Student Information

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Answer 1

a)

$E(BLUE) = (2 \cdot \frac{2}{3} + 3 \cdot \frac{1}{6} + 4 \cdot \frac{1}{6}) = 2.5$
$E(YELLOW) = (1 \cdot \frac{1}{3} + 2 \cdot \frac{1}{3} + 3 \cdot \frac{1}{3}) = 2$
$E(RED) = (1 \cdot \frac{1}{4} + 2 \cdot \frac{1}{4} + 3 \cdot \frac{3}{8} + 5 \cdot \frac{1}{8}) = 2.5$

b)

$E(RRY) = 2 \cdot E(RED) + E(YELLOW) = 2 \cdot 2.5 + 2 = 7$
$E(YYB) = 2 \cdot E(YELLOW) + E(BLUE) = 2 \cdot 2 + 2.5 = 6.5$
I would choose 2 red 1 yellow(RRY) option because its expected value is bigger than the other option.

c)

I would choose 2 yellow 1 blue option. Because expected value of rolling 2 yellow dice is 4 and E(YYB) will be 8. Therefore probability of E(YYB) is bigger than RRY.

d)

Probability of getting 3 is $\frac{1}{3} \cdot \frac{1}{6} + \frac{1}{3} \cdot \frac{2}{6} + \frac{1}{3} \cdot \frac{3}{8} = \frac{7}{24}$
Probability of getting 3 from red dice $\frac{1}{3} \cdot \frac{3}{8} = \frac{1}{8}$
$\frac{\frac{1}{8}}{\frac{7}{24}} = \frac{3}{7}$

e)

R+Y=6 can occur on 2 options.
First: Red=5 Yellow=1
$P(Red5) = \frac{1}{8}$ $P(Yellow1) = \frac{1}{3}$
P(Red5)P(Yellow1)=$(\frac{1}{8}) \cdot (\frac{1}{3}) = \frac{1}{24}$
Second: Red=3 Yellow=3
$P(Red3) = \frac{3}{8}$ $P(Yellow3) = \frac{1}{3}$
P(Red3)P(Yellow3)=$(\frac{3}{8}) \cdot (\frac{1}{3}) = \frac{3}{24}$
Therefore probability of getting 6 is $\frac{1}{24} + \frac{3}{24} = \frac{4}{24} = \frac{1}{6}$

Answer 2

a)

0 outage in Ankara and 2 outages in Istanbul is P(0,2). We can find it from table's third row and its 0.17.

b)

There is no possible day that 2 outages in Ankara. Therefore its 0.

c)

It can happen two way. 2 outages in İstanbul or 1 outage in Ankara and 1 outage in İstanbul. So joint probability is P(0,2)∩P(1,1). $P(0,2) = 0.17, P(1,1) = 0.11$
$P(2) = 0.28$

d)

Probability of 1 outage in Ankara is P(1,0)∩P(1,1) ∩ P(1,2) ∩ P(1,3).
$P(1,0) = 0.12 P(1,1) = 0.11 P(1,2) = 0.22 P(1,3) = 0.15$
$P = 0.6$

e)

$P_a(0) = 0.08 + 0.13 + 0.17 + 0.02 = 0.4$
$P_a(1) = 1 - P_a(0) = 0.6$
$P_a(2) = 0$
$P_a(3) = 0$
$P_i(0) = 0.08 + 0.12 = 0.2$
$P_i(1) = 0.13 + 0.11 = 0.24$
$P_i(2) = 0.17 + 0.22 = 0.39$
$P_i(3) = 0.02 + 0,15 = 0.17$

f)

$P(0,0) = 0.08 P_a(0) = 0.4 P_i(0) = 0.2$
$0.08 = 0.4 \cdot 0.2$ So they are independent.