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Desarrollo taller 22

Estimación del valor $F(2,5)$

Grado 1, 2, 3

X	F(X)
0	2
1	1,2
2	3
3	5,1
4	5,9

G1
X_0
X_1

Fórmula $P_n(X) = \sum_{i=0}^{n-1} f(x_i) L_i(x)$

$L_i(X) = \prod_{\substack{j=0 \\ j \neq i}}^{n} \frac{X - X_j}{X_i - X_j}$

Datos

$n = 4$

$i = 0, 1, 2, 3$

$j = 0, 1, 2, 3$

Grado 1

$$F_1(X) = \frac{X - X_1}{X_0 - X_1} F(X_0) + \frac{X - X_0}{X_1 - X_0} F(X_1)$$

$$F_1(X) = \left(\frac{X - 3}{2 - 3}\right)(3) + \left(\frac{X - 2}{3 - 2}\right)(5,1)$$

$$F_1(X) = -3X + 9 + 5,1X - 10.2 \rightarrow F_1(X) = 2,1X - 1.2$$

Grado 2

$$f_2(x) = \frac{(x-3)(x-4)}{(2-3)(2-4)}(3) + \frac{(x-2)(x-4)}{(3-2)(3-4)}(5,1) +$$

$$\frac{(x-2)(x-3)}{(4-2)(4-3)}(5,9)$$

$$F_2(x) = -x^2 + 4x + 3x - 12 + (-5,1x^2) + 20,4x + 10,2x$$

$$-40,8 + 2,95x^2 - 8,85x - 5,9x + 17,7$$

$$F_2(x) = -0,65x^2 + 5,35x - 5,1$$

Grado 3

$$F_3(x) = \frac{(x-1)(x-2)(x-3)}{(0-1)(0-2)(0-3)}(2) + \frac{(x-0)(x-2)(x-3)}{(1-0)(1-2)(1-3)}(12)$$

$$+ \frac{(x-0)(x-1)(x-3)}{(2-0)(2-1)(2-3)}(3) + \frac{(x-0)(x-1)(x-2)}{(3-0)(3-1)(3-2)}(5,1)$$

$$F_3(x) = -1/3x^2 - 2x + 1/3x^2 + 2 + 0,6x^3 + 3,6x + 1,5x^3$$

$$-4,5x + 0,83x^3 + 1,7x$$

$$F_3(x) = -0,42x^3 + 0,33x^2 - 1,2x + 2$$