

Answer 1)

Color	Type	Origin	Stolen
Red	Sports	Domestic	Yes
Red	Sports	Domestic	No
Red	Sports	Domestic	Yes
Yellow	Sports	Domestic	No
Yellow	Sports	Imported	Yes
Yellow	SUV	Imported	No
Yellow	SUV	Imported	Yes
Yellow	SUV	Domestic	No
Red	SUV	Imported	No
Red	Sports	Imported	Yes

(Red, SUV, Domestic) \rightarrow (Yes or No)
 (Yellow, SUV, Domestic) \rightarrow (Yes or No)

$$P(\text{Yes}) = \frac{5}{10} = 0.5$$

$$P(\text{No}) = \frac{5}{10} = 0.5$$

$$P(y(x_1, \dots, x_n)) = \frac{P(x_1/y) \cdot P(x_2/y) \cdots P(x_n/y)}{P(x_1) P(x_2) \cdots P(x_n)}$$

Color Color	Yes	No
Red	3/5	2/5
Yellow	2/5	3/5

Type	Yes	No
Sports	$\frac{4}{6}$	$\frac{2}{6}$
SUV	$\frac{1}{4}$	$\frac{3}{4}$

Origin	Yes	No
Domestic	$\frac{2}{5}$	$\frac{3}{5}$
Imported	$\frac{3}{5}$	$\frac{2}{5}$

for (Red, SUV, Domestic)

(P = yes) $P(\text{Red}/\text{yes}) P(\text{SUV}/\text{yes}) P(\text{Domestic}/\text{yes})$

$$\Rightarrow \frac{1}{2} \times \frac{3}{5} \times \frac{1}{4} \times \frac{2}{5}$$

$$\Rightarrow 0.03$$

(P = No) $P(\text{Red}/\text{No}) P(\text{SUV}/\text{No}) P(\text{Domestic}/\text{No})$

$$\Rightarrow \frac{1}{2} \times \frac{2}{5} \times \frac{3}{4} \times \frac{2}{5}$$

$$\Rightarrow 0.06$$

Since $0.06 > 0.03$ it gets
~~also~~ classified as ~~also~~
"No"

for (yellow, SUV, Domestic)

$P(\text{yes}) P(\text{yellow/yes}) P(\text{SUV/yes}) P(\text{Domestic/yes})$

$$\Rightarrow \frac{1}{2} \times \frac{2}{5} \times \frac{1}{4} \times \frac{2}{5}$$

$$\Rightarrow 0.02$$

$P(\text{No}) P(\text{yellow/No}) P(\text{SUV/No}) P(\text{Domestic/No})$

$$\Rightarrow \frac{1}{2} \times \frac{3}{5} \times \frac{3}{4} \times \frac{3}{5}$$

$$\Rightarrow 0.135$$

Since $0.135 > 0.02$ it gets classified as "No."