For Naive Bayes, VNB = argmax P(vj) IP(ai | vj), let H denote class healthy and V denote class virulent $P(H) P(\text{single 1H}) P(\text{light } | H) P(\text{one } | H) = \frac{1}{2}, \frac{2}{3}, \frac{2}{3} = \frac{4}{27}$ P(v) P(single | v) P (light | v) Plone | v) = = 1 = 1 = 1 77 7 54, thus Wa=+1 . It's class is healthy 0.2 for text classification, $V_{NB} = \underset{i \in V}{\operatorname{argnax}} P(v_j) T P(a_i | v_j)$ $P(a_i | v_j) = \frac{rk+1}{n+1 \text{ Voc}}$ P(A) P(cats | A) Pleat | A) ... P(bones | A) $|| = \frac{1}{2} \frac{0+1}{8+6} \cdot \frac{0+1}{8+6} \cdot \frac{0+1}{8+6} = \frac{1}{2\times 1+7} \quad \text{$n=8$ in A and no word in larget sentence}$ P(B)P(cots B)P(eat 1B) ... P(bones 1B) $|12| = \frac{1}{2} \frac{1+1}{5+6} \cdot \frac{o+1}{5+6} \cdot \frac{o+1}{5+6} \cdot \frac{o+1}{5+6} \cdot \frac{o+1}{5+6} \cdot \frac{o+1}{5+6} = \frac{2^2}{117}$ 22 > 11/2, so this sentence belongs to class B

0.3

Let the symbols below denote each feature and class.

Mexagon: H

Smile: A not smile: 7.8

2. Shape Mose Smile PCC)= 3/8 P(B)= 5/8 P(D) = 2/8 P15) = 3/8 P(H)= 3/8

 $P(X|C,B) = \frac{P(X,C,B)}{P(C,B)} = \frac{1/8}{2/8} = \frac{1}{2}$ PG/DB)= 1/8=1 P(S/H,B)= 2/8-0 P(X/C,S)=118=1 P(X/D,S)= = 0 P(X/H/S) = 1/8-1

For P(II), we just need to use 1 - the above 13 probabilities

Shape -> Nose minimus something or one

P(c) = 3/8 $P(B|c) = \frac{P(c|B)}{|B|} = \frac{2/8}{3/8} = \frac{2}{3}$ P(D) = 2/8 $P(B|D) = \frac{1/8}{218} = \frac{1}{2}$ $P(H) = \frac{3}{8}$ $P(B|H) = \frac{113}{8} = \frac{2}{3}$

 $P(|S) = \frac{2}{3/8} = \frac{2}{3}$

For P(S(C), P(S(D), P(S/H)) and P(IS/B), P(IS/S) we just need to colculate the difference between

I and the above probabilities

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