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09/03/2023 ML Lab 7 Task - 1

Task 1:

For given car dataset, apply Naive Bayes algorithm for the classification. Show all the steps of the training phase and identify the class for test data point (colour = Yellow, Type = Sports, Origin = Domestic). Solve answer on paper and upload the image.

Example No	Colour	Type	Origin	Stolen?
1	Red	Sports	Domestic	Yes
2	Red	Sports	Domestic	No
3	Red	Sports	Domestic	Yes
4	Yellow	Sports	Domestic	No
5	Yellow	Sports	Imported	Yes
6	Yellow	SUV	Imported	No
7	Yellow	SUV	Imported	Yes
8	Yellow	SUV	Domestic	No
9	Red	SUV	Imported	No
10	Red	Sports	Imported	Yes

Soln -

We know,

$\frac{p}{q}$ = ratio; p → No. of success, q → No. of fails = 1 - p.

$$P(\text{'Yes'}) = \underset{(\text{Color})}{\frac{2}{5}} \times \underset{(\text{Type})}{\frac{4}{5}} \times \underset{(\text{Origin})}{\frac{2}{5}} \times \underset{(\text{Total})}{\frac{5}{10}} = 0.064$$

$$P(\text{'No'}) = \underset{(\text{Color})}{\frac{3}{5}} \times \underset{(\text{Type})}{\frac{2}{5}} \times \underset{(\text{Origin})}{\frac{3}{5}} \times \underset{(\text{Total})}{\frac{5}{10}} = 0.072$$

$P(\text{'No'}) > P(\text{'Yes'})$

Ans: [Class = Stolen ≐ No]