ML # Assignment - 1

solution 1 :-

→ To find :-

$P(sunny/a\ cone\ of\ ice\text{-}cream) = ?$

$P(rainy/a\ cup\ of\ hot\ coffee) = ?$

Given

→ The occurrence of each word is Independent

∴ $P(a\ cone\ of\ ice\ cream)$

$= P(a)\ P(cone)\ P(of)\ P(ice)\ P(cream)$

Part (a) :-

$P(sunny/a\ cone\ of\ ice\ cream)$

Using Bayes theorem :-

$$P(A/B) = \frac{P(B/A)\cdot P(A)}{P(B)}$$

we can find

$$P\left(sunny/a\ cone\ of\ ice\text{-}cream\right) = \frac{P\left(\frac{a\ cone\ of\ ice\ cream}{sunny}\right)\times P(sunny)}{P(a\ cone\ of\ ice\text{-}cream)}$$

∴ Also since the words are independant :-

∴ $= P(sunny/a)$

∴ Also since we want to classify the tags with higher probability, so ignoring the denominator :-

∴ $= \boxed{\begin{array}{l} P(a/sunny)\cdot P(cone/sunny)\cdot P(of/sunny)\cdot \\ P(ice/sunny)\cdot P(cream/sunny)\cdot P(sunny) \end{array}}$

☆

Similarly :-

Part ⑧ ☆

$\boxed{\begin{array}{l} P(rainy/a\ cup\ of\ hot\ coffee) \\ = P(a/rainy)\cdot P(cup/rainy)\cdot P(of/rainy)\cdot P(hot/rainy) \\ \qquad \cdot P(coffee/rainy)\cdot P(rainy). \end{array}}$