Natural Language Processing

HW 1

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Task introduction

- **Topic** : Multi-label Classification in NLP
- **Purpose** : Apply deep learning model (e.g. RNN, LSTM) to predict the concern in tweets
- You can use any external package you want, e.g. Pytorch, Keras, scikit-learn
- **Tips** : Enhance model performance with pretrained word embeddings and attention
- Transformer-based model such as BERT is not allowed in HW 1

- Requirement :

1. Submit a report and your source code to E3
2. Upload your submission to Kaggle

Dataset

COVID-19 anti-vaccine tweets labelled with various specific anti-vaccine concerns in a multi-label setting.

- HW1_dataset.zip
  - train.json
  - val.json
  - test.json
  - sample_submission.csv

Data Introduction

Each object in the json file contains information about a tweet and its associated labels, including:

- ‘ID’ : unique identifier of the tweet
- ‘tweet’ : the content of the tweet
- ‘labels’ : concerns that have been identified within the tweet with the specific terms causing the concerns and their positions. Each tweet can have multiple concerns!


```
{'ID': '1349576125454852097',
 'tweet': '@4mishee @ScottMorrisonMP can keep his vaccine 💉 I’ll take covid with its “ non existent “ symptoms over some b
ig pharma no liability or indemnity lab 💉 cooked vaccine thank you.',
 'labels': {'pharma': [{'index': 0,
    'start': 19,
    'end': 25,
    'terms': 'big pharma no liability or indemnity'}],
  'unnecessary': [{'index': 0,
    'start': 13,
    'end': 17,
    'terms': 'non existent “ symptoms'}]}},
```

Kaggle Submission Format

Your model is expected to classify the concern of the tweets in 'test.json' file, and then upload your model's predictions to Kaggle. the submission format should be :

- A 1977*13 .csv file, first row for column name and the last 1976 rows for your result ('1' indicates that the tweet has the concern, '0' signifies that it does not)
- First row must match the one shown in the sample_submission.csv, make sure the order is correct !

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	index	ineffective	unnecessary	pharma	rushed	side-effect	mandatory	country	ingredients	political	none	conspiracy	religious	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	1	0	0	0	0	0	0	0	0	0	0	0	0	
4	2	0	0	0	0	0	0	0	0	0	0	0	0	

Kaggle Submission (70%)

- Kaggle link
- Display team name : <student ID>
- Public leaderboard is calculated with approximately 50% of the test data, private leaderboard is calculated with the other 50%, so the final standings may be different. You can only view your private leaderboard score after the competition has ended.
- There is a simple baseline and a strong baseline, beat them to get higher score.

Public Private

This leaderboard is calculated with approximately 50% of the test data. The final results will be based on the other 50%, so the final standings may be different.

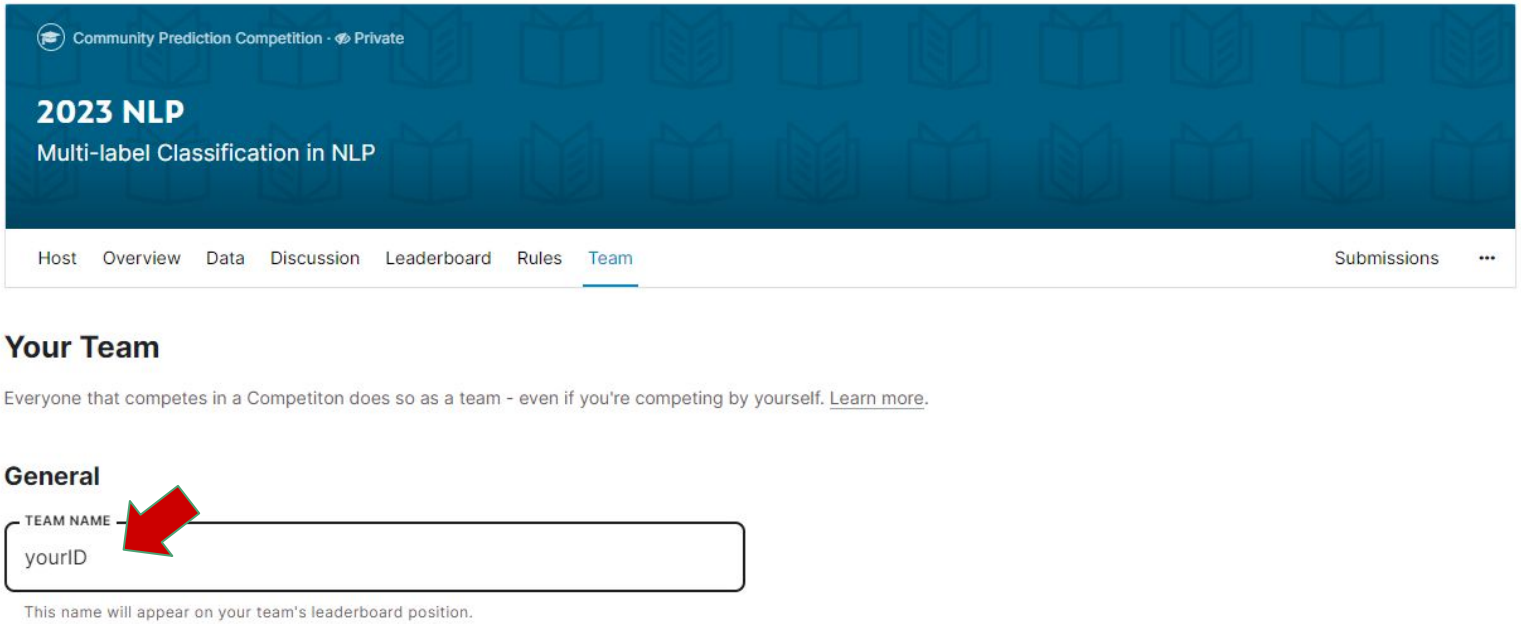
#	Team	Members	Score	Entries	Last
	Strong Beseline		0.44299		
	Simple Baseline		0.30744		

Kaggle Submission (70%)

- Kaggle link
- Display team name : <student ID>
- Public leaderboard is calculated with approximately 50% of the test data, private leaderboard is calculated with the other 50%, so the final standings may be different. You can only view your private leaderboard score after the competition has ended.
- There is a simple baseline and a strong baseline, beat them to get higher score.
- The scoring metric is macro-F1, higher score means better performance.
- You can submit at most 5 times each day and choose 2 of the submissions to be considered for the private leaderboard, or will otherwise default to the best public scoring submissions.

Change your team name

Please remember to change the team name to <student ID>, or there will be a deduction of 5 points for HW 1.



Report Submission

Answer the following 3 questions :

1. Describe how you build your model ? How did you do to preprocess your data from dataset ? The distribution of the concern is imbalanced, what did you do to improve the macro F1 score on those concern which are in small scale ?

2. Have you tried pretrained word embedding ? (e.g. Glove or Word2vec) What was their influence on the result after using them ?

3. Have you tried attention on your model ? What was its influence on the result? When your model predict the concern, what was it focusing on ? Do some case studies.

Please answer the questions in detail to get the full point of each question.

Grading policy

- Kaggle (70%)
  - 30% based on the public leaderboard score and 70% based on the private leaderboard score
  - Basic score :
    Over strong baseline : 55
    Over simple bassline : 40
    Under simple baseline : 25
  - Ranking score:
    15-(15/N)*(ranking-1), N=numbers of people in the interval

- Report (30%)
  - 10% for each quesiton

You will receive 0 points if you do not submit the source code.

E3 Submission

Submit your source code and report to E3 before 11/7(Tue) 23:59, no late submissions will be accepted !

Format :

- HW1_<student ID>.zip
  - source code : HW1_<student ID>.py or HW1_<student ID>.ipynb
  - report : HW1_<student ID>.pdf

If you have any question about HW 1, please feel free to contact with TA: Wei-Ling Hsu through email weiling.hsu.cs11@nycu.edu.tw

Have Fun !