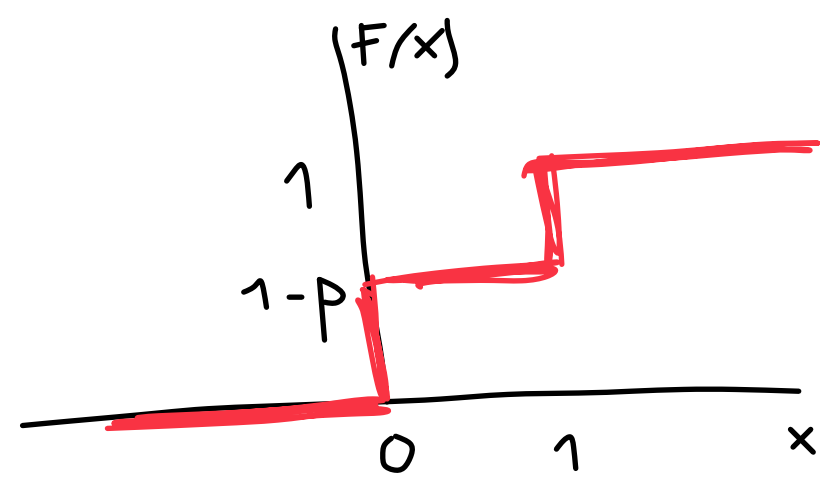
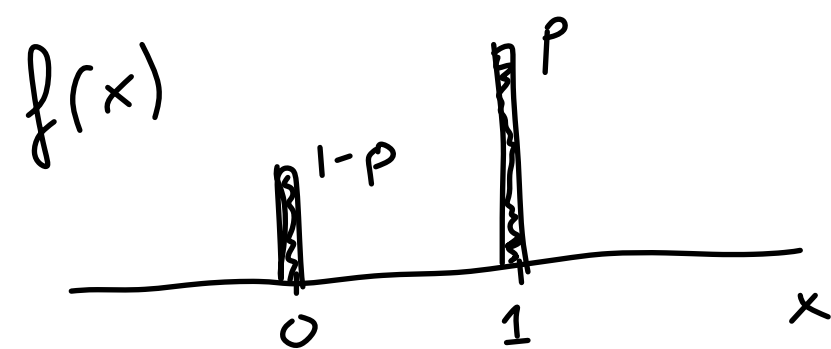


Bernoulli

$$f(x) = \begin{cases} p & x=1 \\ 1-p & x=0 \end{cases} \quad F(x) = \begin{cases} 0 & x < 0 \\ 1-p & 0 \leq x < 1 \\ 1 & x \geq 1 \end{cases}$$



$$E[X] = 1 \cdot p + 0 \cdot (1-p) = p$$

$$E[X^2] = 1^2 \cdot p + 0^2 \cdot (1-p) = p$$

METODO 2

$$\text{Var}[X] = E[X^2] - (E[X])^2 = p - p^2 = p(1-p)$$

METODO 1

$$\begin{aligned} &= (1-p)^2 p + (-p)^2 (1-p) = \\ &= (1-2p+p^2)p + p^2 - p^3 = \\ &= p - 2p^2 + p^3 + p^2 - p^3 = p - p^2 \end{aligned}$$

ESEMPIO

CAMPIONE: 5, 10, 15, 20, 90
(X)

$$E[X] = 28$$

$$n = 5$$

$$\text{Skew}(x) = \frac{E(X - E[X])^3}{\sigma_x^3} = \frac{43'524}{30'961.03} \approx 1.4$$

↑ ASIMMETRIA

↑ VARIANZA

$$\begin{aligned} \sigma_x^2 &= \frac{1}{5} ((5-28)^2 + (10-28)^2 + \dots + (90-28)^2) = \\ &= \frac{1}{5} ((-28)^2 + (-18)^2 + \dots + 62^2) = \frac{1}{5} 4930 = \\ &= 986 \end{aligned}$$

$$\sigma_x = \sqrt{986} = 31.4 \rightarrow \sigma_x^3 = 31.4^3 = 30961.03$$

$$\begin{aligned} &= \frac{1}{5} ((5-28)^3 + (10-28)^3 + \dots + (90-28)^3) = \\ &= 43524 \end{aligned}$$

$$S_x^2 = \sigma_x^2 \frac{5}{4} = 1'232.5 \rightarrow S_x = \sqrt{S_x^2} = 35.11$$

$$\text{Skew}(x) \text{ campionaria Tipo 2: } \frac{43'524}{35.11^3} = 1.006$$

Skew(x) campionaria Tipo 1

$$\begin{aligned} \text{Skew}_1(x) &= \frac{n^2}{(n-1)(n-2)} \text{Skew}_2(x) \\ &= \frac{5^2}{4 \cdot 3} 1.006 = \\ &\approx 2.1 \end{aligned}$$