

Bijkomende oefenvragen

1. man: $\mu = 77$ $\sigma = 9,5$ M
 vrouw: $\mu = 64$ $\sigma = 8,8$ V

inhoud lift: $L = 6M + 5V$ magniet met zijn $M_1 + M_2 + M_3 + M_4 + M_5 + M_6 + V_1 + V_2 + V_3 + V_4 + V_5$

$$\begin{aligned} E(L) &= E(6M + 5V) = 6E(M) + 5E(V) \\ &= 6 \cdot 77 + 5 \cdot 64 \\ &= 462 + 320 = 782 \end{aligned}$$

$$\begin{aligned} \text{Var}(L) &= \text{Var}(6M + 5V) = \text{Var}(6M) + \text{Var}(5V) \\ &= 6^2 (9,5)^2 + 5^2 (8,8)^2 \\ &= 36 \cdot 90,25 + 25 \cdot 77,44 \\ &= 3249 + 1936 = 5185 \end{aligned}$$

6 Var M + 5 Var V

$$\sigma_L = 72,0069$$

$$\begin{aligned} P(L \geq 800) &= P\left(\frac{L - \mu_L}{\sigma_L} > \frac{800 - \mu_L}{\sigma_L}\right) \\ &= P\left(Z > \frac{18}{72,0069}\right) \\ &= P(Z > 0,25) \\ &= 1 - P(Z \leq 0,25) \\ &= 1 - 0,5987 \\ &= 0,4013 \end{aligned}$$

2. $X = \text{totaal aantal opgegeven fouten}$ $\rightarrow$ log normale verdeling

$$\begin{aligned} E(X|Y=y) &= 20 + 0,5y \\ \text{Var}(X|Y=y) &= (20 + 0,5y)^2 \end{aligned}$$

$$Y = \text{\# pagina's} \sim \text{Pois}(50)$$

$$\hookrightarrow P(Y=y) = \frac{e^{-50} 50^y}{y!}$$

$$\begin{aligned} E(Y) &= 50 = \text{Var}(Y) \\ \Rightarrow \sigma_Y &= \sqrt{50} \end{aligned}$$

$$\begin{aligned} S_0 &= E(Y^2) - (E(Y))^2 \\ S_0 &= E(Y^2) - 2500 \\ &= 2550 \end{aligned}$$

gezocht: σ_X

$$\text{Var}(X) = E(\text{Var}(X|Y=y)) + \text{Var}(E(X|Y=y))$$

$$= E((20 + 0,5y)^2) + \text{Var}(20 + 0,5y)$$

$$\begin{aligned} &= E(400 + 20y + 0,25y^2) + \text{Var}(20 + 0,5y) \\ &= 400 + 20E(y) + 0,25E(y^2) + 0,25\text{Var}(y) \\ &= 400 + 20 \cdot 50 + 0,25E(y^2) + 0,25 \cdot 50 \\ &= 400 + 1000 + 12,5 + 0,25(E(y^2)) \\ &= 400 + 1000 + 12,5 + 0,25 \cdot 2550 = 12050 \end{aligned}$$

$$\sigma_X = 45,2269$$