

Math Unsupervised

Neda Saleem



Motivation

Goal

How do people talk
about math?

Expectation

Lots of hate



Approach

Data

9,000' tweets

Keyword 'math'

Topic Modeling

TF-IDF Vectorizer

NMF

Sentiment analysis

Vader



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⁺Expected



✦ **Bad at Math:**

'bad', 'grade', 'fumbles'

✦ **Math Teacher:**

'teacher', 'grades', 'test'

✦ **Hate Math:**

'hard', 'crying', 'stressed'

✦ **Math is hard:**

'hard', 'huh', 'guess'

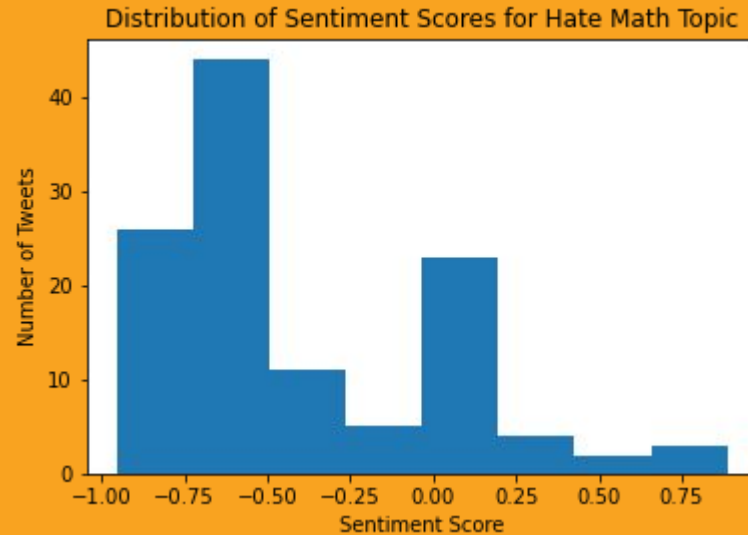
✦ **Needing Help:**

'help', 'need', 'homework', 'pls'



Sentiment - Hate math

● Mean Sentiment
score = -0.41



+ Not so Expected



✧ Love math:

'love', 'test', 'got', 'super',
'enjoy'

✧ Colors to subject:

'science', 'english', 'red',
'blue', 'green'

✧ Pay for hw:

'pay', 'calculus',
'assignment', 'statistics'

✧ Anime character memes:

'hes', 'reason', 'think',
'wake', 'character',
'breathe'





rea 愛

@bluebocchan

...

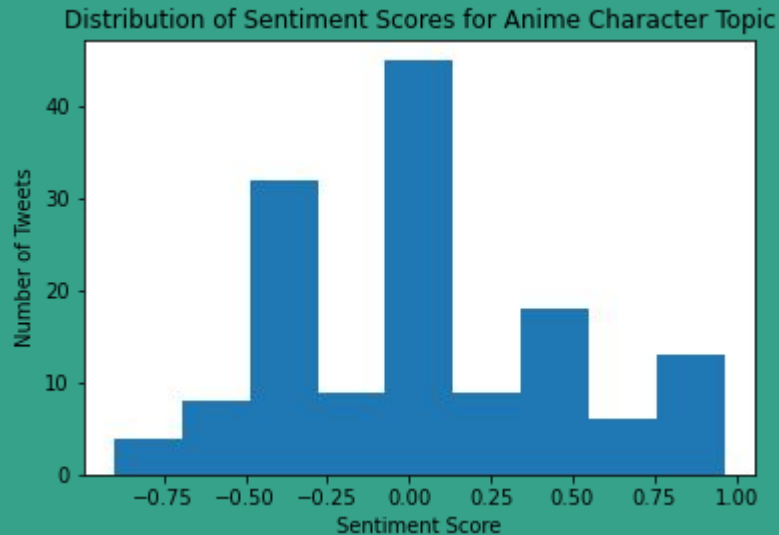
Gaara is NOT a 2D character. It's an emotion. He's the reason i wake up in the morning. He's what i think about in every boring math lesson. He's a reason to breathe.



Astre ★ -_- 💧 @Phantomastre_ · Nov 1

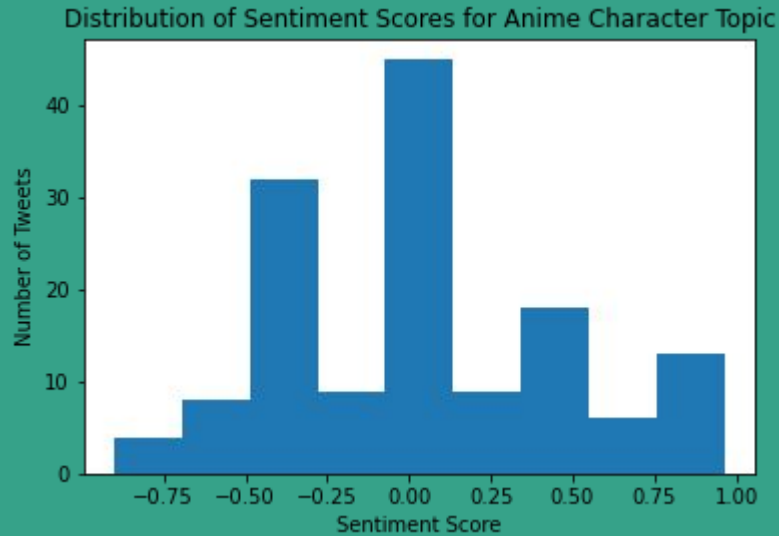
Ciel is NOT a 2D character. It's an emotion. He's the reason i wake up in the morning. He's what i think about in every boring math lesson. He's a reason to breathe. [twitter.com/madaragf/statu...](https://twitter.com/madaragf/status...)

Sentiment - Anime character



Mean Sentiment
score = 0.03

Sentiment - Anime character



● Mean Sentiment
score = 0.03

● Meme Sentiment score
= -0.32

+ Used for Insults

✦ Did the math:

'did', 'wrong', 'work', 'failed'

✦ Election:

'Trump', 'Biden', 'votes',
'win', 'count', 'million'

✦ Understand basic math:

'understand', 'basic',
'stupid'



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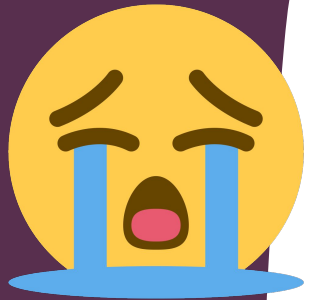
'Trump', 'Biden', 'votes',
'win', 'count', 'million'

✦ Understand basic math:

'understand', 'basic',
'stupid'



Common Emojis!



grinning face double exclamation mark thumbs up
red heart **pensive face** relieved face
grinning face with sweat slightly smiling face
rolling on the floor laughing
sparkles thinking face
smiling face with heart-eyes smiling face with sunglasses
clown face
loudly crying face
pleading face smiling face with hearts
beaming face with smiling eyes
face with rolling eyes skull
broken heart unamused face smiling face star-struck
folded hands
woozy face **face with tears of joy**
flushed face grinning face with big eyes

Takeaways

Expected

Not Expected

Used for
insults



Takeaways

Expected

Not Expected

**Used for
insults**



Takeaways

Expected

Not Expected

**Used for
insults**



Takeaways

Expected

Not Expected

**Used for
insults**

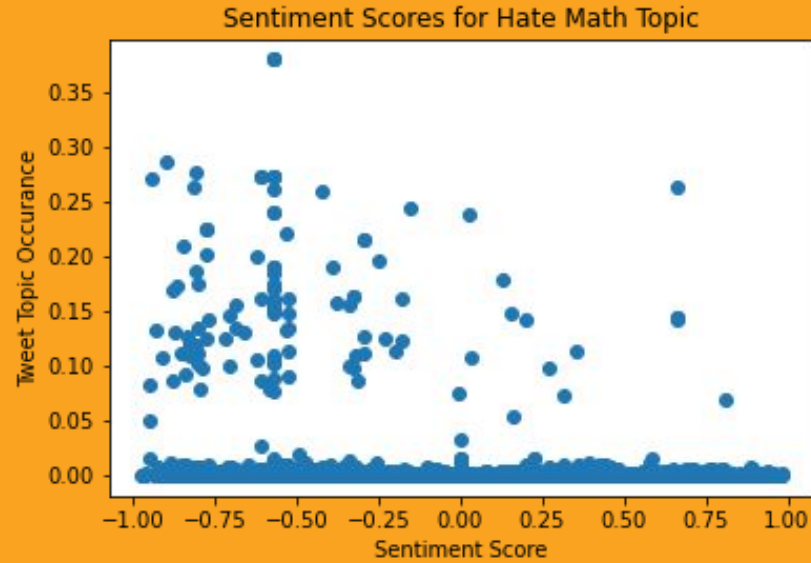




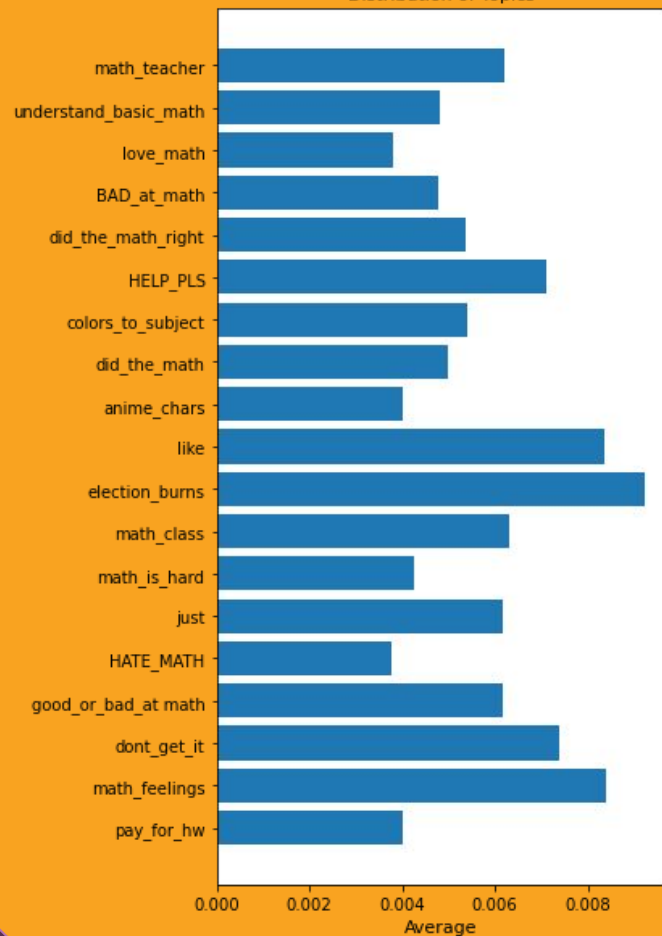
Questions?

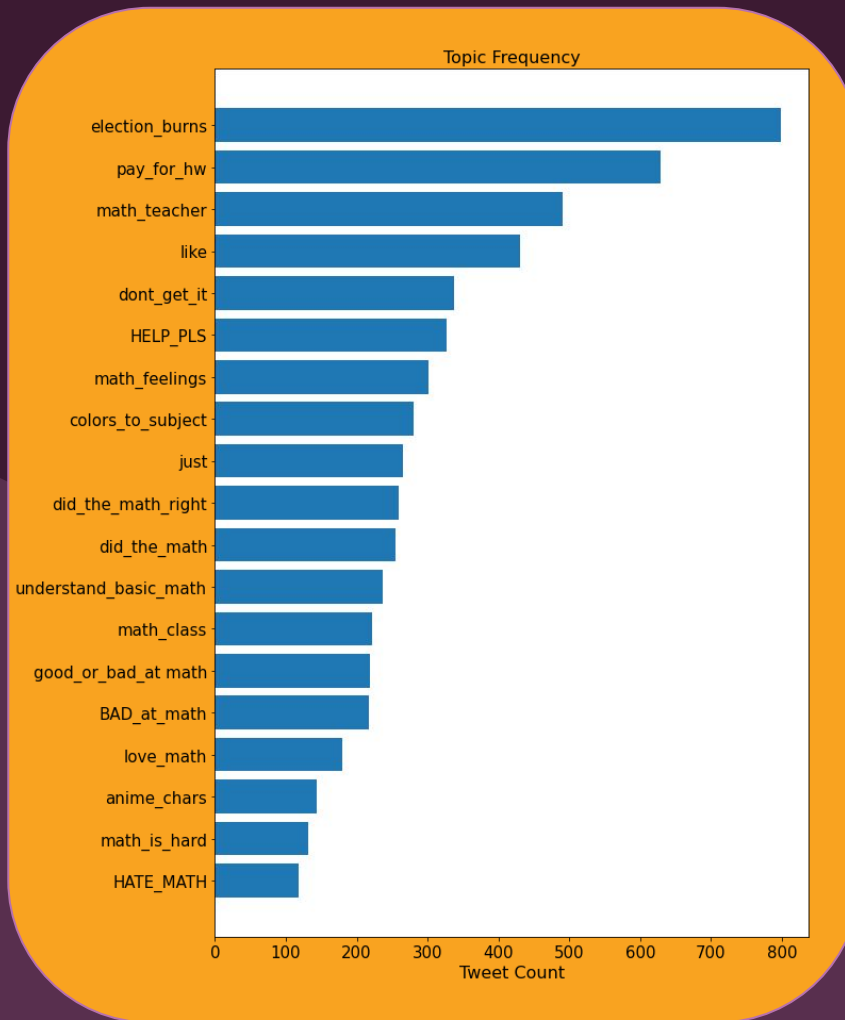


Appendix

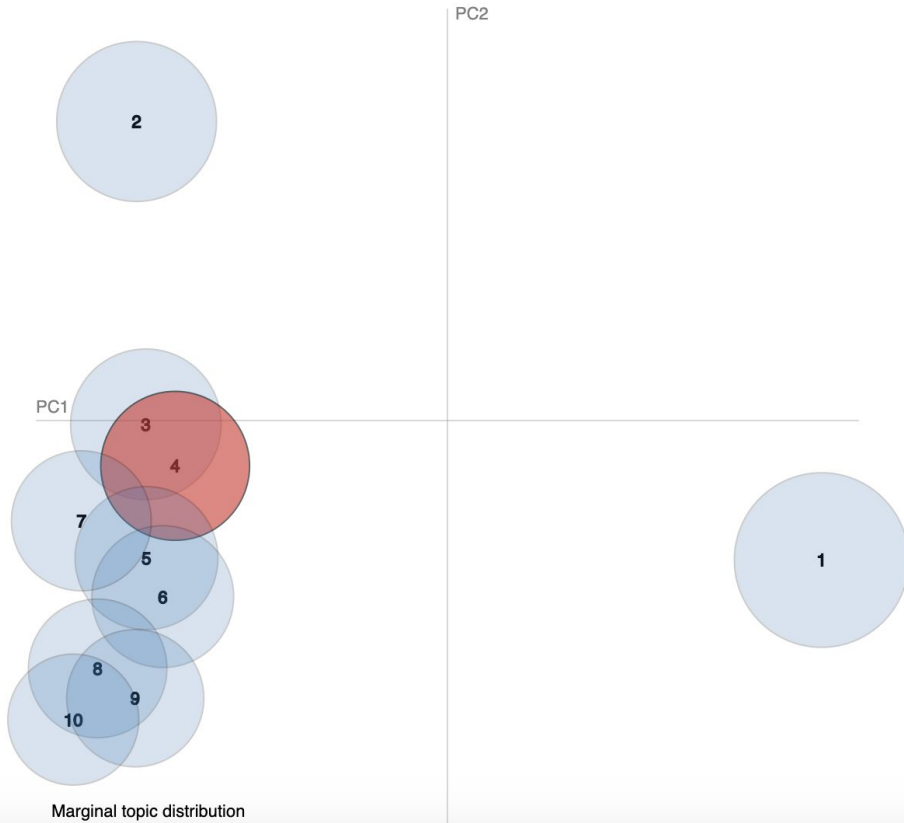


Distribution of Topics

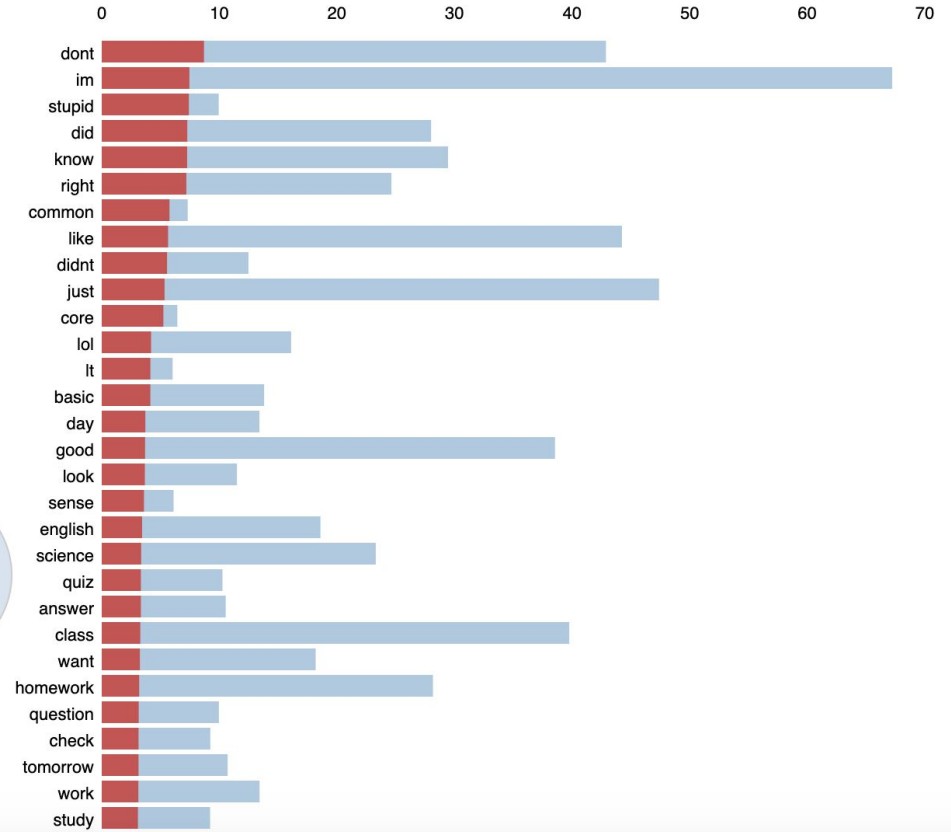




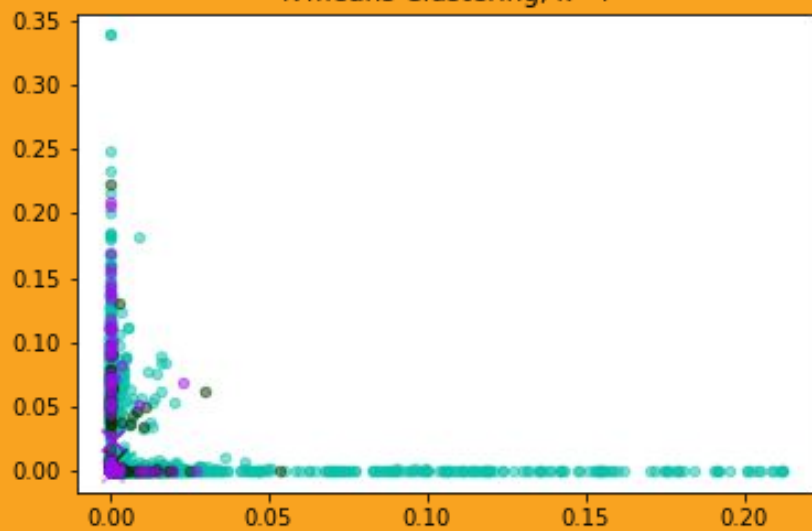
Intertopic Distance Map (via multidimensional scaling)



Top-30 Most Relevant Terms for Topic 4 (10.3% of tokens)



K-means Clustering, k=4



+ Future Work

✦ **More
emojis
analysis**

✦ **Special
events in
time**

