

Relaciones de recurrencia

$$Q_n = 5Q_{n-1} + 6Q_{n-2} \quad Q_0 = 5 \quad Q_1 = 7$$

$$0 \quad Q_0$$

$$0 \quad 5$$

$$1 \quad 7$$

$$2 \quad 5Q_1 + 6Q_0 = 5 \times 7 + 6 \times 5 = 75$$

$$3 \quad 5Q_2 + 6Q_1 = 5 \times 75 + 6 \times 7$$

$$375 + 42 = 417$$

100

Ecuación característica

$$Q_n = C_1 Q_{n-1} + C_2 Q_{n-2} + \dots + C_k Q_{n-k} \quad C_i \neq 0$$

$$Q_n = 5Q_{n-1} + 6Q_{n-2}$$

$$Q_n = Q_{n-1} + 2Q_{n-2} + Q_{n-3}$$

$$Q_n = r^n$$

$$r^n = C_1 r^{n-1} + C_2 r^{n-2} + \dots + C_k r^{n-k}$$

$$r^{n-k-n+k} = 0$$

$$\frac{r^n}{r^{n-k}} = \frac{C_1 r^{n-1}}{r^{n-k}} + \frac{C_2 r^{n-2}}{r^{n-k}} + \dots + \frac{C_k r^{n-k}}{r^{n-k}}$$

$$r^k = C_1 r^{k-1} + C_2 r^{k-2} + \dots + C_k \quad \text{E.C.}$$

$$Q_n = 5Q_{n-1} + 6Q_{n-2} \quad Q_0 = 5 \quad Q_1 = 7$$

$$Q_n = r^n$$

$$r^n = 5r^{n-1} + 6r^{n-2}$$

$$\frac{Y^n}{Y^{n-2}} = \frac{5Y^{n-1}}{Y^{n-2}} + \frac{6Y^{n-2}}{Y^{n-2}} \rightarrow Y^2 = 5Y + 6$$

$$Y^2 - 5Y - 6 = 0$$

$$Y^k = C_1 Y^{k-1} + C_2 Y^{k-2} + \dots + C_k \quad \text{e.c.}$$

$$Y^k - C_1 Y^{k-1} - C_2 Y^{k-2} - \dots - C_k = 0$$

$$Y_1, Y_2, Y_3, \dots, Y_k$$

$$q_n = A(Y_1)^n + B(Y_2)^n + \dots + K(Y_k)^n$$

$$a \quad b \quad c$$

$$Y^2 - 5Y - 6 = 0$$

$$ax^2 + bx + c$$

$$Y_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$Y_{1,2} = \frac{5 \pm \sqrt{25 - 4(1)(-6)}}{2(1)}$$

$$Y_{1,2} = \frac{5 \pm \sqrt{49}}{2} = \frac{5+7}{2} = 6$$

$$\frac{5-7}{2} = -1$$

$$q_n = A(6)^n + B(-1)^n$$

Solución
general

$$q_0 = 5 \quad q_1 = 7$$

$$\begin{cases} 5 = A + B \\ 7 = 6A - B \end{cases}$$

$$12 = 7A$$

$$A = \frac{12}{7}$$

$$5 = \frac{12}{7} + B$$

$$B = \frac{35}{7} - \frac{12}{7}$$

$$B = \frac{23}{7}$$

$$q_n = \frac{12}{7}(6)^n + \frac{23}{7}(-1)^n$$

$$\frac{10}{2}$$

$$2.70$$

$$\hookrightarrow a_n = 5a_{n-1} - 6a_{n-2}$$

$$a_n = r^n$$

$$r^n = 5r^{n-1} - 6r^{n-2}$$

$$r^2 = 5r - 6$$

$$r^2 - 5r + 6 = 0$$

$$\frac{5 \pm \sqrt{25 - 4(6)}}{2}$$

$$\frac{4}{2} = 2$$

$$\frac{6}{2} = 3$$

$$a_n = A(2)^n + B(3)^n$$

Sol general

$$5 = A + B$$

$$\frac{10}{2} = A + 2B$$

$$7 = 2A + 3B \rightarrow \frac{7}{2} = A + \frac{3}{2}B$$

$$\frac{3}{2} = -\frac{1}{2}B$$

$$B = -3$$

$$5 = A - 3$$

$$A = 8$$

$$a_n = 8(2)^n - 3(3)^n$$

Supongamos $\in \mathbb{C}$

$$\{1, 1, 2, 2, 2\}$$

$$a_n = A1^n + B1^n + C2^n + D2^n + E2^n$$

No es correcto

$$\{2, 2\}$$

$$a_0 = 1$$

$$a_1 = 3$$

$$a_n = A(2)^n + B(2)^n$$

$$1 = A + B$$

$$3 = 2A + 2B$$

$$1 = A + B$$

$$\frac{3}{2} = A + B$$

Sistema Incoherente

$$a_n = A1^n + Bn1^n +$$

$$C2^n + Dn2^n + En^22^n$$

$$1^n(n+1)$$

$$2^n(n^2+n+1)$$

Pol ord 2

$\{2, 2\}$

$$a_n = A2^n + B_n2^n$$

$$S = A$$

$$20 = 2A + 2B$$

$$20 = 10 + 2B$$

$$a_n = 5 \cdot 2^n + 5n2^n$$

$$a_0 = 5$$

$$a_1 = 20$$

$$(r-2)(r-2) = r^2 - 2r - 2r + 4$$

$$r^2 - 4r + 4$$

$$a_n = 4a_{n-1} - 4a_{n-2}$$

$$B = 5$$