

▼ Hyperparameter Tuning for RoBERTa

To further improve the strong performance of the RoBERTa model on the classification task, we experimented with hyperparameter tuning (hpt).

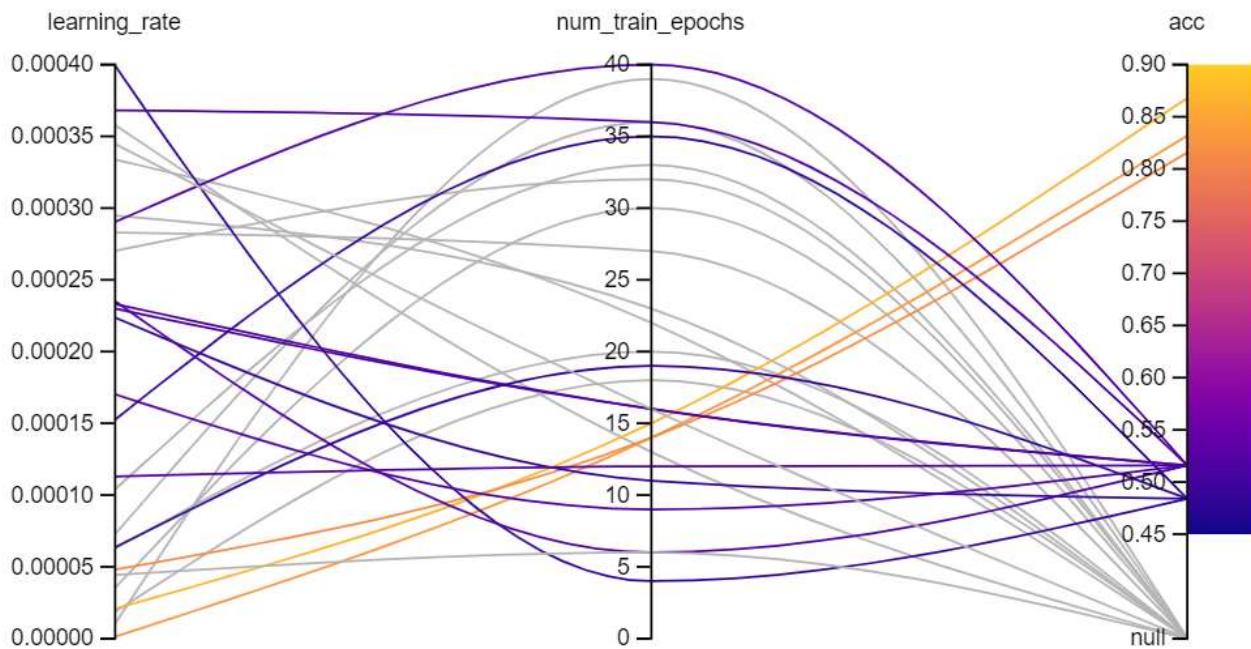
We use the wandb.ai developer tools integration of the simpletransformers library to keep track of the statistics during sweeps. wandb.ai provides very convenient visualization tools that help us evaluating the tuning efforts.

Setup

- We tried to optimize accuracy over training epochs (1 to 40) and learning rate (0 to 0.0004).
- We use an early stopping criterion which ends training if accuracy has not improved by 0.01 over 5 training steps.
- To avoid hyperparameter tuning to take several weeks a GPU is mandatory. We used google Colab's environment which offers GPU usage for free.

Results

- Hyperparameter tuning suggests picking low learning rates (<0.00005) with modest training epochs (around 15) (see the graph below)
- With a training / evaluation data split of 0.95 and 0.05 on the training data, evaluation showed promising results with accuracy scores above 0.80.
- Unfortunately, using these hyperparameters did not improve the performance on the test data, and we therefore stick with simple fine tuning of the RoBERTa model with default parameters.



You can see the full output reported to wandb.ai here:

<https://wandb.ai/mattzee/TwitterSarcasmComp%20-%20Hyperparameter%20Optimization2>

Challenges

- The optimizer is very sensitive to parameters, if the setup is not correct hpt aborts with CUDA memory error (see e.g. <https://github.com/ThilinaRajapakse/simpletransformers/pull/829>)
- Google Colab has frequently stopped execution, possible due to an extended run time of the optimizer or no user interaction
- We were able to produce some results, but hpt was never truly finalized on google colab

References

<https://simpletransformers.ai/docs/tips-and-tricks/>

<https://docs.wandb.com/integrations/simpletransformers>

<https://towardsdatascience.com/hyperparameter-optimization-for-optimum-transformer-models-b95a32b70949>

▼ Code

Colab Python Setup

Connect to google drive and set the correct working directory

```
from google.colab import drive  
drive.mount('/content/gdrive')
```

Mounted at /content/gdrive

```
import os  
os.chdir('/content/gdrive/MyDrive/TxtClassComp_MattzeePrivate/')
```

```
!pwd
```

/content/gdrive/MyDrive/TxtClassComp_MattzeePrivate

▼ Install required libraries/frameworks

```
!pip install jsonlines  
!pip install pandas
```

```
Collecting jsonlines  
  Downloading https://files.pythonhosted.org/packages/4f/9a/ab96291470e305504aa4b7a2e  
Requirement already satisfied: six in /usr/local/lib/python3.6/dist-packages (from jsonlines)  
Installing collected packages: jsonlines  
Successfully installed jsonlines-1.2.0  
Requirement already satisfied: pandas in /usr/local/lib/python3.6/dist-packages (1.1.3)  
Requirement already satisfied: python-dateutil>=2.7.3 in /usr/local/lib/python3.6/dist-packages  
Requirement already satisfied: pytz>=2017.2 in /usr/local/lib/python3.6/dist-packages  
Requirement already satisfied: numpy>=1.15.4 in /usr/local/lib/python3.6/dist-packages  
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.6/dist-packages (from jsonlines)
```

```
!pip install simpletransformers
```

```
Collecting simpletransformers
  Downloading https://files.pythonhosted.org/packages/c8/1e/13448b9e3c07e94dd035d9a7f
    |██████████| 204KB 8.9MB/s
Collecting streamlit
  Downloading https://files.pythonhosted.org/packages/a3/3b/8b70128553de980a5120b512c
    |██████████| 7.4MB 12.3MB/s
Requirement already satisfied: pandas in /usr/local/lib/python3.6/dist-packages (from
Collecting tensorboardx
  Downloading https://files.pythonhosted.org/packages/af/0c/4f41bcd45db376e6fe5c619c6
    |██████████| 317KB 45.4MB/s
Collecting tqdm>=4.47.0
  Downloading https://files.pythonhosted.org/packages/8a/54/115f0c28a61d56674c3a5e05c
    |██████████| 71kB 8.2MB/s
Collecting transformers>=4.0.0
  Downloading https://files.pythonhosted.org/packages/ed/db/98c3ea1a78190dac41c0127a6
    |██████████| 1.4MB 52.8MB/s
Collecting sentencepiece
  Downloading https://files.pythonhosted.org/packages/e5/2d/6d4ca4bef9a67070fa1cac508
    |██████████| 1.1MB 54.4MB/s
Collecting seqeval
  Downloading https://files.pythonhosted.org/packages/9d/2d/233c79d5b4e5ab1dbf111242
    |██████████| 51kB 5.6MB/s
Requirement already satisfied: requests in /usr/local/lib/python3.6/dist-packages (fr
Collecting tokenizers
  Downloading https://files.pythonhosted.org/packages/0f/1c/e789a8b12e28be5bc1ce2156c
    |██████████| 2.9MB 48.4MB/s
Collecting wandb
  Downloading https://files.pythonhosted.org/packages/ca/5e/9df94df3bfee51b92b54a5e61
    |██████████| 1.8MB 19.0MB/s
Requirement already satisfied: regex in /usr/local/lib/python3.6/dist-packages (from
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: scipy in /usr/local/lib/python3.6/dist-packages (from
Requirement already satisfied: numpy in /usr/local/lib/python3.6/dist-packages (from
Requirement already satisfied: astor in /usr/local/lib/python3.6/dist-packages (from
Collecting base58
  Downloading https://files.pythonhosted.org/packages/3c/03/58572025c77b9e6027155b27
Requirement already satisfied: altair>=3.2.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: tzlocal in /usr/local/lib/python3.6/dist-packages (fr
Requirement already satisfied: python-dateutil in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: protobuf!=3.11,>=3.6.0 in /usr/local/lib/python3.6/di
Collecting pydeck>=0.1.dev5
  Downloading https://files.pythonhosted.org/packages/9e/9d/8fbf1f56cc5891e6c3295bf94
    |██████████| 4.5MB 3.3MB/s
Collecting watchdog
  Downloading https://files.pythonhosted.org/packages/e6/76/39d123d37908a772b6a281d8f
    |██████████| 102kB 10.8MB/s
Requirement already satisfied: click>=7.0 in /usr/local/lib/python3.6/dist-packages (f
Collecting gitpython
  Downloading https://files.pythonhosted.org/packages/24/d1/a7f8fe3df258549b30341515
    |██████████| 163kB 51.1MB/s
Requirement already satisfied: cachetools>=4.0 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: tornado>=5.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: packaging in /usr/local/lib/python3.6/dist-packages (f
Requirement already satisfied: pyarrow in /usr/local/lib/python3.6/dist-packages (fr
Collecting blinker
  Downloading https://files.pythonhosted.org/packages/1b/51/e2a9f3b757eb802f61dc1f2b6
    |██████████| 112kB 60.6MB/s
Requirement already satisfied: toml in /usr/local/lib/python3.6/dist-packages (from
Collecting validators
  Downloading https://files.pythonhosted.org/packages/41/4a/3360ff3cf2b4a1b9721ac1fb1
```

```
Requirement already satisfied: pytz>=2017.2 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: six in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Requirement already satisfied: filelock in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Collecting sacremoses
  Downloading https://files.pythonhosted.org/packages/7d/34/09d19aff26edcc8eb2a01bed8
    |██████████| 890kB 46.1MB/s
Requirement already satisfied: dataclasses; python_version < "3.7" in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: urllib3!=1.25.0,!!=1.25.1,<1.26,>=1.21.1 in /usr/local/lib/python3.6/dist-packages
Collecting configparser>=3.8.1
  Downloading https://files.pythonhosted.org/packages/08/b2/ef713e0e67f6e7ec7d59aea3e
Collecting subprocess32>=3.5.3
  Downloading https://files.pythonhosted.org/packages/32/c8/564be4d12629b912ea431f1a
    |██████████| 102kB 13.8MB/s
Collecting shortuuid>=0.5.0
  Downloading https://files.pythonhosted.org/packages/25/a6/2ecc1daa6a304e7f1b216f08c
Requirement already satisfied: PyYAML in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Collecting sentry-sdk>=0.4.0
  Downloading https://files.pythonhosted.org/packages/b1/5c/018bf9a5c24343a664deaea76
    |██████████| 133kB 58.5MB/s
Collecting docker-pycreds>=0.4.0
  Downloading https://files.pythonhosted.org/packages/f5/e8/f6bd1eee09314e7e6dee49cb
Requirement already satisfied: psutil>=5.0.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: promise<3,>=2.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: joblib>=0.11 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: jinja2 in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Requirement already satisfied: jsonschema in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: entrypoints in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: toolz in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Requirement already satisfied: setuptools in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Collecting ipykernel>=5.1.2; python_version >= "3.4"
  Downloading https://files.pythonhosted.org/packages/52/19/c2812690d8b340987eed2cbc
    |██████████| 122kB 58.9MB/s
Requirement already satisfied: ipywidgets>=7.0.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: traitlets>=4.3.2 in /usr/local/lib/python3.6/dist-packages
Collecting gitdb<5,>=4.0.1
  Downloading https://files.pythonhosted.org/packages/48/11/d1800bca0a3bae820b84b7d8
    |██████████| 71kB 11.5MB/s
Requirement already satisfied: pyparsing>=2.0.2 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: decorator>=3.4.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: MarkupSafe>=0.23 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: jupyter-client in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: ipython>=5.0.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: nbformat>=4.2.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: widgetsnbextension~=3.5.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: ipython-genutils in /usr/local/lib/python3.6/dist-packages
Collecting smmap<4,>=3.0.1
  Downloading https://files.pythonhosted.org/packages/b0/9a/4d409a6234eb940e6a78dfdfc
Requirement already satisfied: jupyter-core>=4.6.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: pyzmq>=13 in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Requirement already satisfied: simplegeneric>0.8 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: pickleshare in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: pexpect; sys_platform != "win32" in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: prompt-toolkit<2.0.0,>=1.0.4 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: pygments in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Requirement already satisfied: notebook>=4.4.1 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: ptyprocess>=0.5 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: wcwidth in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
Requirement already satisfied: Send2Trash in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: nbconvert in /usr/local/lib/python3.6/dist-packages (from tensorflow<2.0.0,>=1.12.0)
```

```
Requirement already satisfied: terminado>=0.8.1 in /usr/local/lib/python3.6/dist-packages (from -r requirements.txt (line 1))
Requirement already satisfied: mistune<2,>=0.8.1 in /usr/local/lib/python3.6/dist-packages (from -r requirements.txt (line 2))
Requirement already satisfied: pandocfilters>=1.4.1 in /usr/local/lib/python3.6/dist-packages (from -r requirements.txt (line 3))
Requirement already satisfied: testpath in /usr/local/lib/python3.6/dist-packages (from -r requirements.txt (line 4))
Requirement already satisfied: defusedxml in /usr/local/lib/python3.6/dist-packages (from -r requirements.txt (line 5))
Requirement already satisfied: bleach in /usr/local/lib/python3.6/dist-packages (from -r requirements.txt (line 6))
Requirement already satisfied: webencodings in /usr/local/lib/python3.6/dist-packages (from -r requirements.txt (line 7))
Building wheels for collected packages: seqeval, watchdog, blinker, sacremoses, subprocess
  Building wheel for seqeval (setup.py) ... done
  Created wheel for seqeval: filename=seqeval-1.2.2-cp36-none-any.whl size=16171 sha256=52df45d75646c37428f7e626214704a0e
  Stored in directory: /root/.cache/pip/wheels/52/df/1b/45d75646c37428f7e626214704a0e
  Building wheel for watchdog (setup.py) ... done
  Created wheel for watchdog: filename=watchdog-1.0.1-cp36-none-any.whl size=72206 sha256=52df45d75646c37428f7e626214704a0e
```

▼ Load libraries

```
Stored in directory: /root/.cache/pip/wheels/92/a0/00/8690a57883956a301d91cf4ec999c

from simpletransformers.classification import ClassificationModel,ClassificationArgs
import pandas as pd
import numpy as np
import logging
import json
import sklearn
from statistics import mean, mode
import os
# import json
import jsonlines
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.metrics import precision_recall_fscore_support
```

የኢትዮጵያ ተስፋዬና ማረጋገጫ ፊርማ መሠረት ተስፋዬና ማረጋገጫ የሚከተሉ ስራውን የሚከተሉ ስራውን

▼ Load and prepare the data

```
test_file = '/content/gdrive/MyDrive/TxtClassComp_MattzeePrivate/data/test.jsonl'  
train_file = '/content/gdrive/MyDrive/TxtClassComp_MattzeePrivate/data/train.jsonl'
```

```
data_train = []
iter = 1
with jsonlines.open(train_file) as f:
    for line in f.iter():
        #data = json.load(line)
        #print(line) # or whatever else you'd like to do
        #print('processing training line: ' + str(iter))
        iter +=1
        data_train.append(line)
        #data = json.loads(line)
        #print(data)
```

```
data_test = []
iter = 1
with jsonlines.open(test_file) as f:
    for line in f.iter():
        #data = json.load(line)
```

12.12.2020

GoogleColab_RobertaLarge_HyperparameterTuning_Context.ipynb - Colaboratory

```
#data = json.loads(line)
#print(line) # or whatever else you'd like to do
#print('processing test line: ' + str(iter))
iter +=1
data_test.append(line)
#data = json.loads(line)
#print(data)
print("Count of training data entries:")
print(len(data_train))
print("Count of test data entries:")
print(len(data_test))
```

```
Count of training data entries:
5000
Count of test data entries:
1800
```

```
train_data_pd = pd.DataFrame.from_dict(data_train)
test_data_pd = pd.DataFrame.from_dict(data_test)
print("Training and Test Datasets converted to Pandas DataFrames...")
```

```
Training and Test Datasets converted to Pandas DataFrames...
```

```
#!pip install nltk
import nltk
nltk.download('stopwords')
nltk.download('punkt')
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize, SpaceTokenizer
from nltk.stem import PorterStemmer

#print(stopwords.words('english'))

#for j in stopwords.words('english'):
#    print(j)

#print(stopwords.words())
```

```
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Unzipping corpora/stopwords.zip.
[nltk_data] Downloading package punkt to /root/nltk_data...
[nltk_data]   Unzipping tokenizers/punkt.zip.
```

```
#print(train_data_pd['context'][1])
#print(train_data_pd['response'][1])
#print(train_data_pd['context'][1][0]+train_data_pd['context'][1][1])
#print(len(train_data_pd['context'][3040]))

#test = train_data_pd['context'][10][0] + train_data_pd['context'][10][1] +train_data_pd['
#print(test)
#test2 = train_data_pd['context'][11][0] + train_data_pd['context'][11][1] +train_data_pd['
https://colab.research.google.com/drive/1XaEAtUpsIzx0tkCjwr3WP6Oa8TOVsRv7?authuser=1#scrollTo=Ck7VQ-DrOw5Q&printMode=true
```

12.12.2020

GoogleColab_RobertaLarge_HyperparameterTuning_Context.ipynb - Colaboratory

```
test2 = train_data_pd['context'][0] + train_data_pd['context'][1] + train_data_pd['context'][2]
all_stopwords = stopwords.words('english')
tk = SpaceTokenizer()
ps = PorterStemmer()

for i in range(len(train_data_pd)):
    #train_data_pd['response'][i]=train_data_pd['response'][i]+train_data_pd['context'][i]
    train_data_pd['response'][i]=train_data_pd['response'][i]+train_data_pd['context'][i][0]
    train_data_pd['response'][i]=train_data_pd['response'][i].replace('@USER', '').strip()
    text_tokens = tk.tokenize(train_data_pd['response'][i])
    tokens_without_sw = [word for word in text_tokens if not word in all_stopwords]
    test4=""
    for i in tokens_without_sw:
        test4 = test4 + " "+ps.stem(i)
    test4.strip()
    train_data_pd['response'][i]=test4
```

```
for i in range(len(test_data_pd)):
    #test_data_pd['response'][i]=test_data_pd['response'][i]+test_data_pd['context'][i][0]
    test_data_pd['response'][i]=test_data_pd['response'][i]+test_data_pd['context'][i][1]
    test_data_pd['response'][i]=test_data_pd['response'][i].replace('@USER', '').strip().lower()

    text_tokens = tk.tokenize(test_data_pd['response'][i])
    tokens_without_sw = [word for word in text_tokens if not word in all_stopwords]
    test4=""
    for i in tokens_without_sw:
        test4 = test4 + " "+ps.stem(i)
    test4.strip()
    test_data_pd['response'][i]=test4
```

```
#print(train_data_pd['response'][1])
#print(len(train_data_pd['response'][1]))
print("Converted response PD data to include Context Data")
print("Converted response to lowercase and removed stop words as well as @USER")
print("Converted response to stem words using PortStemmer")
```

Converted response PD data to include Context Data
Converted response to lowercase and removed stop words as well as @USER
Converted response to stem words using PortStemmer

```
print(test_data_pd['response'][10])
```

define this way : 1 . desiring the good of the other ; wanting them to thrive / flour

```
test=train_data_pd['response'][0]+train_data_pd['context'][0][0] + train_data_pd['context'][1][0]
#print(test)
test2 = test.replace('@USER', '').strip().lower()
```

```

print(test2)
test3 = test2

all_stopwords = stopwords.words('english')
#text_tokens = word_tokenize(test3)
tk = SpaceTokenizer()

text_tokens = tk.tokenize(test3)
tokens_without_sw = [word for word in text_tokens if not word in all_stopwords]
test4=""
for i in tokens_without_sw:
    test4 = test4 + " "+i
test4.strip()

#for j in stopwords.words('english'):
#    print(j)
#    test3=test3.replace(j, '')
#print(test3)

i don't get this .. obviously you do care or you would've moved right along .. instead
'get .. obviously care would've moved right along .. instead decided care troll .. c
hild named barron ... #bebestr melania care less . fact . 100a minor child deserves p
rivacy kept politics . pamela karlan , ashamed angry obviously biased public panderi
ng . using child . child named barron ... #bebestr melania care less . fact . 100'.

#Define the vector of actual results:
Actual_Results = []
for l in data_train:
    if l['label'] == 'SARCASM':
        Actual_Results.append(1)
    else:
        Actual_Results.append(0)

## Import the various SKLearn ML models for testing:

from sklearn.model_selection import train_test_split
from sklearn.metrics import confusion_matrix
from sklearn.svm import LinearSVC
from sklearn.model_selection import cross_val_score
from sklearn.naive_bayes import GaussianNB
from sklearn.linear_model import LogisticRegression
from sklearn.ensemble import RandomForestClassifier

# getting training dataset features and labels
features = train_data_pd['response']
labels = train_data_pd['label']
labels = Actual_Results

data processing...

```

```
# Splitting of training data into train and test data
rawdata_train, rawdata_test, rawlabels_train, rawlabels_test = train_test_split(features,
print("Training dataset split into this many train samples:")
print(len(rawdata_train))
print("Training dataset split into this many validation samples:")
print(len(rawdata_test))

Training dataset split into this many train samples:
4500
Training dataset split into this many validation samples:
# of features:
Final test dataset is this many samples:
# of features:

train_df = pd.DataFrame({
    'text': rawdata_train.str.replace('@USER', '', regex=False).str.strip(),
    'labels': rawlabels_train
})
#rawdata_train, rawdata_test, rawlabels_train, rawlabels_test

eval_df = pd.DataFrame({
    'text': rawdata_test.str.replace('@USER', '', regex=False).str.strip(),
    'labels': rawlabels_test
})

train_df
```

text labels		
text labels		
eval_df		
398	countered with #climatechange activists stuck ...	1
3833	when we share love , we get love too . our vib...	0
4836	give me nothing . just saying no one really kn...	0
4572	⌚ sining happens nearly everywhere . as a res...	0
636	i was going for the . pv method gives mmp the ...	1
...
1928	here are my two favorite quotes that reflect c...	1
4366	very idea ! please call my #office (the # 1 #...	0
3550	you are very welcomed , lamar ağa and shardall...	0
2189	so says someone who is follower of a religion ...	1
3480	i ' m liking this tweet . does that help ?than...	0

500 rows × 2 columns

▼ Hyperparameter Tuning

Install necessary libraries and set model and tuning parameters

```
!pip install wandb
```

```
Requirement already satisfied: wandb in /usr/local/lib/python3.6/dist-packages (0.10
Requirement already satisfied: python-dateutil>=2.6.1 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: promise<3,>=2.0 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: Click>=7.0 in /usr/local/lib/python3.6/dist-packages (
Requirement already satisfied: subprocess32>=3.5.3 in /usr/local/lib/python3.6/dist-p
Requirement already satisfied: six>=1.13.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: configparser>=3.8.1 in /usr/local/lib/python3.6/dist-p
Requirement already satisfied: sentry-sdk>=0.4.0 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: watchdog>=0.8.3 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: protobuf>=3.12.0 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: psutil>=5.0.0 in /usr/local/lib/python3.6/dist-package
Requirement already satisfied: PyYAML in /usr/local/lib/python3.6/dist-packages (from
Requirement already satisfied: GitPython>=1.0.0 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: shortuuid>=0.5.0 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: requests<3,>=2.0.0 in /usr/local/lib/python3.6/dist-pa
Requirement already satisfied: docker-pycreds>=0.4.0 in /usr/local/lib/python3.6/dist
Requirement already satisfied: certifi in /usr/local/lib/python3.6/dist-packages (fr
Requirement already satisfied: urllib3>=1.10.0 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: setuptools in /usr/local/lib/python3.6/dist-packages (
Requirement already satisfied: gitdb<5,>=4.0.1 in /usr/local/lib/python3.6/dist-pac
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.6/dist-packages
```

Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.6/dist-packages
 Requirement already satisfied: smmap<4,>=3.0.1 in /usr/local/lib/python3.6/dist-packages

```
import wandb
import logging
from sklearn.metrics import accuracy_score, f1_score

sweep_config = {
    "name": "vanilla-sweep-batch-16",
    "method": "bayes",
    "metric": {"name": "acc", "goal": "maximize"},
    "parameters": {
        "num_train_epochs": {"min": 1, "max": 40},
        "learning_rate": {"min": 0, "max": 4e-4},
    },
    "early_terminate": {"type": "hyperband", "min_iter": 6},
}
}
```

```
projectname="TwitterSarcasmComp - Hyperparameter Optimization2"
```

```
sweep_id = wandb.sweep(sweep_config, project=projectname)
```

```
logging.basicConfig(level=logging.INFO)
transformers_logger = logging.getLogger("transformers")
transformers_logger.setLevel(logging.WARNING)
```

wandb: Appending key for api.wandb.ai to your netrc file: /root/.netrc
 Create sweep with ID: 88svtgvp
 Sweep URL: <https://wandb.ai/mattzee/TwitterSarcasmComp%20-%20Hyperparameter%20optimization2>

```
model_args = ClassificationArgs()
model_args.eval_batch_size = 4
model_args.evaluate_during_training = True
model_args.evaluate_during_training_silent = False
model_args.evaluate_during_training_steps = 1000
model_args.learning_rate = 4e-4
model_args.manual_seed = 2
model_args.max_seq_length = 256
model_args.multiprocessing_chunksize = 5000
model_args.no_cache = True
model_args.no_save = True
model_args.num_train_epochs = 10
model_args.overwrite_output_dir = True
model_args.reprocess_input_data = True
model_args.train_batch_size = 4
model_args.gradient_accumulation_steps = 2
model_args.use_early_stopping = True
model_args.early_stopping_delta = 0.01
model_args.early_stopping_metric = "acc"
model_args.early_stopping_metric_minimize = False
model_args.early_stopping_patience = 5
model_args.train_custom_parameters_only = False
```

```
#model_args.labels_list = ["not_entailment", "entailment"]
#model_args.wandb_project = projectname
```

```
def train():
    # Initialize a new wandb run
    wandb.init(config=model_args)

    # Create a TransformerModel
    model = ClassificationModel(
        "roberta",
        "roberta-base",
        use_cuda=True,
        args=model_args,
        sweep_config=wandb.config
    )

    # Train the model
    model.train_model(
        train_df,
        eval_df=eval_df,
        acc=lambda truth, predictions: accuracy_score(
            truth, [round(p) for p in predictions]
        ),
    )

    # Sync wandb
    wandb.join()
```

▼ Start HPT

```
wandb.agent(sweep_id, train)
```