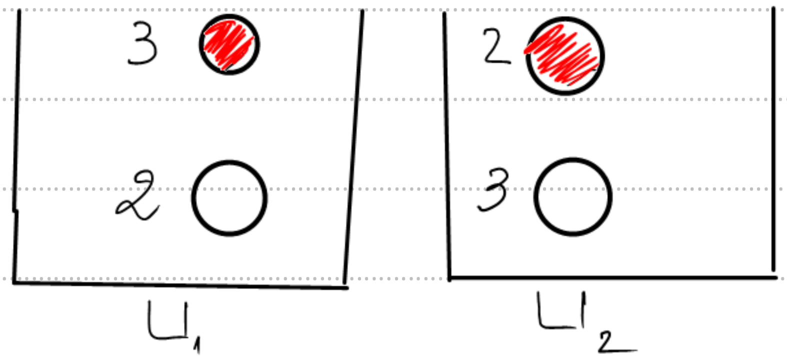
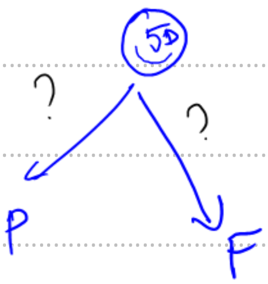
Exercice:



Expérience: Exp_1 puis Exp_2

$(Lancer_1 \times \Omega_2$



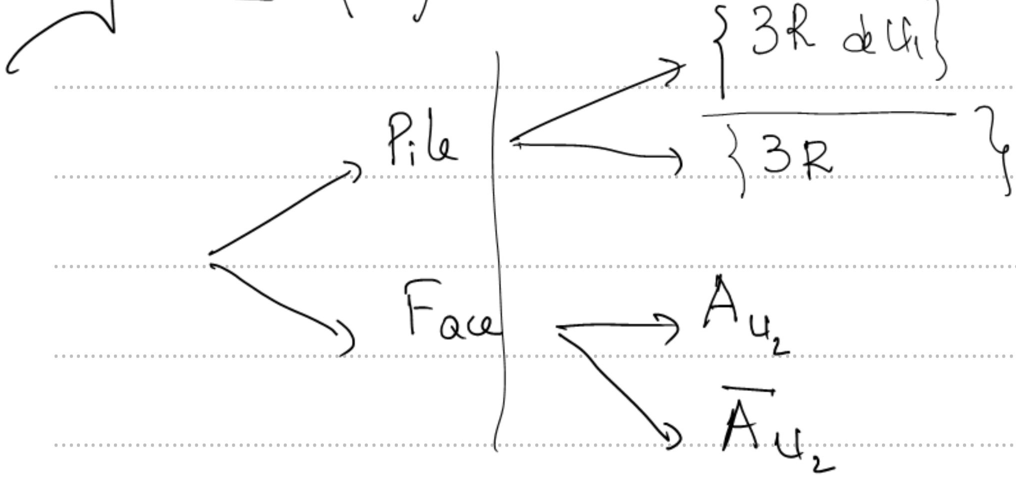
- $p(Pile) = 2\,P(Face)$

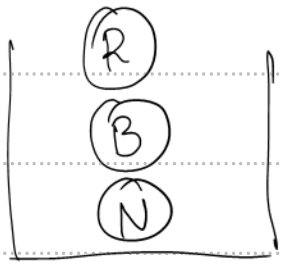
$$\underbrace{P(Pile)}_{} + P(Face) = 1$$

- $3P(Face) = 1 \Rightarrow \boxed{P(Face) = \frac{1}{3}}$

$\Rightarrow \boxed{P(pile) = \frac{2}{3}}$

1) $P(A) = ?$



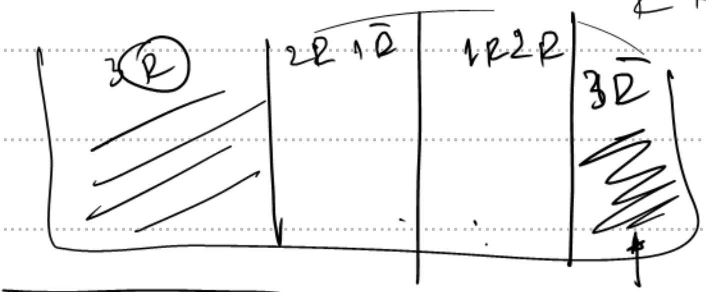


$\boxed{\overline{3R}} = 2R\,B$

$R\,B\,N$

$2R\,N$

$\overline{R}\,\overline{R}\,\overline{R}$



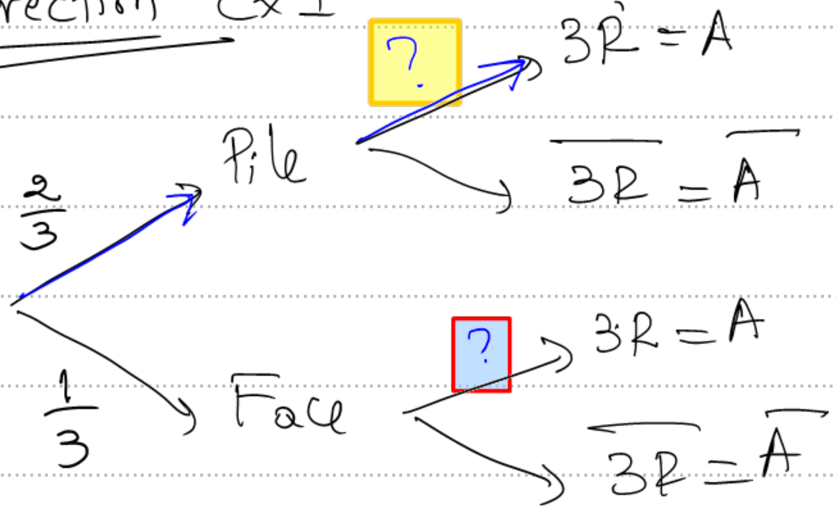
$\overline{A}$

$\overline{\{3R\}}$

Attention $\overline{3R} = 3\overline{R}$ (Faux)

$\overline{3R} = \{2R \text{ et } 1\overline{R}\}$ ou $\{1R \text{ et } 2\overline{R}\}$ ou $\{3\overline{R}\}$

Correction Ex 1



$$A = \underline{(A \cap Pile)} \sqcup \underline{(A \cap Face)}$$

$$p(A) = p(A \cap Pile) + p(A \cap Face)$$

$$= p(Pile) \times \boxed{p\left(A / Pile\right)} + p(Face) \times \boxed{p\left(A / F\right)}$$

$$p(A) = \frac{2}{3} \times \frac{C_3^3}{C_5^3} + \frac{1}{3} \left(\frac{2}{5}\right) \times \left(\frac{2}{5}\right) \times \left(\frac{2}{5}\right)$$

$$p(A) = \frac{11}{125}$$

- $B = (\text{obtenir } 2\,R \text{ et } 1\,\overline{R})$

$B = (\text{Pile et } B_{U_1}) \text{ ou } (\text{Face et } B_{U_2})$

$p(B) = \frac{2}{3} \times \frac{\boxed{C_3^2 \times C_2^1}}{C_5^3} + \frac{1}{3} \times \boxed{\frac{2}{5}\,\frac{2}{5}\,\frac{3}{5}} \times C_3^2$

$= \cancel{\frac{58}{125}} \text{ ou } \frac{62}{125}$

$C = (\text{Pile et } C_{U_1}) \text{ ou } (\text{Face et } C_{U_2})$

$p(C) = \frac{2}{3} \times p(C/\text{Pile}) + \frac{1}{3} \times p(C/\text{Face}) \ldots 0.$

$p(C) = \frac{2}{3} \times p\{\underbrace{0\,R}_{\text{Impossib}} \text{ ou } 1\,R \text{ et } 2\,\bar{R}\} + \frac{1}{3} \times p\{(\bar{R}, \bar{R}, \bar{R}) \text{ ou } \underbrace{(R, \bar{R}, \bar{R})}_{\text{ou 3 situ}}\}$

$p(C) = \frac{2}{3} \times \frac{C_3^1 \times C_2^2}{C_5^3} + \frac{1}{3} \times \left[\frac{3}{5} \times \frac{3}{5} \times \frac{3}{5} + \frac{2}{5} \times \frac{3}{5} \times \frac{3}{5} \times C_3^1\right]$

$= \frac{77}{125}$

$p(B \cup C) = p(B) + p(C) - p(\underbrace{B \cap C}_{0})$

• $B = \underline{2R}$ et $1\bar{R}$

$C = 0R$ ou $1R$ et $2\bar{R}$

$B \cap C = \emptyset$

d'où $\boxed{p(B \cup C) = p(B) + p(C)} = \dots$

Remarque

D = au moins 1 jeton rouge.

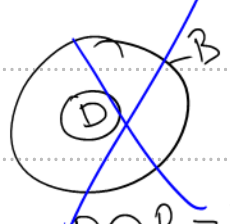
$B = 2R$ et $1R$

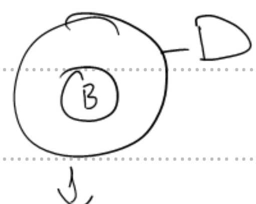
① • Si D est realisé $\cancel{\Longrightarrow}$ B est realisé Faux

($1R$ et $2\bar{R}$) ou ($3R$)

② • Si B est realisé $\Longrightarrow$ D est realisé ✓

$\Longrightarrow$ $\cancel{D \subset B}$ ou $B \subset D$





$\cancel{D \cap B = D}$ $B \cap D = B$.

Remarque. $(2R \text{ et } 1R)$

U_1	U_2	U_3
$4R$	$2R$	$1R$
$6\overline{R}$	$5\overline{R}$	$3\overline{R}$

Exp tirer 1 jeton de U_1 puis
1 jeton de U_2 puis
1 jeton de U_3.

B (obtenir exactement 2 Rouges)

$$B = \underbrace{(R, R, \overline{R}) \text{ ou } (R, \overline{R}, R) \text{ ou } (\overline{R}, R, R)}$$

Il y a $C_3^2 = 3$ situations

$$p(B) = \frac{4}{10} \times \frac{2}{7} \times \frac{1}{4} + \frac{4}{10} \times \frac{5}{7} \times \frac{1}{4} + \frac{6 \times 2 \times 1}{10 \times 7 \times 4}$$

2) Loi de probabilité de X

* Epreuve $\xrightarrow{p=\frac{11}{125}}$ $\boxed{\text{Succe : } A}$
* Epreuve $\xrightarrow{(1-p)=q=\frac{114}{125}}$ Echec $\bar{A}$

* Epreuve est répété 10 fois (n) d'une façon Identique et Indépendante.

* X : associe nbre de succes parmi 10

$\Longrightarrow$ X suit loi Binomiale de paramètre $n = 10$ $\quad p = \frac{11}{125}$

$$\Rightarrow X(\Omega) = \{0, 1, 2 \text{ ——— } 10\}$$

$A \quad A \quad \bar{A} \quad \bar{A} \quad . \quad . \quad A$

$$P(X=k) = C_{10}^{k}\left(\frac{11}{125}\right)^{k} \times \left(\frac{114}{125}\right)^{10-k}$$

$k \in \{0, 1 -- 10\}$.

$$X(\Omega) = \left\{ \begin{array}{ll} 0 \text{ Succé} & \\ 1 \text{ Succe} & 9 \text{ échec} \\ 2\ S. & 8\ \overline{S} \\ 3\ S & 7\ \overline{S} \\ \vdots & \\ 9S & 1\ \overline{S} \\ 10\ S. & \end{array} \right\}$$

$\underbrace{\text{au moins } 1S}_{(1 \leq X)}$

$$p(1 \leq X) = p(1 \leq X \leq 10)$$

$$\overline{(1 \leq X)} = (X = 0)$$

$$p(1 \leq X) = 1 - p(X = 0)$$

$$= 1 - \left(\frac{114}{125}\right)^{10}$$

c) $E(X) = np = 10 \times \frac{11}{125} = \frac{110}{125}$

$$\simeq 0{,}88 \simeq \boxed{1}$$