CSE556: NLPQuiz - 3

Total Marks: 30

1. Define Sentiment and Opinion. Give one example of each and justify them. [1 + 2 Marks]
   Sentiment expresses a more generic/societal view.
   Opinions are personal interpretations.

   One example each of Sentiment and Opinion
   No Fixed Answer
   If the example given resonates with the definitions, give marks
   As per instructions, if examples given are the same as in lecture slides, then no marks will be fetched.

2. Mention two attributes that differentiate Sentiment and Emotion.[2 Marks]
   Target - Sentiment always requires a target. Emotion may not.
   State - Emotions are volatile and temporary and can change frequently; however, sentiments are more persistive.

   Note: These are the two expected answers. However, we would consider other appropriate differential attributes as well, say, sentiment expresses a societal view while emotion is a psychological state of human mind.

3. Give an example of Humble Bragging.[1 Marks]
   Draw attention to something of which someone is proud.
   No Fixed Answer
   If the example given resonates with the definition, give marks
   As per instructions, if examples given are the same as in lecture slides, then no marks will be fetched.

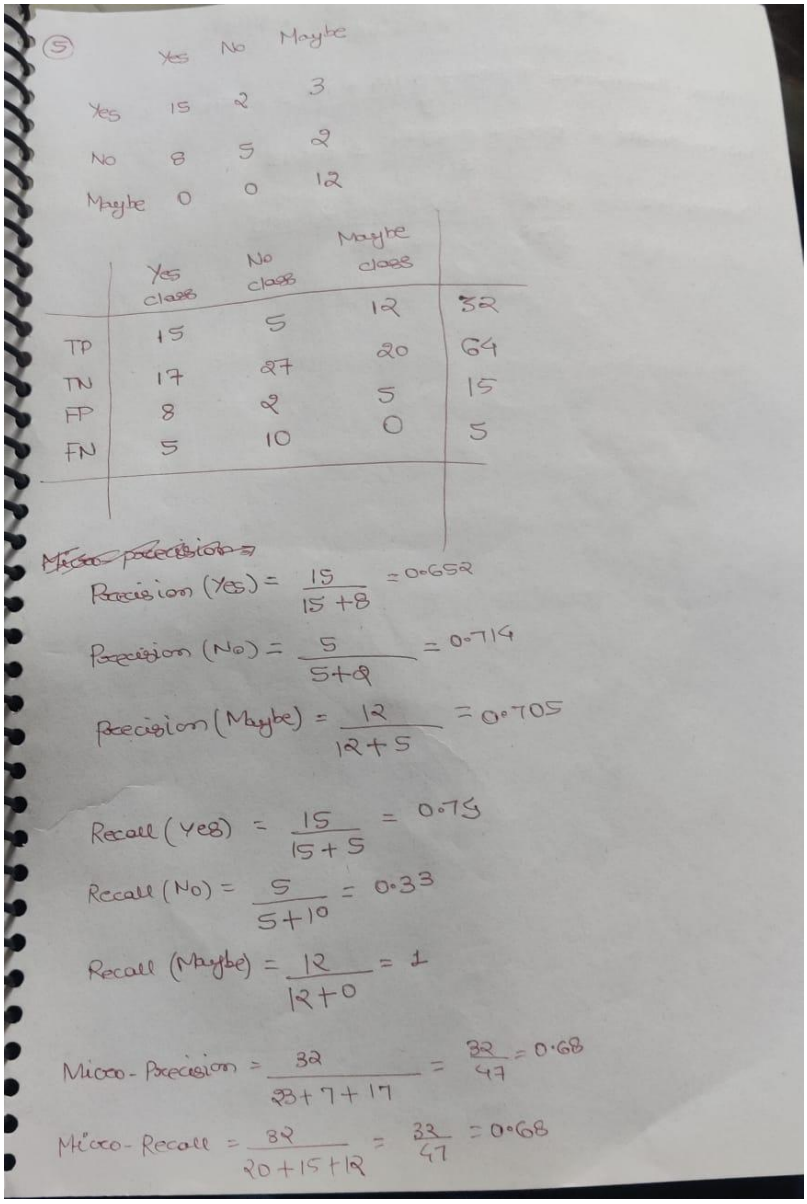
4. Consider the sentiment intensity range of [-1 (extremely negative), +1 (extremely positive)], e.g., awesome (0.9), bad (-0.3), etc. Devise a generic formula to negate the sentiment of any token. For example, if 'bad' is -0.3, find the formula that should compute the intensity of "not bad" or vice-versa. [5 Marks]
   No right or wrong answer for this.
   1. We will check the equation and assign 5 if the polarity is getting reversed accordingly.
   2. Thereafter, try to break the equation for any one example. If we can find it, 2 marks will be deducted. (We won't be too strict. We'll make a few test cases and check against them.)

   A potential solution: Let x be the sentiment intensity of a token. Then, the intensity of the negation of token would simply be -1 * (Sentiment intensity of token), i.e., -x.

   For example, for the equation mentioned above, it is according to rule 1.
   E.g. Good (0.3) → not good (-0.3) OK

   However, I can give a simple example that would break the setup.
   Terrible (0.9) → non terrible? Would it be -0.9? It does not make sense, right? FAIL, so penalize 2 marks.

5. Compute micro, macro, and weighted average F1-scores for the following confusion matrix. Rows are actual, Columns are predicted. Show precision, recall, and F1 computations. [9 Marks] Note: Zero marks without computation.



⑤

	Yes	No	Maybe
Yes	15	2	3
No	8	5	2
Maybe	0	0	12

	Yes class	No class	Maybe class	
TP	15	5	12	32
TN	17	27	20	64
FP	8	2	5	15
FN	5	10	0	5

Precision (Yes) = $\frac{15}{15+8}$ = 0.652

Precision (No) = $\frac{5}{5+2}$ = 0.714

Precision (Maybe) = $\frac{12}{12+5}$ = 0.705

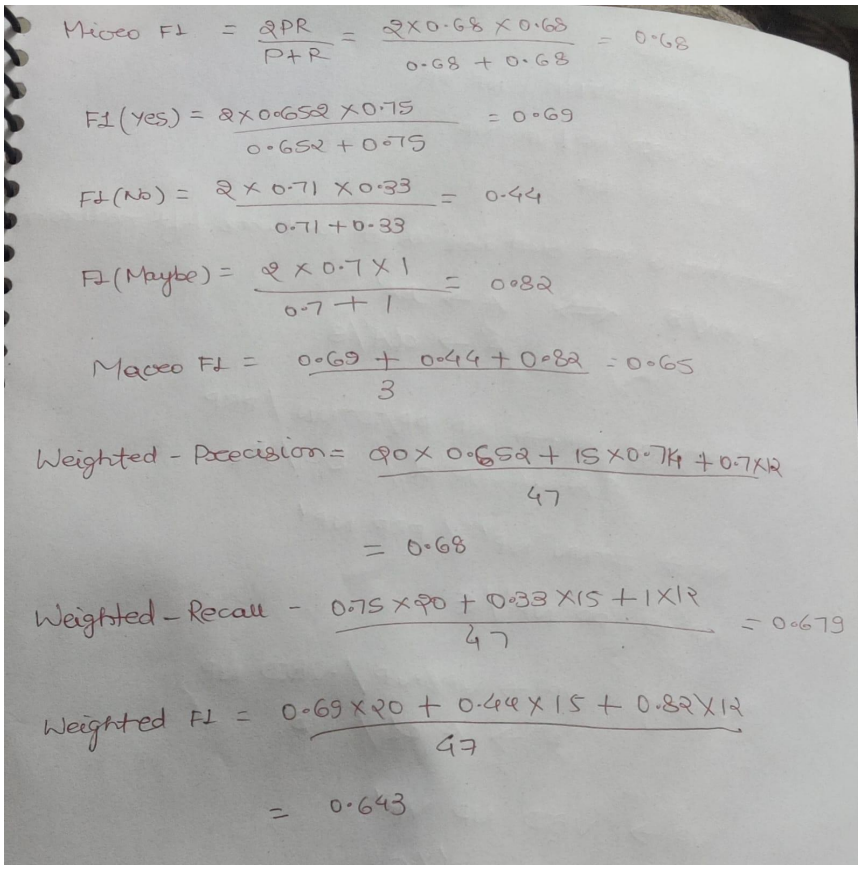
Recall (Yes) = $\frac{15}{15+5}$ = 0.75

Recall (No) = $\frac{5}{5+10}$ = 0.33

Recall (Maybe) = $\frac{12}{12+0}$ = 1

Micro-Precision = $\frac{32}{23+7+17}$ = $\frac{32}{47}$ = 0.68

Micro-Recall = $\frac{32}{20+15+12}$ = $\frac{32}{47}$ = 0.68



6. Is the following grammar suitable for top-down parsing? If yes, you do not need to do anything except writing “It is suitable” and you’ll get full marks. Otherwise, identify the problem and resolve it. [10 Marks]

Except for the following productions others will remain the same.
NP → PRP | DT NN | NP PP
VP → VBD NP | VP NP

Removing left recursion:
NP → PRP NP’ | DT NN NP’
NP’ → PP NP’ | epsilon

VP → VBD NP VP’
VP’ → NP VP’ | epsilon

There will not be any partial marking. If someone has missed any production, he/she will get zero. The intuition is if you miss any production, then grammar will change and as a consequence, the language accepted by this grammar will change.

(6)

S → NP NP

NP → PRP | DTNN | NP PP

VP → VBD NP | VP NP

PP → IN NP

Grammer is not suitable as it contains left recursion

$A \to A\alpha / \beta \iff A \to \beta A'$

$A' \to \alpha A' / \epsilon$

Changing NP → NP PP / DTNN / PRP

$A \to A\alpha / \beta_1 / \beta_2$

NP → DTNN NP' / PRP NP'

NP' → PP NP' / ∈

Changing VP → VP NP / VBD NP

$A \to A\alpha / \beta$

VP → VBD NP VP'

VP' → NP VP' / ∈