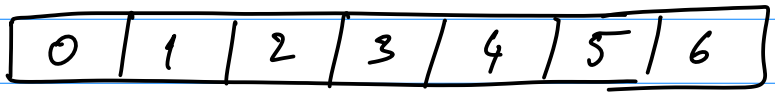
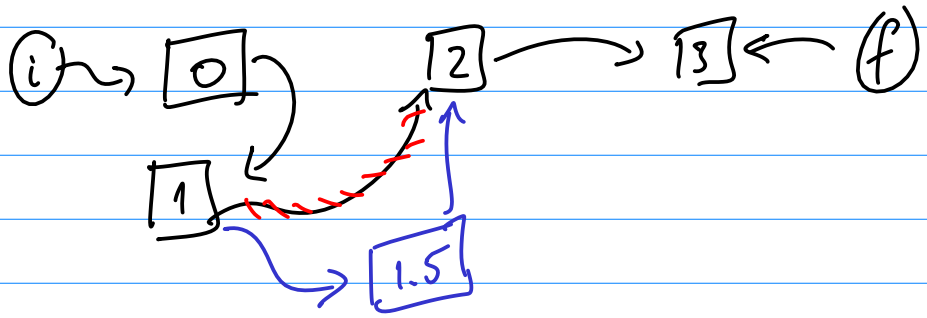
ARRAY:



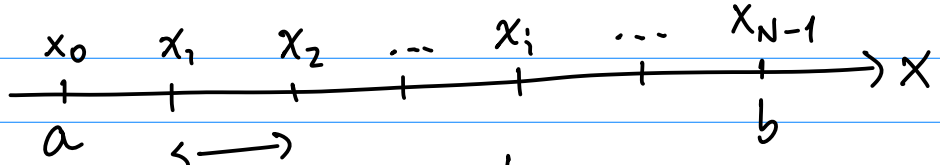
Lista:

ÁRVORE



Integral

$$\int_a^b f(x)\,dx \approx \sum_{x_i=a}^{b} f(x_i)\,\Delta x$$

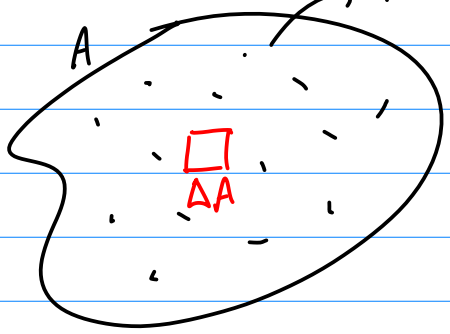


Δx : passo de discretização

Integral Monte Carlo

$$\int_A f(x,y)\,dx\,dy \approx \sum_{x_i,y_i} f(x_i,y_j)\,\Delta x \Delta y$$

ΔA

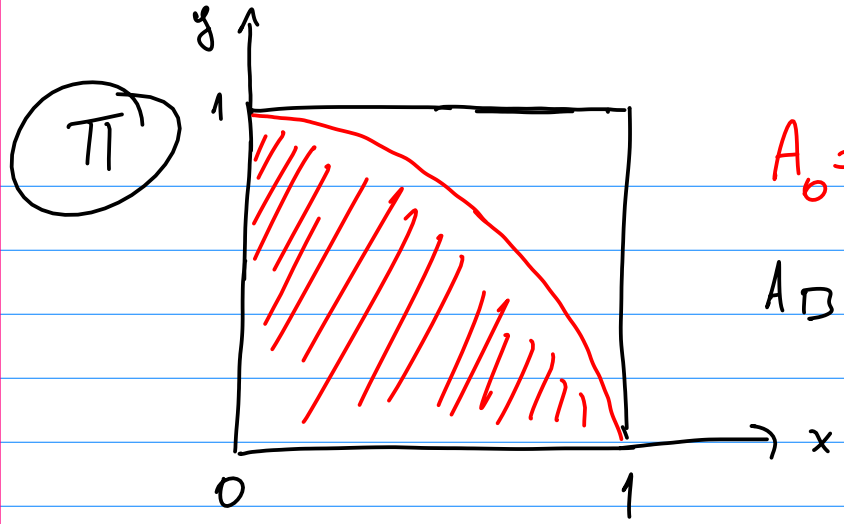


pontos aleatórios dentro de A } N pontos

$\Delta x, \Delta y$?

$$\Delta A \approx \frac{A}{N}$$

$$\int_A f(x,y)\,dA \approx \sum_{i,j} f(x_i, y_j)\,\frac{A}{N}$$



$A_0 = \pi/4$

$A_\square = 1$

Área do quadrado?

$$A_\square = \int_\square dx\,dy$$

$$A_\square \approx \frac{1}{N} \sum_{i,j} 1$$

Área do $\frac{1}{4}$ círculo?

$$A_0 = \int_{D \to \frac{1}{4}\text{ círculo}} dx\,dy$$

$$A_0 = \int_\square f(x,y)\,dx\,dy$$

$\Delta A = \frac{1}{N}$

$$f(x,y) = \begin{cases} 1, & \text{se } (x,y) \in \frac{1}{4} O \\ 0, & \text{c.c.} \end{cases}$$

$$A_0 = \frac{1}{N} \sum_{i,j} f(x_i, y_j) = \frac{N_{in}}{N_{TOTAL}}$$

TAREFA: calcular $4 \cdot A_0$

```
def calc_pi(N):
    ...
    Return 4.Nin/N
```