

3. Aproxime $f(1.3675)$ a partir de los siguientes datos:

x	1.27	1.29	1.31	1.33	1.35	1.37
F(x)	13.270567	13.781763	14.307413	14.847887	15.403567	15.974842

Ejecutaremos el script en Matlab, insertando los valores de X y f(x)

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>> Lagrange
INTERPOLACIÓN Y POLINOMIO DE LAGRANGE
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Valor a interpolar x: 1.3675
Datos [X0 X1 X2 ... Xn]: [1.27 1.29 1.31 1.33 1.35 1.37]
Valores de la función:
    1-Utilizar una función.
    2-Ingresa valores
Opción: 2
Valores F(x) [F(X0) F(X1) ... F(Xn)]: [13.270567 13.781763 14.307413 14.847887 15.403567 15.974842]

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Los resultados obtenidos son:

El valor aproximado para $f(1.3675) = 15.902566400768277$

Grado del Polinomio: 5

Obteniendo las Funciones de Lagrange

$$L_0(x) = \frac{(x-1.2900000000000000)(x-1.3100000000000000)(x-1.3300000000000000)(x-1.3500000000000000)(x-1.3700000000000000)}{(1.2700000000000000-1.2900000000000000)(1.2700000000000000-1.3100000000000000)(1.2700000000000000-1.3300000000000000)(1.2700000000000000-1.3500000000000000)(1.2700000000000000-1.3700000000000000)}$$

$$L_0(1.3675000000000000) = 0.019039154052735$$

$$L_1(x) = \frac{(x-1.2700000000000000)(x-1.3100000000000000)(x-1.3300000000000000)(x-1.3500000000000000)(x-1.3700000000000000)}{(1.2900000000000000-1.2700000000000000)(1.2900000000000000-1.3100000000000000)(1.2900000000000000-1.3300000000000000)(1.2900000000000000-1.3500000000000000)(1.2900000000000000-1.3700000000000000)}$$

$$L_1(1.3675000000000000) = -0.119762420654303$$

$$L_2(x) = \frac{(x-1.2700000000000000)(x-1.2900000000000000)(x-1.3300000000000000)(x-1.3500000000000000)(x-1.3700000000000000)}{(1.3100000000000000-1.2700000000000000)(1.3100000000000000-1.2900000000000000)(1.3100000000000000-1.3300000000000000)(1.3100000000000000-1.3500000000000000)(1.3100000000000000-1.3700000000000000)}$$

$$L_2(1.3675000000000000) = 0.322837829589860$$

$$L_3(x) = \frac{(x-1.2700000000000000)(x-1.2900000000000000)(x-1.3100000000000000)(x-1.3500000000000000)(x-1.3700000000000000)}{(1.3300000000000000-1.2700000000000000)(1.3300000000000000-1.2900000000000000)(1.3300000000000000-1.3100000000000000)(1.3300000000000000-1.3500000000000000)(1.3300000000000000-1.3700000000000000)}$$

$$L_3(1.3675000000000000) = -0.495018005371119$$

$$L_4(x) = \frac{(x-1.2700000000000000)(x-1.2900000000000000)(x-1.3100000000000000)(x-1.3300000000000000)(x-1.3700000000000000)}{(1.3500000000000000-1.2700000000000000)(1.3500000000000000-1.2900000000000000)(1.3500000000000000-1.3100000000000000)(1.3500000000000000-1.3300000000000000)(1.3500000000000000-1.3700000000000000)}$$

$$L_4(1.3675000000000000) = 0.530376434326201$$

$$L_5(x) = \frac{(x-1.2700000000000000)(x-1.2900000000000000)(x-1.3100000000000000)(x-1.3300000000000000)(x-1.3500000000000000)}{(1.3700000000000000-1.2700000000000000)(1.3700000000000000-1.2900000000000000)(1.3700000000000000-1.3100000000000000)(1.3700000000000000-1.3300000000000000)(1.3700000000000000-1.3500000000000000)}$$

$$L_5(1.3675000000000000) = 0.742527008056625$$

Polinomio:

$$P_5(x) = L_0(x)*F(X_0) + L_1(x)*F(X_1) + L_2(x)*F(X_2) + L_3(x)*F(X_3) + L_4(x)*F(X_4) + L_5(x)*F(X_5)$$

$$P_5(1.3675000000000000) = (0.019039154052735)*(13.270567000000000) + (-0.119762420654303)*(13.781763000000000) + (0.322837829589860)*(14.300000000000000) + (-0.495018005371119)*(14.700000000000000) + (0.530376434326201)*(15.100000000000000) + (0.742527008056625)*(15.500000000000000)$$

$$P_5(1.3675000000000000) = 15.902566400768277$$