Susto 3 - Probabilidade

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1) a- moeda $\Omega = 2$
dado $\Omega = 6$
total $\Omega = 12$

2) $P(A) = 2/3$ $P(\bar{A}) = 1/3$
$P(B) = 4/5$ $P(\bar{B}) = 1/5$
$P(C) = 1/10$ $P(\bar{C}) = 9/10$
ninguem acertar: $1/3 \cdot 1/5 \cdot 3/10 = 1/50 = 0,02$
alguém acertar: $1 - 0,02 = 0,98$

3) $P(C) = 10\%$
$P(G|C) = 40\%$ $P(C|G) = \frac{P(C \cap G)}{P(G)}$
$P(G|\bar{C}) = 60\%$

$P(C \cap G) = P(C) \cdot P(G|C) = \frac{1}{10} \cdot \frac{4}{10} = \frac{1}{25}$

$P(G) = P(G \cap C) \cup P(G \cap \bar{C})$
$= P(C) \cdot P(G|C) + P(\bar{C}) \cdot P(G|\bar{C}) = \frac{1}{10} \cdot \frac{4}{10} + \frac{9}{10} \cdot \frac{6}{10} = \frac{29}{50} \cong 0,068$

$\therefore P(C|G) = \frac{29}{50}$

4) $P(B) = 1/4$ $\quad P(A|B) = 8/10$

$P(M) = 1/2$ $\quad P(A|M) = 1/2$

$P(F) = 1/4$ $\quad P(A|F) = 1/5$

$$P(F|A) = \frac{P(F \cap A)}{P(A)}$$

$$P(F \cap A) = P(F) \cdot P(A|F) = 1/4 \cdot 1/5 = 1/20$$

$$P(A) = P(A \cap B) \cup P(A \cap M) \cup P(A \cap F)$$

$$P(B) \cdot P(A|B) + P(M) \cdot P(A|M) + P(F) \cdot P(A|F) = 1/4 \cdot 8/10 + 1/2 \cdot 1/2 + 1/4 \cdot 1/5 = 1/2$$

$$P(F|A) = \frac{1/20}{1/2} = 1/10$$

5) a- $P(ENG) = 11/20 = 0,55$

b- $P(MAS) = 23/40 = 0,575$

c- $P(CC \cup MAS) = P(CC) + P(MAS) - P(CC \cap MAS) = 13/20 = 0,65$

d- $P(ENG \cap FEM) = 1/5 = 0,2$

e- $P(\overline{CB}) = 1 - P(CB) = 17/20 = 0,85$

6) $P(B \cup D) = P(B) + P(D) - P(B \cap D) = 0,122$

$P(\bar{A}) = 1 - P(A) = 1 - 11/18 = 7/18 = 0,38$

7) $P(B_1) = 3/10$ $\quad P(D|B_1) = 1/50$

$P(B_2) = 9/20$ $\quad P(D|B_2) = 3/100$

$P(B_3) = 1/4$ $\quad P(D|B_3) = 1/50$

$P(D) = P(D \cap B_1) \cup P(D \cap B_2) \cup P(D \cap B_3)$

$P(B_1) \cdot P(D|B_1) + P(B_2) \cdot P(D|B_2) + P(B_3) \cdot P(D|B_3)$

$3/10 \cdot 1/50 + 9/20 \cdot 3/100 + 1/4 \cdot 1/50 = 0,0245$

$P(B_3|D) = \frac{P(B_3 \cap D)}{P(D)} = \frac{P(B_3) \cdot P(D|B_3)}{P(D)} = \frac{1/4 \cdot 1/50}{0,0245} = 50/49 \approx 0,20$

$\therefore P(D) = 0,0245$

$P(B_3|D) = 50/49 \approx 0,20$

8) $P(D) = 0,83$

$P(A) = 0,82$

$P(D \cap A) = 0,78$

a - $P(A|D) = \frac{P(A \cap D)}{P(D)} = \frac{0,78}{0,83} \approx 0,94$

b - $P(D|A) = \frac{P(D \cap A)}{P(A)} = \frac{0,78}{0,82} \approx 0,95$

9) $\frac{8}{12} \cdot \frac{7}{11} = \frac{14}{33} = 0,\dot{4}2$

10) a- $\frac{7}{18} \cdot \frac{6}{17} = \frac{7}{51} = 0,137$

b- $\frac{7}{18} \cdot \frac{6}{18} = \frac{7}{54} = 0,129$

11) $P(\bar{J} \cap \bar{H} \cap \bar{R}) = P(\bar{J}) \cdot P(\bar{H}) \cdot P(\bar{R}) =$

$0,4 \cdot 0,3 \cdot 0,2 = 0,024$

$\therefore P(\bar{J} \cap \bar{H} \cap \bar{R}) = 0,024$