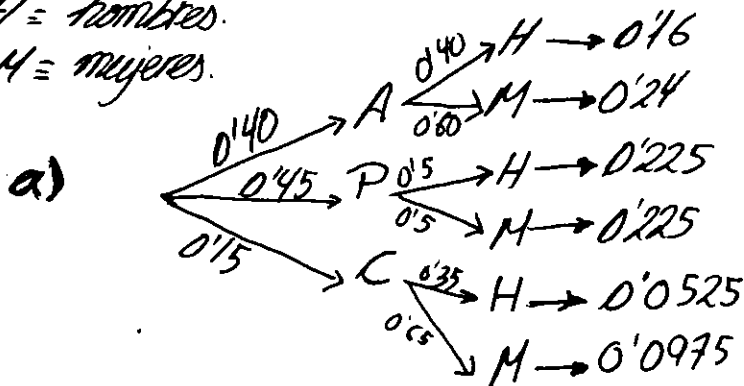
A = personas alérgicas a los animales.

P = personas alérgicas a las plantas.

C = personas alérgicas a algunas comidas.

H = hombres.

M = mujeres.



b)  $P(H) = P(A)P(H/A) + P(P)P(H/P) + P(C)P(H/C) = 0.16 + 0.225 + 0.0525 = 0.4375$

c)  $P(P|M) = \frac{P(P)P(H/P)}{P(H)} = \frac{0.225}{0.5625} = 0.4$

2)  $X \sim N(8, 2.5)$

a)  $P(5 \leq X \leq 10) = P\left(\frac{5-8}{2.5} \leq Z \leq \frac{10-8}{2.5}\right) = P(-1.2 \leq Z \leq 0.8) = P(Z \leq 0.8) + P(Z \leq -1.2) - 1 = 0.7881 + 0.8849 - 1 = 0.673$

b)  $n=4 \rightarrow \bar{X} \sim N\left(8, \frac{2.5}{4}\right) \rightarrow \bar{X} \sim N(8, 1.25)$

$P(\bar{X} > 11) = P\left(Z \geq \frac{11-8}{1.25}\right) = P(Z \geq 2.4) = 1 - P(Z \leq 2.4) = 1 - 0.9918 = 0.0082$

c)  $n=24$   
 $P(X > 8) = P\left(Z \geq \frac{8-8}{2.5}\right) = P(Z \geq 0) = 0.5$  }  $np = 24 \cdot 0.5 = 12 \text{ unidades}$

3)  $n=49$   
 $\bar{x}=2075$   
 $\sigma=250$

a)  $\alpha=0.01 \rightarrow Z_{\alpha/2}=2.575$

$$\left[ 2075 - 2.575 \frac{250}{\sqrt{49}}, 2075 + 2.575 \frac{250}{\sqrt{49}} \right]$$

$$\boxed{[1983.04, 2166.96]}$$

b)  $EMC=10 \quad n \geq \left( \frac{1.645 \cdot 250}{10} \right)^2 = 1692$

$$\boxed{n \geq 1692}$$

4)  $n=49$   
 $\alpha=0.01 \rightarrow Z_{\alpha/2}=2.575$

$[9, 11] \rightarrow \begin{cases} \bar{x} = \frac{11+9}{2} = 10 \text{ horas} \\ EMC = \frac{11-9}{2} = 1 \text{ hora} \end{cases}$

a) 10 horas.

b)  $\sigma = \frac{EMC \sqrt{n}}{Z_{\alpha/2}} = \frac{1 \cdot \sqrt{49}}{2.575} = 2.72$

$$\left[ 10 - 1.96 \frac{2.72}{\sqrt{49}}, 10 + 1.96 \frac{2.72}{\sqrt{49}} \right]$$

$\alpha=0.05 \rightarrow Z_{\alpha/2}=1.96$

$$\boxed{[9.24, 10.76]}$$

c)  $EMC=0.5 \rightarrow Z_{\alpha/2} = \frac{EMC \cdot \sqrt{n}}{\sigma} = \frac{0.5 \sqrt{49}}{2.72} = 1.29$

$1 - \frac{\alpha}{2} = 0.9015 \rightarrow Z_{1-\alpha/2} = 1.803 \rightarrow \alpha = 0.197 \rightarrow 1 - \alpha = 0.803$

Es decir un 80.3% de confianza.