$$\Omega = \{(x_0, F(x_0)), (x_1, F(x_1)), (x_2, F(x_2))\}$$

$n = 3$

Polinomio de interpolación

$$P(x) = \sum_{i=0}^{n-1} y_i \cdot L_i(x)$$

$$P(x) = y_0 L_0(x) + y_1 L_1(x) + y_2 L_2(x)$$

$$P(x) = F(x_0) L_0(x) + F(x_1) L_1(x) + F(x_2) L_2(x)$$

$$L_0(x) = \frac{x - x_1}{x_0 - x_1} \cdot \frac{x - x_2}{x_0 - x_2}$$

$$L_1(x) = \frac{x - x_0}{x_1 - x_0} \cdot \frac{x - x_2}{x_1 - x_2}$$

$$L_2(x) = \frac{x - x_0}{x_2 - x_0} \cdot \frac{x - x_1}{x_2 - x_1}$$

$$P(x) = F(x_0) \cdot \frac{x - x_1}{x_0 - x_1} \cdot \frac{x - x_2}{x_0 - x_2}$$

$$+ F(x_1) \cdot \frac{x - x_0}{x_1 - x_0} \cdot \frac{x - x_2}{x_1 - x_2}$$

$$+ F(x_2) \cdot \frac{x - x_0}{x_2 - x_0} \cdot \frac{x - x_1}{x_2 - x_1}$$

$$P(x) = F(x_0)L_0(x) + F(x_1)L_1(x) + F(x_2)L_2(x)$$

$$P'(x) = F(x_0)L_0'(x) + F(x_1)L_1'(x) + F(x_2)L_2'(x)$$

$$L_0(x) = \frac{x-x_1}{x_0-x_1}\cdot\frac{x-x_2}{x_0-x_2}$$

$$L_0(x) = \frac{x}{x_0-x_1}-\frac{x_1}{x_0-x_1}\cdot\frac{x}{x_0-x_2}\cdot\frac{-x_2}{x_0-x_2}$$

$$L_0'(x) = \frac{1}{x_0-x_1}\left(\frac{x-x_2}{x_0-x_2}\right)+\frac{1}{x_0-x_2}\left(\frac{x-x_1}{x_0-x_1}\right)$$

$$L_1(x) = \left(\frac{x}{x_1-x_0}-\frac{x_0}{x_1-x_0}\right)\cdot\left(\frac{x}{x_1-x_2}-\frac{x_2}{x_1-x_2}\right)$$

$$L_1'(x) = \frac{1}{x_1-x_0}\left(\frac{x-x_2}{x_1-x_2}\right)+\frac{1}{x_1-x_2}\left(\frac{x-x_0}{x_1-x_0}\right)$$

$$L_2(x) = \left(\frac{x}{x_2-x_0}-\frac{x_0}{x_2-x_0}\right)\cdot\left(\frac{x}{x_2-x_1}-\frac{x_1}{x_2-x_1}\right)$$

$$L_2'(x) = \frac{1}{x_2-x_0}\left(\frac{x-x_1}{x_2-x_1}\right)+\frac{1}{x_2-x_1}\left(\frac{x-x_0}{x_2-x_0}\right)$$

$P'(x) =$

$$P'(x_0) = F(x_0)L_0'(x_0) + F(x_1)L_1'(x_0) + F(x_2)\cdot L_2'(x_0)$$

$$L_0'(x_0) = \frac{1}{x_0-x_1}(1)+\frac{1}{x_0-x_2}(1)$$

$$L_1'(x_0) = \frac{1}{x_1-x_0}\left(\frac{x_0-x_2}{x_1-x_2}\right)+\frac{1}{x_1-x_2}(0)$$

$$L_1'(x_0) = \frac{1}{x_1-x_0}\left(\frac{x_0-x_2}{x_1-x_2}\right)$$

$$L_2'(x_0) = \frac{1}{x_2 - x_0}\left(\frac{x_0 - x_1}{x_2 - x_1}\right) + \frac{1}{x_2 - x_1}(0)$$

$$L_2'(x_0) = \frac{1}{x_2 - x_0}\left(\frac{x_0 - x_1}{x_2 - x_1}\right)$$

$$L_0'(x_0) = \frac{1}{x_0 - x_1} + \frac{1}{x_0 - x_2}$$

$$L_0'(x_0) = \frac{1}{x_0 - (x_0 + h)} + \frac{1}{x_0 - (x_0 + 2h)}$$

$$L_0'(x_0) = \frac{1}{-h} + \frac{1}{-2h}$$

$$L_0'(x_0) = \frac{-2}{2h} + \frac{-1}{2h}$$

$$L_0'(x_0) = -\frac{3}{2h}$$

Escaneado con CamScanner

$$L_1'(x_0) = \frac{1}{(x_0+h)-x_0} \cdot \left(\frac{x_0-(x_0+2h)}{(x_0+h)-(x_0+2h)}\right)$$

$$L_1'(x_0) = \frac{1}{h} \cdot \left(\frac{x_0-x_0-2h}{x_0+h-x_0-2h}\right)$$

$$L_1'(x_0) = \frac{1}{h} \cdot \left(\frac{\cancel{-}2h}{\cancel{-}h}\right)$$

$$L_1'(x_0) = \frac{2}{h}$$

$$L_1'(x_0) = \frac{4}{2h}$$

$$L_2'(x_0) = \frac{1}{(x_0+2h)-x_0} \cdot \left(\frac{x_0-(x_0+h)}{(x_0+2h)-(x_0+h)}\right)$$

$$L_2'(x_0) = \frac{1}{2h} \cdot \left(\frac{x_0-x_0-h}{\cancel{x_0}+2h-\cancel{x_0}-h}\right)$$

$$L_2'(x_0) = \frac{1}{2h} \cdot \left(\frac{-h}{h}\right)$$

$$L_2'(x_0) = \frac{1}{2h} \cdot -1$$

$$p'(x_0) = F(x_0) \cdot \frac{-3}{2h} + F(x_1) \cdot \frac{4}{2h} + F(x_2) \cdot \frac{-1}{2h}$$

$$p'(x_0) = \frac{1}{2h}\left(-3F(x_0) + 4F(x_1) - F(x_2)\right)$$