

$$C(\text{pos})$$

$$= P$$

$$0.09 \times 0.07 \times 0.29 \times 0.04 \times 0.08$$

$$= \frac{9 \times 7 \times 29 \times 4 \times 8}{100^5} = \underline{58464}$$

VS

$$C(\text{neg})$$

$$= \frac{16 \times 6 \times 6 \times 15 \times 1}{100^5} = \underline{95040}$$

$$V = 7$$

$$\text{count(action)} = 11$$

$$\text{count(comedy)} = 9$$

fun, couple, love, love

comedy

fast, furious, shoot

action

couple, fly, fast, fun, fun

comedy

furious, shoot, shoot, fun

action

fly, fast, shoot, love

action.

$$\begin{cases} P(\text{action}) = \frac{3}{5} \end{cases}$$

$$\begin{cases} P(\text{comedy}) = \frac{2}{5} \end{cases}$$

$$P(\text{fast} | \text{action}) = \frac{2 + 1}{11 + 7} = \frac{3}{18} = \frac{1}{6}$$

$$P(\text{couple} | \text{ac}) = \frac{0 + 1}{11 + 7} = \frac{1}{18}$$

$$P(\text{shoot} | \text{ac}) = \frac{4 + 1}{11 + 7} = \frac{5}{18}$$

$$P(\text{fly} | ac) = \frac{1+1}{11+7} = \frac{1}{9}$$

$$\therefore \frac{3}{5} \times \frac{1}{6} \times \frac{1}{18} \times \frac{5}{18} \times \frac{1}{9} = P(D | ac)$$

$$P(\text{fast} | co) = \frac{1+1}{9+7} = \frac{2}{16} = \frac{1}{8}$$

$$P(\text{couple} | co) = \frac{2+1}{9+7} = \frac{3}{16}$$

$$P(\text{shoot} | co) = \frac{0+1}{9+7} = \frac{1}{16}$$

$$P(\text{fly} | co) = \frac{1+1}{9+7} = \frac{1}{8}$$

$$\therefore \frac{2}{5} \times \frac{1}{8} \times \frac{3}{16} \times \frac{1}{16} \times \frac{1}{8} = P(D | co)$$

good, good, great, poor

$$P(\text{pos}) = \frac{2}{5}, \quad P(\text{neg}) = \frac{3}{5}$$

$$C\#(\text{pos}) = 9$$

$$C\#(\text{neg}) = 14$$

$$\underbrace{V=3}_{?}$$

$$P(\text{good} | \text{pos}) = \frac{3 + 1}{9 + 3}$$

$$P(\text{good} | \text{neg}) = \frac{2 + 1}{14 + 3}$$

$$P(\text{great} | \text{pos}) = \frac{5 + 1}{9 + 3}$$

$$P(\text{great} | \text{neg}) = \frac{2 + 1}{14 + 3}$$

$$P(\text{poor} | \text{pos}) = \frac{1 + 1}{9 + 3}$$

$$P(\text{poor} | \text{neg}) = \frac{10 + 1}{14 + 3}$$

X add-1:

$$\log \frac{2}{5} + \log \frac{1}{3} + \log \frac{5}{7} + \log \frac{1}{9}$$

$$= -2.0845 \dots (\text{pos})$$

$$\log \frac{3}{5} + \log \frac{1}{7} + \log \frac{1}{7} + \log \frac{5}{7} = -2.058$$

(neg)

Add 1:

$$\log \frac{2}{5} + \log \frac{1}{3} + \log \frac{5}{12} + \log \frac{1}{6}$$

$$= -2.033 (\text{pos})$$

$$\log \frac{3}{5} + \log \frac{3}{17} + \log \frac{3}{17} + \log \frac{11}{17}$$

$$= -1.9117$$

(neg)

$$\text{precision} = \frac{tp}{tp + fp} = \frac{80}{80 + 30} = \frac{8}{11}$$

$$\text{recall} = \frac{tp}{tp + fn} = \frac{80}{80 + 20} = 0.8$$

$$\text{acc} = \frac{150}{200} = \underline{0.75}$$

$$F_1 = \frac{2PR}{R+P} = \frac{2 \cdot \frac{4}{5} \cdot \frac{8}{11}}{0.8 + \frac{8}{11}}$$

$$= \underline{0.76 \dots}$$

		Actual		
		pos	neut	neg
Pre dicted	pos	100	20	10
	neut	330	120	20
	neg	15	25	95

$$\frac{100 + 120 + 95}{130 + 470 + 135} = \text{acc}$$

		Ac	
		T	F
pos	Pre	T	100
		F	30
		T	345
		F	260

[5]

$$\frac{tp}{tp + fp}$$

$$\frac{\begin{array}{cc} 0.1 & 0.1 \\ \text{"} & \text{"} \end{array} 2PR}{\begin{array}{cc} R & P \\ \text{"} & \text{"} \\ 0.1 & 0.1 \end{array}} = \frac{0.02}{0.2} = 0.1$$