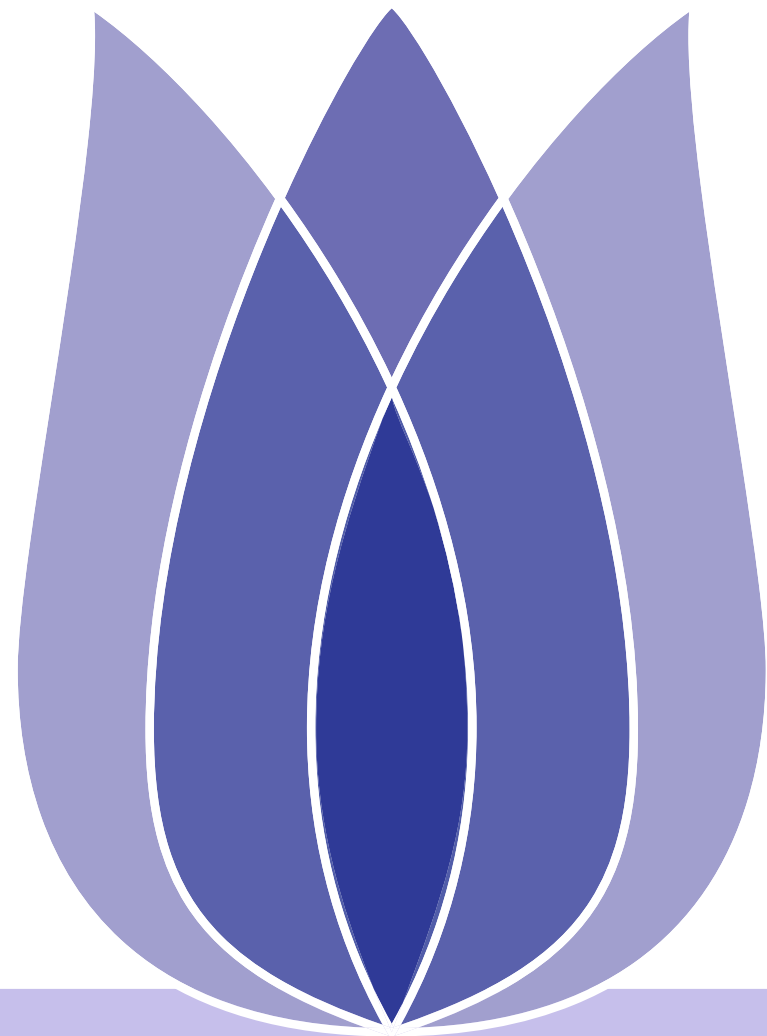


Flip 01 Project Report

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Qingdao University of Technology

January 10th





Overview

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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. Capturing sentiment in language is important in these times where decisions and reactions are created and updated in seconds. The purpose of this task is to detect hate speech in tweets. For the sake of simplicity, if there is racist or sexist sentiment on Twitter, we will say that it contains hate speech. Therefore, the task is to classify racist or sexist tweets from other tweets. If there is a system that can detect this type of text, it will definitely make the Internet and social media a better, non-malicious communication space.



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Data Analysis



Statistical Analysis Data

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Table 1: The First Five Rows of The Train Data

| | textID | text | selected_text | sentiment |
|---|------------|---|-------------------------------|-----------|
| 0 | cb774db0d1 | I'dhaveresponded,ifIweregoing | I'dhaveresponded,ifIweregoing | neutral |
| 1 | 549e992a42 | SoooSADIwillmissyouhereinSanDiego!!! | SoooSAD | negative |
| 2 | 088c60f138 | mybossisbullyingme... | bullyingme | negative |
| 3 | 9642c003ef | whatinterview!leavemealone | leavemealone | negative |
| 4 | 358bd9e861 | Sonsof * * * *,whycouldn'ttheyputthemont... | Sonsof * * * *, | negative |

Table 2: The First Five Rows of The Test Data

| | textID | text | sentiment |
|---|------------|--|-----------|
| 0 | f87dea47db | Lastsessionofthedayhttp://twitpic.com/67ezh | neutral |
| 1 | 96d74cb729 | Shanghaiisalsoreallyexciting(precisely – ... | positive |
| 2 | eee518ae67 | RecessionhitVeroniqueBranquinho,shehasto... | negative |
| 3 | 01082688c6 | happybday! | positive |
| 4 | 33987a8ee5 | http://twitpic.com/4w75p – Ilikeit!! | positive |



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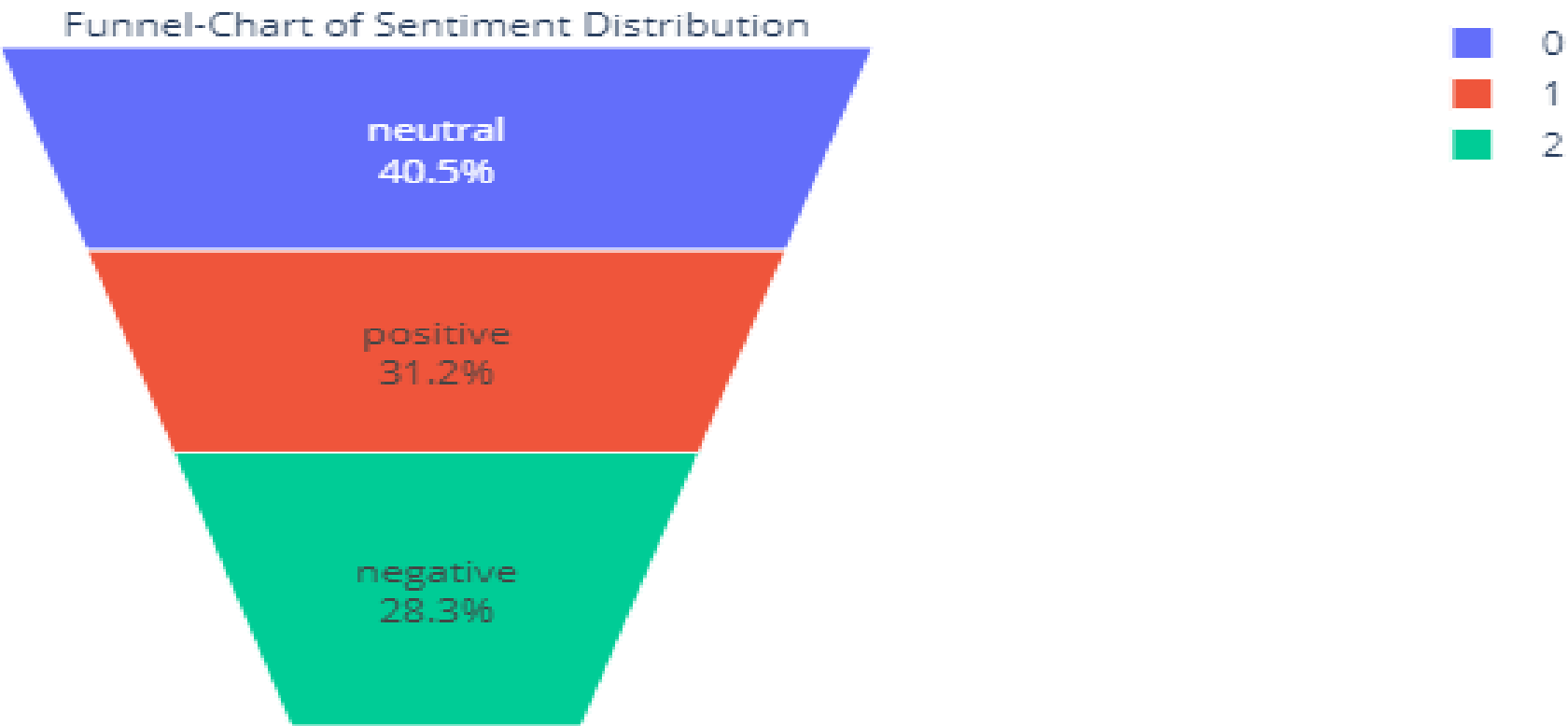
Table 3: Train Data Describe

| | textID | text | selected_text | sentiment |
|---------------|------------|----------------------------------|---------------|-----------|
| <i>count</i> | 27481 | 27480 | 27480 | 27481 |
| <i>unique</i> | 27481 | 27480 | 22463 | 3 |
| <i>top</i> | 703d8ea662 | hiiiimonmyipod...icantfallasleep | good | neutral |
| <i>freq</i> | 1 | 1 | 199 | 11118 |



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- To draw a Funnel-Chart for better visualization



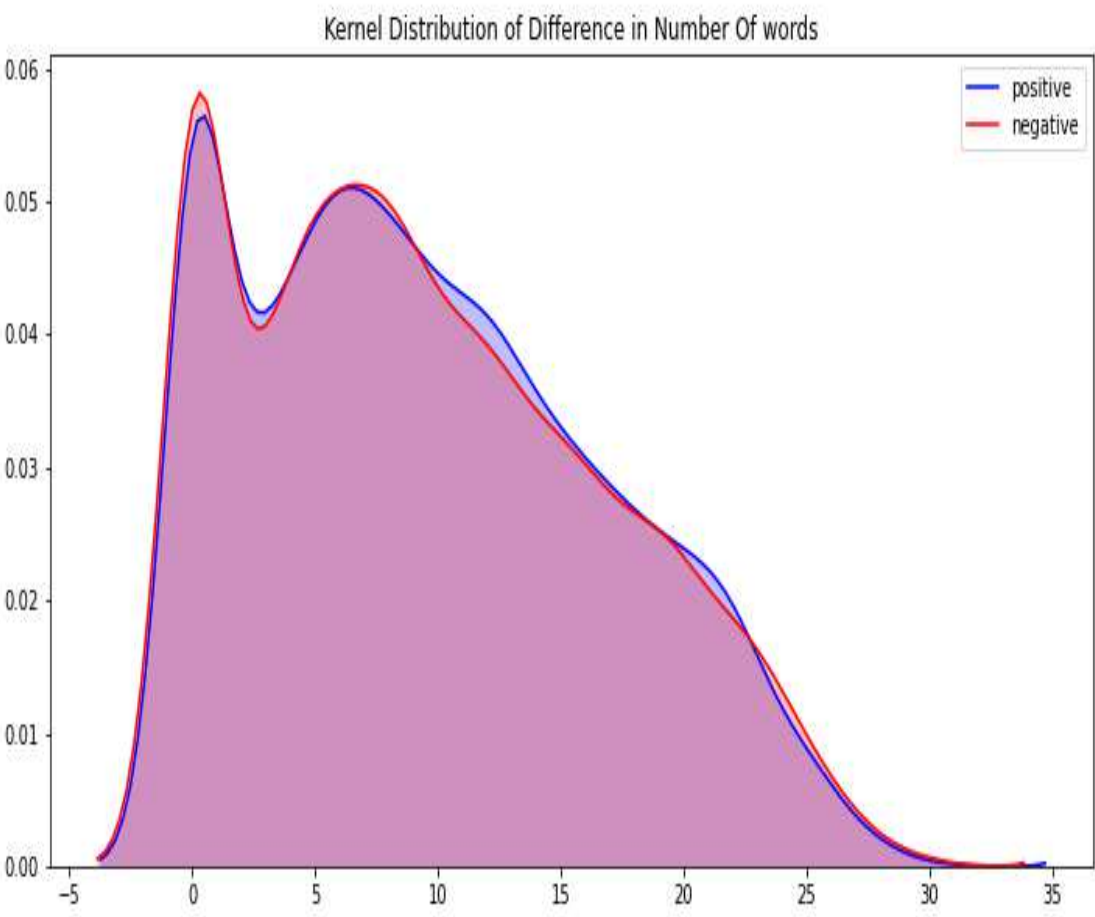
- From the above Funnel-Chart,the neutral sentiment accounted for the majority, followed by the positive and the least negative.



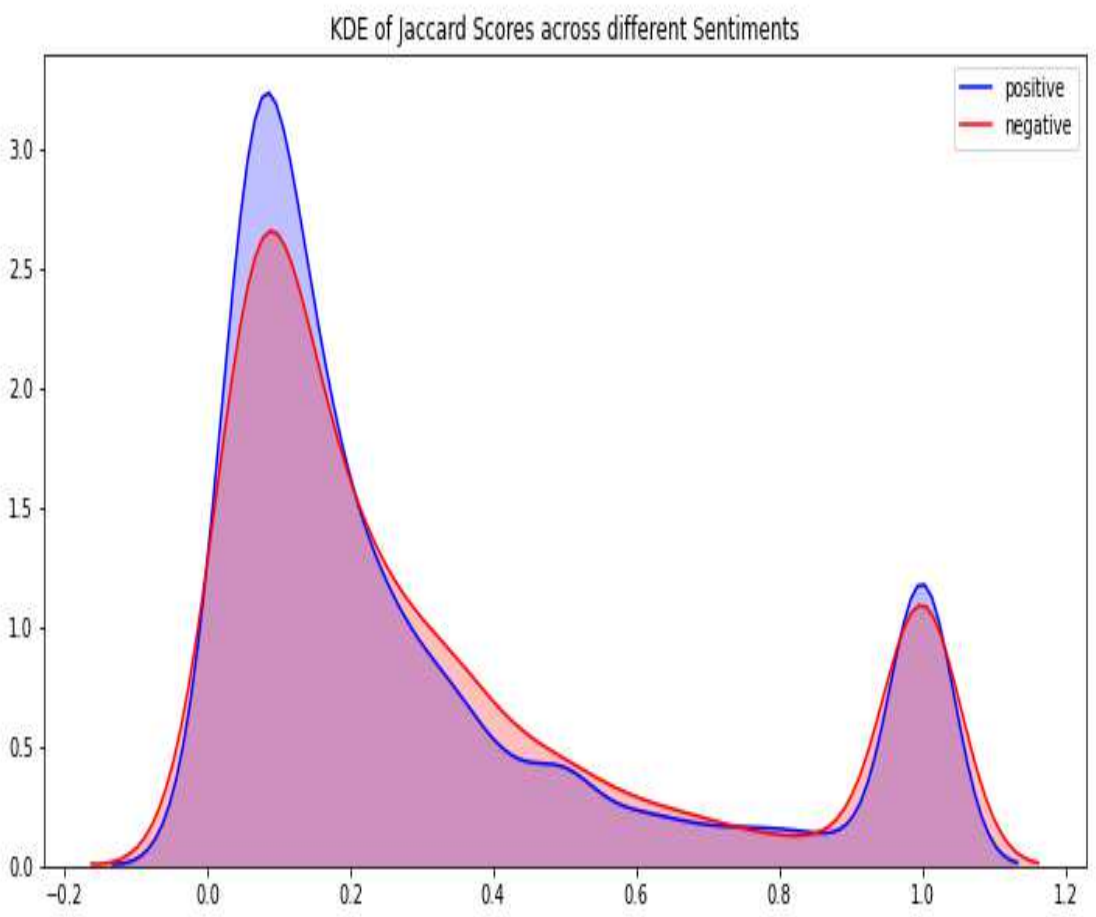
Data Visualization

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- So further analysis is needed to check the difference in Number of Words and the Jaccard Scores similarity across Different Sentiments between Text and selected_text.



(a) Negative and Positive Sentiment

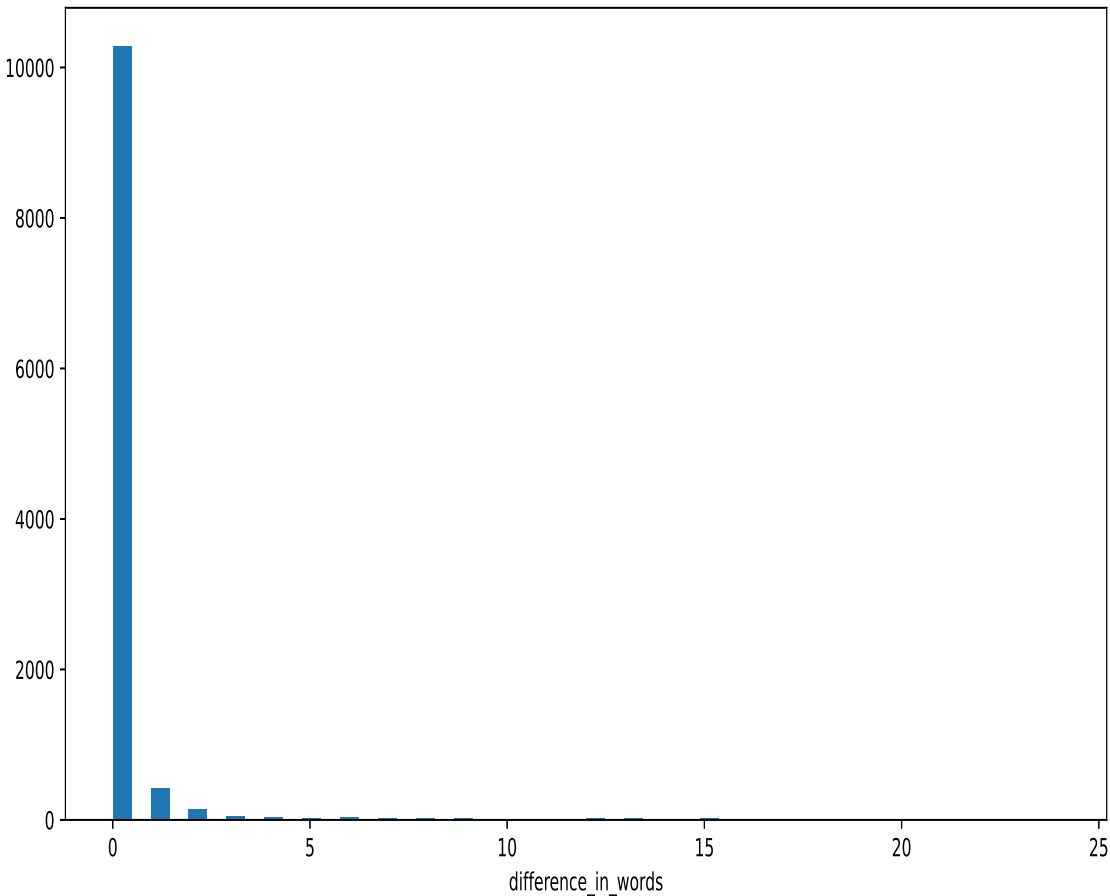


(b) Negative and Positive Sentiment

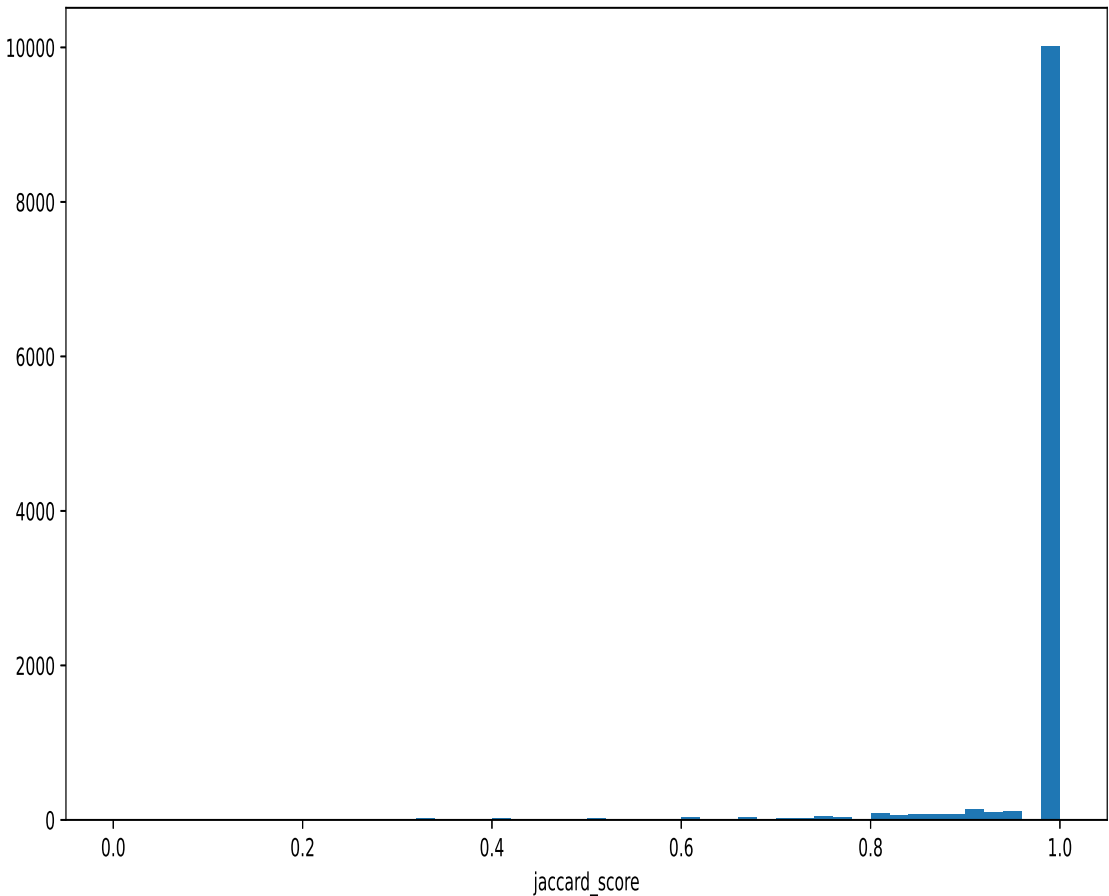


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(c) Difference in Number of Words in Neutral Sentiment



(d) Jaccard Scores in Neutral Sentiment



Conclusion Of EDA

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- It can be seen that the number of tweets with a jaccard similarity of 1 between text extraction and text is more neutral sentiment.In conclusion maybe we can use neutral "text" as it is for "selected_text" in test data submission.
- We can see from the Jaccard Score Plot that there is peak for negative and positive plot around score of 1 .That means there is a cluster of tweets where there is a high similarity between text and selected texts ,if we can find those clusters then we can predict text for selected texts for those tweets irrespective of segment.



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- View the Jaccard value of positive tweets with words less than or equal to 2

| | textID | text | selected_text | sentiment | jaccard_score |
|-------|------------|------------------------------------|------------------------------------|-----------|---------------|
| 68 | fa2654e730 | Chilliin | Chilliin | positive | 1.0 |
| 80 | bbbc46889b | THANK YYYYYYYYYOOOOOOOOOOUUUUU! | THANK YYYYYYYYYOOOOOOOOOOUUUUU! | positive | 1.0 |
| 170 | f3d95b57b1 | good morning | good morning | positive | 1.0 |
| 278 | 89d5b3f0b5 | Thanks | Thanks | positive | 1.0 |
| 430 | a78ef3e0d0 | Goodmorning | Goodmorning | positive | 1.0 |
| ... | ... | ... | ... | ... | ... |
| 26690 | e80c242d6a | Goodnight; | Goodnight; | positive | 1.0 |
| 26726 | aad244f37d | *hug* | *hug* | positive | 1.0 |
| 26843 | a46571fe12 | congrats! | congrats! | positive | 1.0 |
| 26960 | 49a942e9b1 | Happy birthday. | Happy birthday. | positive | 1.0 |
| 27293 | 47c474aaf1 | Good choice | Good | positive | 0.5 |

207 rows × 8 columns



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Data cleaning



Data cleaning

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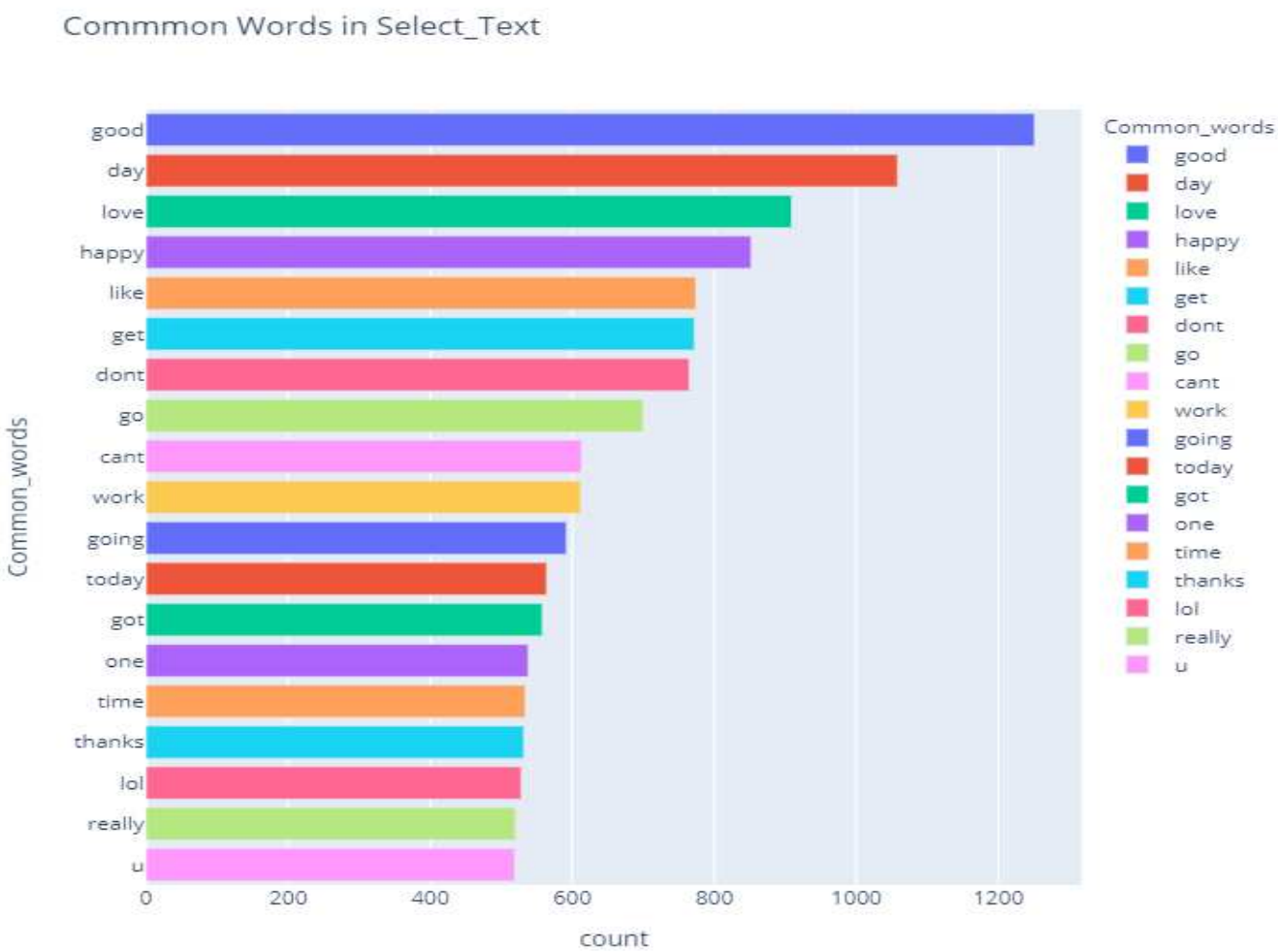
- First,make text lowercase,remove text in square brackets,remove links,remove punctuation and remove words containing numbers.
- Then to remove the stopwords.



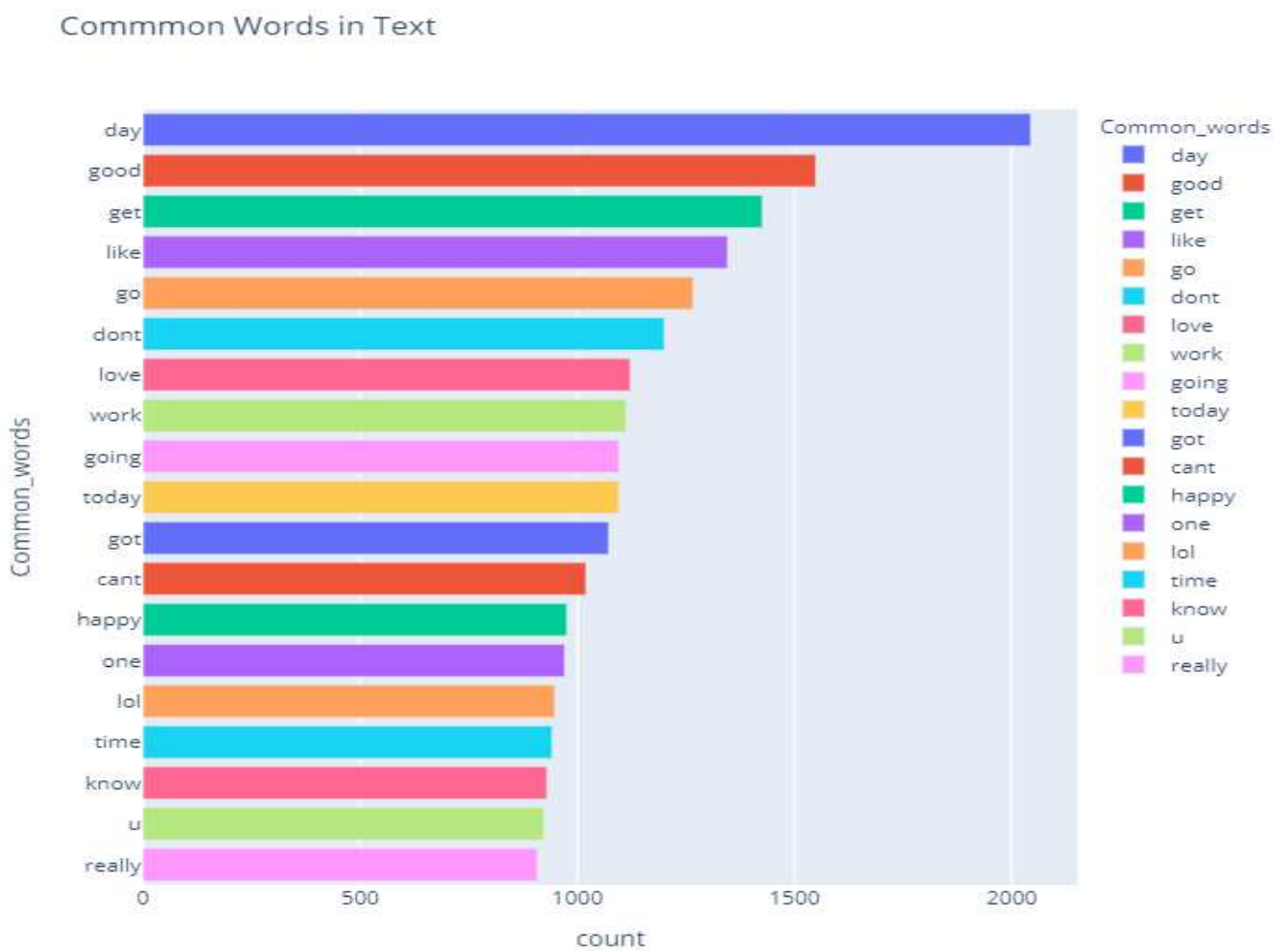
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- We can see that the top 20 most common words and the text in the selected text are almost the same.



(e)



(f)



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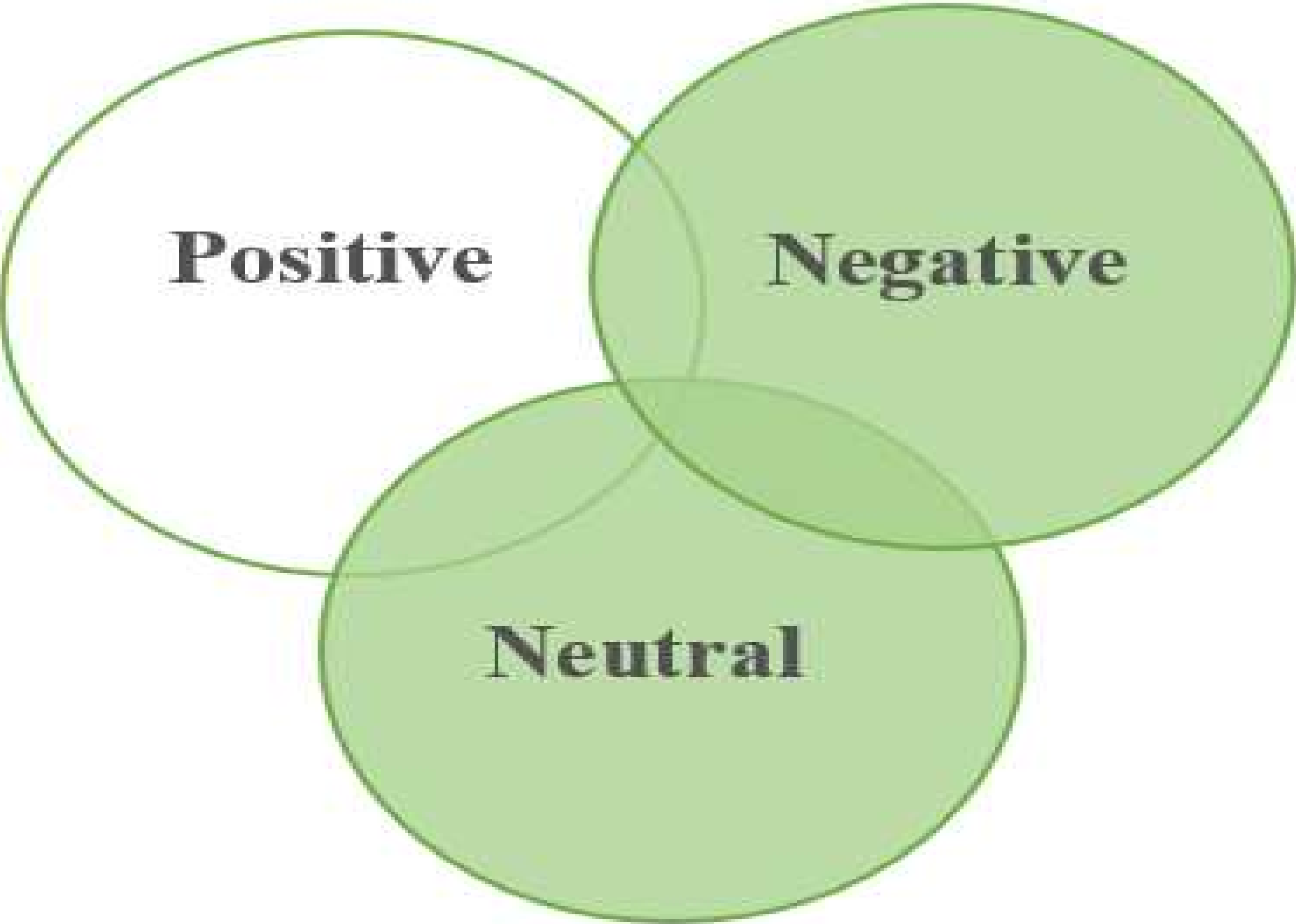
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■ Unique Words in each Segment





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- Unique Words in each Segment
- By Looking at the Unique Words of each sentiment,we now have much more clarity about the data,these unique words are very strong determiners of Sentiment of tweets.

| | words | count |
|---|-----------------|-------|
| 0 | congratulations | 29 |
| 1 | thnx | 10 |
| 2 | appreciated | 8 |
| 3 | shared | 7 |
| 4 | presents | 7 |
| 5 | greetings | 7 |
| 6 | blessings | 6 |
| 7 | mothersday | 6 |
| 8 | mcr | 6 |
| 9 | coolest | 6 |

(g) Positive

| | words | count |
|---|------------|-------|
| 0 | ache | 12 |
| 1 | suffering | 9 |
| 2 | allergic | 7 |
| 3 | cramps | 7 |
| 4 | saddest | 7 |
| 5 | pissing | 7 |
| 6 | sob | 6 |
| 7 | dealing | 6 |
| 8 | devastated | 6 |
| 9 | noes | 6 |

(h) Negative

| | words | count |
|---|------------|-------|
| 0 | settings | 9 |
| 1 | explain | 7 |
| 2 | mite | 6 |
| 3 | hiya | 6 |
| 4 | reader | 5 |
| 5 | pr | 5 |
| 6 | sorta | 5 |
| 7 | fathers | 5 |
| 8 | enterprise | 5 |
| 9 | guessed | 5 |

(i) Neutral



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Model



Model-NER

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- To use text as selected_text for all neutral tweets due to their high jaccard similarity.
- To use text as selected_text for all tweets having number of words less than 3 in text.
- Train two different models for Positive and Negtive tweets.
- To use spacy for creating our own customised NER model or models (seperate for each Sentiment).





Train Model-NER

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- Set up the pipeline and train the entity recognizer,create the built-in pipeline components and add them to the pipeline.
- Add labels: entities.
- Get names of other pipes to disable them during training.
- The sample can be divided into equal subsets, one gradient descent can be made for each subset, then the values of parameters can be updated, and then the gradient descent can be continued in the next subset.
- Training models for Positive and Negative tweets.



TULIP

Team for Universal Learning and Intelligent Processing



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■ Unique Words in each Segment

| | textID | text | sentiment |
|---|------------|---|-----------|
| 0 | f87dea47db | Last session of the day http://twitpic.com/67ezh | neutral |
| 1 | 96d74cb729 | Shanghai is also really exciting (precisely -... | positive |
| 2 | eee518ae67 | Recession hit Veronique Branquinho, she has to... | negative |
| 3 | 01082688c6 | happy bday! | positive |
| 4 | 33987a8ee5 | http://twitpic.com/4w75p - I like it!! | positive |
| 5 | 726e501993 | that`s great!! weeee!! visitors! | positive |
| 6 | 261932614e | I THINK EVERYONE HATES ME ON HERE lol | negative |
| 7 | afa11da83f | soooooo wish i could, but im in school and my... | negative |
| 8 | e64208b4ef | and within a short time of the last clue all ... | neutral |
| 9 | 37bcad24ca | What did you get? My day is alright.. haven` ... | neutral |

(j)

| | textID | selected_text |
|---|------------|--|
| 0 | f87dea47db | Last session of the day http://twitpic.com/67ezh |
| 1 | 96d74cb729 | exciting |
| 2 | eee518ae67 | shame! |
| 3 | 01082688c6 | happy bday! |
| 4 | 33987a8ee5 | http://twitpic.com/4w75p - I like it!! |
| 5 | 726e501993 | that`s great!! weeee!! visitors! |
| 6 | 261932614e | HATES |
| 7 | afa11da83f | blocked |
| 8 | e64208b4ef | and within a short time of the last clue all ... |
| 9 | 37bcad24ca | What did you get? My day is alright.. haven` ... |

(k)



Model-BERT

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- Data analysis, data visualization and data cleaning are all consistent with the above. BERT model is used for prediction, and the accuracy of this model is higher than that of NER model in NLP.



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- The data was divided into 5 parts of the same size, and each part was trained for 3 iterations to get the best Jaccard Score.

```
[0.7091828843199642, 0.7080587949898328, 0.6973334213940873, 0.6967458256274228, 0.7040539762147914]
```



Test Model-BERT

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Table 4: There are 10 Random Comparison Results in The Test Results

| | textID | text | selected_text |
|---|------------|---|--|
| 0 | 12005b65fc | Waitingformyturnonwiifitgymclosed | waitingformyturnonwiifitgymclosed |
| 1 | bcf13877f7 | Goodmorningeveryone | good |
| 2 | 575e4a89fe | ttsridiculouslysweetofyou | ridiculouslysweetofyou |
| 3 | a0b1828b67 | Bridesalamode'powwowfirstthingthismorningTh... | lovely |
| 4 | 472c3e2c41 | Gettingsomewherewithmyfirst'real'KiokuDBandcatal... | gettingsomewherewithmyfirst'real'kiokudbandcata... |
| 5 | ce71d002ec | Mommasdayismay10th!Don'tforgettodosomethingnice... | nice |
| 6 | 8db4aaef4a | watchingthenotebook | watchingthenotebook |
| 7 | 895de1648c | reallytired.andhavetoworkthewholedaytomorrow,t... | reallytired. |
| 8 | 78d89e7c64 | YeahprblypickinupsongsforSingStar.Haven'tchecke... | yeahprblypickinupsongsforsingstar.haven'tchecke... |
| 9 | 756d255e40 | isathomewithapukeyboy!Poorlittlebaby | poorlittlebaby |



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