

Sandsynlighedsfunktionen for (X_1, X_2) er

$$\begin{aligned} p(x_1, x_2) &= P(X_1 = x_1 \text{ og } X_2 = x_2) \\ &= P(X_1 = x_1)P(X_2 = x_2) = (1 - p_1)^{x_1} p_1 (1 - p_2)^{x_2} p_2 . \end{aligned}$$

Heraf følger at

$$\begin{aligned} P(X_1 = X_2) &= \sum_{(x_1, x_2): x_1 = x_2} (1 - p_1)^{x_1} p_1 (1 - p_2)^{x_2} p_2 \\ &= \sum_{x=0}^{+\infty} (1 - p_1)^x p_1 (1 - p_2)^x p_2 = \sum_{x=0}^{+\infty} p_1 p_2 ((1 - p_1)(1 - p_2))^x \\ &= p_1 p_2 \frac{1}{1 - (1 - p_1)(1 - p_2)} = \frac{p_1 p_2}{p_1 + p_2 - p_1 p_2} . \end{aligned}$$