2. Kansrekenen : Oefeningen

① . $P(\text{schoppen aas}) = \frac{1}{52}$

. $P(\text{aas}) = \frac{4}{52}$

. $P(\text{aas} \cup \text{harten}) = P(\text{aas}) + P(\text{harten}) - P(\text{harten aas})$
$= \frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52}$

. $P(\text{aas of harten 10}) = P(\text{aas}) + P(\text{harten 10})$
$= \frac{4}{52} + \frac{1}{52} = \frac{5}{52}$

② . $P(\text{wit}) = \frac{5}{24}$. $P(\text{niet wit}) = 1 - \frac{5}{24} = \frac{19}{24}$

. $P(\text{wit} \cup \text{blauw}) = P(\text{wit}) + P(\text{blauw}) = \frac{5}{24} + \frac{11}{24} = \frac{16}{24}$

③ MET teruglegging → onafhankelijk

. $P(W \wedge W) = P(W) \cdot P(W) = \frac{5}{8} \cdot \frac{5}{8} = 0,39$

. $P((W \wedge W) \cup (Z \wedge Z)) = P(W) \cdot P(W) + P(Z) \cdot P(Z) =$
$= 0,39 + \frac{3}{8} \cdot \frac{3}{8} = 0,53$

. $P((W \wedge Z) \cup (W \wedge W) \cup (Z \wedge W)) = 1 - P(Z \wedge Z)$
$= 1 - \frac{9}{64} = 0,86$

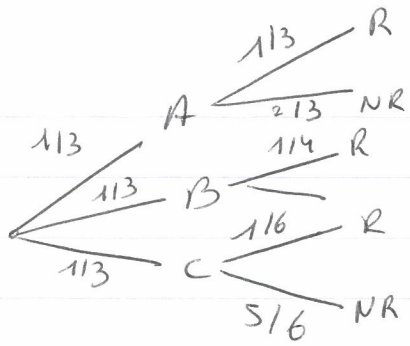
ZONDER teruglegging → afhankelijk

. $P(W_1 \wedge W_2) = P(W_2 | W_1) \cdot P(W_1) = \frac{4}{7} \cdot \frac{5}{8} = 0,36$

. $P((W_1 \wedge W_2) \cup (Z_1 \wedge Z_2)) = P(W_2 | W_1) \cdot P(W_1) + P(Z_2 | Z_1) \cdot P(Z_1)$
$= 0,36 + \frac{2}{7} \cdot \frac{3}{8} = 0,46$

. $1 - P(Z_1 \wedge Z_2) = 1 - P(Z_2 | Z_1) \cdot P(Z_1) = 1 - \frac{2}{7} \cdot \frac{3}{8} = 0,89$

(8)



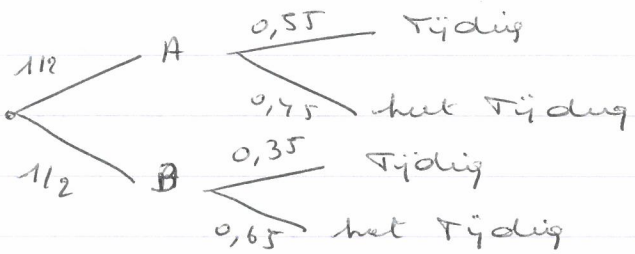
Regel v Bayes

$U = A \cup B \cup C$

$$P(C|R) = \frac{P(R|C) \cdot P(C)}{P(R|A) \cdot P(A) + P(R|B) \cdot P(B) + P(R|C) \cdot P(C)}$$

$$= \frac{1/6 \cdot 1/3}{1/3 \cdot 1/3 + 1/4 \cdot 1/3 + 1/6 \cdot 1/3} = 0,22$$

(10)



Wet v/d Totale Kans

$$P(\text{STop}) = P(S|A) \cdot P(A) + P(S|B) \cdot P(B)$$
$$= 0,45 \cdot \frac{1}{2} + 0,65 \cdot \frac{1}{2} = 0,55$$

(11) $P(\text{ong}|\text{Man}) = 0,113$

$P(\text{ong}|\text{Vr}) = 0,057$

$P(\text{Man}) = 0,55$

$$P(\text{Vr}|\text{ong}) = \frac{P(\text{ong}|\text{Vr}) \cdot P(\text{Vr})}{P(\text{ong}|\text{Vr}) \cdot P(\text{Vr}) + P(\text{ong}|\text{Man}) \cdot P(\text{Man})}$$

$$= \frac{0,057 \cdot 0,45}{0,057 \cdot 0,45 + 0,113 \cdot 0,55} = 0,2921$$

$= 29,21\ \%$

(12) a) Wetwild tot. kans

• $P(\text{Fout}) = P(F|A).P(A) + P(F|B).P(B) + P(F|C).P(C) + P(F|D).P(D)$

$= 0{,}01 \cdot 0{,}2 + 0{,}04 \cdot 0{,}3 + 0{,}06 \cdot 0{,}1 + 0{,}02 \cdot 0{,}4$

$= 0{,}028 \Rightarrow$ 2,8 %

b) Regel v Bayes

• $P(A|F) = \frac{P(F|A).P(A)}{P(F)} = \frac{0{,}01 \cdot 0{,}2}{0{,}028} = 0{,}0714 =$ 7,14 %

(13) $P(H|\omega) = 0{,}8$ $\quad P(\omega) = \frac{30}{50} = 0{,}6$

$P(H|\zeta) = 0{,}3$ $\quad P(C) = \frac{20}{50} = 0{,}4$

$$P(\omega|H) = \frac{P(H|\omega).P(\omega)}{P(H|\omega).P(\omega) + P(H|C).P(C)}$$

$$= \frac{0{,}8 \cdot 0{,}6}{0{,}8 \cdot 0{,}6 + 0{,}3 \cdot 0{,}4} = 0{,}8 =$$ 80 %

(14) $P(M) = 0{,}49$ $\quad P(J) = 0{,}51$

$P((M \wedge M \wedge J) \vee (M \wedge S \wedge M) \vee (J \wedge M \wedge M))$

$= 0{,}49 \cdot 0{,}49 \cdot 0{,}51 + 0{,}49 \cdot 0{,}51 \cdot 0{,}49 + 0{,}51 \cdot 0{,}49 \cdot 0{,}49$

$=$ 0,367335...

(15) $P(Z) = \frac{15}{30} = 1/2$ $\quad P(B) = \frac{10}{30} = 1/3$ $\quad P(R) = \frac{5}{30} = 1/6$

$P(Z_v|Z) = \frac{8}{10}$ $\quad P(B_v|Z) = \frac{2}{10}$ $\quad P(R_v|Z) = 0$

Regel v Bayes $P(Z_v|B) = \frac{3}{10}$ $\quad P(B_v|B) = \frac{5}{10}$ $\quad P(R_v|B) = 2/10$

$P(Z_v|R) = \frac{1}{10}$ $\quad P(B_v|R) = \frac{3}{10}$ $\quad P(R_v|R) = 6/10$

$$P(Z|Z_v) = \frac{P(Z_v|Z).P(Z)}{P(Z_v|Z).P(Z) + P(Z_v|B).P(B) + P(Z_v|R).P(R)}$$

$$= \frac{8/10 \cdot 1/2}{8/10 \cdot 1/2 + 3/10 \cdot 1/3 + 1/10 \cdot 1/6}$$

$=$ 0,774194