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Id → 202318019

Subj → B.D

Course → MSC DS.

Ques.	Category	Document
	−	- - - - -
	+	- - - -
	?	predictable with no Fun

Ans

Priors $= \frac{F}{Total} = P(-) = 3/5$, $P(+) = 2/5$

Conditional OR LIKLIHOOD $= P(W_i|C) = \dfrac{Count(W_1,C)+1}{(\sum_{wev} Count(v,c))} + |V|$

Probabilities →

$P(\text{predictable}|-) = \dfrac{1+1}{14+20} = \dfrac{2}{34} = \dfrac{1}{17}$

$P(\text{with}|-) = \dfrac{0+1}{34} = \dfrac{1}{34}$

$P(\text{no}|-) = \dfrac{1+1}{34} = \dfrac{2}{34} = \dfrac{1}{17}$

$P(\text{fun}|-) = \dfrac{0+1}{34} = \dfrac{1}{34}$

$$P(\text{predictable} \mid +) = \frac{0+1}{9+24} = \frac{1}{33}$$

$$P(\text{with} \mid +) = \frac{0+1}{9+24} = \frac{1}{33}$$

$$P(\text{no} \mid +) = \frac{0+1}{33} = \frac{1}{33}$$

$$P(\text{Fun} \mid +) = \frac{1+1}{33} = \frac{2}{33}$$

Choosing the Category:

$$P(+ \mid \text{test}) = P(\text{predictable} \mid +) \times P(\text{with} \mid +) \times P(\text{no} \mid +) \times P(\text{Fun} \mid +) \times P(+)$$

$$= \left(\frac{2}{33}\right)\left(\frac{1}{33}\right)\left(\frac{2}{33}\right)\left(\frac{1}{33}\right)\left(\frac{3}{5}\right)$$

$$= \frac{6}{5929605} \Rightarrow 6.8488\times10^{-7}$$

$$\approx 0.00000 0007$$

$$P(- \mid \text{test}) = \left(\frac{1}{17}\right)\left(\frac{1}{34}\right)\left(\frac{1}{17}\right)\left(\frac{1}{34}\right)\left(\frac{2}{5}\right)$$

$$= \frac{6}{98720420} \approx 1.7959 \times 10^{-6}$$

$$= \frac{2}{1536640}$$

$$\approx 0.000002$$

Thus, we can say that the category of test document will be negative $(-)$.