

XII Camparis Aeriennes

P na poids de passager $P \sim N(70, 8)$

B Bagage $B \sim N(15, 4)$

$$T = P + B$$

$$T \sim N(85, \sqrt{64+16})$$

$$T \sim N(85, \sqrt{80})$$

$$T \sim N(85, 4\sqrt{5})$$

$$\sqrt{80} = 2\sqrt{4 \times 2 \times 2 \times 5} = 4\sqrt{5}$$

$$\begin{aligned} \text{Prob}(T \geq 80) &= \text{Prob}\left(\frac{T-85}{4\sqrt{5}} \geq \frac{80-85}{4\sqrt{5}}\right) = \text{Pr}(N(0,1) \geq \frac{-5}{4\sqrt{5}}) \\ &= \text{Pr}(N(0,1) \geq -\frac{\sqrt{5}}{4}) \\ &= 1 - \text{Prob}(N(0,1) \leq \frac{\sqrt{5}}{4}) \end{aligned}$$

$$E(\sum_{i=1}^{100} T_i) = 100 \times 85$$

$$\text{Var}(\sum_{i=1}^{100} T_i)$$

$$= 100 \times \text{Var} T_i$$

$$\sum_{i=1}^{100} T_i \leq 8600$$

$$\text{Prob}(\sum T_i \leq 8600) = \text{Pr}\left(\frac{\sum T_i - 8500}{100 \times 4\sqrt{5}} \leq \frac{100}{100 \times 4\sqrt{5}}\right)$$

$$= \text{Pr}(N(0,1) \leq \frac{10}{4\sqrt{5}}) = \text{Pr}(N(0,1) \leq \frac{5}{2\sqrt{5}}) = \text{Pr}(N(0,1) \leq \frac{\sqrt{5}}{2}) = 0,7123 = 71,23\%$$

3/ Nombre Max

N nbre de passager

~~Prob~~ 1

$$\text{Prob}(\sum T_i \geq 8600) = 0,17$$

Prob

$$E(\sum_{i=1}^N T_i) = N \times 85$$

$$\text{Prob}(\sum_{i=1}^N T_i > 8600) = 0,10$$

$$\text{Var}(\sum T_i) = \sqrt{\text{Var} \sum T_i} = \sqrt{\sum \text{Var} T_i} = \sqrt{N \text{Var} T_i} = \sqrt{N} \times \sqrt{80}$$

$$\text{Pr}(\sum_{i=1}^N T_i > 8600) = \text{Pr}\left(\frac{\sum T_i - N \times 85}{\sqrt{N} \times 4\sqrt{5}} \geq \frac{8600 - N \times 85}{\sqrt{N} \times 4\sqrt{5}}\right) = 0,10$$

$$\frac{8600 - N \times 85}{\sqrt{N} \times 4\sqrt{5}} = 1,28$$

$$8600 - N \times 85 - 1,28 \times 4 \times \sqrt{5} \times \sqrt{N} = 0$$

$$N \times 85 + 1,28 \times 4 \times \sqrt{5} \times \sqrt{N} - 8600 = 0$$

$$n^2 \times 85 + 1,28 \times 4 \times \sqrt{5} \times n - 8600 = 0$$

$$\begin{aligned} n &= \sqrt{N} \\ n^2 &= N = 99,83 \end{aligned}$$

$$\frac{90000}{100} \rightarrow 900 \quad 84 \quad (77,16)$$