

Math Unsupervised

Neda Saleem



Motivation

Goal

How do people talk
about math?

Expectations

Lots of hate



Approach

Data

9,000' tweets

Keyword 'math'

Scraped on 11/2 11/3 11/5

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'

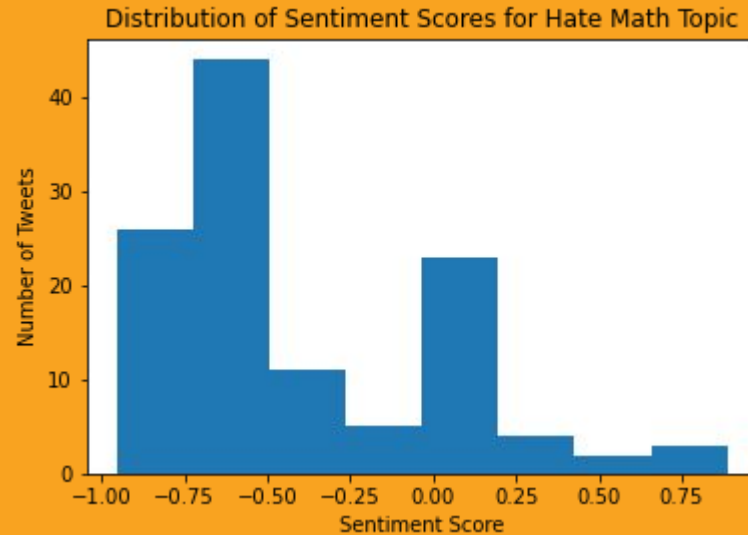
✦ **Needing Help:**

'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

...

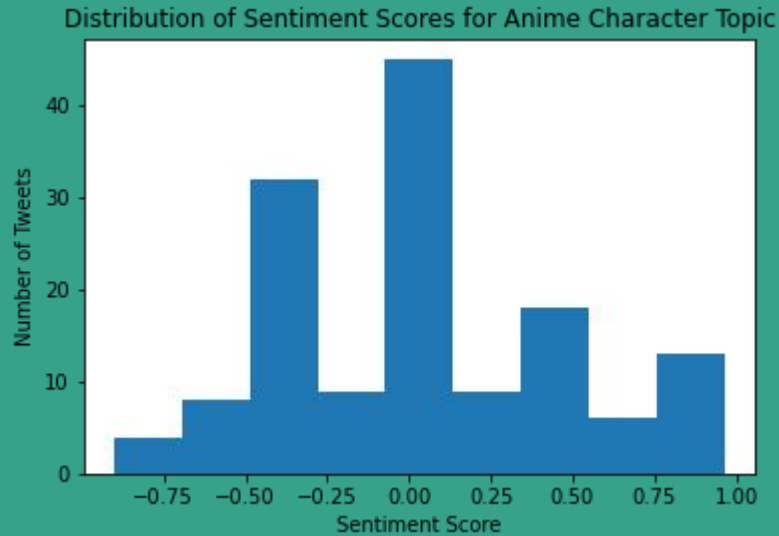
Gaara is NOT a 2D character. It's an emotion. He's the reason i wake up in the morning. He's what i think about in every boring math lesson. He's a reason to breathe.



Astre ★ -_- 💧 @Phantomastre_ · Nov 1

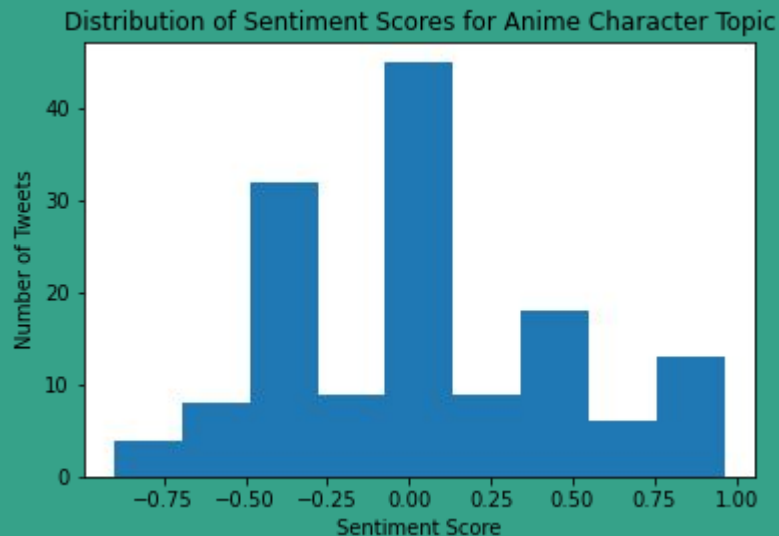
Ciel is NOT a 2D character. It's an emotion. He's the reason i wake up in the morning. He's what i think about in every boring math lesson. He's a reason to breathe. [twitter.com/madaragf/statu...](https://twitter.com/madaragf/status...)

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'



+ Used for Insults

✦ Did the math:

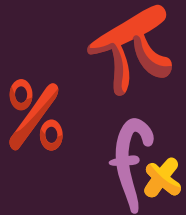
'did', 'wrong', 'work', 'failed'

✦ Election:

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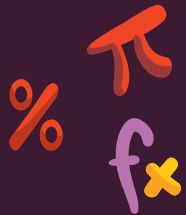
'did', 'wrong', 'work', 'failed'

✦ Election:

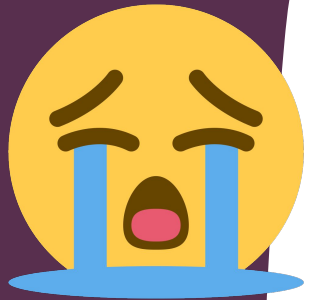
'Trump', 'Biden', 'votes',
'win', 'count', 'million'

✦ 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 clown face smiling face with sunglasses
loudly crying face
pleading face smiling face with hearts
weary face beaming face with smiling eyes skull
broken heart unamused face star-struck
woozy face smiling face folded hands
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

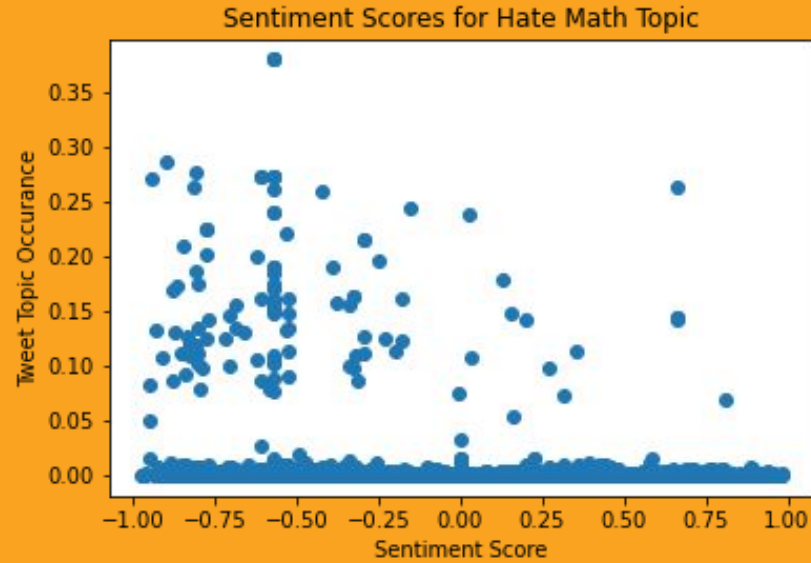
**Used for
insults**



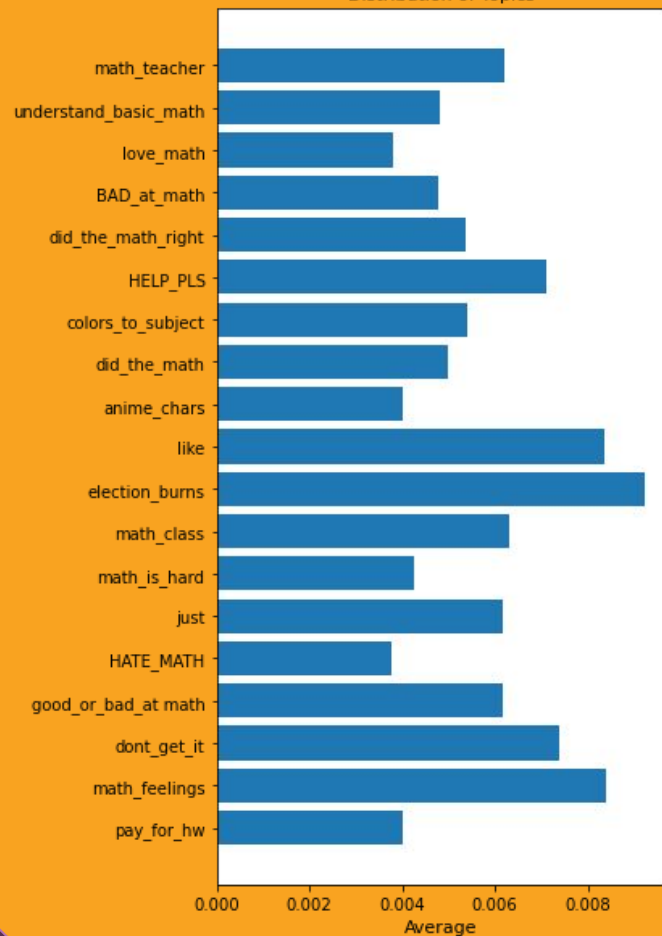


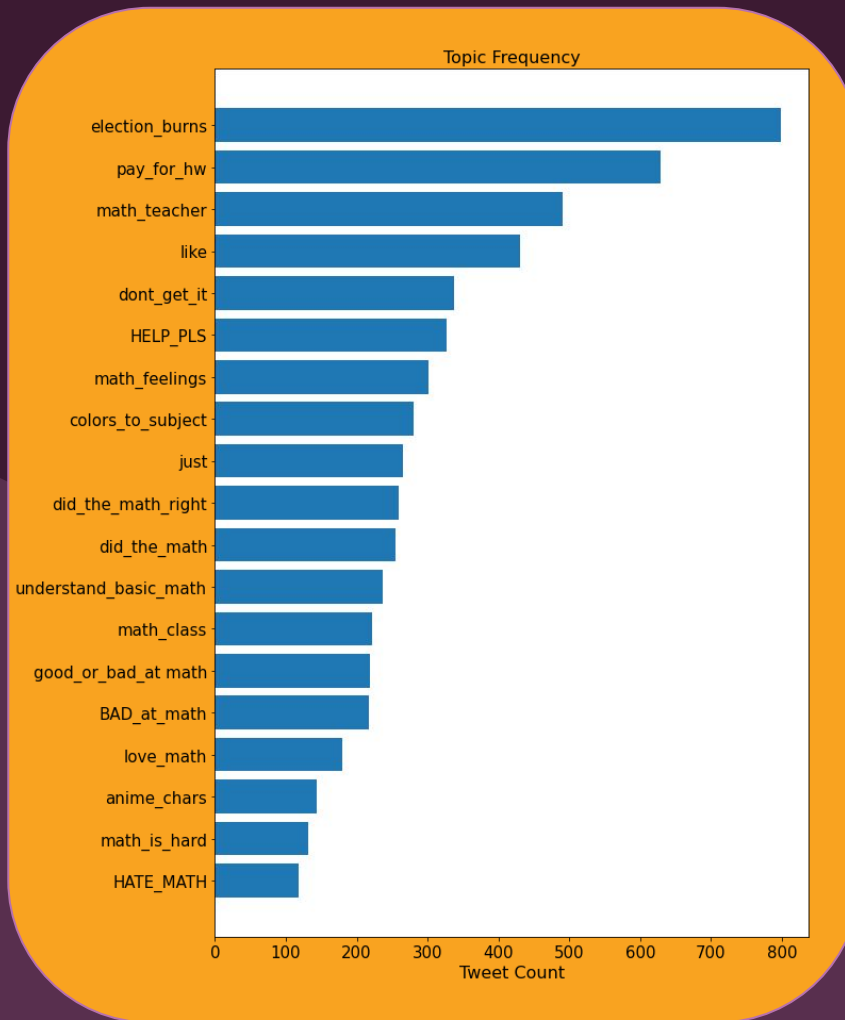
Questions?

Appendix

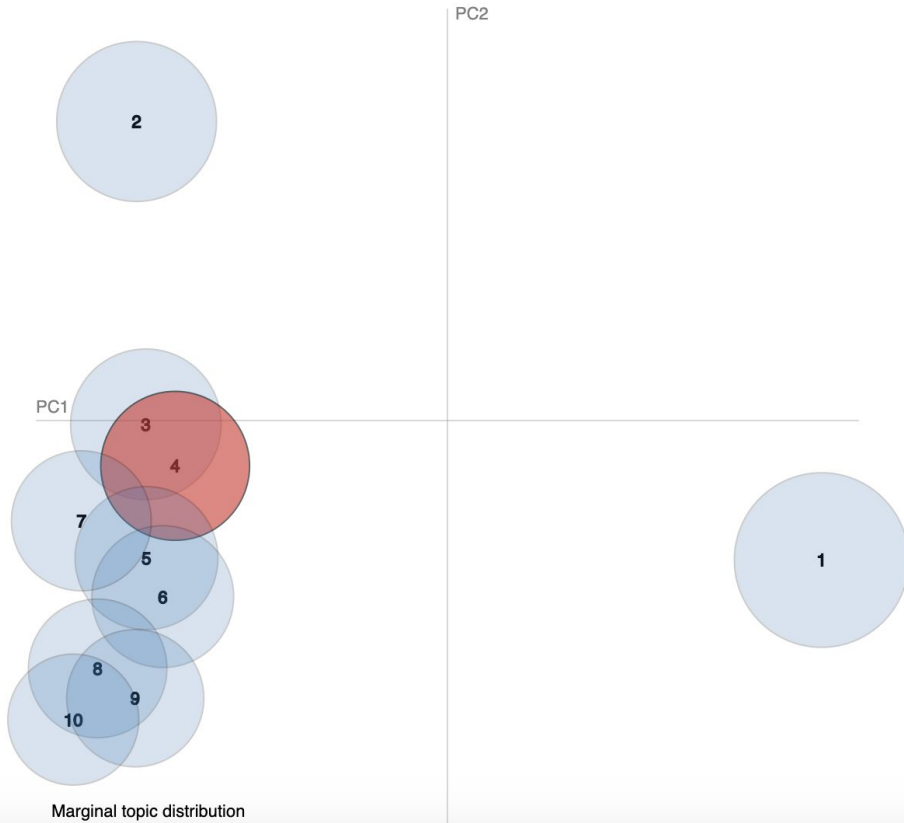


Distribution of Topics

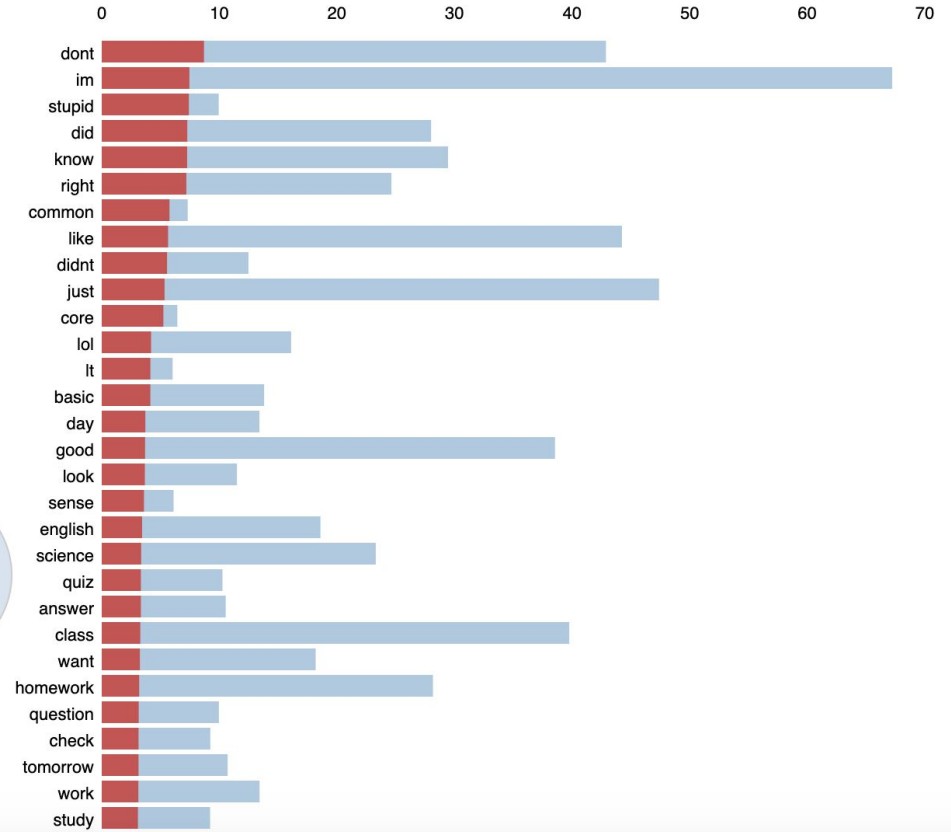




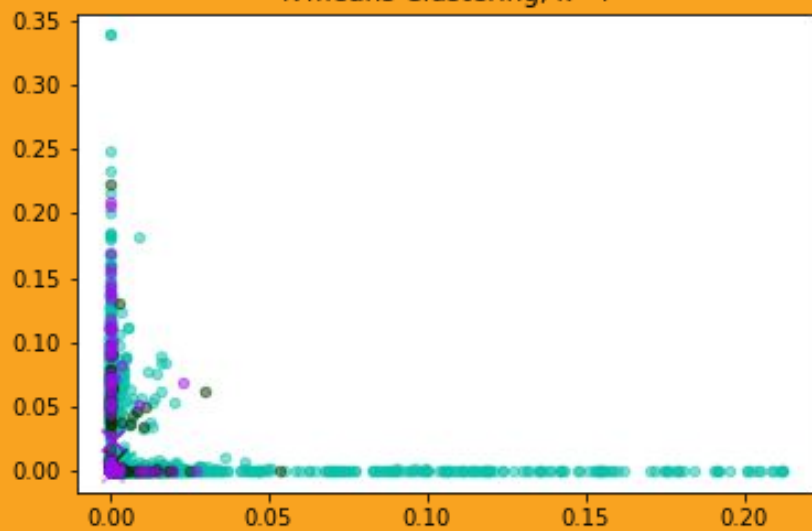
Intertopic Distance Map (via multidimensional scaling)



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**

