



#Bitcoin Sentiment Analysis

FRE. GY 7773 Machine Learning in Finance - Final Project

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OUTLINE

What we do?

How we do?

What we get?

Further Expectation

#Bitcoin Sentiment Analysis

What we do?

01.

Sentiment Analysis

- Sentiment Analysis is the use of NLP, text analysis, computational linguistics, and biometrics to **systematically** identify, extract, quantify, and study affective states and subjective information.

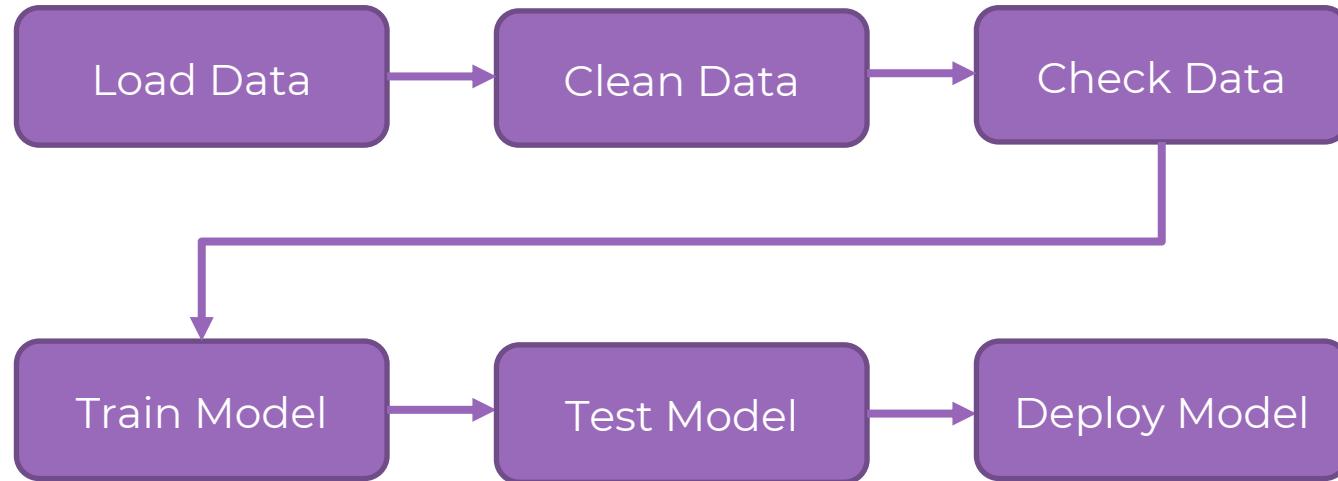


#Bitcoin Sentiment Analysis

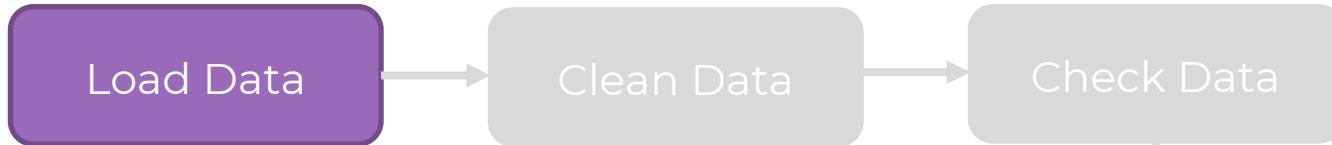
How we do?

02.

PROCESS



PROCESS



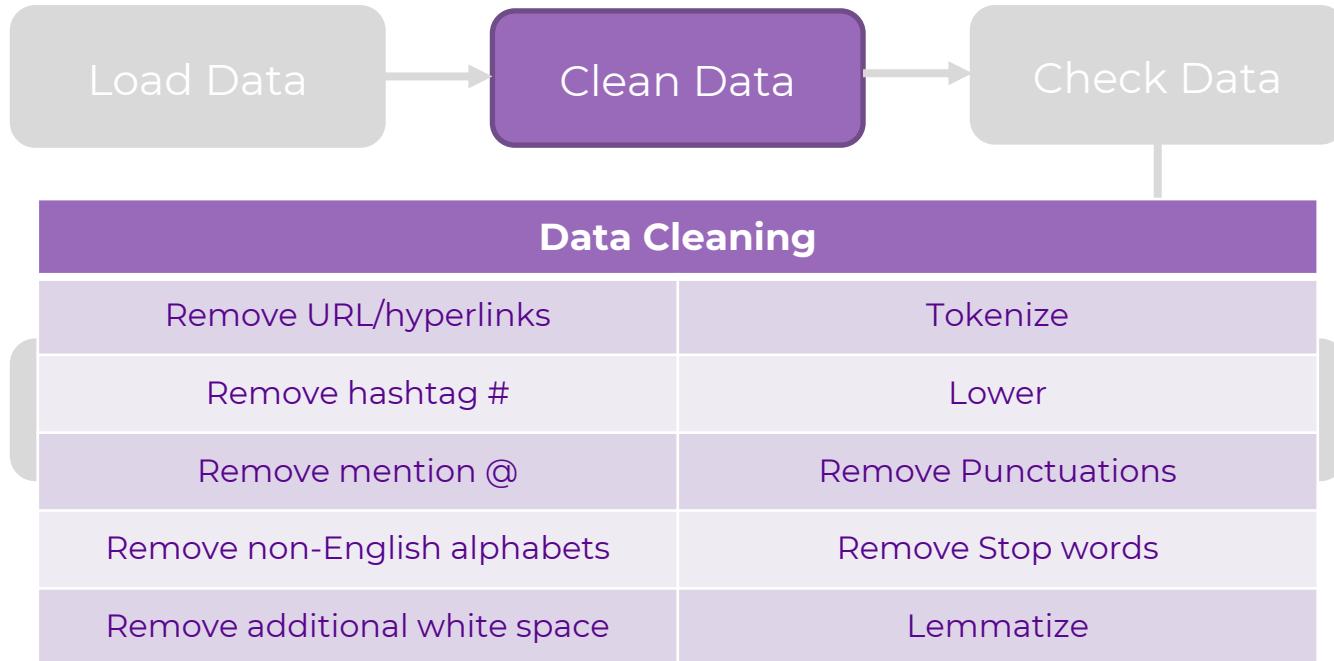
> Bitcoin_tweets.csv (864.6 MB)



Detail Compact Column 10 of 13 columns ▾

	A user_location	A user_descripti...	A user_created	# user_followers	A user_friends	A user_favourites	A user_verified	A date	A text
Train	Atlanta, GA	Biz Consultant, real estate, fintech, startups, posts are not the view of my employer, RTs are not e...	2009-04-26 20:05:09	8534.0	7605	4838	False	2021-02-10 23:59:04	Blue Ridge Bank shares halted by NYSE after #bitcoin ATM announcement @MyBlu...
		😎 BITCOINLIVE is a Dutch platform aimed at informing the general public about crypto & technology! ...	2019-10-17 20:12:10	6769.0	1532	25483	False	2021-02-10 23:58:48	😎 Today, that's this #Thursday, we will do a "👉 Take 2" with our friend @LeoWandersleb, #Btc #wall...
	London, England	IM Academy : The best #forex, #SelfEducation, #Cryptocurrency trading	2014-11-10 10:50:37	128.0	332	924	False	2021-02-10 23:54:48	Guys evening, I have read this article about BTC and would like to share with you all -

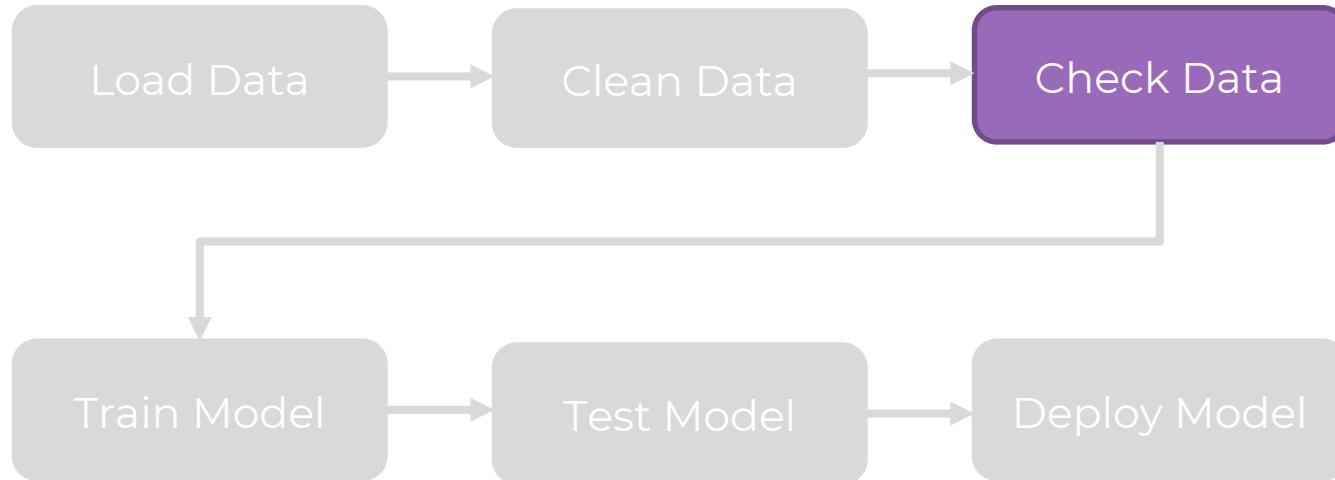
PROCESS



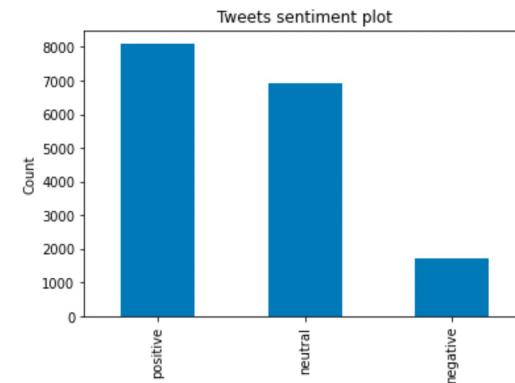
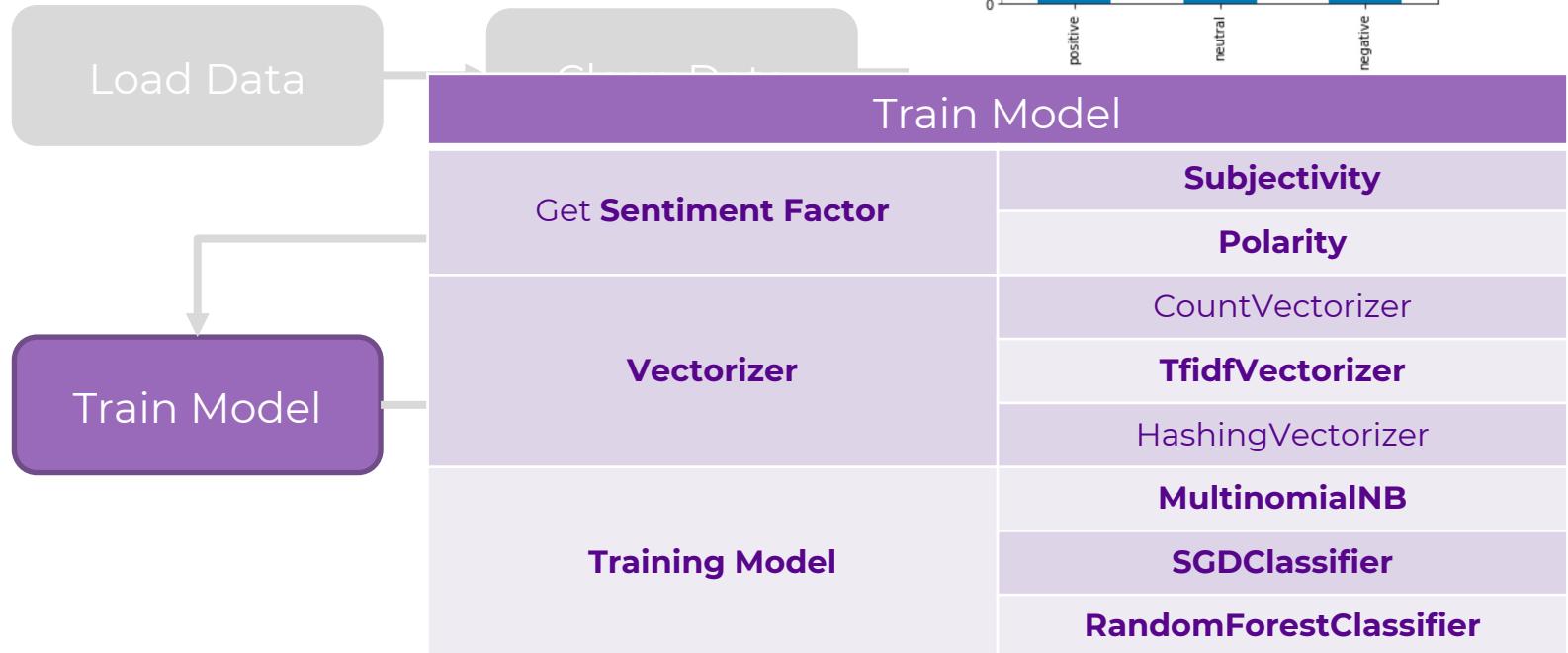
PROCESS

Check Whether Chars are **long enough** for analysis

If **len(sentence)<5**, tag it for future analysis

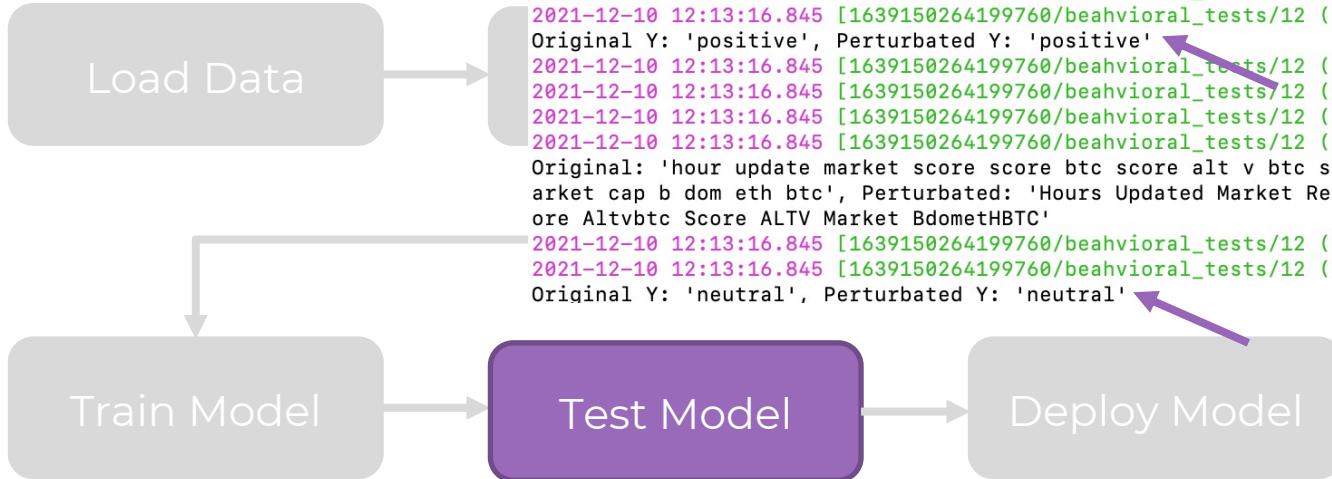


PROCESS



(Sample)

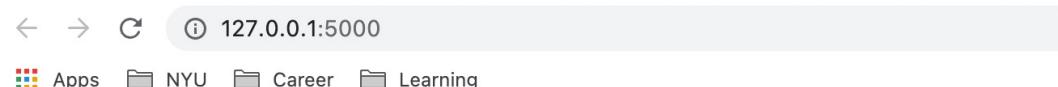
PROCESS



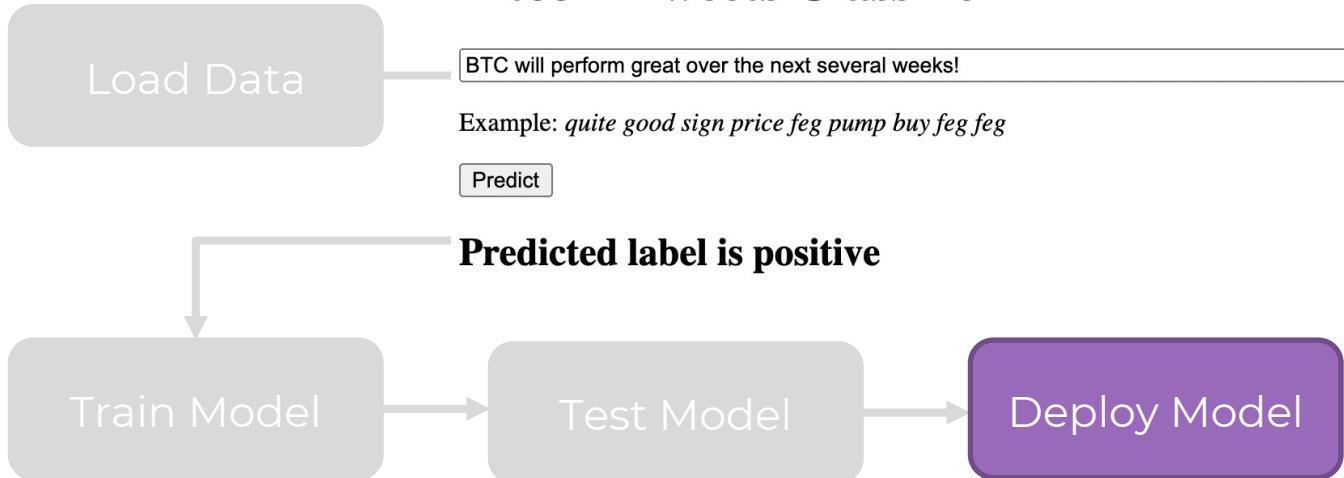
Behavior Test Section

Using BackTranslation Package to test the robustness of the Model

PROCESS



Bitcoin Tweets Classifier



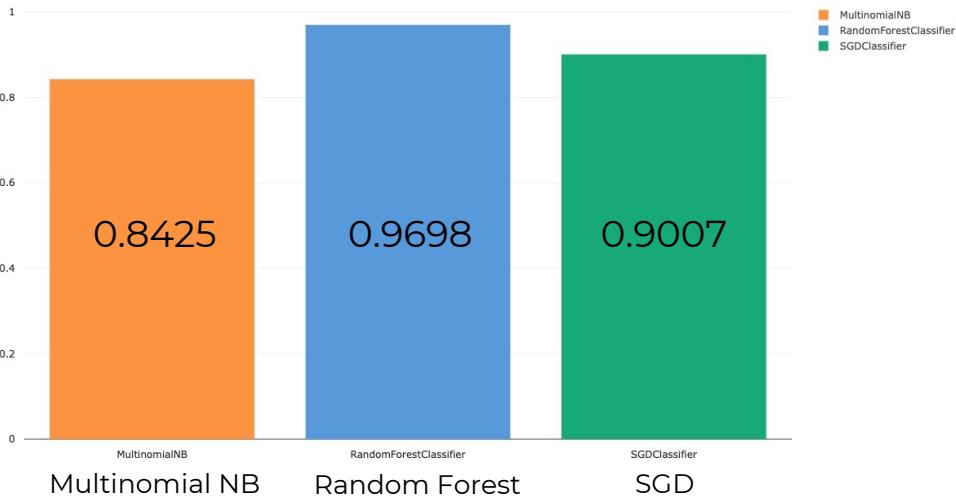
#Bitcoin Sentiment Analysis

What we get?

0.3.

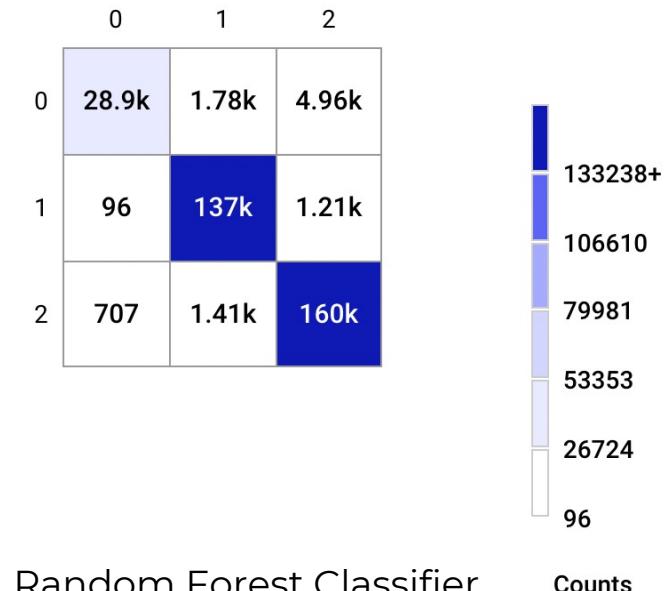
Model Results

Accuracy Score



Confusion Matrix

Predicted Category



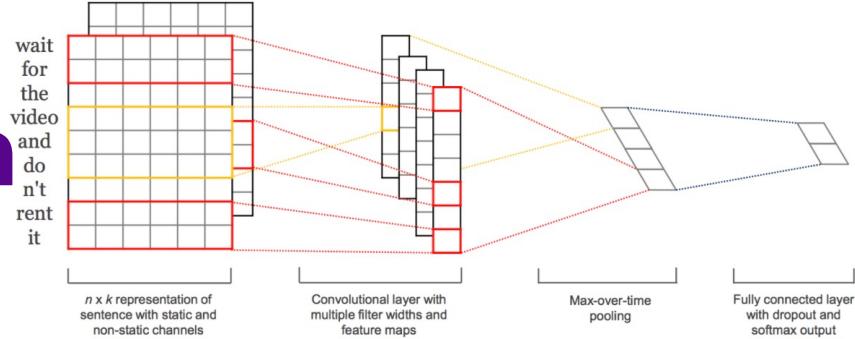
Random Forest Classifier

Deep Learning in Text Classification

➤ Deep learning is proving very good at text classification

➤ The Architecture is comprised of three key pieces:

- 1. Word Embedding:** A distributed representation of words where different words that have a similar meaning (based on their usage) also have a similar representation.
- 2. Convolutional Model:** A feature extraction model that learns to extract salient features from documents represented using a word embedding.
- 3. Fully Connected Model:** The interpretation of extracted features in terms of a predictive output.



Deep Learning in Text Classification

Sample code when building the model:

```
vocab_size = 5000  
embedding_size = 32  
epochs = 10
```

```
rms = RMSprop()  
model= Sequential()  
model.add(Embedding(vocab_size, embedding_size, input_length=max_len))  
model.add(Conv1D(filters=32, kernel_size=2, padding='same', activation='relu'))  
model.add(MaxPooling1D(pool_size=2))  
model.add(Bidirectional(LSTM(32)))  
model.add(Dropout(0.4))  
model.add(Dense(3, activation='softmax'))
```

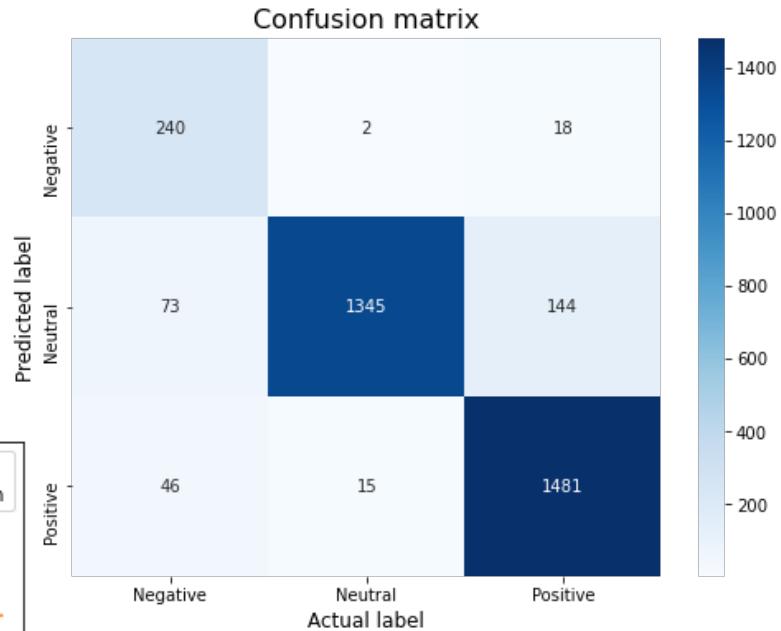
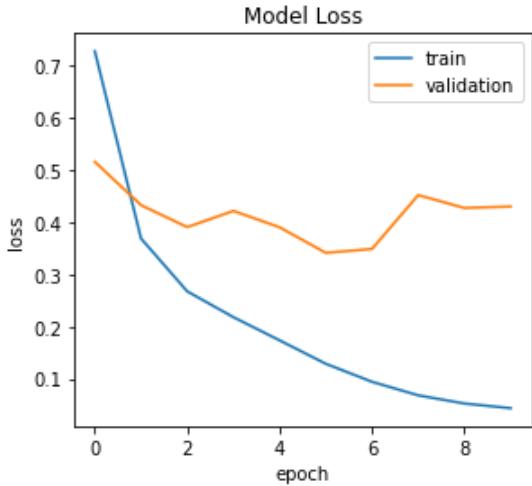
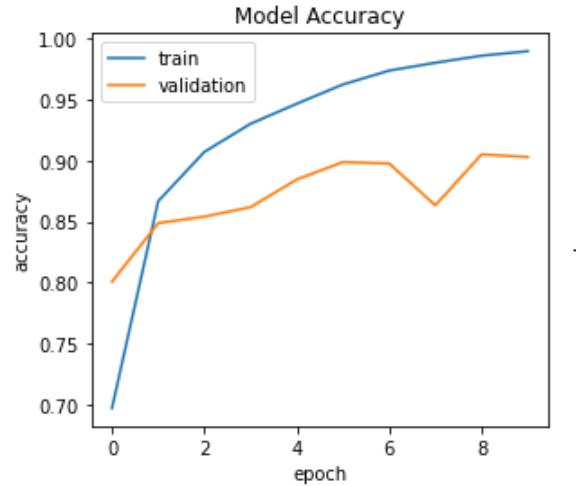
Word Embedding

Convolutional: One Dimension

MaxPooling: One Dimension

Fully connected layer

Model Results



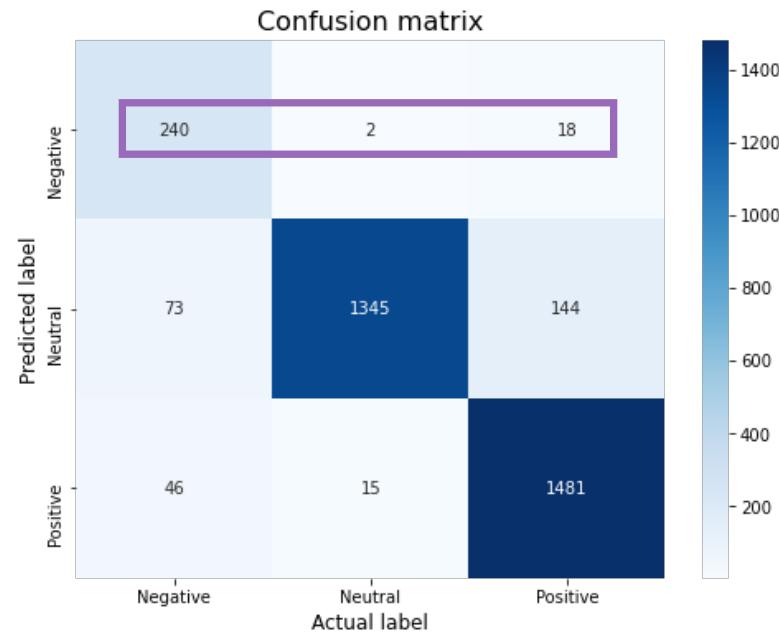
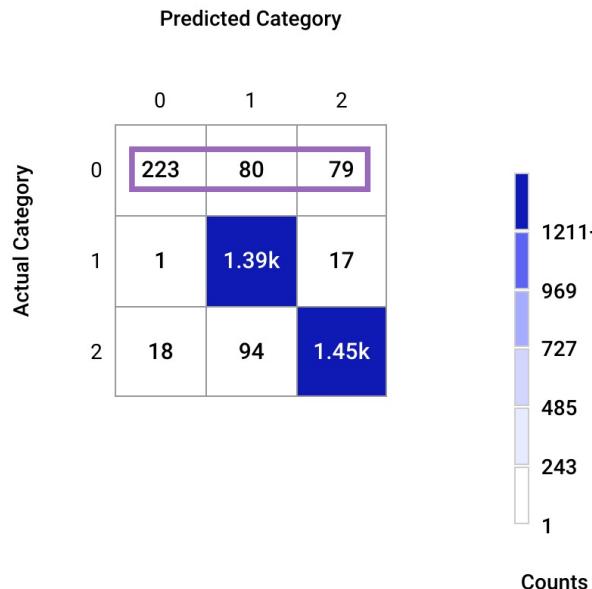
Neural Network Classifier (Sample)

Results

- **Accuracy :** 0.9058
- **Precision :** 0.9102
- **Recall :** 0.9034
- **F1 Score :** 0.9068

Model Results

Random Forest Classifier
(Sample Data)



Neural Network Classifier
(Sample Data)

#Bitcoin Sentiment Analysis

Further Expectation

04

FURTHER EXPECTATIONS

1. ML Model

Great model precision!

Apply it in financial Market!

2. Other Data

Eg. User's Followers

User with more followers
may have greater impacts
on sentiment score

3. DL Model

The performance of DL
model depends heavily on
the nodes we set.

Further explore the model
with different nodes.

“
**Thank you
for listening!**

Q&A