News Classifier EDA

Chow Jun Wei and Esraa Sultan

24 November 2021

Problem Definition

- To classify a (group of) sentence(s) into their corresponding category. We have 20 categories.

Data Glacier
Your Deep Learning Partner

Comp.graphics	Comp.os.ms-windows.misc	Comp.sys.ibm.pc.hardware	Comp.sys.mac.hardware
Comp.windows.x	Rec.autos	Rec.motorcycles	Rec.sport.baseball
Rec.sport.hockey	Sci.crypt	Sci.electronics	Sci.med
Sci.space	Misc.forsale	Talk.politics.misc	Talk.politics.guns
Talk.politics.mideast	Talk.religion.misc	Alt.atheism	Soc.religion.christian

Purpose of this presentation

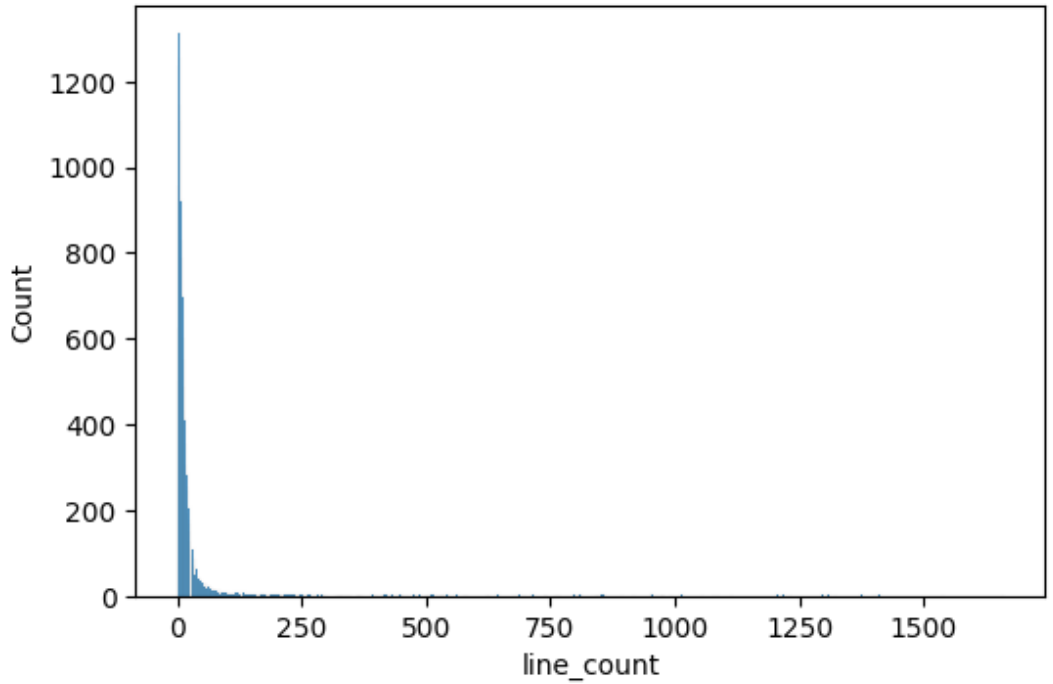
To show how the data looks like, whenever possible. We **do not** yet show any recommendations from this presentation.

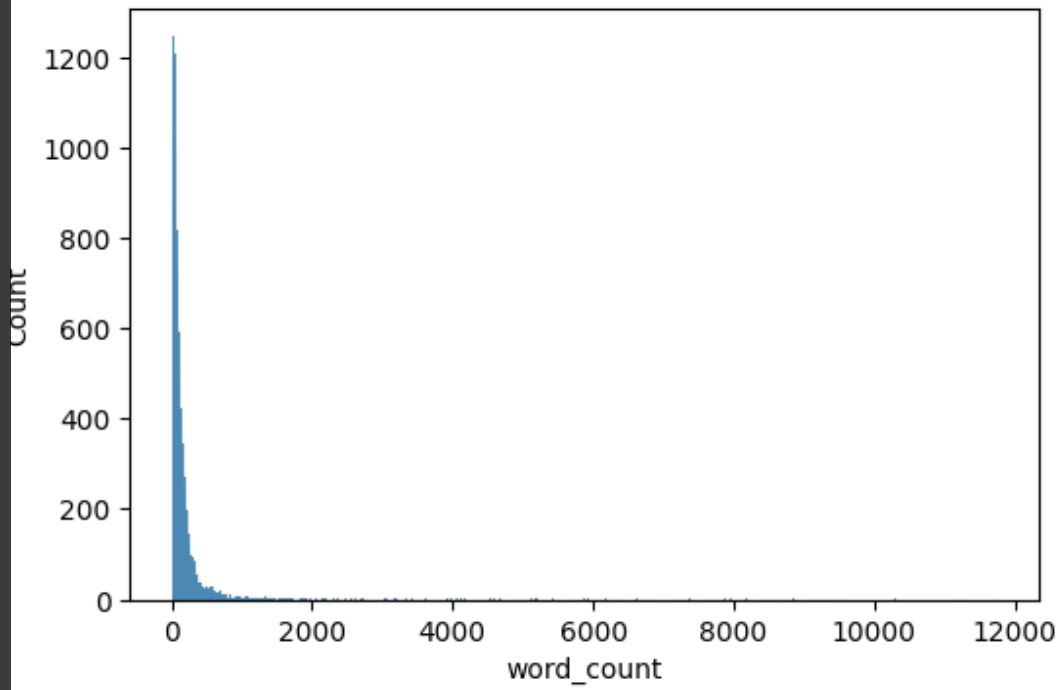
Data Glacier
Your Deep Learning Partner

The next few slides contain information on **before** we clean the data

Line number count and word count

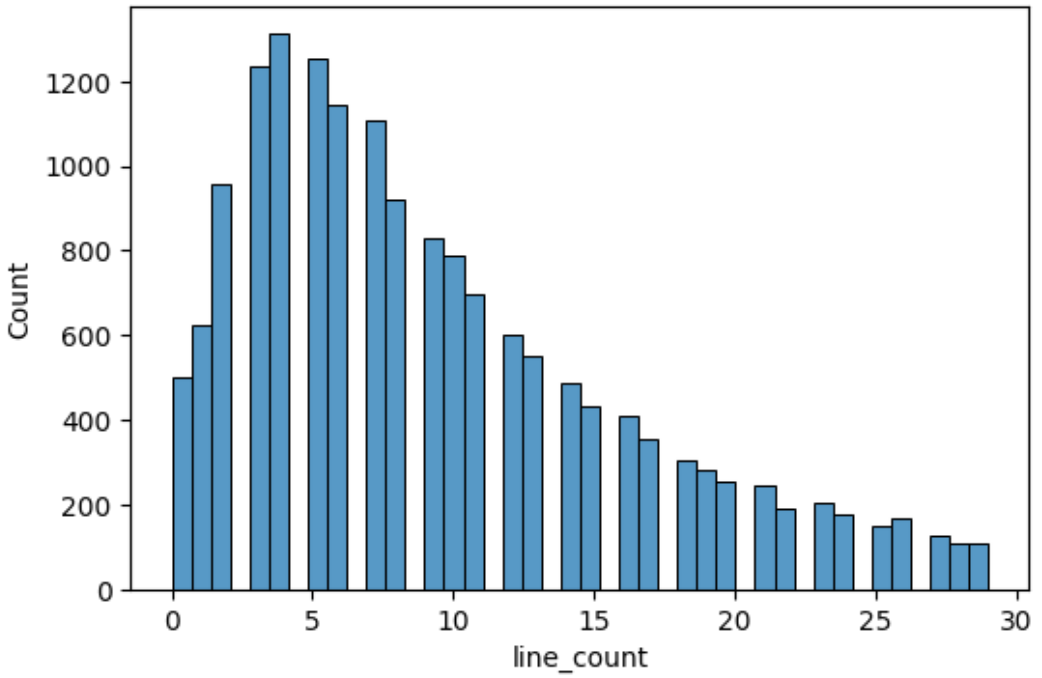
Most contains only a few sentences; but some are very long

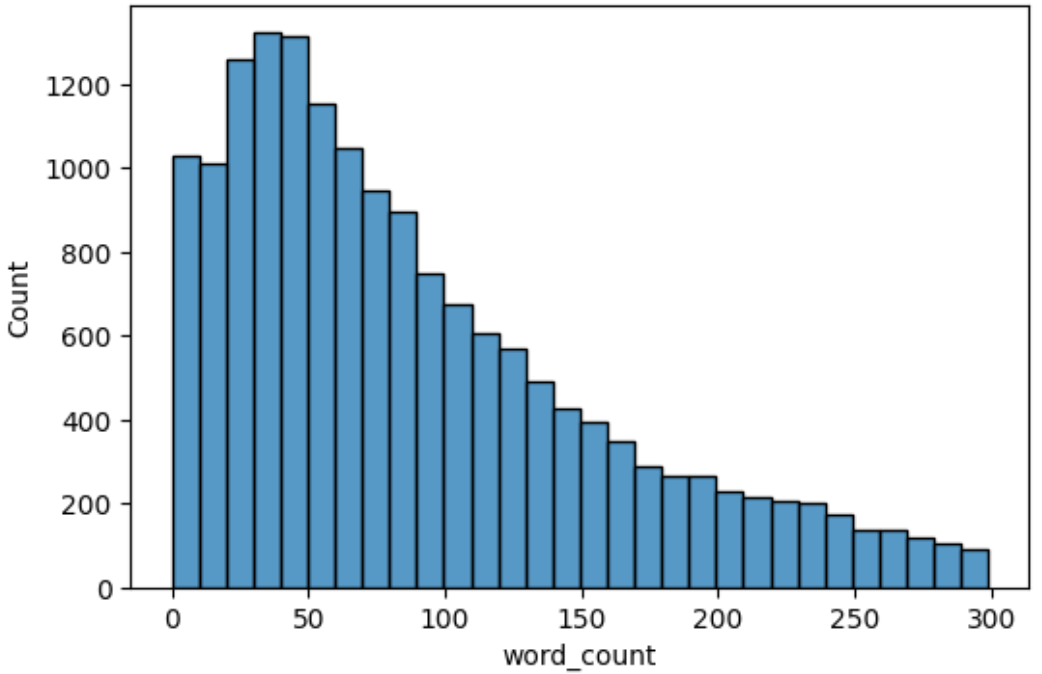




Data Glacier
Your Deep Learning Partner

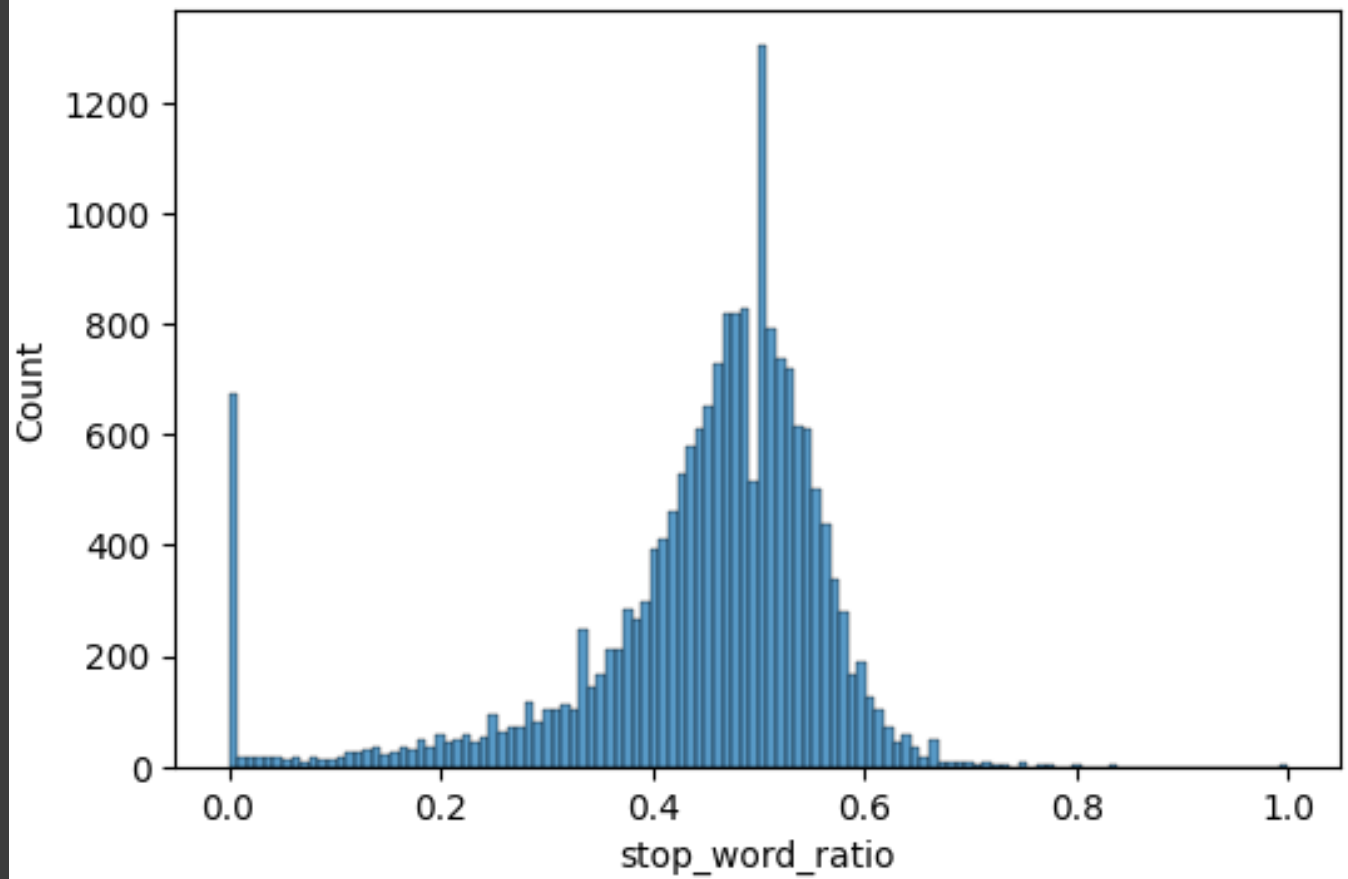
Zoomed in to small range





Stop words per word count ratio

On average, half of the words per article are considered stop words

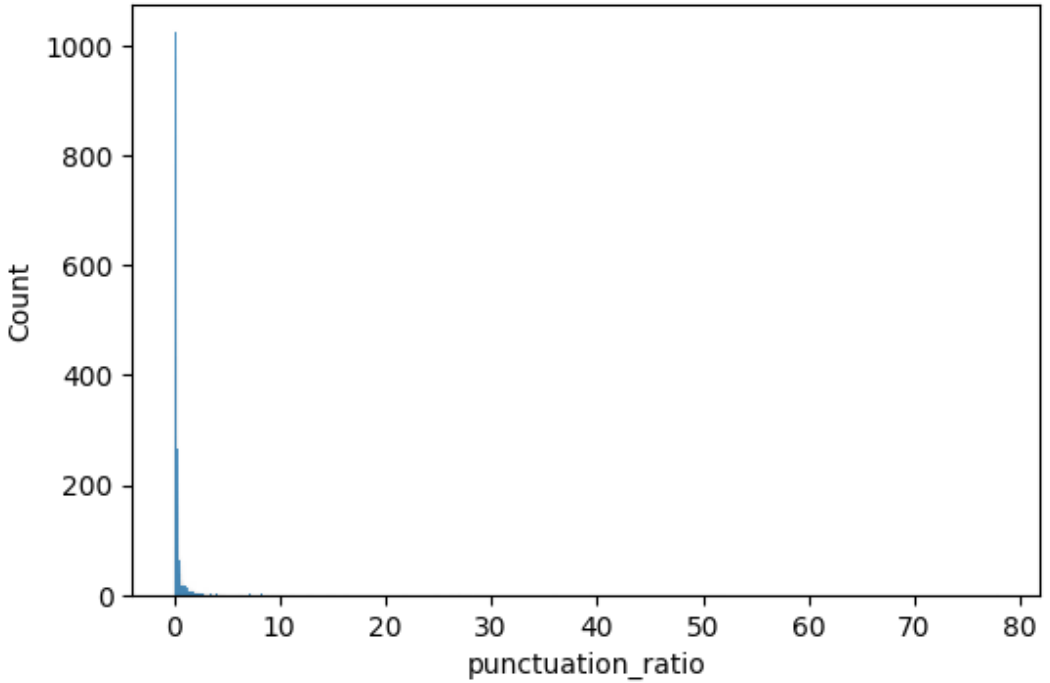



```
Median:  0.4745762711864407
Mean:  0.443714166539526
Std:  0.13075392883348091
```

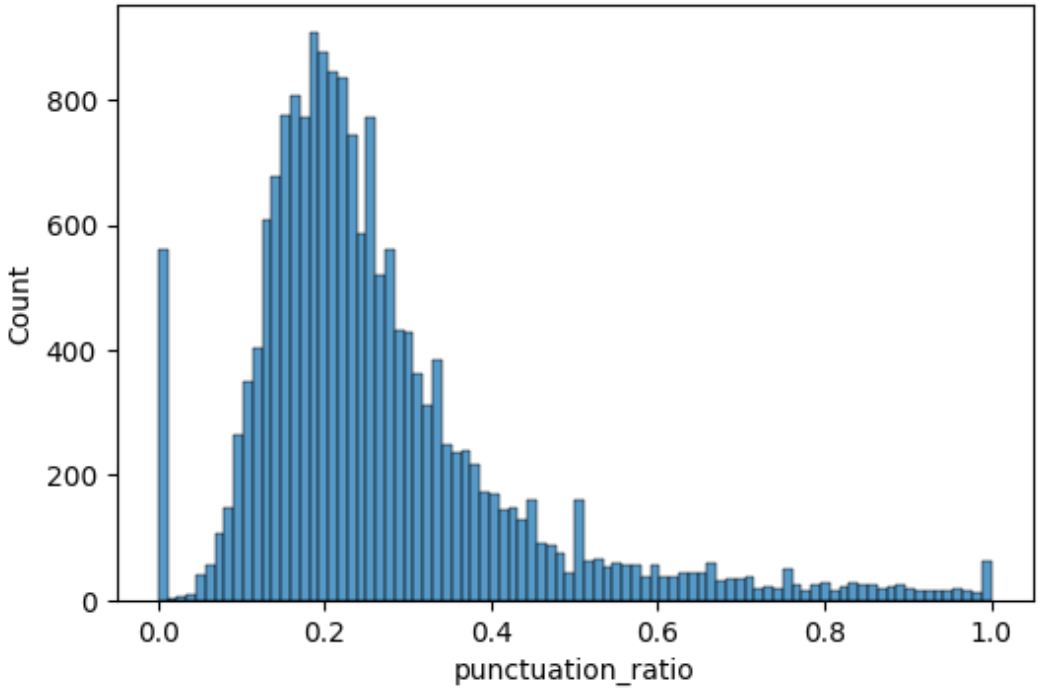
Data Glacier
Your Deep Learning Partner

Punctuation to Word Ratio

There contains a long-tailed distribution, but mostly followed Poisson distribution where it's not at the tail.



Full



Zoomed in

Data Glacier
Your Deep Learning Partner

What changes after cleaning

Not much changes are noticed after cleaning. The statistics does shift a bit (by 0,002) but that’s almost negligible.

Unigrams, Bigrams, Trigrams

The actual table is too huge to put here. We would summarize them in the next three slides.

Unigrams

- Top 3 common words: **don’t, think, know.**
- Top 3 uncommon words: **image, space, god**.
- Conclusion: Not much information extracted from unigrams to distinguish between categories.

Data Glacier
Your Deep Learning Partner

Bigrams

- Top 3 common words: **don’t think, don’t know, does know.**
- Uncommon words gives better indications here. Examples: **space station, human rights, medical newsletter, image processing, hard disk,** etc.
- Can separate major categories (between science and politics, for example) but not really for sub-categories (sci.crypt vs sci.electronics).

Trigrams

- Top 3 common: not available.
- Uncommon: emails, phone numbers, separators (=====, ------) occupy most top-k trigrams. Useful ones includes **linked allocation unit** for example.
- They are not necessary the most useful separator between categories. Category 10 contains numbers for their top-k trigrams such as 0 0 0, 0 1 1, 2 2 2, that are not meaningful.

Data Glacier
Your Deep Learning Partner

Recommended Models (Technical User)

- Any Neural Net models shall do good.
- One suggests the use of AWD-LSTM defaults of fastai NLP.

Thank You