Série 1

Ex 1:

a) $\Omega = \{1p, 1f, 2p, 2f .. \}$

$|\Omega| = 12$ $\qquad P = \frac{1}{12}$ ← tout les 12 sont equiprobable

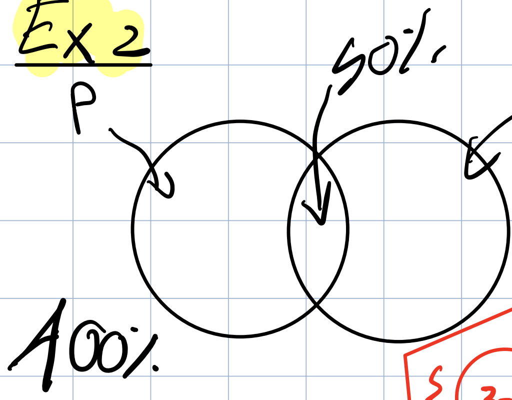
c) 1 2 3 4 5 6

$\Omega = \{12, 13, 14, 15, 16, 23, 24, 25, 26, 34, 35, 36, 45, 46, 56\}$

$|\Omega| = 15 \qquad \binom{6}{2,2,2} \cdot \frac{1}{3!}$ $\qquad P = \frac{1}{15}$

b) $\Omega = [50, \infty[$
$= \{50, 51, \dots\}$

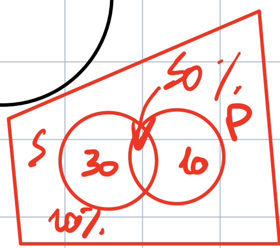
Ex 2



$80\% \rightarrow$ SCALA

$60\% \rightarrow$ Python

$50\% \rightarrow S + P$



a) $100 - 80 = 20\%$

20% ne connaisse pas scala

b) $100 - \cancel{50 =} 50\%$ 10

50% ne connaisse ni Scala ni Python

c) $80 - 50 \cancel{=} 30\%$ 10

d) $P = \dfrac{\text{n. pers qui } \checkmark \text{Scala } \checkmark \text{Py.}}{\text{n. pers. } \checkmark \text{Scala}} = \dfrac{50}{80} \cdot 100$

Ex 3

a) $P = \dfrac{\text{Nombre de comb. poss.}}{\text{Nombre d'essai tot}}$

10^6

Nombre de combinaisons poss. $= \dfrac{n!}{(n-6)!}$

$$P = \frac{\frac{n!}{n-6!}}{10^6}$$

b) $$P = \frac{\frac{n!}{(n-7)!}}{10^6}$$

26^6

c) $$P = \frac{\binom{n}{6}}{10^6} = \cancel{\frac{\frac{n!}{(n-6)!\,6!}}{10^6}}$$

$(2\cdot 26)^6$

d) $$P = \frac{\binom{2n}{6}}{10^6} = \cancel{\frac{\frac{2n!}{(2n-6)!\,6!}}{10^6}}$$

Ex 4

$$\begin{matrix} 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 \\ \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{matrix} = \frac{1}{16} \ast$$

a) $$P = \frac{\binom{4}{2}}{4!} = \frac{\frac{4!}{2!\,2!}}{4!} = \frac{\frac{4\cdot 3!}{4}}{4!}$$

$$= \frac{1}{3\cdot 2} = \frac{1}{6} \Rightarrow \frac{\binom{4}{2}}{16} = \frac{6}{16}$$

$\ast$

b) Valeurs de la somme $= 0, 1, 2, 3, 4$

$$P(\{0\}) = \frac{1}{16} \leftarrow \binom{4}{0}$$

$$P(\{1\}) = \frac{4}{16} = \frac{1}{6} \quad \binom{4}{1}$$

$$P(\{2\}) = \frac{6}{16} \leftarrow \binom{4}{2} = a)$$

$$P(\{3\}) = \frac{\binom{4}{3}}{16} = \frac{\frac{4!}{(4-3)!\,3!}}{16} = \frac{4}{16}$$

$$P(\{4\}) = \frac{\binom{4}{4}}{16} = \frac{1}{16}$$

c) Contrôle = 2 $\quad P = 0{,}02$

Séquences modifiées avec somme = 2

$$\left.\begin{matrix} 0 & 1 & 1 & 0 \\ 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{matrix}\right\}\ \text{4 messages à 2 chang.}$$

$0\ 1\ 0\ 1 \rightarrow$ 1 mess. à 4 chang.

$$P = 4 \cdot 0{,}02^2 \cdot 0{,}98^2 + 1 \cdot 0{,}02^4$$

Cas général :

$$\text{prob} = \binom{n}{2} \cdot \frac{1}{2^n}$$