Clase pasada: $\longrightarrow$ Modelos deterministas

$\downarrow$

Sucesiones

(Soluciones numéricas)

M. discretos — M. continuos

s. de recurrencia

- Modelo exponencial $\longrightarrow$ $y_{n+1} = K y_n$ $\leftarrow$
- Modelo logísticos $\longrightarrow$ $y_{n+1} = K y_n - \underbrace{\beta y_n^2}_{\text{T. no lineal}}$

$$= y_n (K - \beta y_n)$$

$$= y_n K \left(1 - \frac{\beta}{K} y_n\right)$$

¿Cómo estimar parámetros modelo logístico?

Ec. en dif.

$$y_{n+1} = K y_n$$

$$\underbrace{y_{n+1} - y_n}_{} = K y_n - y_n$$

$$\underbrace{\Delta y_n}_{} = (K-1) \underbrace{y_n}_{}$$

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Ec. en dif.

$$\Delta y_n = (K-1) y_n - \beta y_n^2$$

$$\boxed{\frac{\Delta y_n}{y_n}} = (K-1) - \beta \underbrace{y_n}_{}$$

$$\underbrace{z_n}_{}$$

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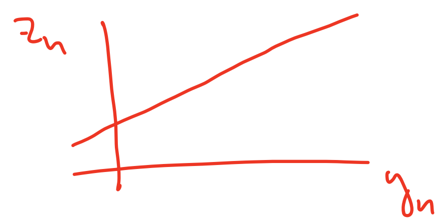
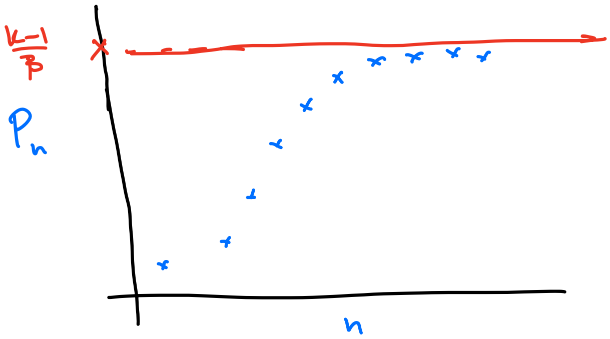


$$z_n = \underbrace{m}_{\downarrow\ (-\beta)} y_n + \underbrace{b}_{\downarrow\ (K-1)}$$



$$\Rightarrow \quad \Delta P_n \approx 0 \quad \Rightarrow \quad 0 \approx (k-1) - \beta P_n$$

$$P_n \approx \frac{(k-1)}{\beta}$$

Opcional (chaos)

$$* \; \underbrace{x_{n+1} = (1 - x_n)\, r\, x_n}_{\text{¿Converge para todo } r\,?} \; * \qquad \left[P_{n+1} = \left(1 - \frac{\beta}{k} P_n\right) P_n k \right]$$

$$\left[\; x_{n+1} = g(x_n) \;\longrightarrow\; \left.\begin{matrix} x_n \to \# \\ n \to \infty \end{matrix}\right\} \;\; \lim_{n\to\infty} x_n = \# \; \right]$$

Sucesion converge