

UVIS - PRVI KOLOKVIJ 2020./2021. (A)

2)
$$\left. \begin{array}{l} P(A^c) < 1/2 \Rightarrow P(A) > 1/2 \\ P(B^c) < 1/3 \Rightarrow P(B) > 2/3 \end{array} \right\} \begin{array}{l} \text{nezavisnost} \\ P(A \cap B) = P(A) \cdot P(B) > \frac{1}{2} \cdot \frac{2}{3} = \frac{1}{3} \\ \Rightarrow P(A^c \cup B^c) = P((A \cap B)^c) = 1 - P(A \cap B) < 1 - \frac{1}{3} = \frac{2}{3} \end{array}$$

3)
$$\Omega = \{(P, G), (G, P), (P, G), (G, G)\}$$

$$A_i = \{\text{igrač A je pobjednik u } i\text{-toj partiji}\} \Rightarrow P(A_i) = P(\{(G, P), (G, G)\}) = \frac{1}{2}$$

$$B_i = \{\text{igrač B je pobjednik u } i\text{-toj partiji}\} \Rightarrow P(B_i) = P(\{(P, G)\}) = \frac{1}{4}$$

a)
$$P(\{\text{niti jedan igrač nije pobjednik u prvoj partiji}\}) = P(A_1^c \cap B_1^c) = P(\{(P, P)\}) = \frac{1}{4}$$

b)
$$P(\{\text{u prve četiri partije nitko nije pobjednik}\} \cap \{\text{u petoj je pobjednik igrač B}\})$$

$$= \left(\frac{1}{4}\right)^4 \cdot \left(\frac{1}{4}\right) = \left(\frac{1}{4}\right)^5$$

4)
$$A = \left\{ \begin{array}{l} \text{red ne započine} \\ \text{ili ne završava} \end{array} \right\} = A_1 \cup A_2$$

$$\Omega - \text{ sastoji se od 12-ničkih permutacija.}$$

$$h(\Omega) = 12!$$

$$P(A) = P(A_1 \cup A_2) = 1 - P(A_1^c \cap A_2^c) = 1 - \frac{h(A_1^c \cap A_2^c)}{h(\Omega)} = 1 - \frac{\binom{5}{2} \cdot 2! \cdot 10!}{12!} = \left(\text{ili } \frac{9! \cdot 10!}{12!} \right) =$$

$$\approx 1 - 0.15152 \approx 0.84848$$

5) HIPOTEZE:

$H_1 = \{\text{emitiran je poruk AAAAA}\}$	$P(H_1) = 0.3, P(H_2) = 0.5, P(H_3) = 0.2$
$H_2 = \{\text{emitiran je poruk BBBB}\}$	$P(E H_1) = 0.6 \cdot 0.2 \cdot 0.2 \cdot 0.6 = 0.6^2 \cdot 0.2^2$
$H_3 = \{\text{emitiran je poruk CCCC}\}$	$P(E H_2) = 0.2 \cdot 0.6 \cdot 0.2 \cdot 0.2 = 0.2^3 \cdot 0.6^2$
$E = \{\text{primljen je poruk ABCA}\}$	$P(E H_3) = 0.2 \cdot 0.2 \cdot 0.6 \cdot 0.2 = 0.2^3 \cdot 0.6$
$F = \{\text{primljen je poruk ACBB}\}$	$P(F H_1) = 0.6 \cdot 0.1 \cdot 0.2 \cdot 0.2 = 0.2^3 \cdot 0.6$
	$P(F H_2) = 0.2 \cdot 0.1 \cdot 0.6 \cdot 0.6 = 0.2^2 \cdot 0.6^2$
	$P(F H_3) = 0.2 \cdot 0.6 \cdot 0.2 \cdot 0.2 = 0.2^3 \cdot 0.6$

$$\Rightarrow P(F) = \sum_{i=1}^3 P(F|H_i) \cdot P(H_i) = 0.0096$$

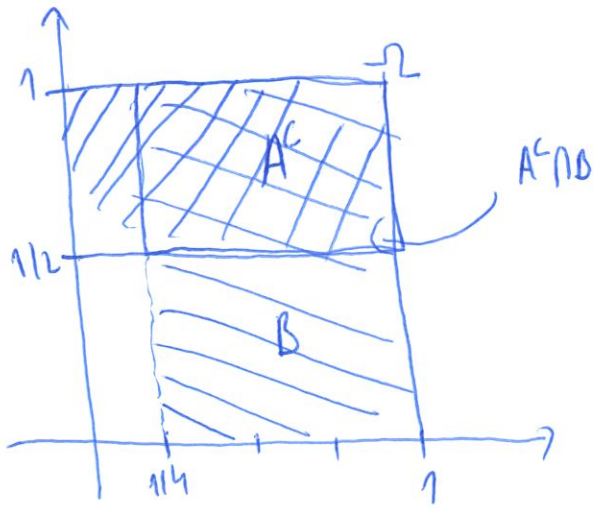
$$\Rightarrow P(E) \neq P(F)$$

 yepetiji je emitiran poruk primljen
 ABCA, ACBB

(24/3125) = 0.00768

(30/3125)

(6.)



$$\Rightarrow P(A^c \cap B) = \frac{\lambda(A \cap B)}{\lambda(\Omega)} = \frac{3/4 \cdot 1/2}{1} = \frac{3}{8}$$