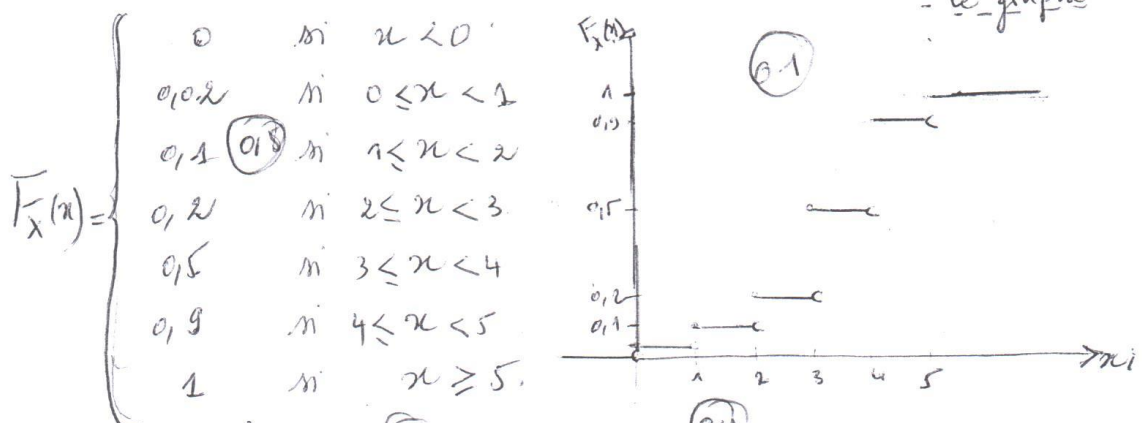


Corrigé type de l'examen de Stat II

Ex n°1: $F_X(x_i) = P(X \leq x_i)$.

x_i	0	1	2	3	4	5
$P(X=x_i)$	0,02	0,08	0,1	0,13	0,14	0,1
$F_X(x_i)$	0,02	0,1	0,2	0,35	0,49	1



② $E(X) = \sum_{i=1}^6 x_i P(X=x_i) = 3,28 \approx 3 \text{ voitures}$

* $V(X) = E(X^2) - E(X)^2 = \sum_{i=1}^6 x_i^2 P(X=x_i) - E(X)^2 = 12,108 - (3,28)^2 = 1,3216 \approx 1,32$

③ $P(X \leq 2) = F_X(2) = 0,2$; $P(X > 3) = 0,15$

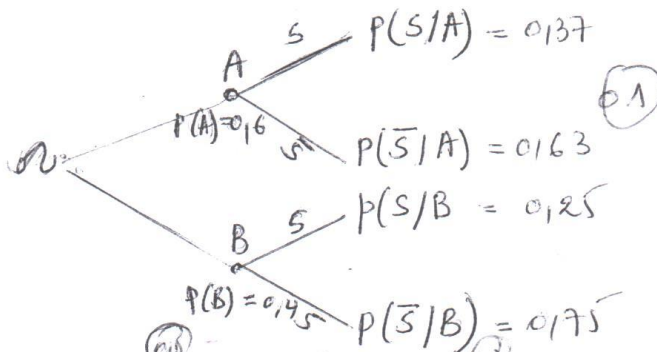
$P(2 < X \leq 6) = 0,18$; $P(X \geq 7) = 0$

④ $E(Y) = 10 \cdot E(X) + 500 = 10 \times 3,28 + 500 = 532,8 \text{ €}$

* $V(Y) = 10^2 V(X) = 100 \times 1,3216 = 132,16 \text{ €}^2$

Exn°2 :

- ① A et B forment un système complet d'événements.
 • $P(B) = 1 - P(A) = 1 - 0,6 = 0,4$.



② $P(A \cap S) = P(A) \cdot P(S/A) = 0,6 \times 0,37 = 0,222$.

③ $P(S) = P(A) \cdot P(S/A) + P(B) \cdot P(S/B) = 0,6 \times 0,37 + 0,4 \times 0,25 = 0,322$.

④ $P(B/S) = \frac{P(B) \cdot P(S/B)}{P(S)} = \frac{0,4 \times 0,25}{0,322} = 0,31$ [Théorème de Bayes]

⑤ $P(A/\bar{S}) = \frac{P(A) \cdot P(\bar{S}/A)}{P(\bar{S})} = \frac{0,6 \times 0,63}{1 - 0,322} = 0,557$

Exn°3 :

① $P(A) = \frac{N \cdot C_F}{N \cdot C_P} = \frac{C_5^4}{C_7^4} = \frac{5}{70} = 0,071$

② $P(B) = \frac{C_1^1 \cdot C_3^3}{C_8^4} = \frac{1}{70} = 0,014$

③ $P(C) = 1 - P(A) = 1 - \frac{5}{70} = \frac{65}{70} = 0,92$

④ $P(D) = P(C) = \frac{65}{70} = 0,92$