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Profesor: Materia:

Institución: Curso: Nota:

Se lanzan 2 dados juntos una sola vez

$EM = 6 \times 6 = 36$

$X = \{2, 12\}$

A) Función de probabilidad acumulativa (CDF)

$X = D_1 + D_2$ Valores posibles $= \{2, 3, 4, \ldots, 12\}$

$$f(x) = \begin{cases} 0, & 2 \leq X \leq 12 \end{cases}$$

2) $\frac{1}{36}$

$\frac{1}{36} + \frac{2}{36} = \frac{3}{36}$

3) $\frac{3}{36} + \frac{3}{36} = \frac{6}{36}$

4) $\frac{6}{36} + \frac{4}{36} = \frac{10}{36}$

5) $\frac{10}{36} + \frac{5}{36} = \frac{15}{36}$

6) $\frac{15}{36} + \frac{6}{36} = \frac{21}{36}$

7) $\frac{21}{36} + \frac{5}{36} = \frac{26}{36}$

8) $\frac{26}{36} + \frac{4}{36} = \frac{30}{36}$

9) $\frac{30}{36} + \frac{3}{36} = \frac{33}{36}$

10) $\frac{33}{36} + \frac{2}{36} = \frac{35}{36}$

11) $\frac{35}{36} + \frac{1}{36} = 1$

12)

B) función de probabilidad conjunta

$P(D_1 = x\ D_2 = y) = \frac{1}{36}$ $x = 1, \dots, 6$ $y = 1, \dots, 6$

$EM = 6 \times 6 = 36$ uniforme

$F_{D_1 D_2}(x,y) = \begin{cases} \frac{1}{36} & x = 1,2,3,4,5,6 \quad y = 1,2,3,4,5,6 \\ 0, & \text{en otro caso} \end{cases}$

C) Valor medio (esperanza) $E(X) = E(D_1 + D_2) = E(D_1) + E(D_2)$

Por cada dado:

$E(D_i) = \frac{1+2+3+4+5+6}{6} = 3.5$

Para los 2 dados ya que

$E(X+Y) = E(X) + E(Y)$

$E(D_1 + D_2) = 3.5 + 3.5 = 7$

2. $P(0 < x < 6)$ $F(x) = \begin{cases} Hx^2 & 0 < x < 6 \\ 0, & x \leq 0 \quad x \geq 6 \end{cases}$

$\int_0^6 H x^2 dx = H \int_0^6 x^2 = H\left(\frac{x^3}{3}\Big|_0^6\right) = H\left(\frac{6^3}{3} - \frac{0}{3}\right) = H\frac{6^3}{3} = 72H$

Acumulativa

$F(x) = \begin{cases} \frac{1}{72} x^2 & 0 \leq x \leq 6, \text{ si } x < 0 \ f(x) = 0 \\ 0 & x \leq 0, \ x \geq 6 \end{cases}$

$0 \leq x \leq 6$ entonces

$F(x) = \int_0^x \frac{1}{72} x^2 dx = \frac{1}{72} \frac{x^3}{3}\Big|_0^x = \frac{1}{72}\left(\frac{x^3}{3} - \frac{0^3}{3}\right) = \frac{x^3}{216}$

$x \geq 6$

$F(x) = \frac{1}{72}\left(\int_0^6 x^2\,dx + \int_6^\infty x^2\,dx\right) = \frac{1}{72}\left(\frac{6^3}{3} - \frac{0^3}{3}\right) = 1$

entonces:

$$F(x) = \begin{cases} 0 & x \leq 0 \\ \frac{x^3}{216} & 0 < x < 6 \\ 1 & x \geq 6 \end{cases}$$

Varian Ec

$E(X) = E(X^2) - [E(X)]^2 = 27,6 - (4,5)^2 = 27,6 - 20,25$

$E(X) = 7,35$