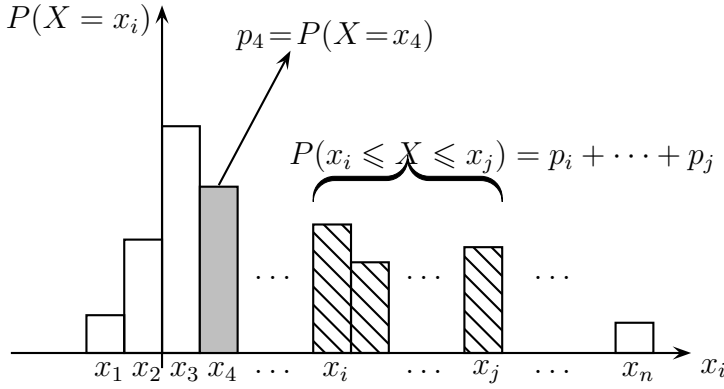


x_i	x_1	x_2	x_3	\dots	x_n
$\text{Prob}(X = x_i)$	p_1	p_2	p_3	\dots	p_n

- pour tout $1 \leq i \leq n$, $p_i \geq 0$

- $\sum_{i=1}^n p_i = 1$



- Espérance : $E(X) = \sum_{i=1}^n x_i p_i$

- Variance : $V(X) = E((X - E(X))^2)$
 $= \sum_{k=1}^n (x_k - E(X))^2 p_k$

- Ecart type : $\sigma = \sqrt{V(X)}$

Probabilités cumulées croissantes

$$P(X \leq x_i) = \sum_{k=1}^i p_k$$

x_i	x_1	x_2	x_3	\dots	x_n
$P(X = x_i)$	p_1	p_2	p_3	\dots	p_n
$P(X \leq x_i)$	0	p_1	$p_1 + p_2$	$p_1 + p_2 + p_3$	1

Loi binomiale $\mathcal{B}(n, p)$ $E(X) = np$, $\sigma(X) = \sqrt{npq}$

$$P(X = k) = C_n^k p^k (1-p)^{n-k}$$

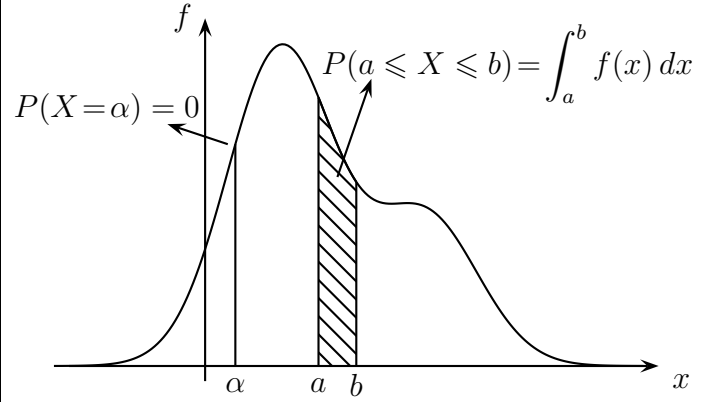
$$P(X \leq N) = \sum_{k=1}^N P(X = k) = \sum_{k=1}^N C_n^k p^k (1-p)^{n-k}$$

$$P(N_1 \leq X \leq N_2) = \sum_{k=N_1}^{N_2} C_n^k p^k (1-p)^{n-k}$$

x	$-\infty$	$+\infty$
$f(x)$	0	0

- pour tout $x \in \mathbb{R}$, $f(x) \geq 0$

- $\int_{-\infty}^{+\infty} f(x) dx = 1$



- Espérance : $E(X) = \int_{-\infty}^{+\infty} x f(x) dx$

- Variance : $V(X) = E((X - E(X))^2)$
 $= \int_{-\infty}^{+\infty} (x - E(X))^2 f(x) dx$

- Ecart type : $\sigma = \sqrt{V(X)}$

Fonction de répartition $F(x) = P(X \leq x)$

$$= \int_{-\infty}^x f(t) dt$$

x	$-\infty$	$+\infty$
$f(x)$	0	0
$F(x)$	0	1

Loi normale $\mathcal{N}(m, \sigma)$ $E(X) = m$, $\sigma(X) = \sigma$

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-m)^2}{2\sigma^2}}, \quad P(X = a) = 0$$

$$P(X \leq a) = \int_{-\infty}^a f(x) dx = \Pi(a)$$

$$P(a < X \leq b) = \int_a^b f(x) dx = \Pi(b) - \Pi(a)$$