3 de octubre de 2016.

VAR. ALEATORIA DISCRETA.

- Valor esperado ó media ó promedio
- Varianza y desviación estándar
- distribución binomial

RESTA DE DOS DADOS SIMULTANEA.

X	0	1	2	3	4	5
$P(x)$	$\frac{6}{21}$	$\frac{5}{21}$	$\frac{4}{21}$	$\frac{3}{21}$	$\frac{2}{21}$	$\frac{1}{21}$

$$E(x) = \sum_{i=1}^{6} x_i P(x_i)$$

Variable aleatoria discreta

$$E(x) = (0)\frac{6}{21} + (1)\frac{5}{21} + (2)\frac{4}{21} + (3)\frac{3}{21} + (4)\frac{2}{21} + (5)\frac{1}{21}$$

$$= \frac{5+8+9+8+5}{21} = \frac{35}{21} \Rightarrow 1.\underline{66}$$

X	0	1	2	3	4	5
$P(x)$	$\frac{6}{21}$	$\frac{5}{21}$	$\frac{4}{21}$	$\frac{3}{21}$	$\frac{2}{21}$	$\frac{1}{21}$

Varianza

$$\sigma^2(x) = \sum_{i=1}^{n} \left(x_i - E(x)\right)^2 P(x_i)$$

$$\sigma^2 = (0-1.66)^2\left(\frac{6}{21}\right) + (1-1.66)^2\left(\frac{5}{21}\right) + (2-1.66)^2\left(\frac{4}{21}\right) +$$

$$+ (3-1.66)^2\left(\frac{3}{21}\right) + (4-1.66)^2\left(\frac{2}{21}\right) + (5-1.66)^2\left(\frac{1}{21}\right).$$

$$\sigma^2 = \left(-\frac{35}{21}\right)^2\left(\frac{6}{21}\right) + \left(-\frac{14}{21}\right)^2\left(\frac{5}{21}\right) + \left(\frac{7}{21}\right)^2\left(\frac{4}{21}\right) + \left(\frac{28}{21}\right)^2\left(\frac{3}{21}\right) +$$

$$+ \left(\frac{49}{21}\right)^2\left(\frac{2}{21}\right) + \left(\frac{70}{21}\right)^2\left(\frac{1}{21}\right) =$$

$\sigma^2 = 0{,}77 + 0{,}10 + 0.021 + 0.25 + 0.51 + 0.52$

$\sigma^2 = 2{,}171$ $E(x) = 1.667$

Varianza Esperado ó media

desv. estandar $\Rightarrow$ $\sigma = \sqrt{\sigma^2}$

$\sigma = 1{,}473$ $8{,}838$ $1{,}66 - 8.838 \rightarrow$

$1{,}66 + 8{,}838 \rightarrow$

Calidad total fallos admisibles

$E(x) \pm 6\sigma$

$\Rightarrow$ VAD

$$E(x) = \sum_{i=1}^{n} x_i P(x_i)$$

$$V(x) \Rightarrow \sigma^2 = \sum_{i=1}^{n} \left(x_i - E(x)\right)^2 P(x_i)$$

$$\sigma = \sqrt{V(x)}$$

Distribución Probabilidades Binomial.

Respuestas = V o F "Bernoulli"

$p = P(V)$ $q = P(F)$

$\boxed{p = 1 - q}$

$R_X = \{0, 1, 2, \ldots, n\}$

$$Bin(k; n, p) = P(X = k) = C^n_k \, p^k q^{n-k}$$

$$C^n_k = \frac{n!}{k!(n-k)!}$$

$k = 0, 1, \ldots, n$

$P_1 = 0.25 \qquad q = 0.75 \qquad k = 0 \ldots 4$

n

$$P(k=1) = C_1^4 (0.25)^1 (0.75)^3$$

$$= \frac{4!}{1!(3!)} (0.25)(0.4218)$$

$$P(k=1) = 4(0.25)(0.4218) = 0.4218$$

$$P(k=2) = C_2^4 (0.25)^2 (0.75)^2 = \frac{4!}{2!2!} (0.065)(0.5625)$$

$$P(k=2) = 6(0.03515) = 0.2109$$

$$P(k=3) = C_3^4 (0.25)^3 (0.75)$$

$$= \frac{4!}{3!\,1!} (0.01562)(0.75)$$

$$= 4(0.0117) = (0.04687)$$

$$P(k=4) = C_4^4 (0.25)^4 (0.75)^0 =$$

$$= (0.25)^4 = 0.0039$$

$$P(k=0) = C_0^4 (0.25)^0 (0.75)^4 = 0.316$$

$$=$$