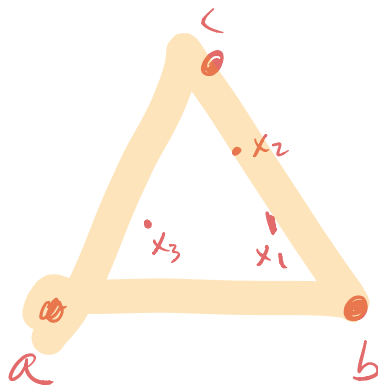


IFS = Iterated Function Systems

basado en el Juego del Caos (Barnsley)



1. Dar tres puntos $v = \{a, b, c\}$ y un x_0

2. Elegir al azar un vértice en v y tomar x_{i+1} "a la mitad de la distancia" de ese vértice y x_i

para $i = 0, 1, \dots$

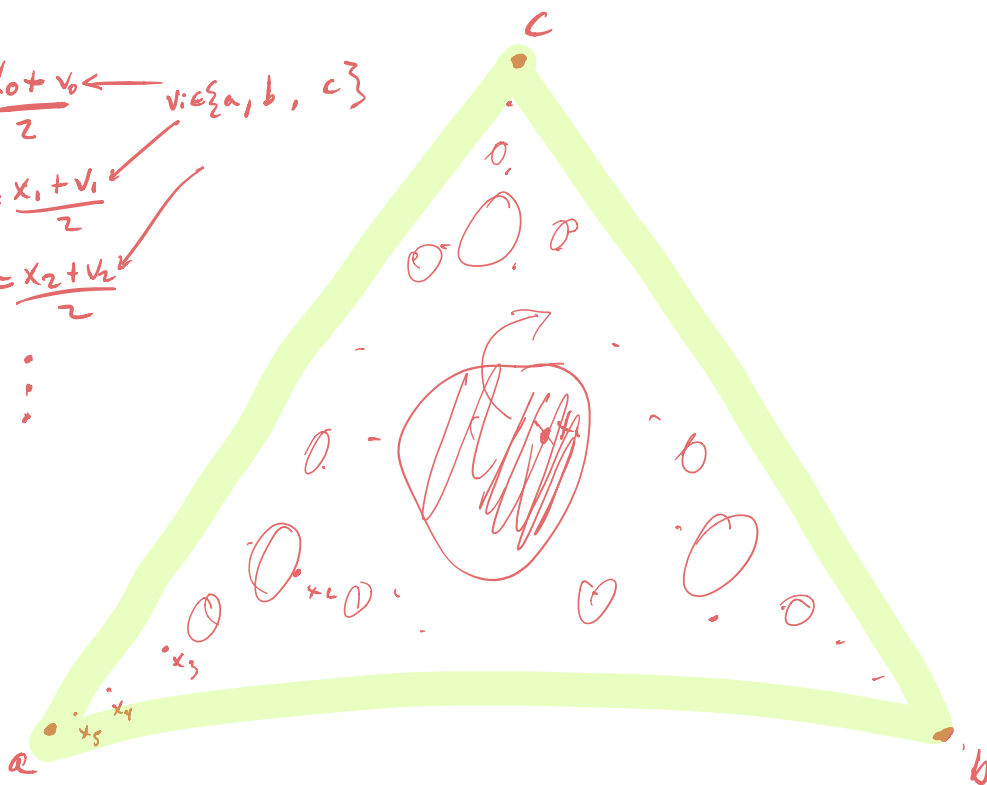
3. repetir paso 2.

$$x_1 = \frac{x_0 + v_0}{2} \leftarrow v_i \in \{a, b, c\}$$

$$x_2 = \frac{x_1 + v_1}{2}$$

$$x_3 = \frac{x_2 + v_2}{2}$$

...



$$f_1(x) = \frac{x+a}{2} = \frac{x}{2} + \frac{a}{2} = A_1x + b_1$$

$$f_2(x) = \frac{x+b}{2} = \frac{x}{2} + \frac{b}{2} = A_2x + b_2$$

$$f_3(x) = \frac{x+c}{2} = \frac{x}{2} + \frac{c}{2} = A_3x + b_3$$

Transformaciones
Afines

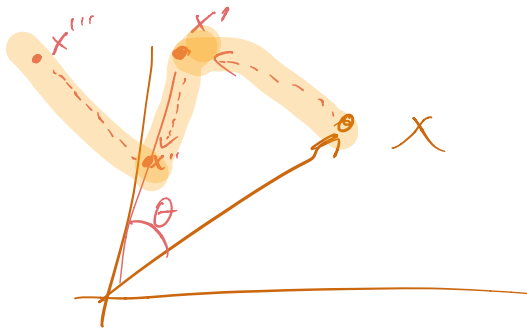
Si f y g son Af, $f \circ g$ es afn

A_i son matrices 2×2

x se escribe como vector 2×1

b_i son vectores 2×1

A_i puede ser una rotación seguida de un escalamiento
 b_i son traslaciones

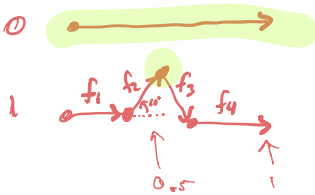


$$R(\theta) = \begin{pmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{pmatrix}$$

$\leftarrow \theta$ grades

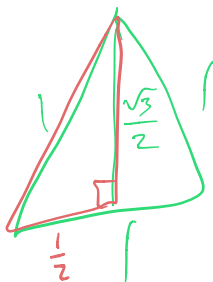
$$v(\theta) = \cos \theta + i \sin \theta$$

Koch



escala = $\frac{1}{3}$

$$\left\{ \begin{array}{l} f_1(x) = \frac{1}{3}x \\ f_2(x) = \frac{1}{3}R(60^\circ)x + \frac{1}{3} \\ f_3(x) = \frac{1}{3}R(-60^\circ)x + \frac{1}{3} + \frac{\sqrt{3}}{3}i \\ f_4(x) = \frac{1}{3}x + \frac{2}{3} \end{array} \right\} \text{IFS}$$

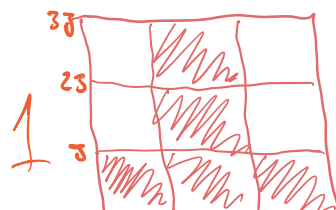
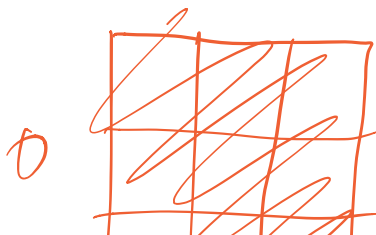


$$1^2 = \left(\frac{1}{2}\right)^2 + h^2$$

$$h = \sqrt{1 - \frac{1}{4}} = \frac{\sqrt{3}}{2}$$

$$1 \cdot \frac{1}{3} = \frac{\sqrt{3}}{6}$$

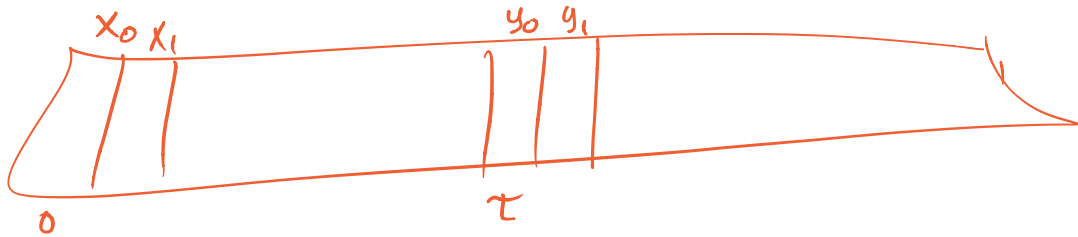
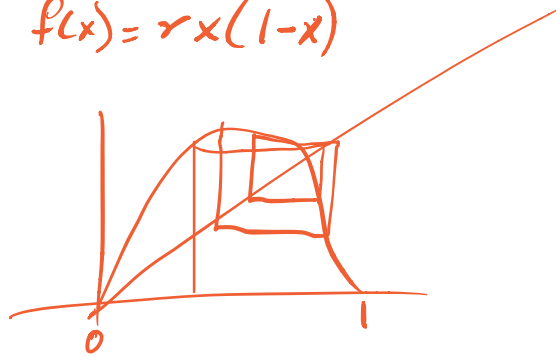
Tarea 1





0 1 2 3

Logística $f(x) = rx(1-x)$



<https://github.com/fhca>

Complejidad 1-2018

• $b \left(\frac{1}{2}, \frac{\sqrt{3}}{2} \right)$

• x_0

a
 $(0,0)$

c
 $(1,0)$

