

Ex 1

$$1) P(X < 3) = P(X = -1) + P(X = 0) = 0.3$$

$$P(X > 2) = P(X = 4) + P(X = 5) = 0.7$$

et par définition

$$E[X] = -1 \times 0.2 + 0 \times 0.1 + 4 \times 0.3 + 5 \times 0.4 = 3$$

$$V[X] = E[X^2] - (E[X])^2$$

$$E[X^2] = (-1)^2 \times 0.2 + 0^2 \times 0.1 + 4^2 \times 0.3 + 5^2 \times 0.4 = 15$$

$$\text{donc } V[X] = 15 - 3^2 = 6$$

Ex 3

loi de X

B	0	1/4	$\frac{1}{12}$
B	1	1/6	1/6

$$P(X=0) = P(\text{B de } d_1 \text{ et } d_2 = 0) = \frac{1}{4}$$

$$P(X=5) = P(d_1 = b_{i1} = 3 \text{ ou } d_1 = b_{i1} = 5) = P(d_1 = 3) \times P(b_{i1} = 3) + P(d_1 = 5) \times P(b_{i1} = 5)$$

$$P(X=1) = 1 - P(X=0) - P(X=5) = 1 - \frac{1}{4} - \frac{1}{6} = \frac{5}{12}$$

$$V[x] = E[x^2] - (E[x])^2$$

$$= 0^2 \times \frac{1}{3} + 1^2 \times \frac{1}{3} + 2^2 \times \frac{1}{3} - \left(\frac{1}{3} + \frac{2}{3} + \frac{4}{3}\right)^2$$

$$= \frac{1}{3} + \frac{1}{3} + \frac{4}{3} - \left(\frac{7}{3}\right)^2$$

$$= \frac{6}{3} - \frac{49}{9} = \frac{6}{3} - \frac{49}{9} = \frac{2}{3} - \frac{49}{9} = \frac{6}{9} - \frac{49}{9} = -\frac{43}{9} \approx -4.777$$

$$E[x] = 0 \times \frac{1}{3} + 1 \times \frac{1}{3} + 2 \times \frac{1}{3} = \frac{1}{3} + \frac{2}{3} = 1$$

$$= \frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1$$