Analyzing the Analyzer

An exercise in Natural Language Processing

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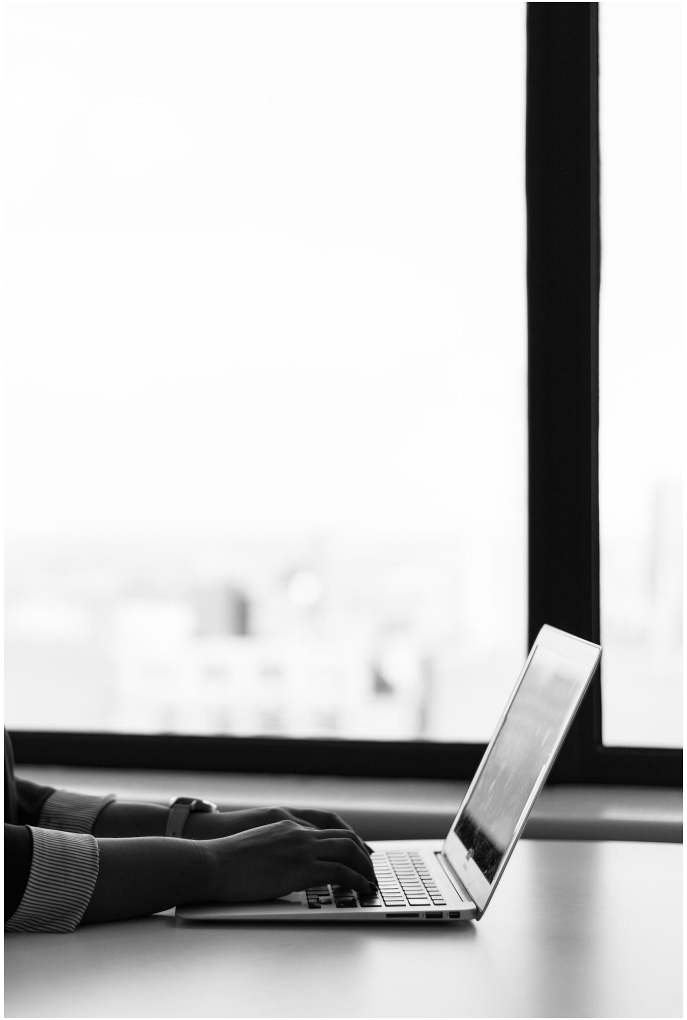

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Feelings!

Reddits

Classifiers

More Feelings!

Analyzer Thoughts

Is Being Alone A Bad Thing?

Pros:

- Recharge
- More Productive
- Boosts Creativity

Cons:

- Critical Inner Voice
- Depression
- Not Healthy

And the **NLTK SentimentIntensityAnalyzer** says so:

```
sent.polarity_scores("alone")

{'neg': 1.0, 'neu': 0.0, 'pos': 0.0, 'compound': -0.25}
```

https://www.psychalive.org/being-alone/

Photo by https://www.pexels.com/@quang-nguyen-vinh-222549

Feelings!

Reddits

Classifiers

More Feelings!

Analyzer Thoughts

Pick two Reddits to classify

reddit r/AskCulinary

reddit r/running

- Lots of text
- Problem statement:
  - If being alone is negative...
  - ... then Running subreddit -> lower Sentiment scores

Feelings!

Reddits

Classifiers

More Feelings!

Analyzer Thoughts

Classifiers

❖ **Models:**

1. Pipeline with:
*** CountVectorizer (transformer)**
*** Multinomial Naive Bayes (estimator)**

Training model score: 0.992
Testing model score: 0.991

2. Pipeline with:
*** TfidfVectorizer (transformer)**
*** KNeighborsClassifier (estimator)**

Training model score: 1.0
Testing model score: 0.985

3. Pipeline with:
*** CountVectorizer (transformer)**
*** Random Forest (estimator)**

Training model score: 0.946
Testing model score: 0.939

So if classifiers are this good, can’t wait to see how Sentiment Analyzers do!

Feelings!

Reddits

Classifiers

More Feelings!

Analyzer Thoughts

Sentiment Analyzers

❖ **NLTK VADER Sentiment Analyzers**

- Vader_lexicon.txt
- 7500 terms
- If term not in lexicon, return neutral score.
  (run, running, cook, bake, family, together)

Term	Mean Rating	Human Ratings
friend	2.2	[2, 2, 3, 2, 3, 3, 1, 2, 2, 2]
alone	-1.0	[-2, -1, -1, -1, -2, -1, 0, -1, -1, 0]

Humans rate terms on scale of sentiment intensity
-4 most negative
+4 most positive

Feelings!

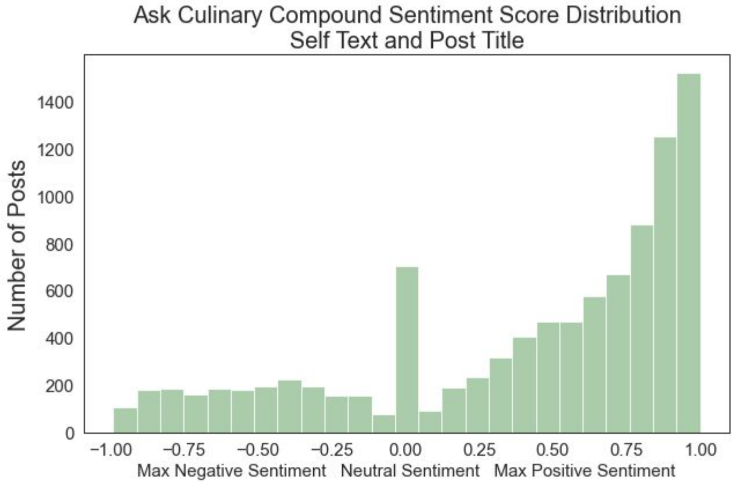
Reddits

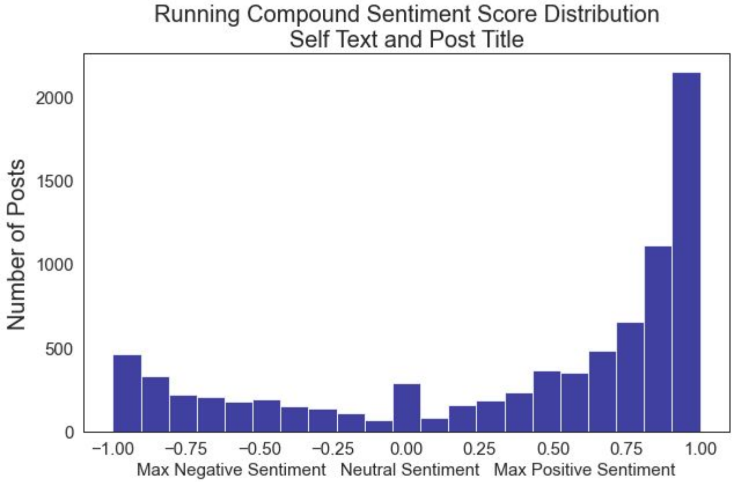
Classifiers

More Feelings!

Analyzer Thoughts

Sentiment Analyzers cont.





Compound Sentiment Scores Normalized -1 to 1

8,000 Ask Culinary posts:

Average Compound Score for all posts: **0.40**

8,000 Running posts:

Average Compound Score for all posts: **0.38**

Running has more positive posts, but a lot more negative to drag it down.

Sentiment Analyzers cont.

❖ **What is missing?**

In **Ask Culinary** 8,000 posts, almost 16,000 vectorized words

- VADER lexicon = 7,500 words
- Only 1,500 of the 16,000 were found in VADER lexicon.

In **Running** 8,000 posts, almost 18,000 vectorized words

- VADER lexicon = 7,500 words
- Only 2,000 of the 16,000 were found in VADER lexicon.

Feelings!

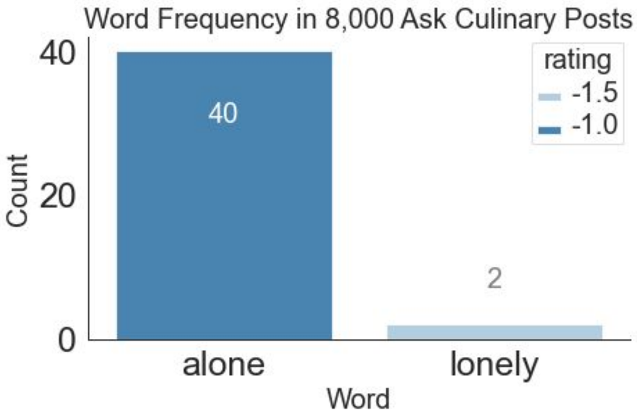
Reddits

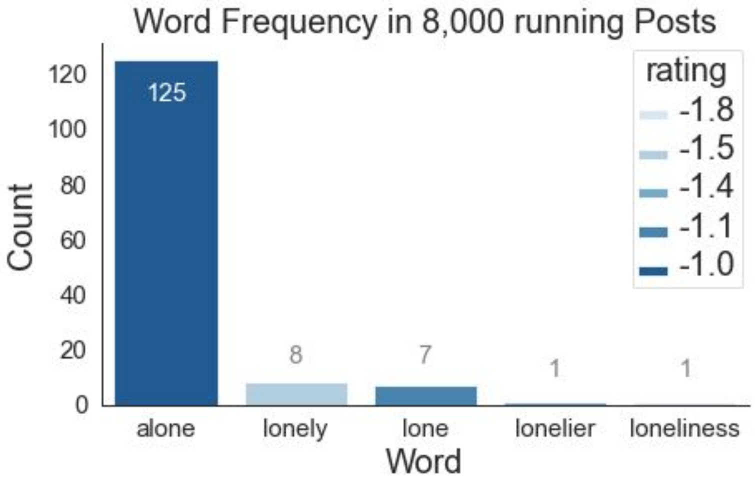
Classifiers

More Feelings!

Analyzer Thoughts

Are runners more lonely?





Feelings!

Reddits

Classifiers

More Feelings!

Analyzer Thoughts

Final Thoughts

- Learn about the tools
  - Stop words!
    - They might impact what you are analyzing (‘fire’, ‘keep’, ‘system’)
  - Lexicon
  - Human ratings
  - Hyperparameters
- Question the results

Analyzing the Analyzer

Thank you!

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