

$$1) P(A \cap B) = \frac{60}{100} = P(A) \cdot P(B) = \frac{75}{100} \cdot \frac{80}{100}$$

↓
A, B jsou nezávislé

$$2) \text{ obě černé: } P(\bar{C}_1 \cap \bar{C}_2) = P(\bar{C}_1) \cdot P(\bar{C}_2) = \frac{2}{4+2} \cdot \frac{5}{3+5} = \frac{5}{24}$$

$$1 \times \text{bílá}, 1 \times \text{černá} \quad P(B_1 \cap \bar{C}_2 \cup \bar{C}_1 \cap B_2) = P(B_1 \cap \bar{C}_2) + P(\bar{C}_1 \cap B_2) = \\ = P(B_1) \cdot P(\bar{C}_2) + P(\bar{C}_1) \cdot P(B_2) = \frac{4}{4+2} \cdot \frac{5}{3+5} + \frac{2}{4+2} \cdot \frac{3}{3+5} = \frac{13}{24}$$

$$3) P(S) = \frac{1}{6}, P(S^c) = \frac{5}{6}, P(U|S) = 0.6, P(U|S^c) = 0.06$$

$$P(U) = P(U|S) \cdot P(S) + P(U|S^c) \cdot P(S^c) = 0.6 \cdot \frac{1}{6} + 0.06 \cdot \frac{5}{6} = \frac{1}{10} + \frac{5}{100} = \underline{\underline{0.15}}$$

$$4) Y = a + bX, EY = b \cdot EX, \text{var } Y = b^2 \text{var } X$$

$$Y = -\frac{1}{2}X + \frac{1}{4}, X \sim N(2, 4^2) \Rightarrow EX = 2, \text{var } X = 4^2$$

$$EY = -\frac{1}{2} \cdot EX + \frac{1}{4} = -\frac{1}{2} \cdot 2 + \frac{1}{4} = -\frac{3}{4}$$

$$\text{var } Y = \left(-\frac{1}{2}\right)^2 \cdot \text{var } X = \frac{1}{4} \cdot 4^2 = \underline{\underline{4}}$$

5) viz skript, testování hypotéz

$$6) f(x_1, x_2) = \int_0^3 \frac{2}{27} x_3(x_1 + x_2) dx_3 = \frac{2}{27} (x_1 + x_2) \cdot \left[\frac{x_3^2}{2}\right]_0^3 = \frac{1}{3} (x_1 + x_2)$$

$$F(x_1, x_2) = \int_0^{x_1} \int_0^{x_2} \frac{1}{3} (t_1 + t_2) dt_1 dt_2 = \frac{1}{6} x_1^2 x_2 + \frac{1}{6} x_1 x_2^2$$

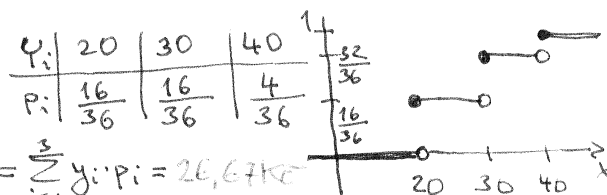
7) X ... osov. počet vybraných 10 Kč mincí, $X \sim B_i(2; \frac{2}{6})$

$$P_0 = \binom{2}{0} \cdot \left(\frac{2}{6}\right)^0 \left(\frac{4}{6}\right)^2 = \frac{16}{36}$$

Y ... cena mince

$$P_1 = \binom{2}{1} \cdot \left(\frac{2}{6}\right)^1 \left(\frac{4}{6}\right)^1 = \frac{16}{36}$$

$$P_2 = \binom{2}{2} \left(\frac{2}{6}\right)^2 \left(\frac{4}{6}\right)^0 = \frac{4}{36}$$



$$EY = \sum_{i=1}^3 y_i \cdot p_i = 26.67 \text{ Kč}$$

$$EY^2 = \sum y_i^2 p_i = 755.55$$

$$\text{var } Y = EY^2 - (EY)^2 = 755.55 - 26.67^2 = 44.27$$

$$S = \sqrt{44.27} = \underline{\underline{6.65 \text{ Kč}}}$$

$$8) \lambda = \frac{340}{250} = 1.36$$

$$P_0 = \frac{1.36^0}{0!} \cdot e^{-1.36} \doteq \underline{\underline{0.26}}$$