FLIP01 Final Assessment

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Overview

Problem Definition

Problem Description

Defn

With all of the tweets circulating every second it is hard to tell whether the sentiment behind a specific tweet will impact a company, or a person's, brand for being viral (positive), or devastate profit because it strikes a negative tone.

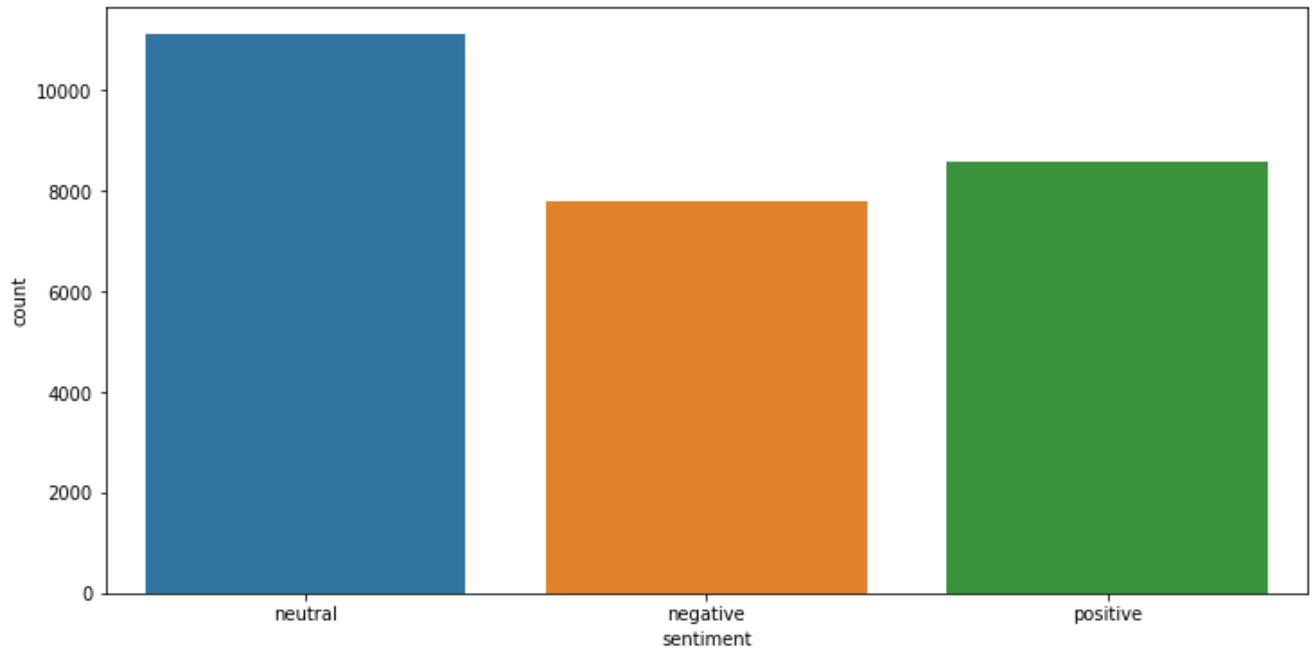
- What's the Sentiment of this tweet.
- What's the part of the tweet (word or phrase) that reflects the sentiment.

ID	text	selected_text	sentiment
$cb774db0d1$	Uh oh, I am sunburned	I am sunburned	negative
$549e992a42$	We saw that the baddie‘s the best	best	positive
$f84b89a828$	Sounds like me	Sounds like me	neutral

Data Visualization

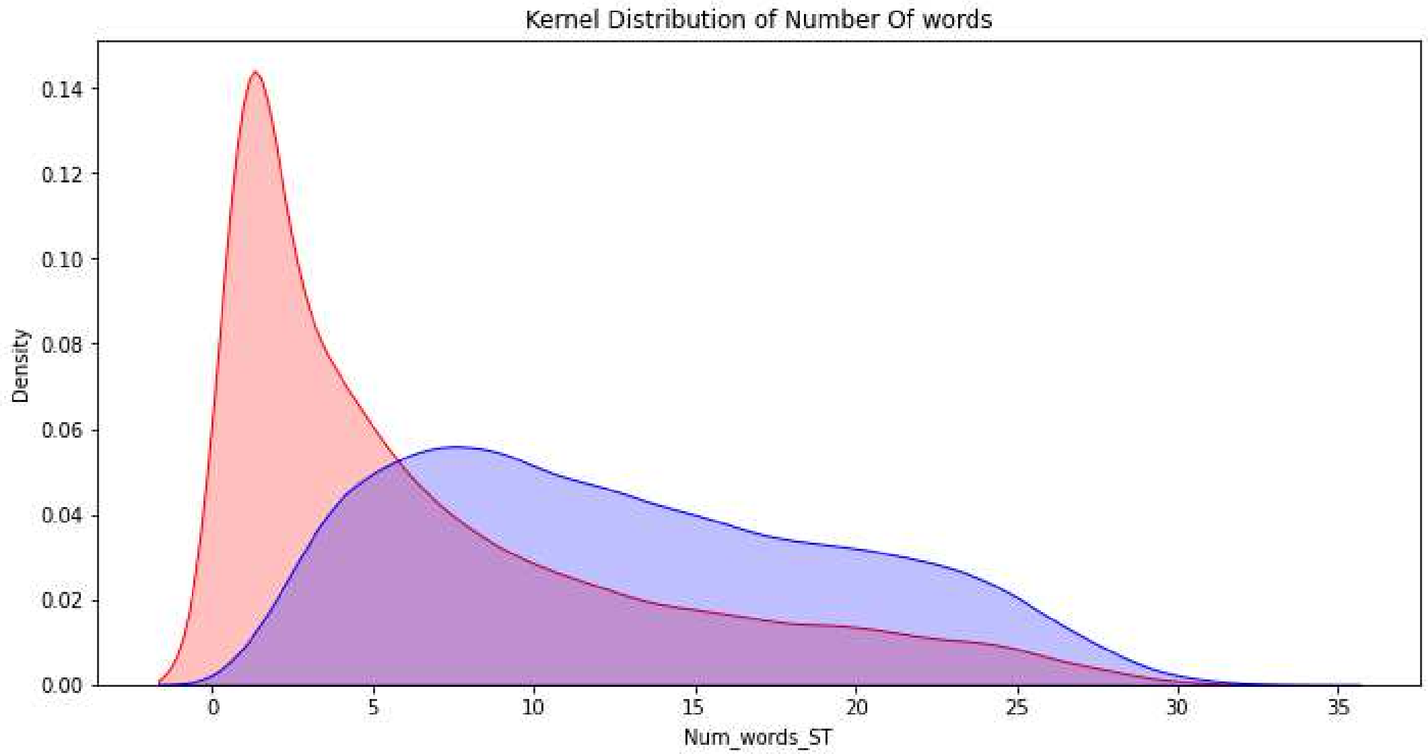
Data Visualization

- First, check the data.The training set contains 27482 data.
  - Take a look at the proportion of different types of text in the training set
  - It can be seen that the number of three kinds of data is relatively average. In addition, there are more neutral texts.



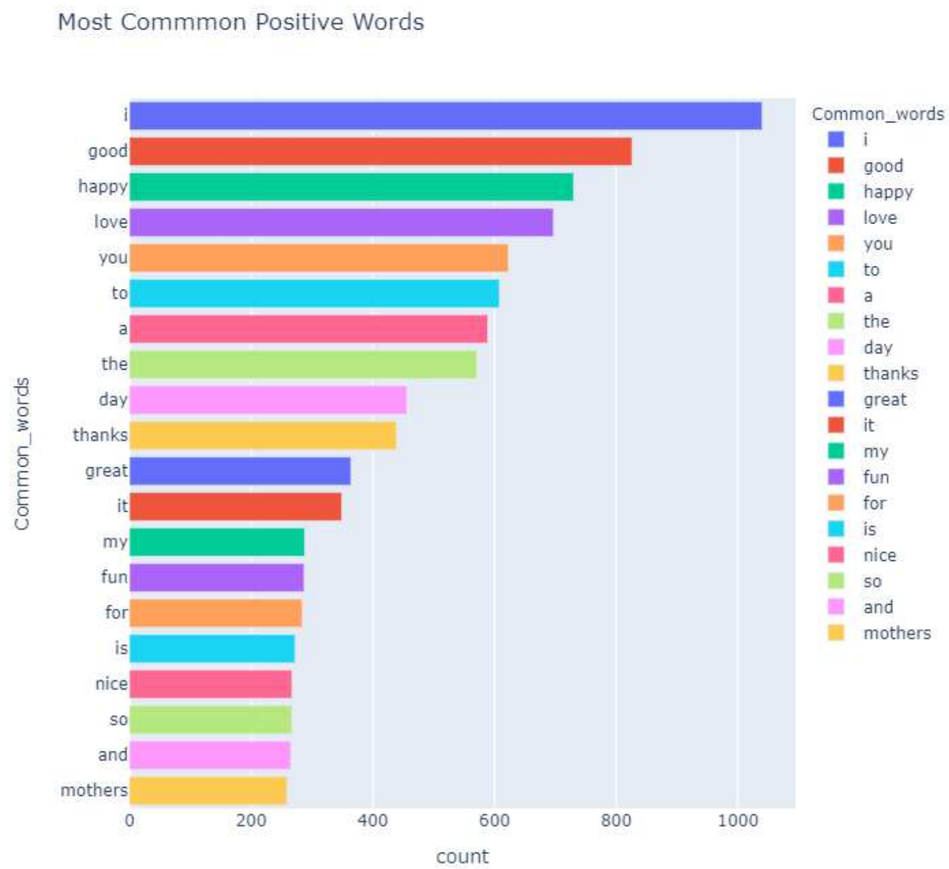
Data Visualization

- Count the distribution interval of the length of the given text and the selected text.



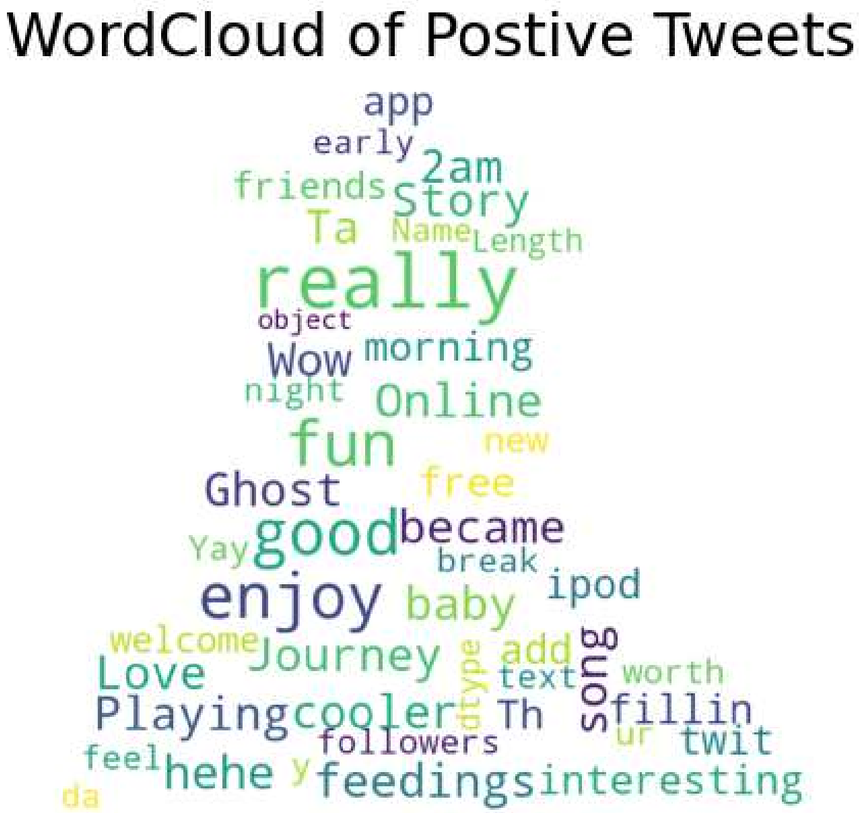
Data Visualization

- Statistics of positive emotions were selected in the text of the highest frequency of the first few words.



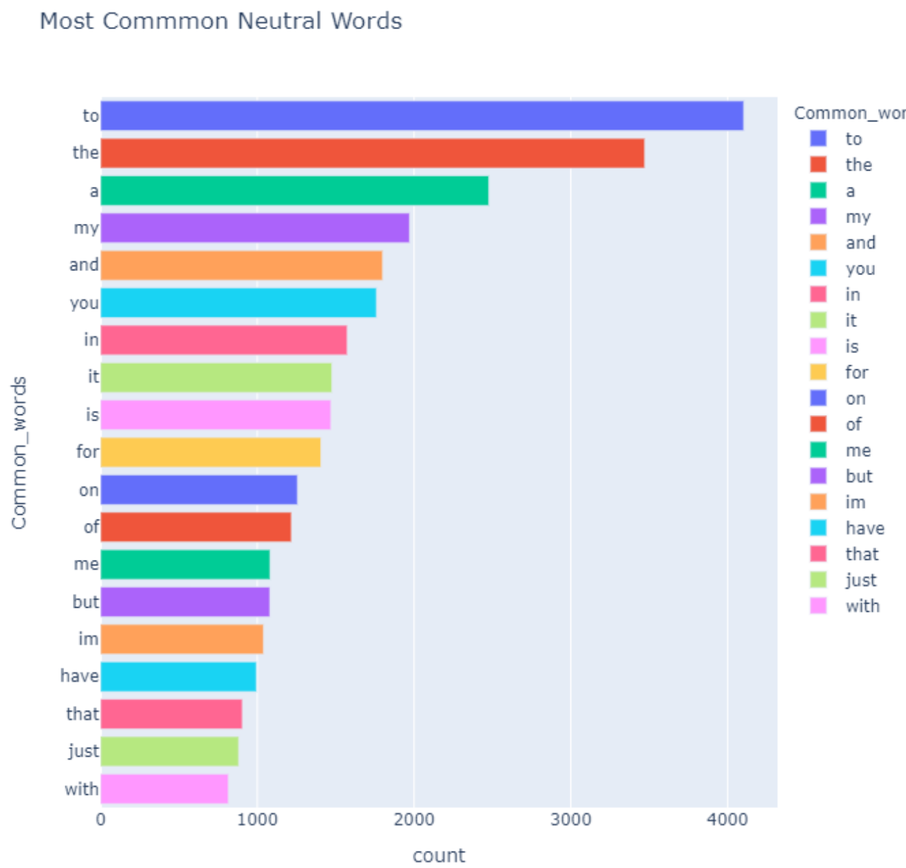
Data Visualization

- The statistical results will be generated word cloud to more intuitive look at the frequency of words.



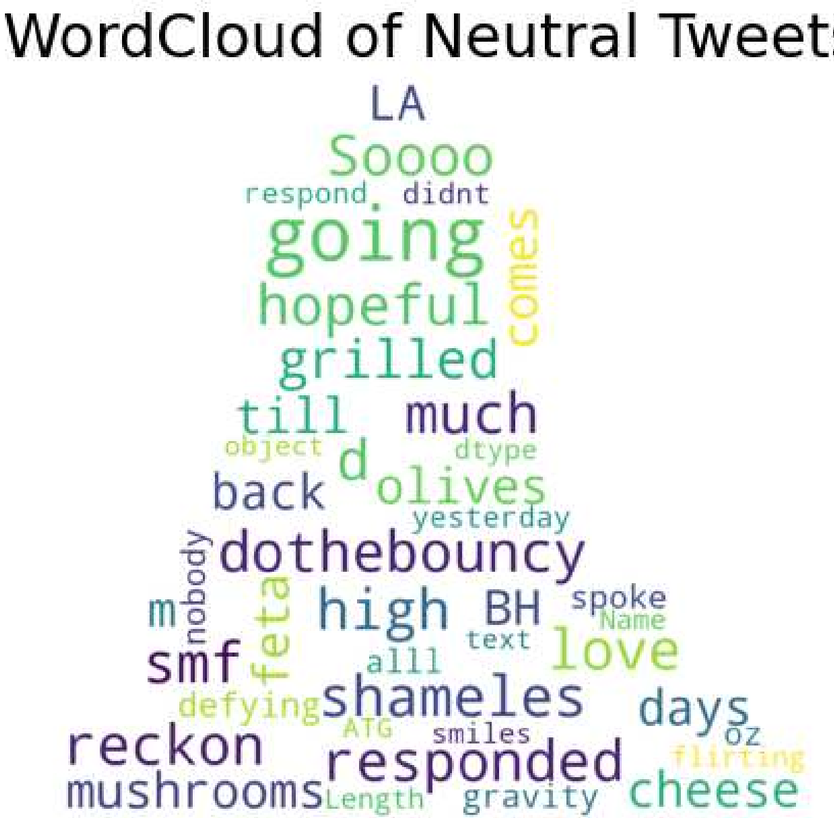
Data Visualization

- Statistics of neutral emotions were selected in the text of the highest frequency of the first few words.



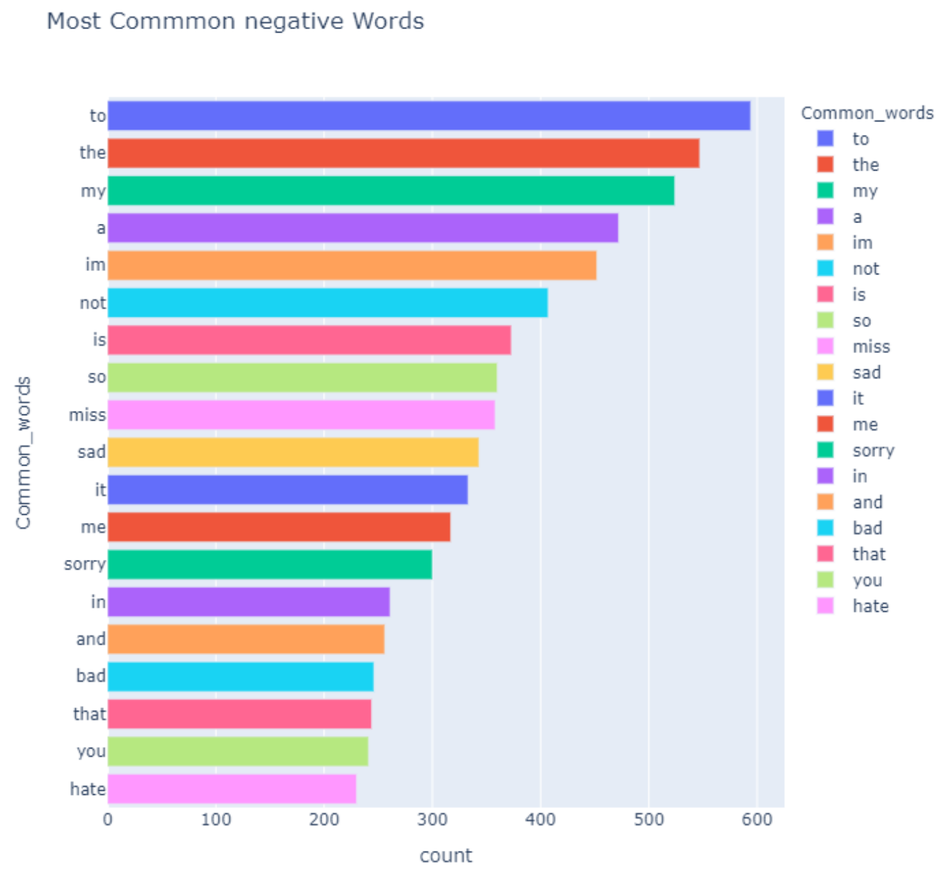
Data Visualization

- The statistical results will be generated word cloud to more intuitive look at the frequency of words.



Data Visualization

- Statistics of negative emotions were selected in the text of the highest frequency of the first few words.



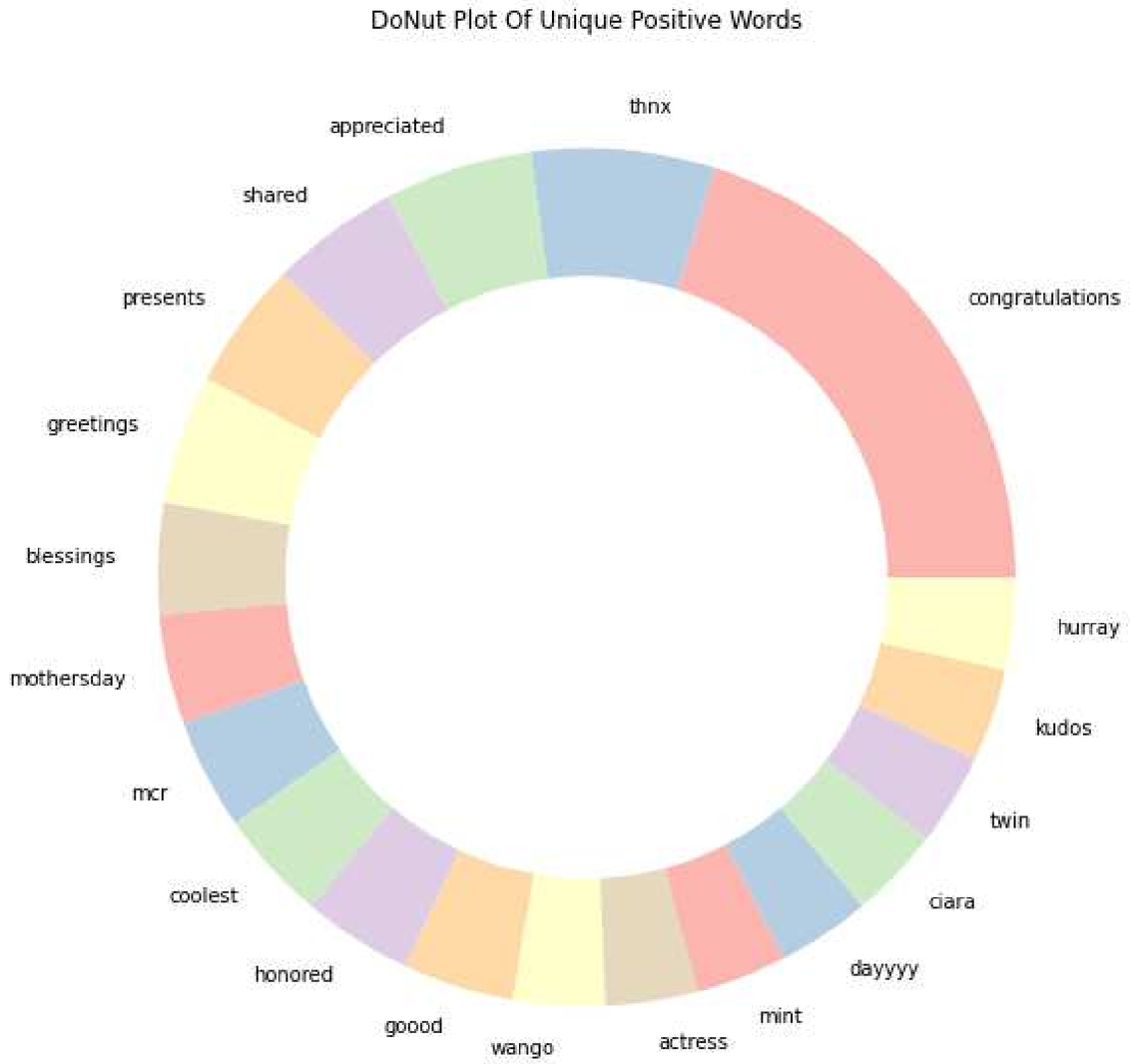
Data Visualization

- The statistical results will be generated word cloud to more intuitive look at the frequency of words.

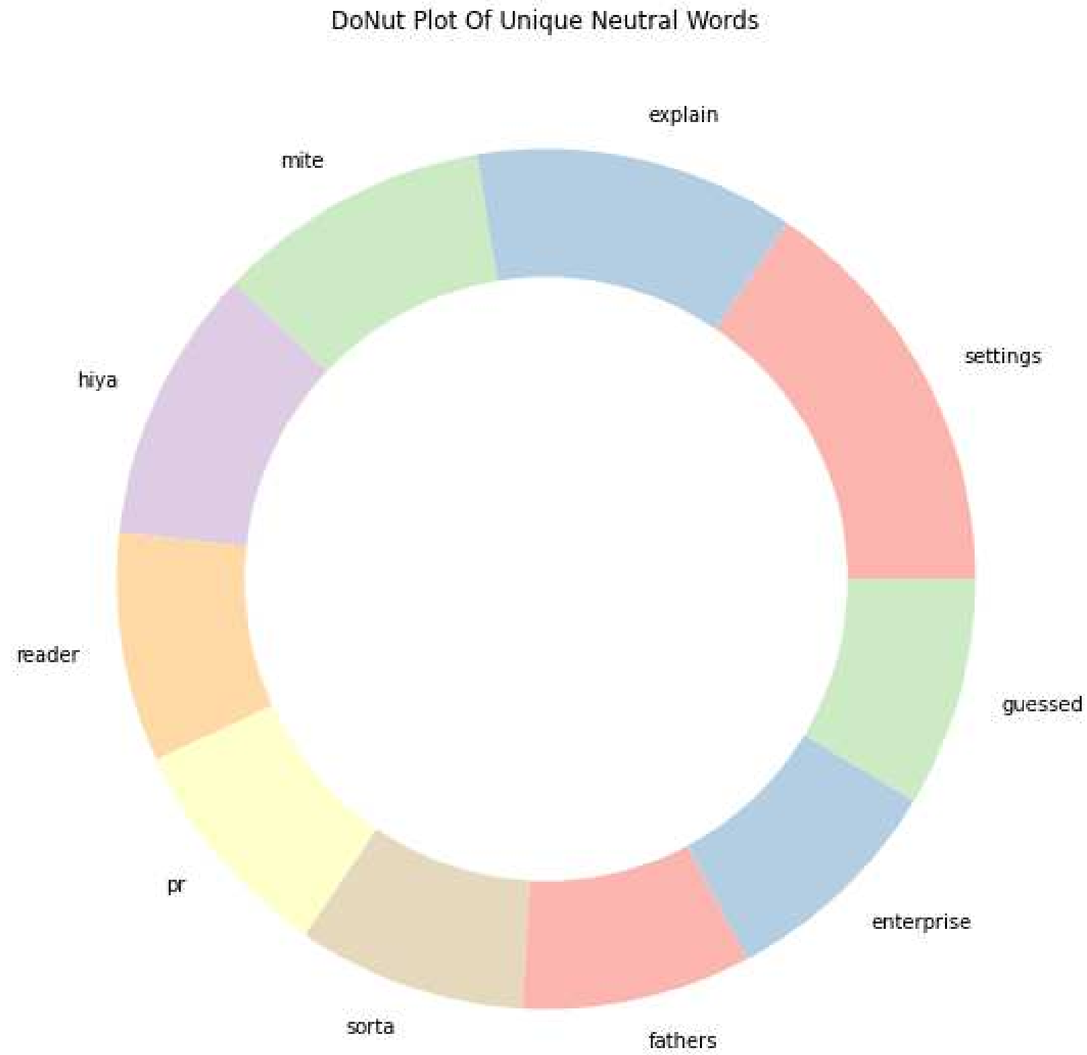
Data Visualization

- It can be seen that our previous statistical text contains some words without emotional tendency.
- After we delete these words, we count the frequency of each word.

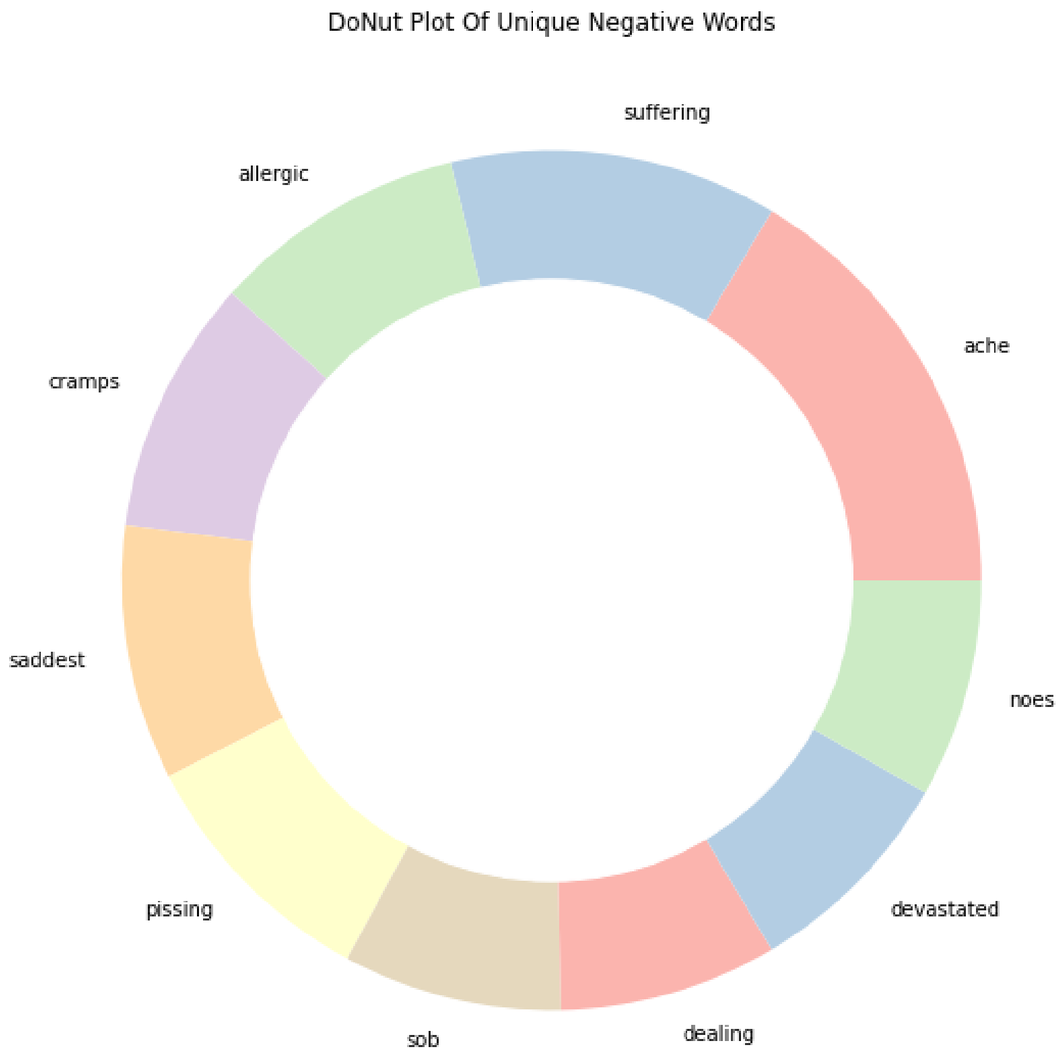
Data Visualization



Data Visualization



Data Visualization



Data Process

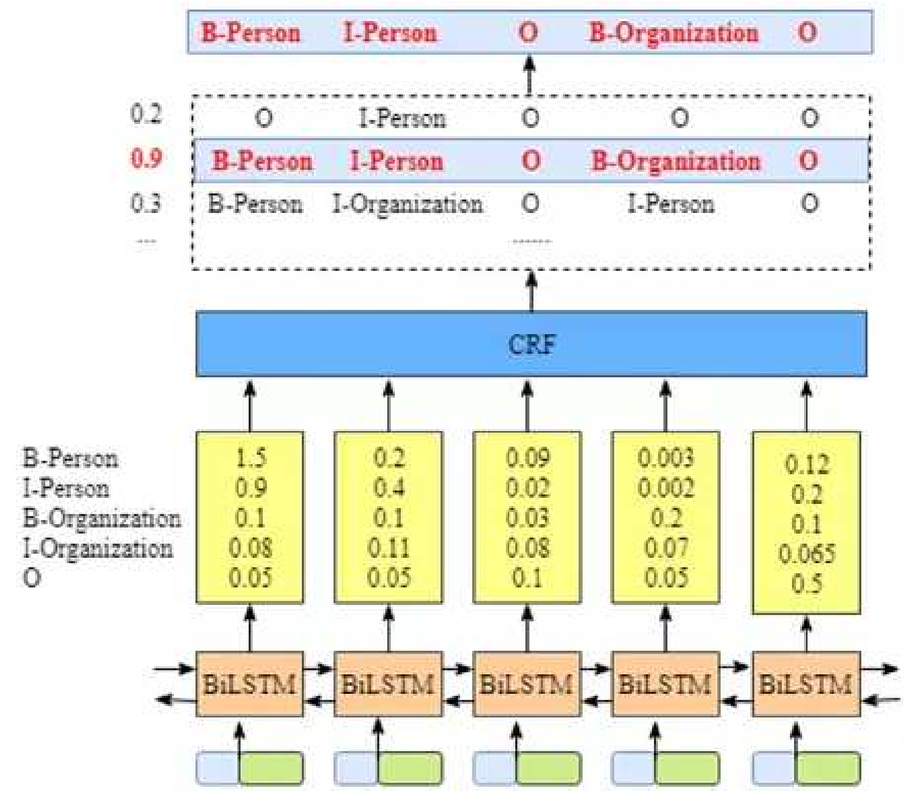
Data Process

- Observe the given training set, and the extracted words are part of the original sentence.
- The data processing part will only delete the blank data in the given training set.

Build The Model

Model:CRF+LSTM

- First, the CRF+LSTM model is used.



Model:CRF+LSTM

- Based on our previous data visualization.We set the MAX_LEN = 48.
- The learning rate is 0.8.
- Activation function is “Relu”.
- The output is one dimension and the convolution kernel size is 1 * 1.
- The optimizer is “SGD”.
- The loss function is “categorical_crossentropy”.
- Epochs = 10.

Model:CRF+LSTM

	textID	text	selected_text	sentiment
0	d93afa85cf	Car not happy, big big dent in boot! Hoping t...	Car not happy, big big dent in boot! Hoping th...	neutral
1	fab6b7d16c	im an avid fan of **** magazine and i love you...	avid fan of	positive
2	2e7082d1c8	MAYDAY?!	MAYDAY?!	neutral
3	684081e4e7	RATT ROCKED NASHVILLE TONITE..ONE THING SUCKED...	RATT ROCKED NASHVILLE TONITE..ONE THING SUCKED...	neutral
4	c77717b103	I love to! But I`m only available from 5pm. ...	I love to!	positive

- Finally, the loss rate of the trained model is 0.5393.

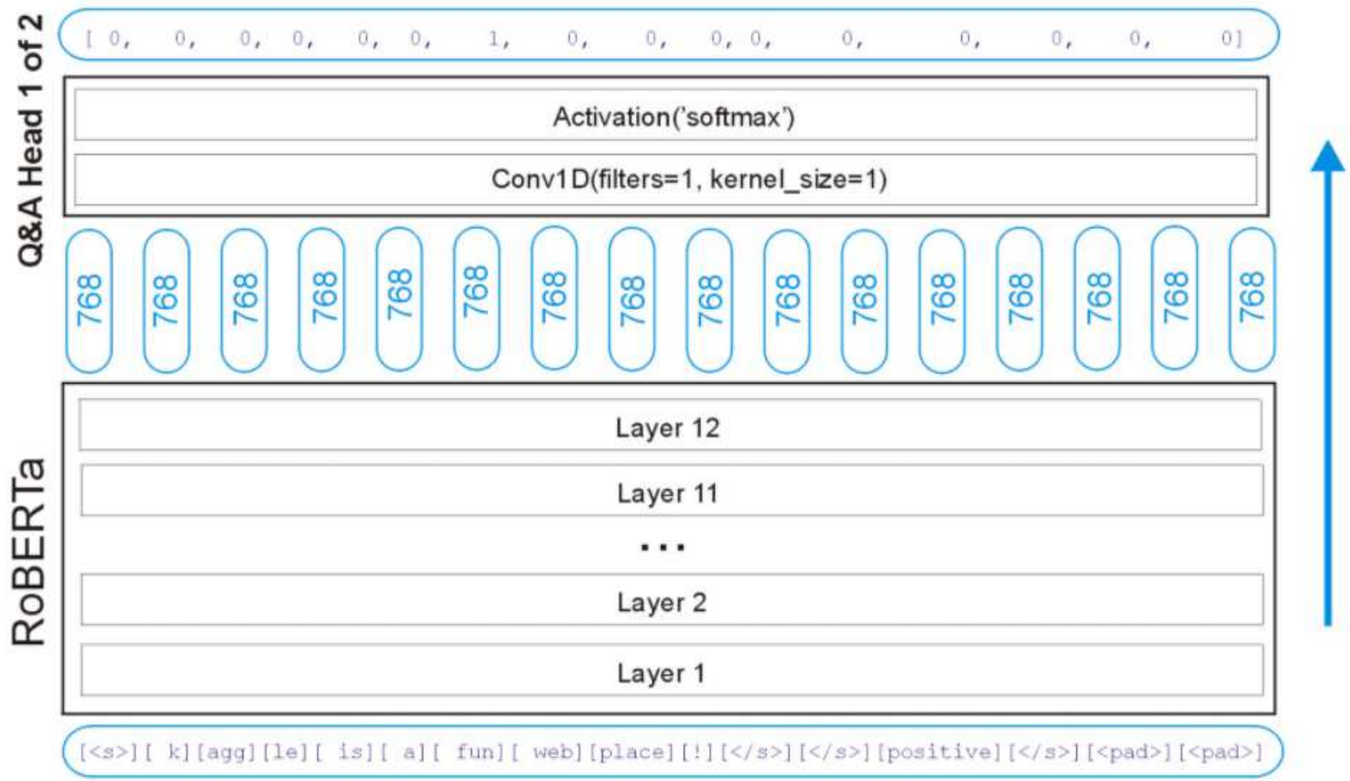
Model:roBERTa

In order to obtain higher accuracy, I choose the widely used model named roBERTa.

- Roberta: a robust method to optimize the pre training of Bert.
- Roberta is an improved algorithm of bert.
  - With bigger batch and more data, let the model train longer.
  - Removed the NSP (next sense prediction) task.
  - Train on a longer sequence.
  - Mask mechanism for dynamically modifying training data.

Model:roBERTa

- Activation function is “softmax”.
- The output is one dimension and the convolution kernel size is 1 * 1.



Model:roBERTa

- Based on our previous data visualization.We set the MAX_LEN = 48.
- The learning rate is 0.9.
- The optimizer is “Adam”.
- The loss function is “categorical_crossentropy”.
- Using k-fold cross validation, it is divided into five parts. Train five times.

Model:roBERTa

	textID	text	selected_text	sentiment
0	eae9c20c8d	#followfriday thank you so much. I`m so be...	day thank you so mu	positive
1	404e86f215	(cont) when told him that I love beans on toa...	I love beans on toast. SO CUTE!	positive
2	81a83e8d9a	why am i up so early	why am i up so early	negative
3	c0d5b45663	Joined you on facebook!	Joined you on facebook!	neutral
4	c3c1abb017	trying to find some friends and not having any...	not having any luck	negative

- Finally, the loss rate of the trained model is 0.707278223332157.

Conclusion

Contact Information

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