CENTENNIAL COLLEGE

PyTorch

Sentiment Analysis on Movie Reviews : A predictive model with pre-trained Bert by PyTorch

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content

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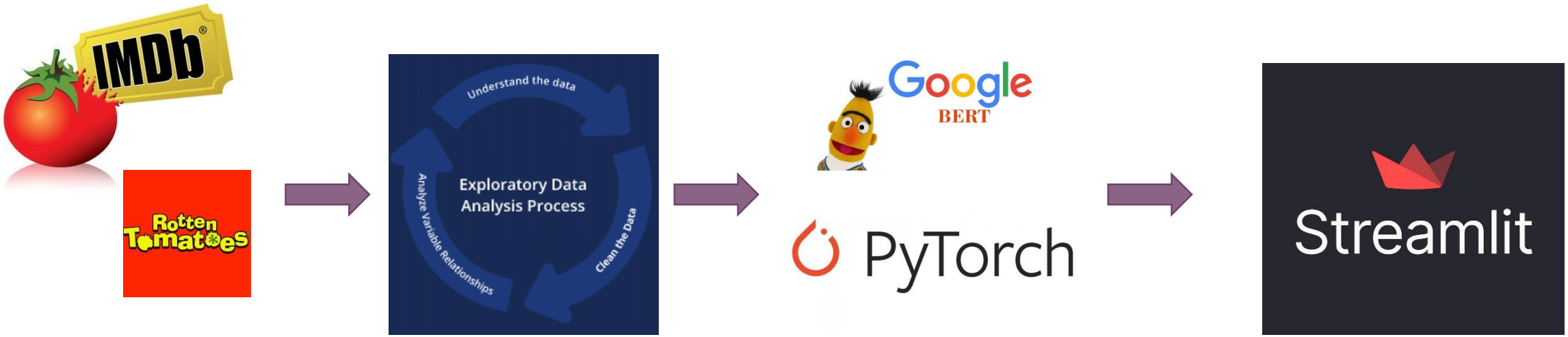
Introduction



Dataset: Kaggle API

KAGGLE · PLAYGROUND PREDICTION COMPETITION · 10 YEARS AGO

Late Submission

Sentiment Analysis on Movie Reviews

Classify the sentiment of sentences from the Rotten Tomatoes dataset

Overview | Data | Code | Models | Discussion | Leaderboard | Rules | Team | Submissions

Overview

Start
Feb 28, 2014

Close
Feb 28, 2015

Description

"There's a thin line between likably old-fashioned and fuddy-duddy, and The Count of Monte Cristo ... never quite settles on either side."

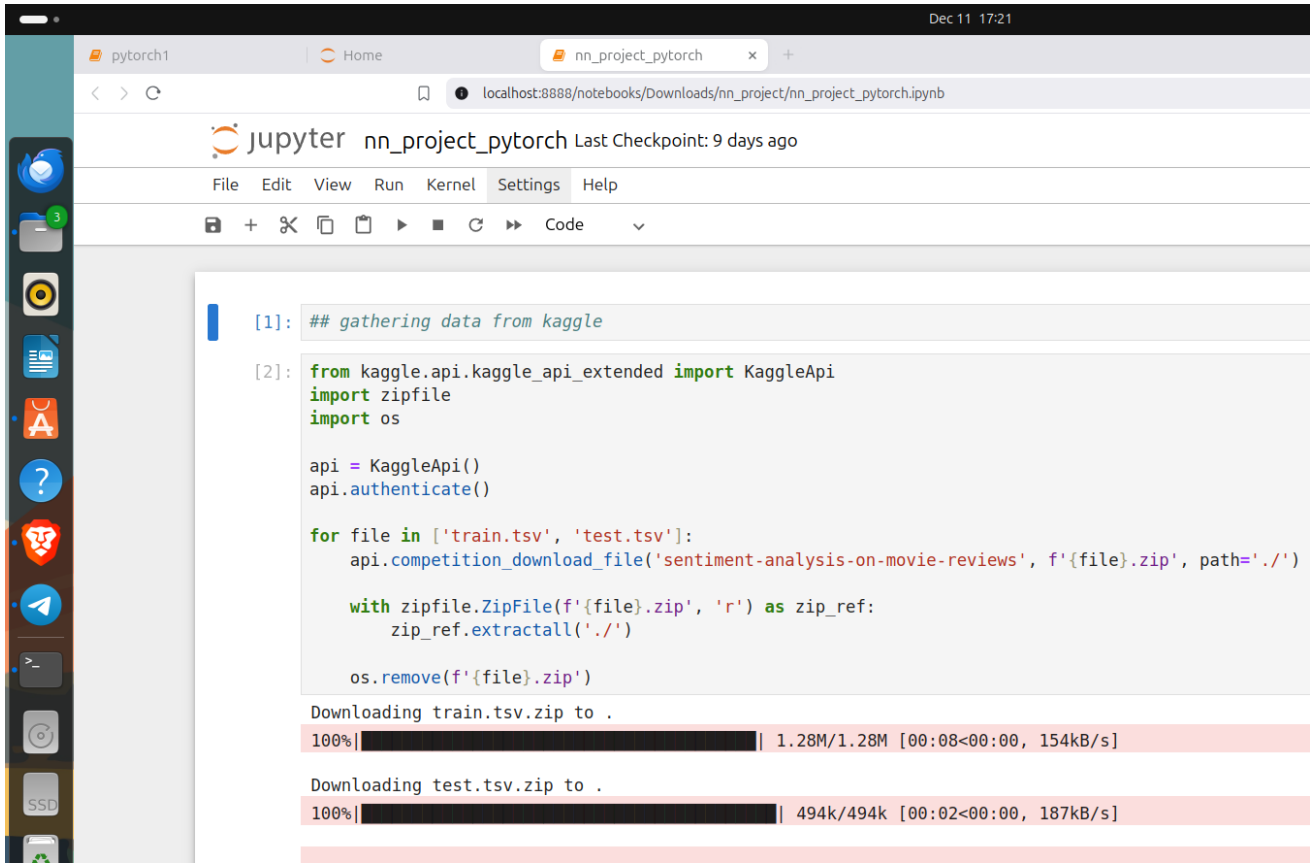
The Rotten Tomatoes movie review dataset is a corpus of movie reviews used for sentiment analysis, originally collected by Pang and Lee [1]. In their work on sentiment treebanks, Socher et al. [2] used Amazon's Mechanical Turk to create fine-grained labels for all parsed phrases in the corpus. This competition presents a chance to benchmark your sentiment-analysis ideas on the Rotten Tomatoes dataset. You are asked to label phrases on a scale of five values: negative, somewhat negative, neutral, somewhat positive, positive. Obstacles like sentence negation, sarcasm,

Competition Host
Kaggle

Prizes & Awards
Knowledge
Does not award Points or Medals

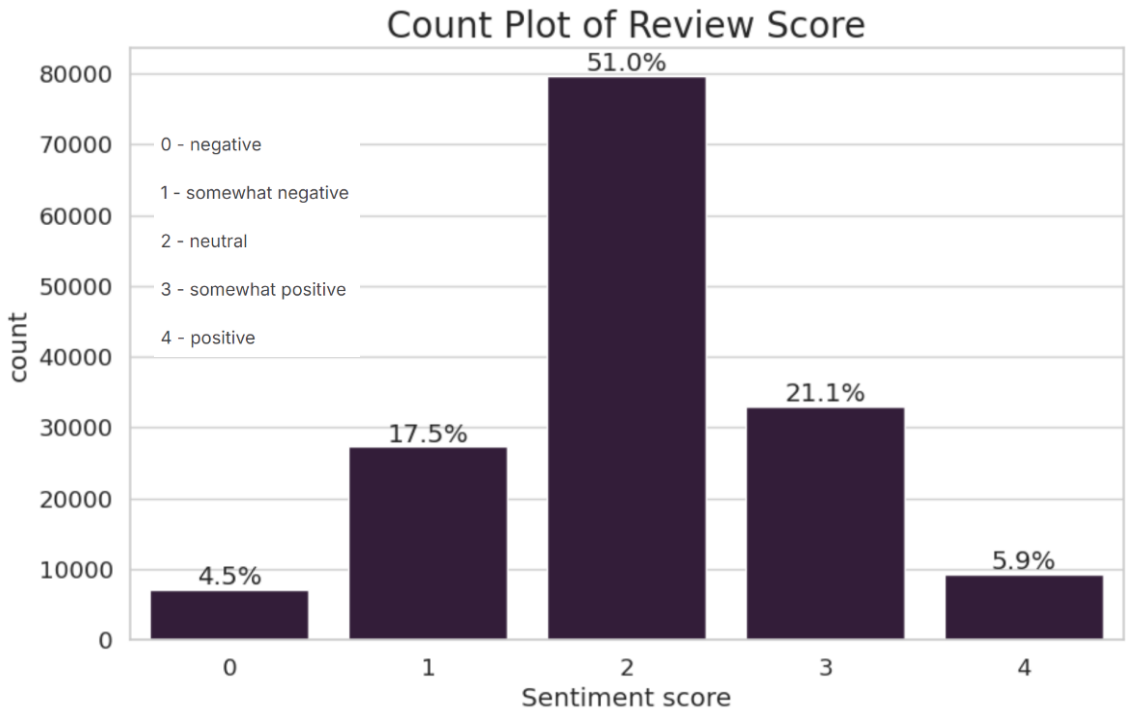
Participation
1,510 Entrants
1,011 Participants
860 Teams
6,813 Submissions

Tags
Text | Multiclass Classification | Categorization Accuracy

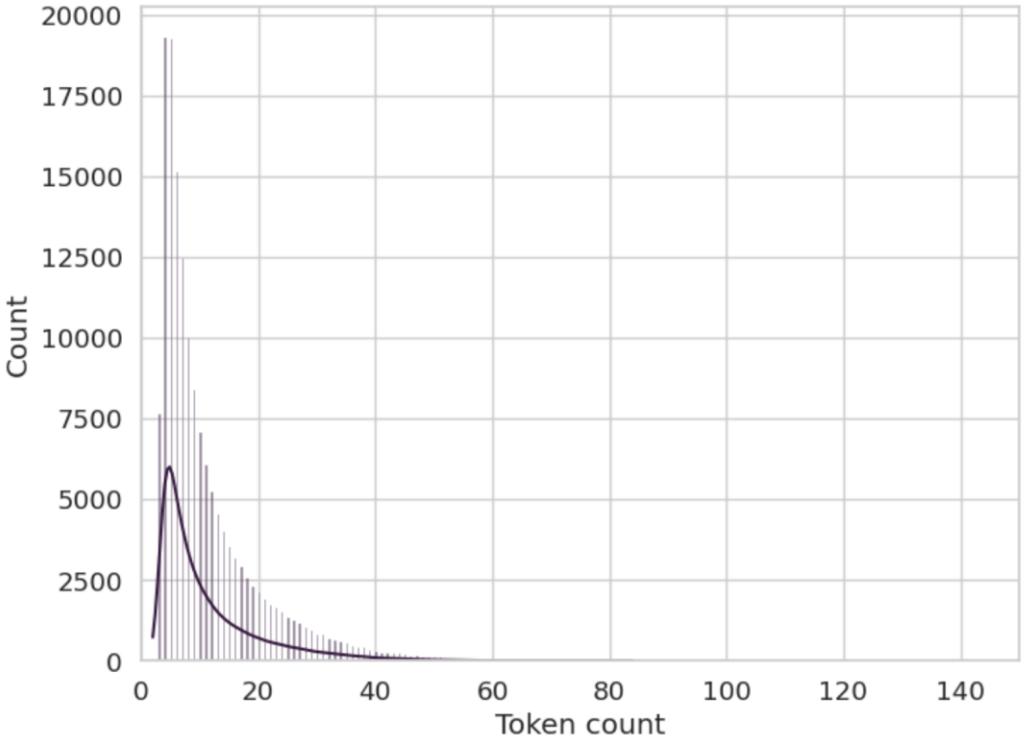


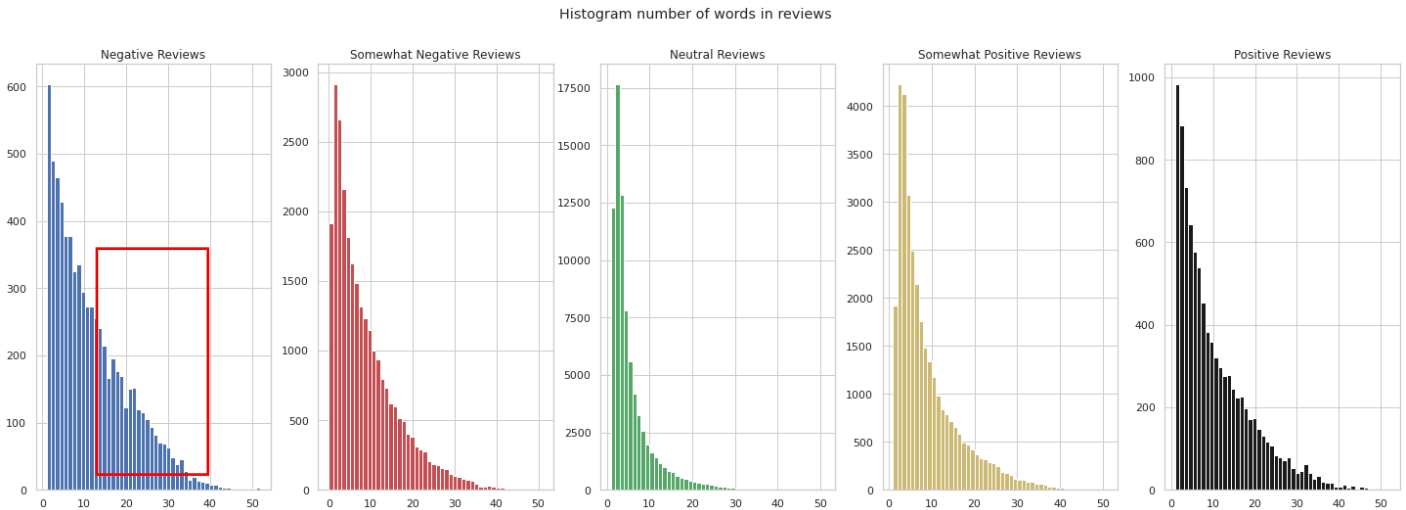
EDA

	PhraseId	SentenceId	Phrase	Sentiment
0	1	1	A series of escapades demonstrating the adage ...	1
1	2	1	A series of escapades demonstrating the adage ...	2
2	3	1	A series	2
3	4	1	A	2
4	5	1	series	2



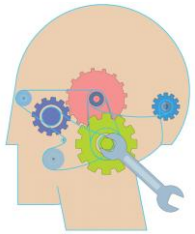
EDA


Count
Token count
0
2500
5000
7500
10000
12500
15000
17500
20000
0
20
40
60
80
100
120
140

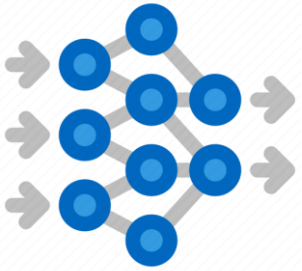

Histogram number of words in reviews
Negative Reviews
Somewhat Negative Reviews
Neutral Reviews
Somewhat Positive Reviews
Positive Reviews

Training: Pre-trained model BERT

Transfer Learning



Fine-Tuning



Output

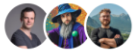
BERT community

Follow 188

AI & ML interests

This organization is maintained by the transformers team at Hugging Face and contains the historical (pre-"Hub") BERT checkpoints.

Team members 3



Models 15

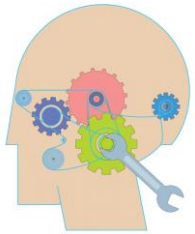
Sort: Recently updated

- google-bert/bert-large-cased-whole-word-masking — Fill-Mask • Updated Apr 10 • 8.39k • 15
- google-bert/bert-large-uncased-whole-word-masking-f… — Question Answering • Updated Feb 19 • 125k • 172
- google-bert/bert-large-uncased-whole-word-masking — Fill-Mask • Updated Feb 19 • 29.2k • 19
- google-bert/bert-large-uncased — Fill-Mask • Updated Feb 19 • 2.71M • 121
- google-bert/bert-large-cased-whole-word-masking-fin… — Question Answering • Updated Feb 19 • 182k • 1
- google-bert/bert-large-cased — Fill-Mask • Updated Feb 19 • 1.31M • 31
- google-bert/bert-base-uncased — Fill-Mask • Updated Feb 19 • 69M • 1.97k
- google-bert/bert-base-multilingual-uncased — Fill-Mask • Updated Feb 19 • 12.9M • 109
- google-bert/bert-base-multilingual-cased — Fill-Mask • Updated Feb 19 • 7.54M • 454
- google-bert/bert-base-german-dbmdz-uncased — Fill-Mask • Updated Feb 19 • 25.2k • 2

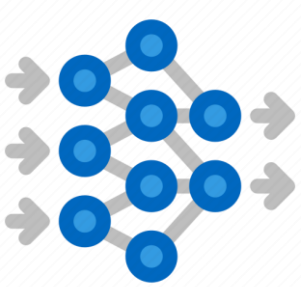
Expand 15 models

Training: Result

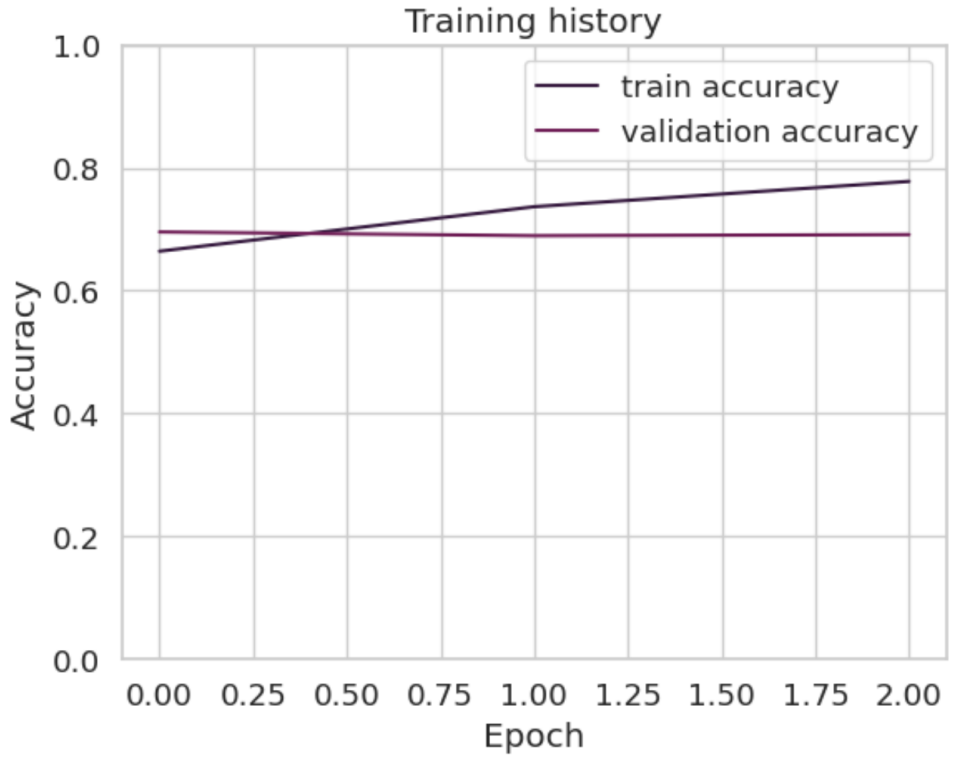
Transfer Learning



Fine-Tuning



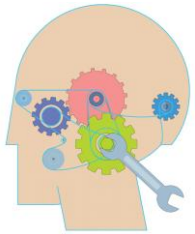
Output



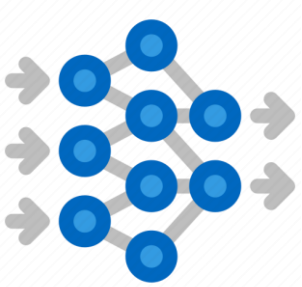

```
Epoch 1/3
----------------------------------

Train loss 0.8075 accuracy 0.6642

Val loss   0.7417 accuracy 0.6956

Epoch 2/3
----------------------------------

Train loss 0.6434 accuracy 0.7367

Val loss   0.7612 accuracy 0.6895

Epoch 3/3
----------------------------------

Train loss 0.5542 accuracy 0.7779

Val loss   0.8015 accuracy 0.6913
```

Training: Result

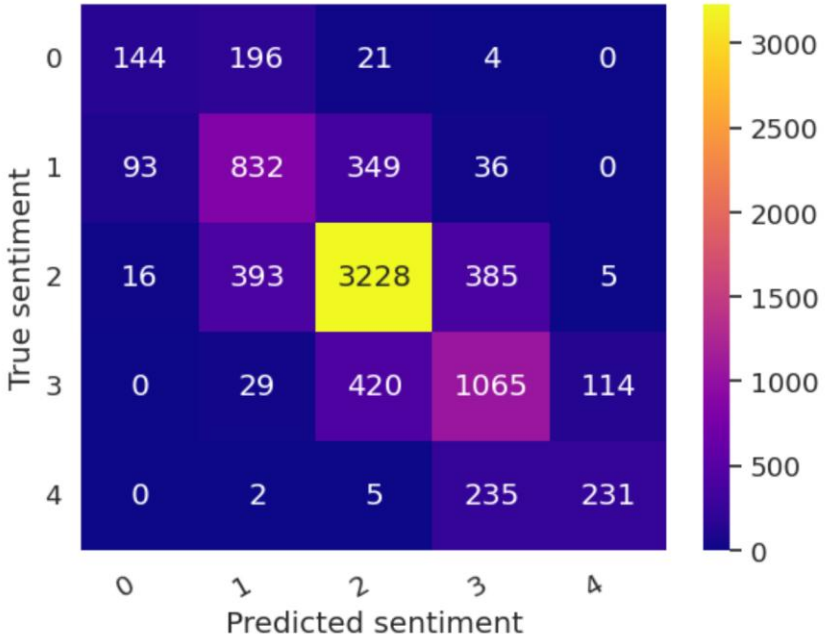
Transfer Learning



Fine-Tuning

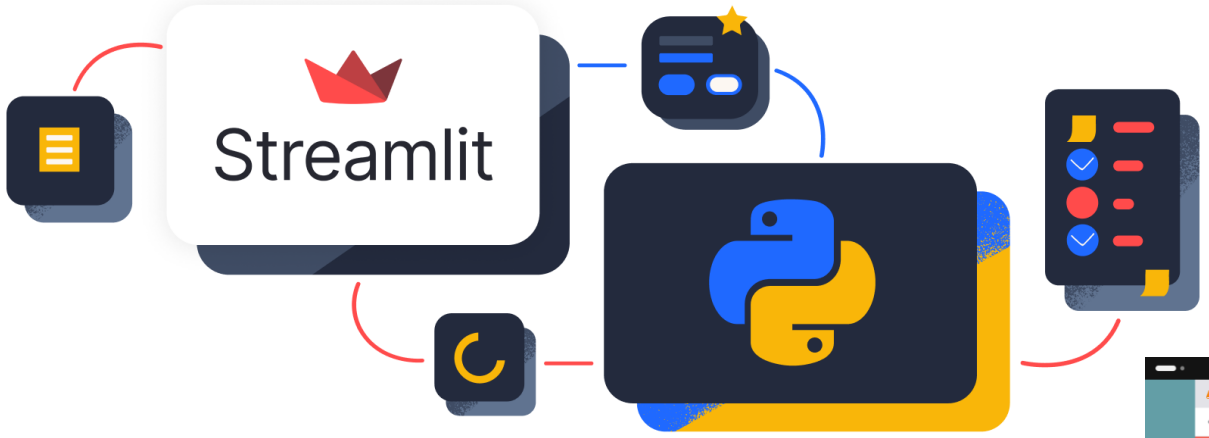


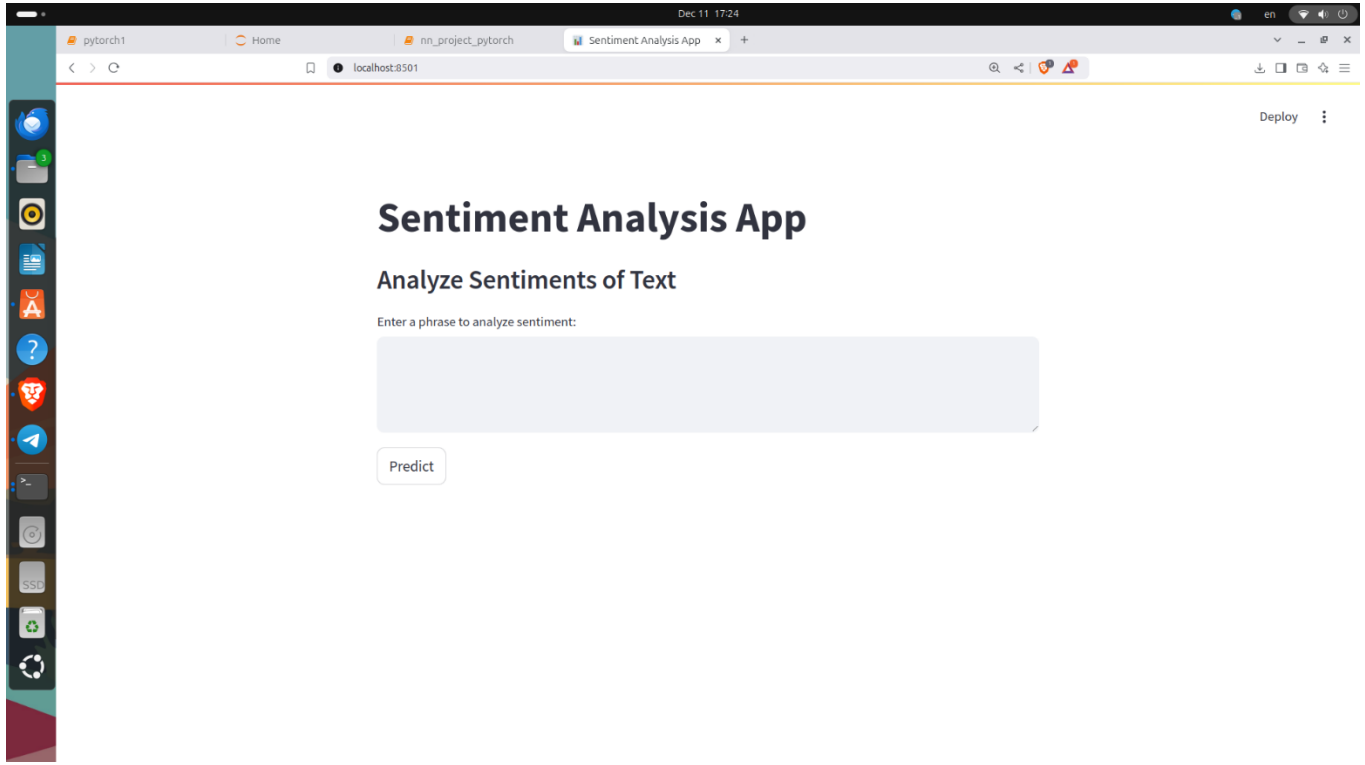
Output



Class	Precision	Recall	F1-Score	Support	Accuracy
0	0.57	0.39	0.47	365	
1	0.57	0.64	0.60	1310	
2	0.80	0.80	0.80	4027	
3	0.62	0.65	0.64	1628	
4	0.66	0.49	0.56	473	
					0.70

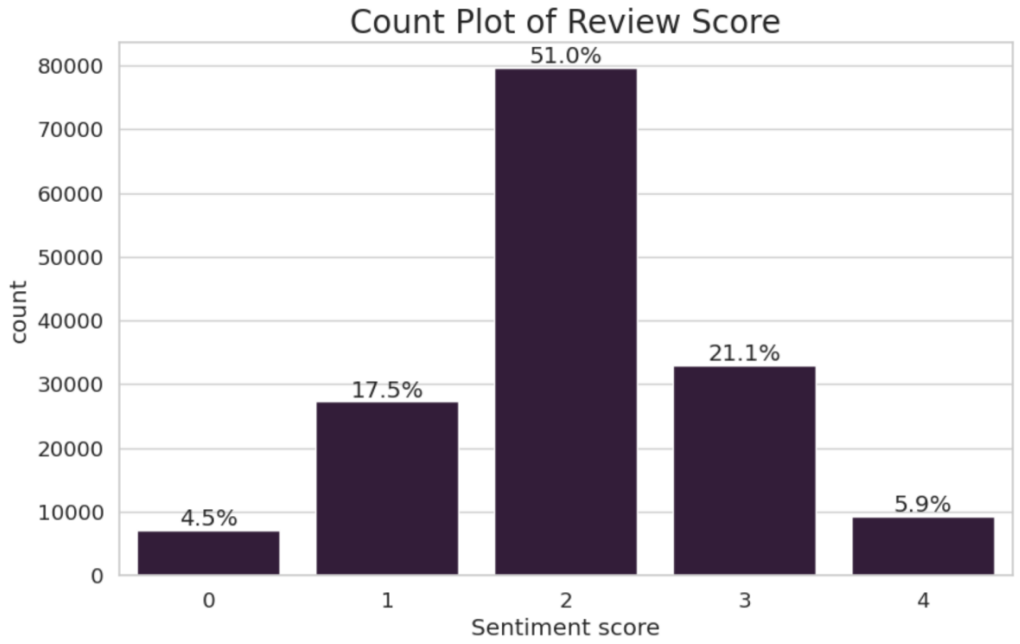
Model Deployment: Live Demo





Conclusion: limitation and Improvement

- **Data binning and Data processing**: bin 0 into 1, bin 3 into 4, to make the data less imbalanced and applied SMOTE in preprocessing data.
- **Model comparison**: compared with other pre-training models
- **Fine tune parameter of networks**



Thank you!