

Financial News Sentiment analysis With NLP

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Background

Project reason & Problem Statement

Understanding customer feelings through news is crucial for a leader with high intuition towards business success. Companies that use sentiment analysis tools to understand how customers feel can improve many things in business, yet **they don't use them; instead, they keep reading the article and don't have time to read it all at the end of the day.**

Hence, the leader doesn't have the confidence to encourage the company to move forward or to keep still and wait until the financial conditions improve. Sentiment analysis tools generate insights into how companies can enhance the customer experience and improve customer service.

Quora The New York Times



Problem Statement & Objective

So, by **making an RNN Model**, we can analyze the headline news sentiment and learn how to understand it with scientific approach and more reliable for big and fast computing news in the articles.





Sentiment Analysis for Financial News

Dataset contains two columns, Sentiment and News Headline

<https://www.kaggle.com/datasets/ankurzing/sentiment-analysis-for-financial-news>



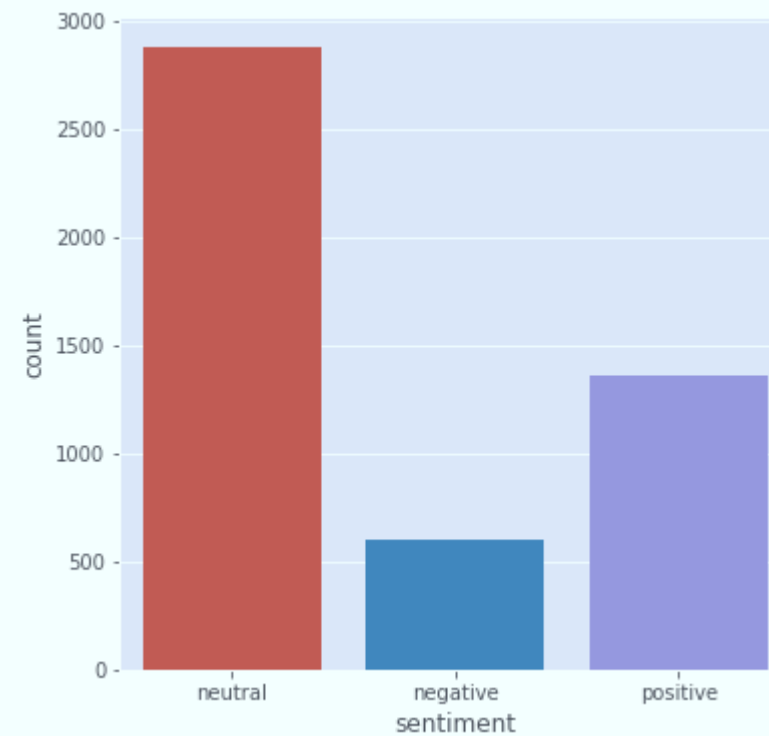
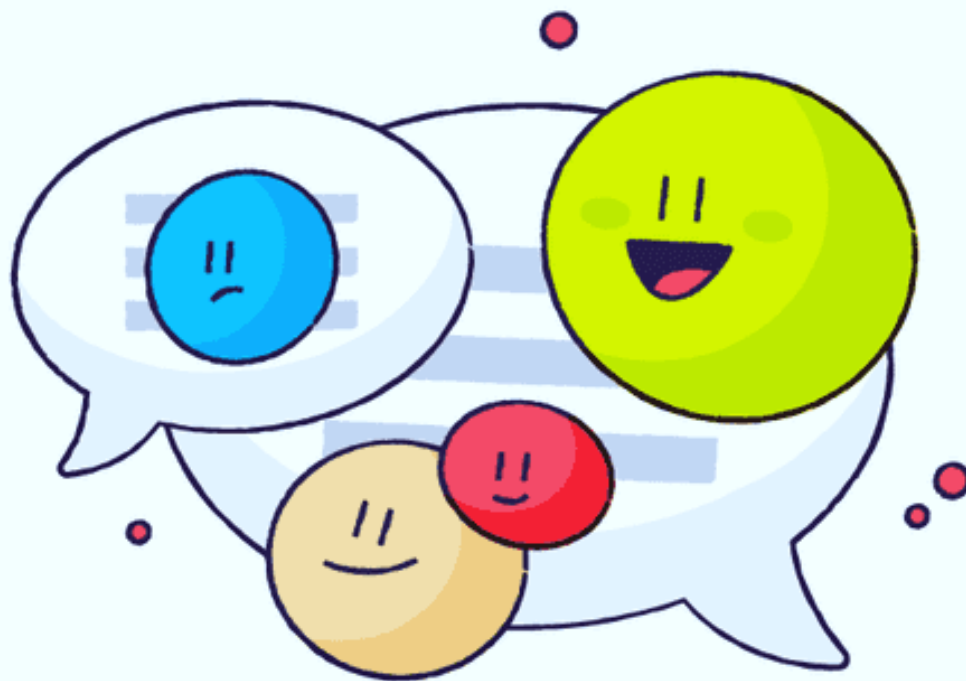
Context | This dataset (FinancialPhraseBank) contains the sentiments for financial news headlines from the perspective of a retail investor.

Content | The dataset contains two columns, "Sentiment" and "News Headline." The sentiment can be negative, neutral, or positive.

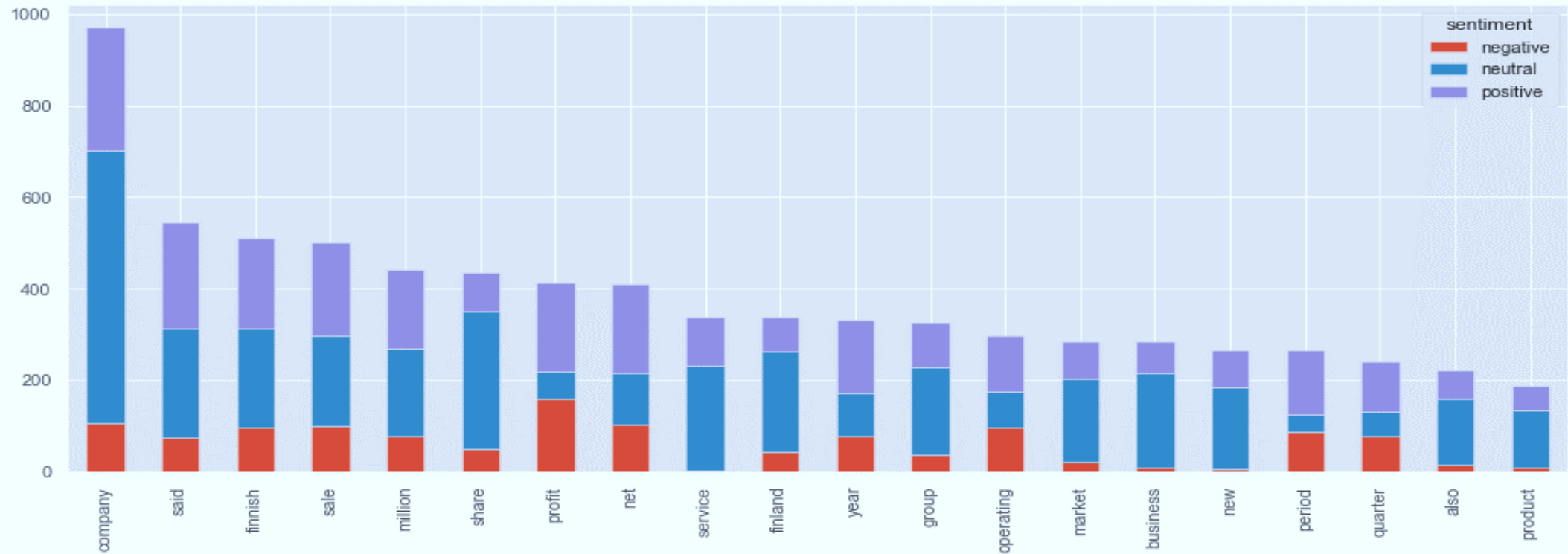
Acknowledgments | Malo, P., Sinha, A., Korhonen, P., Wallenius, J., & Takala, P. (2014). Good debt or bad debt: Detecting semantic orientations in economical texts. Journal of the Association for Information Science and Technology, 65(4), 782-796.

About this file | This dataset contains the sentiments for financial news headlines from the perspective of a retail investor. Further details about the dataset can be found in Malo, P., Sinha, A., Takala, P., Korhonen, P. and Wallenius, J. (2014): "Good debt or bad debt: Detecting semantic orientations in economical texts." Journal of the American Society for Information Science and Technology.

▲ neutral	☰	▲ According to Gra... ☰
Sentiment		News Headline
neutral positive Other (604)	59% 28% 12%	4837 unique values
neutral		Technopolis plans to develop in stages an area of no less than 100,000 square meters in order to hos...
negative		The international electronic industry company Elcoteq has laid off tens of employees from its Tallin...
positive		With the new production plant the company would increase its capacity to meet the expected increase ...
positive		According to the company 's updated strategy for the years 2009-2012 , Basware targets a long-term n...



- From the results of the sentiment column plot, we can see that the data is imbalanced. **The number of headlines with neutral values is far more than negative and positive sentiments.** This often happens because the dataset used comes from **news headlines which tend (naturally) to be neutral and not provoke any party.**
- Therefore, the **weighting of each headline in the definition model needs to be further adjusted** so that sentiment with a slightly smaller amount of data is not undersampling. At the same time, the model can change its computations to focus more on learning on that data when compared to neutral headline data, which are more numerous.



- From the visualization above, **we can see that the top 5 words are a company, said Finnish (another name for Finland), sale, and million.** That is, most of the headlines discuss the company repeatedly, or refer to a company and discuss the performance of the company, whether it's sales or profits. **Most cases in this headline are located in Finnish or the same as Finland, and in that location, they have the most positive sentiment on the words company, said, sale, profit, and net.**
- In conclusion, the company's condition in that location tended to have **positive sentiments towards several overall economic and financial situations.** From the journalist's point of view, people have begun to be optimistic that the economy will be better than the overall negative sentiment.



As seen in the picture above, Negative words (image 01) with the largest fonts are profits, company, sale, net, and finish. We can interpret these words that the journalist making the headline sees the country's condition in Finnish (Finland) tends to have negative sentiments about the overall company's profit and sales. But overall, neutral topics are much more followed by positive sentiment. The interpretation process for images 2 and 3 can also be done with the same reading pattern.

Evaluation

Model Evaluation & Model Deployment

RNN Model with NLP

Financial News Sentiment analysis

~83%

by doing optimization & improvement models, in general, the accuracy and loss of the model become more consistent so that the model tends to be more fit, especially in terms of loss.

- Words that appear most frequently (with particular sentiments), such as company, profits, sales, Finland, Finnish, said.
- **In general, if we are a business owner, CEO, director, or manager, the organization will be much more confident & optimistic** in facing future business challenges through the overall positive sentiment contained in these headline datasets.
- However, negative sentiment also has a percentage of the **total sentiment and must remain a concern for all parties** who will always be affected by stable financial and economic conditions.
- **Recommendation:** increasing the number of datasets. Add more Models modification. Optimization and improvisation can still be improved, such as tuning precise class_weight, learning-rate, and epsilon to get more optimal results.

Model Deployment



Finance Sentiment App

Please write your financial headline here

Finnish sales increase while other organizations lose net profit for around a million

**Here is the sentiment for your
headline : positive**

 Streamlit  heroku

THANK YOU

“The smallest act of kindness is worth more than the grandest intention.”
Oscar Wilde (Playwright & Novelist)