



Predicting Stock Market Trends w/ Sentiment Analysis


Clive Moras

CS - Capstone



Outcome

A tool where a user can input a stock ticker of their choice and the tool will tell the user whether they should buy the stock or not based on the sentiment around the company.



Stocks

- What are stocks?
- Stock prices change!
- Why do stock prices change?
- How are shareholders made aware of these factors?



News

- Shareholders react by selling and buying shares of a company based on the news about the company.
- How the market feels about a company is called the sentiment.
- We set out to use news about a company to gauge its sentiment to then use that to predict what the price of the stock will be.

How does a computer make sense of –

AAPL +3.24% ☆

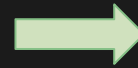
[Trade Apple on Coinbase](#) [Trading disclosure](#) ⓘ

Apple (NASDAQ: AAPL) just reported its best March quarter ever. Total revenue in the fiscal second quarter (the period ended March 28, 2026) climbed 17% year over year to more than \$111 billion, while diluted earnings per share rose 22%. iPhone, riding strong demand for the iPhone 17 lineup, set a March quarter record of \$57 billion -- up an impressive 22% year over year.

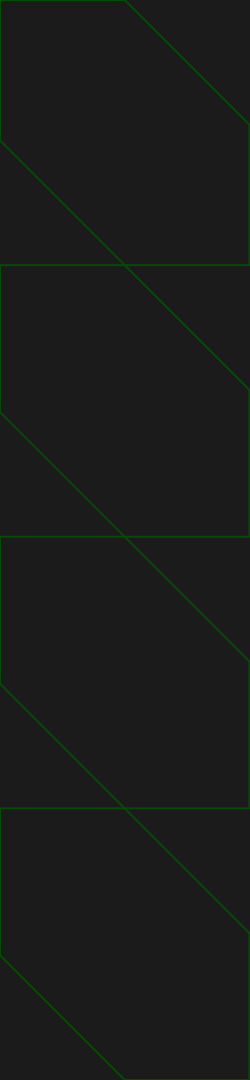
It's a strong report across the board. But for long-term shareholders, the more important story may be quietly playing out in another part of the business.

Will AI create the world's first trillionaire? Our team just released a report on a little-known company, called an "Indispensable Monopoly," providing the critical technology Nvidia and Intel both need.

[Continue »](#)



What is the sentiment of this news article?



NLP (Natural Language Processing) -

NLP allows computers to interpret and comprehend human language by breaking down text or speech into smaller chunks, analyzing relationships between words, and identifying context.

How does a computer make sense of –

AAPL +3.24% ☆

[Trade Apple on Coinbase](#) [Trading disclosure](#) ⓘ

Apple (NASDAQ: AAPL) just reported its best March quarter ever. Total revenue in the fiscal second quarter (the period ended March 28, 2026) climbed 17% year over year to more than \$111 billion, while diluted earnings per share rose 22%. iPhone, riding strong demand for the iPhone 17 lineup, set a March quarter record of \$57 billion -- up an impressive 22% year over year.

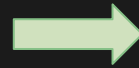
It's a strong report across the board. But for long-term shareholders, the more important story may be quietly playing out in another part of the business.

Will AI create the world's first trillionaire? Our team just released a report on a little-known company, called an "Indispensable Monopoly," providing the critical technology Nvidia and Intel both need.

[Continue »](#)



NLP



Sentiment = 0.765

APPL (Apple) News -

```
{
  "items": "50",
  "sentiment_score_definition": "x <= -0.35: Bearish; -0.35 < x <= -0.15: Somewhat-Bearish; -0.15 < x < 0.15: Neutral; 0.15 <= x < 0.35: Somewhat-Bullish; x >= 0.35: Bullish",
  "relevance_score_definition": "0 < x <= 1, with a higher score indicating higher relevance.",
  "feed": [
    {
      "title": "Barry Schwartz's Top Picks: Fairfax, Fair Isaac Corp, TransDigm Group Inc",
      "url": "https://www.bnnbloomberg.ca/video/shows/market-call/2026/05/01/barry-schwartzs-top-picks-fairfax-fair-isaac-corp-transdigm-group-inc/",
      "time_published": "20260501T171100",
      "authors": [],
      "summary": "Barry Schwartz, President & CEO for Baskin Wealth Management, shared his top stock picks including Fairfax, Fair Isaac Corp, and TransDigm Group Inc. This segment was featured on BNN Bloomberg's Market Call. The article also provides links to other recent market outlooks and stock picks from various financial experts.",
      "banner_image": "https://www.bnnbloomberg.ca/resizer/v2/https%3A%2F%2F3g70guqh4mw9g.cloudfront.net%2F%2F05-01-2026%2F%2F3970dd4c6b174b0ba988191aa137baa2_name_321a5b5436667b857c9f58bb7597032a2a9ef892f8ddf4f17609b6435aad76b3.jpg?smart=true&auth=528912926b166f53119b0d6e2a1833094dc211b8589b6169462c74762549218f6width=274",
      "source": "BNN Bloomberg",
      "category_within_source": "General",
      "source_domain": "BNN Bloomberg",
      "topics": [
        {
          "topic": "financial_markets",
          "relevance_score": "0.908691"
        },
        {
          "topic": "finance",
          "relevance_score": "0.727853"
        }
      ],
      "overall_sentiment_score": 0.424492,
      "overall_sentiment_label": "Bullish",
      "ticker_sentiment": [
        {
          "ticker": "FICO",
          "relevance_score": "1.000000",
          "ticker_sentiment_score": "0.423382",
          "ticker_sentiment_label": "Bullish"
        },
        {
          "ticker": "TDG",
          "relevance_score": "0.816153",
          "ticker_sentiment_score": "0.449791",
          "ticker_sentiment_label": "Bullish"
        },
        {
          "ticker": "AAPL",
          "relevance_score": "0.630911",
          "ticker_sentiment_score": "0.408301",
          "ticker_sentiment_label": "Bullish"
        }
      ]
    }
  ],
}
```

```
},
"overall_sentiment_score": 0.424492,
"overall_sentiment_label": "Bullish",
"ticker_sentiment": [
  {
    "ticker": "FICO",
    "relevance_score": "1.000000",
    "ticker_sentiment_score": "0.423382",
    "ticker_sentiment_label": "Bullish"
  },
  {
    "ticker": "TDG",
    "relevance_score": "0.816153",
    "ticker_sentiment_score": "0.449791",
    "ticker_sentiment_label": "Bullish"
  },
  {
    "ticker": "AAPL",
    "relevance_score": "0.630911",
    "ticker_sentiment_score": "0.408301",
    "ticker_sentiment_label": "Bullish"
  }
]
},
```



Model Inputs -

- Sentiment
- Price
- Overall Market Performance

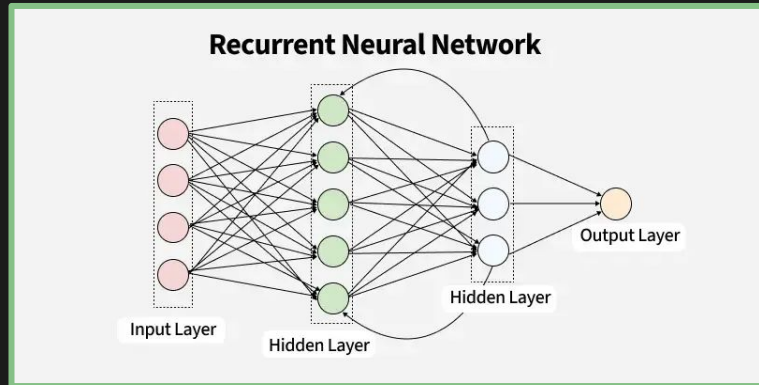
Model Training / Selection -

- 5 year historical stock & sentiment data
- Target variable price or trend?
- Windowing approach

Day 1, Day 2, Day 3, , Day 29, Day 30 -> Day 31

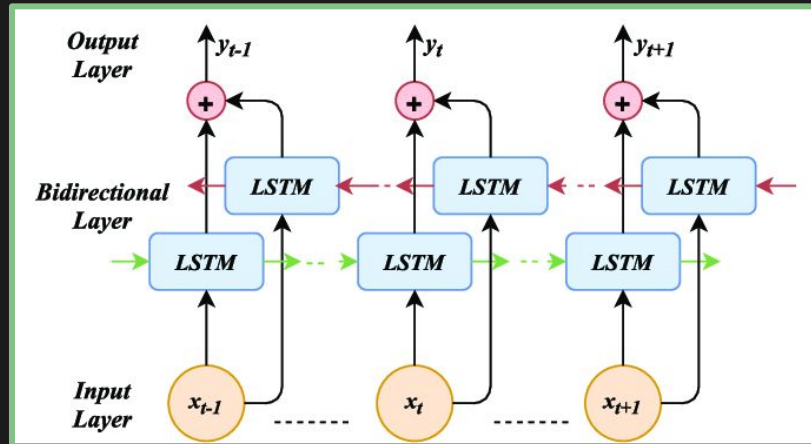
Model Type -

- RNN - Recurrent Neural Networks (RNNs) are a type of artificial neural network designed to process sequential or time-dependent data by using internal memory (hidden states) to retain previous inputs.



Model Type -

- Bidirectional LSTM (Long Short-Term Memory) networks are an extension of traditional LSTMs that process data in both forward and backward directions, capturing past and future context to improve sequence modeling





DEMO LINK

FinBERT

BERT (Bidirectional Encoder Representations from Transformers)

“Roblox shares plummet 18% as child safety measures weigh on bookings”

Financial Sentiment – Negative!



Challenge -

Pulling news data for Apple -

“Samsung Delivers Blowout Quarter with Expanding Margins, Strong Free Cash Flow, and Accelerating Premium Smartphone Demand Driven by AI-Led Galaxy Portfolio, Outpacing Global Peers as Competitive Pressures Weigh on Apple”



Challenge -

Pulling news data for Apple -

"Samsung Delivers Blowout Quarter with Expanding Margins, Strong Free Cash Flow, and Accelerating Premium Smartphone Demand Driven by AI-Led Galaxy Portfolio, Outpacing Global Peers as Competitive Pressures Weigh on Apple"

Sentiment - Positive! (For Samsung)



Challenge -

Pulling news data for Apple -

"Samsung Delivers Blowout Quarter with Expanding Margins, Strong Free Cash Flow, and Accelerating Premium Smartphone Demand Driven by AI-Led Galaxy Portfolio, Outpacing Global Peers as Competitive Pressures Weigh on Apple"

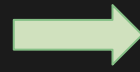
Sentiment - Positive! (For Samsung)

In reality, sentiment - Very Negative! (For Apple)



Tackling the challenge -

Pulling news articles for a company and sorting them by if they mention more than one company



If an article mentions more than one company, we would pass it to an LLM to score the article.



If only one company was mentioned, FinBERT would be sufficient.



Thank you!

Questions?