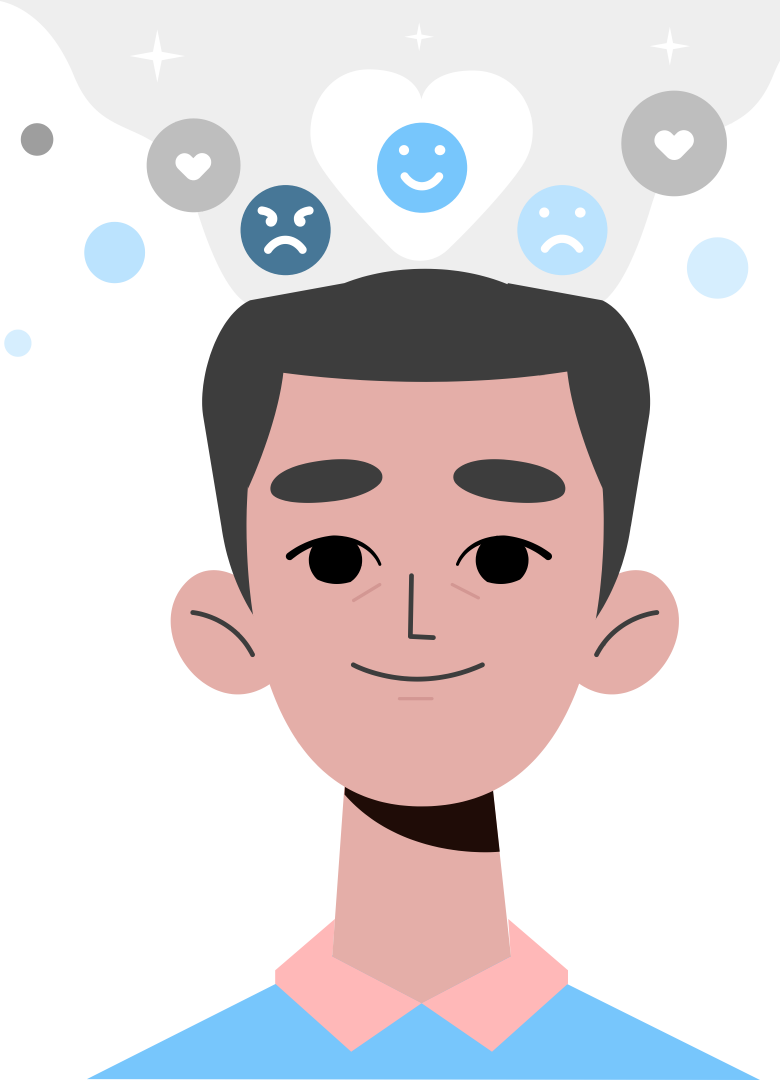

Sentiment Analysis with RNN

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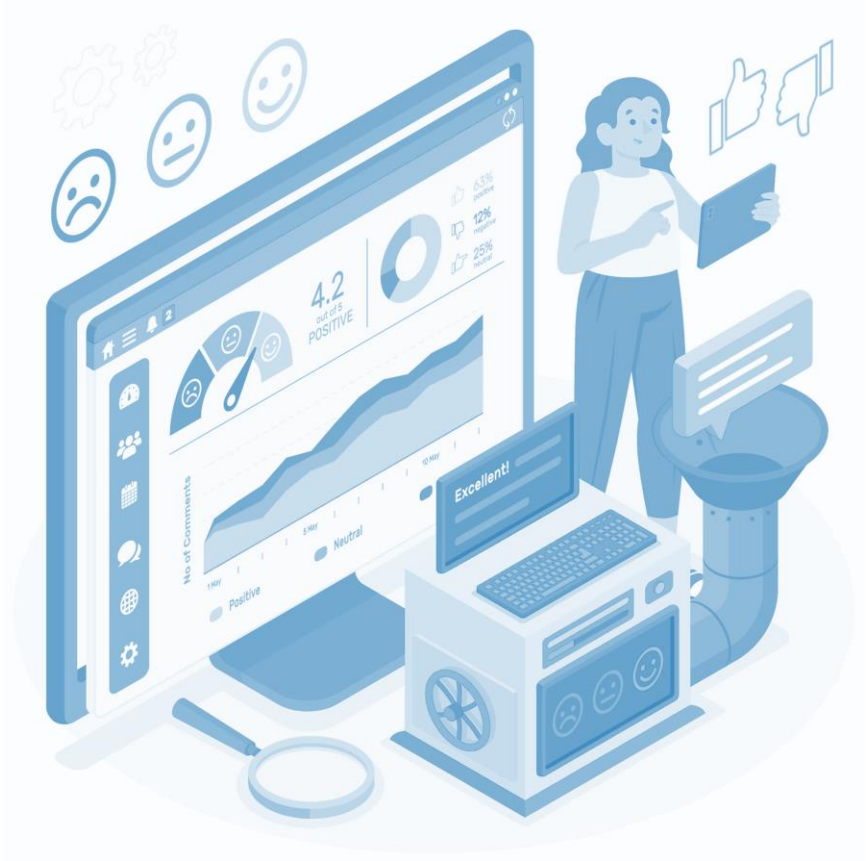


Sentiment Analysis

What is sentiment Analysis ?

Sentiment analysis is an application of natural language processing (NLP) technologies that train computer software to understand text in ways like humans which is used to **determine whether is positive , negative or Neutral**

Why is Sentiment Analysis important ?

Sentiment analysis, also known as opinion mining, is an important business intelligence tool that **helps companies improve their products and services**. We give some benefits of sentiment analysis below

- Provide objective insights
- Build better products and service
- Analyze at scale
- real-time result

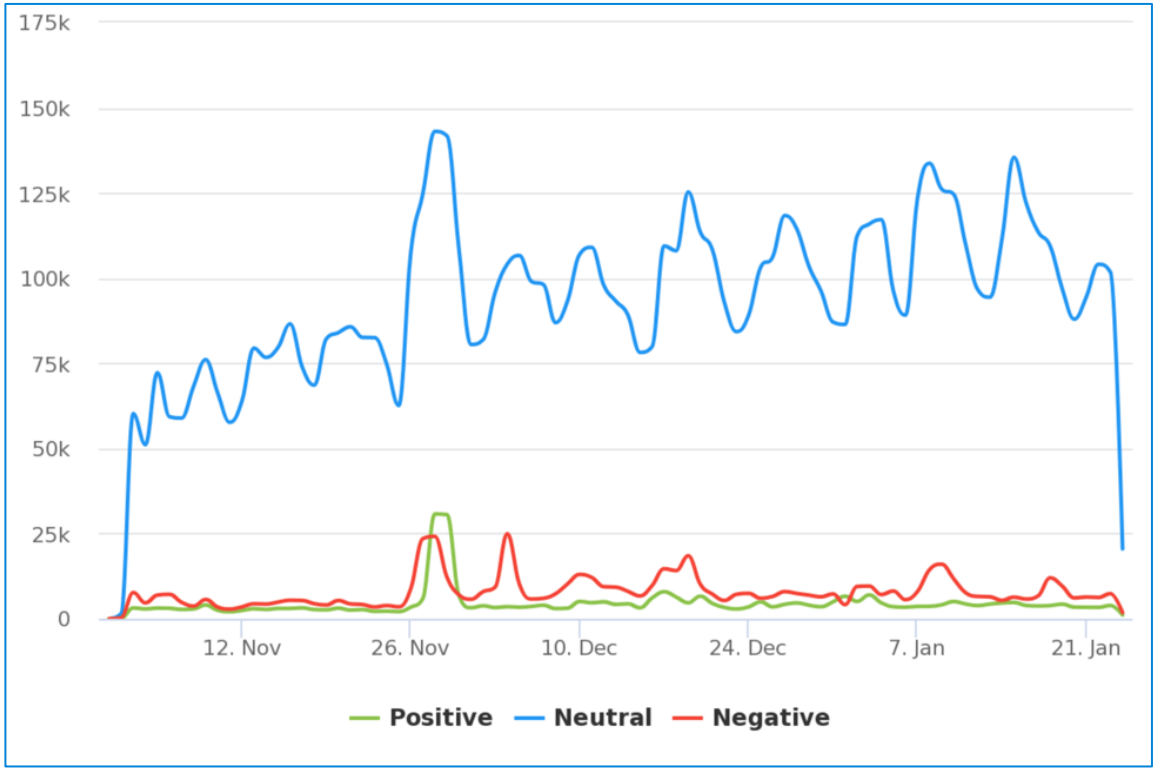
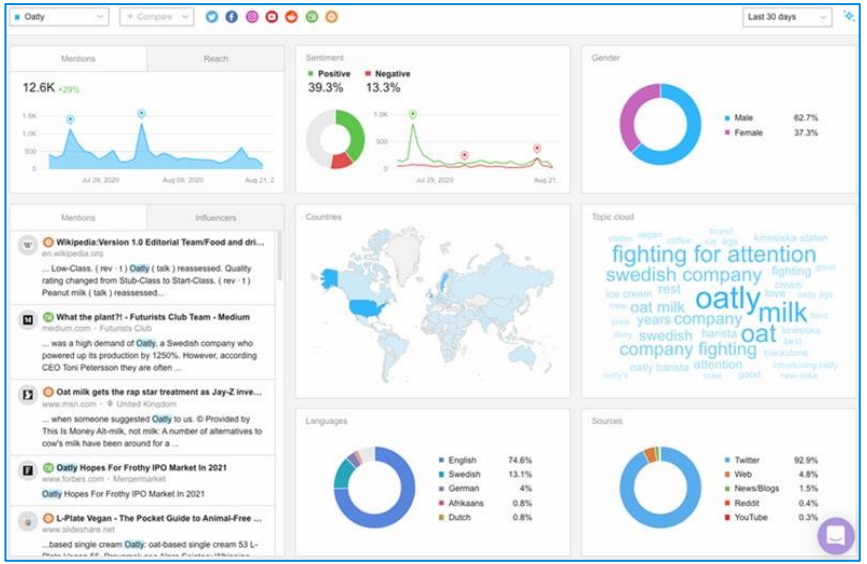


Fig 1 : Sentiment Analysis from Social Listerning

Use cases

Business use sentiment analysis to **derive intelligence and form actionable plans** in different area

- improve customer service
- Brand Monitoring
- Market Research
- Track campaign performance



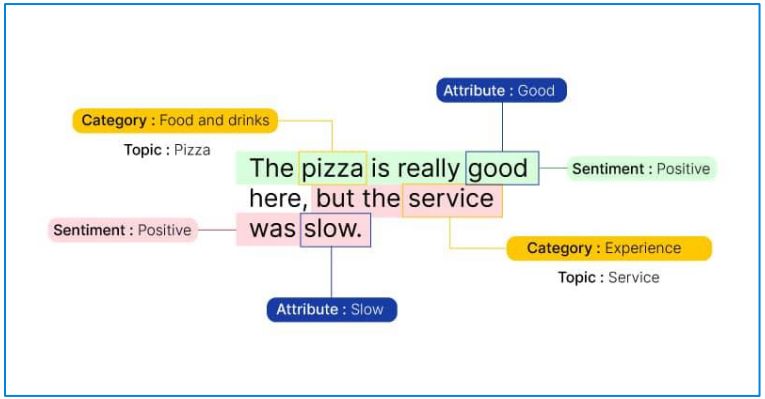
How does it work ?

The analysis typically goes through several stages before providing the final result.

1. Preprocessing

During the preprocessing stage, sentiment **analysis identifies key words to highlight the core message** of the text

- **Tokenization** breaks a sentence into several elements or tokens.
- **Lemmatization** converts words into their root form. For example, the root form of *am* is *be*.
- **Stop-word removal** filters out words that don't add meaningful value to the sentence. For example, *with*, *for*, *at*, and *of* are stop words.



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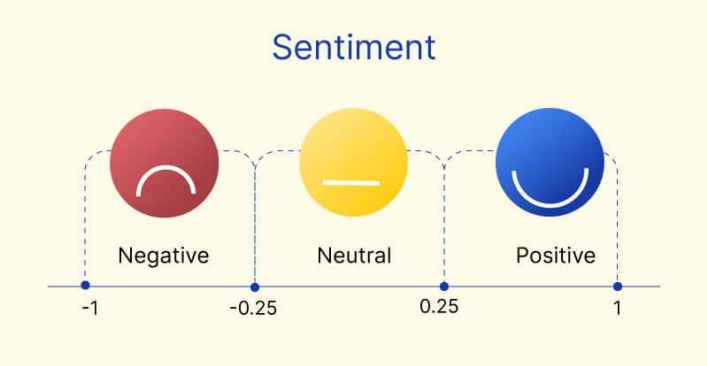


2. Keyword Analysis

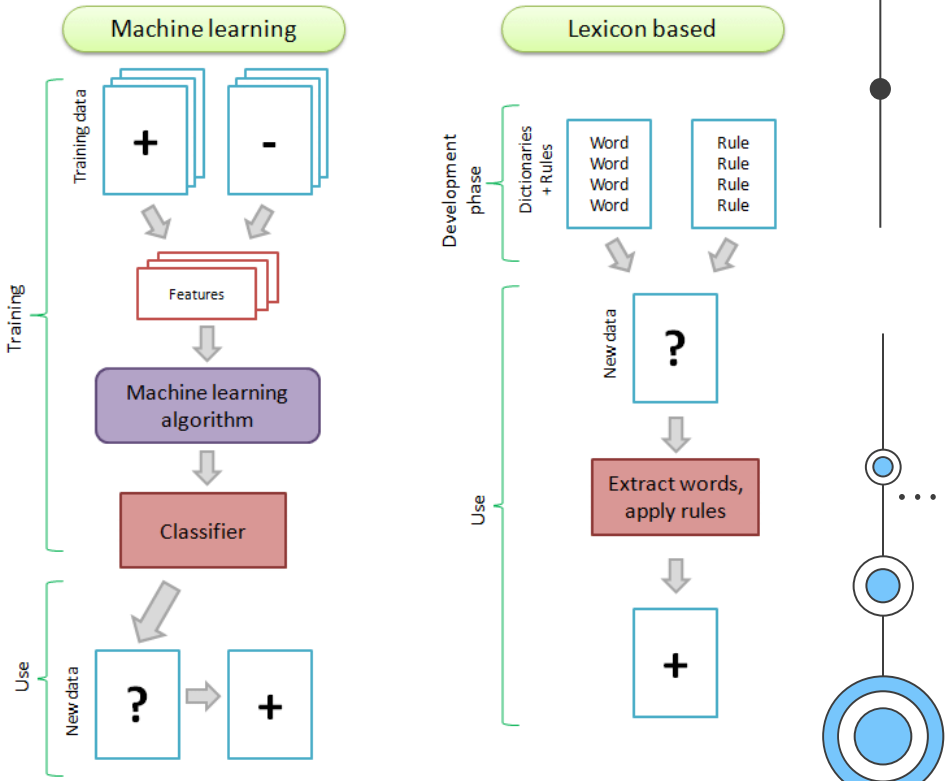
NLP technologies further analyze the **extracted keywords and give them a sentiment score**. A sentiment score is a measurement scale that indicates the emotional element in the sentiment analysis system. It provides a relative perception of the emotion expressed in text for analytical purposes.

For example, researchers use 10 to represent satisfaction and 0 for disappointment when analyzing customer reviews.

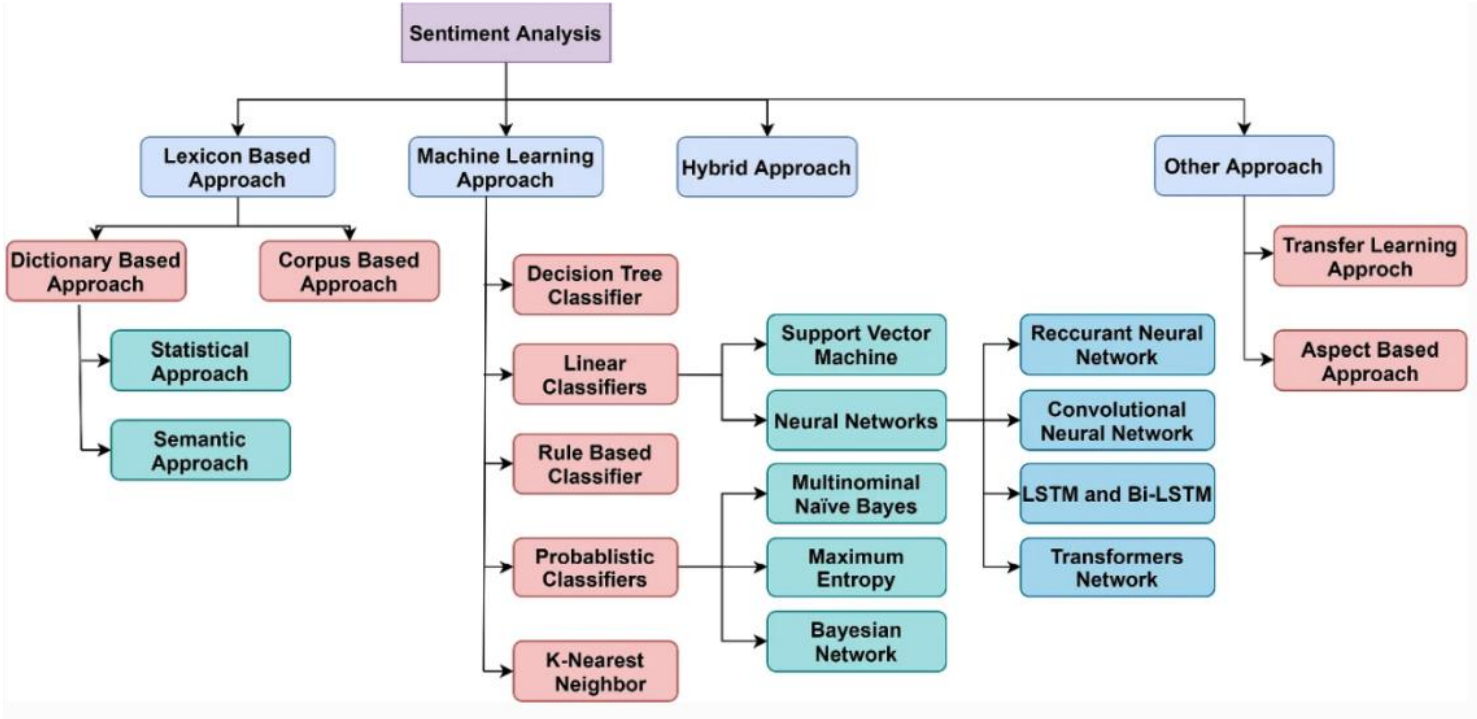
Approaches to Sentiment Analysis

There are **3 main approaches** used by sentiment analysis software

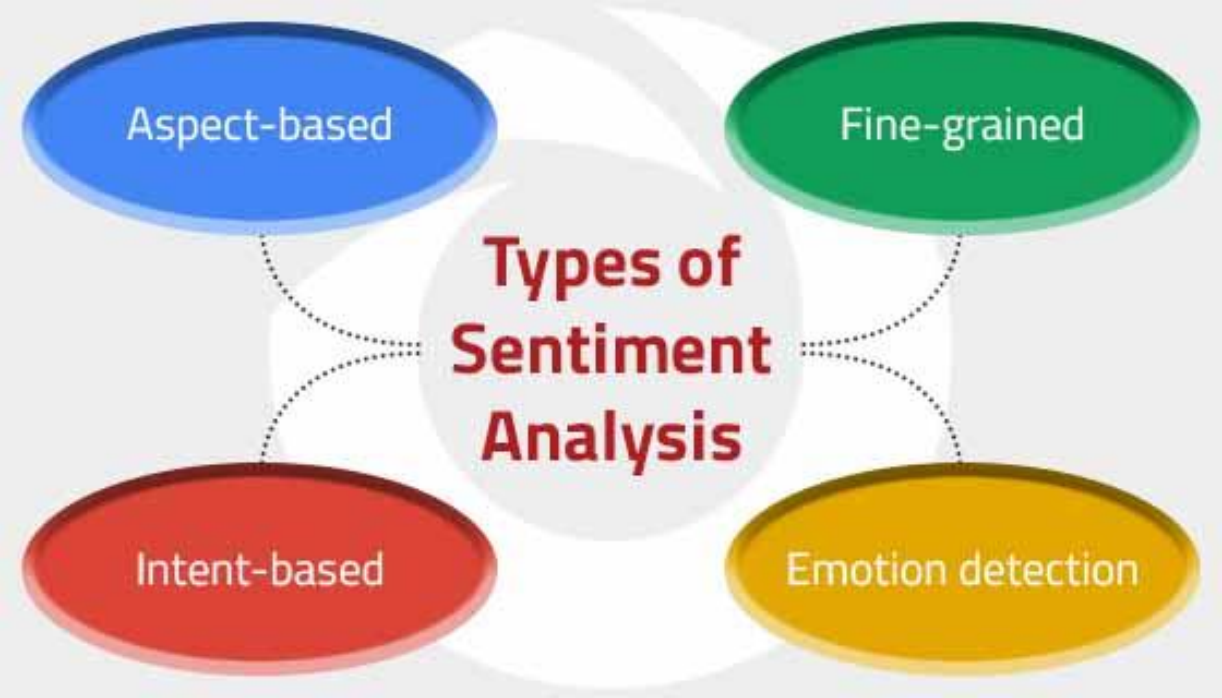
1. Rule – based analysis
   (Lexicon-based)
2. Automated / ML
3. Hybrid



Approaches to Sentiment Analysis



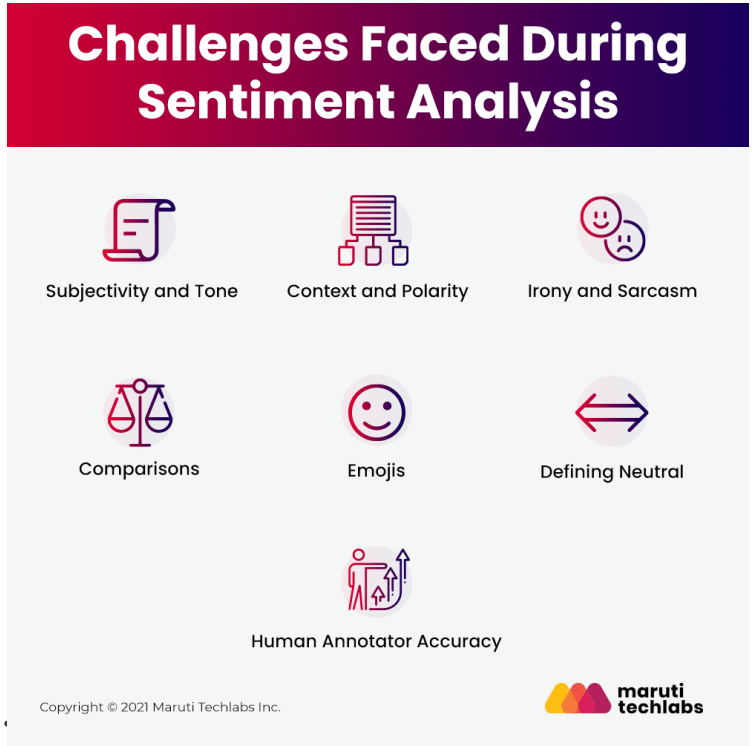
Type of Sentiment Analysis



Challenges in Sentiment Analysis

Despite advancements in natural language processing (NLP) technologies, understanding human language is challenging for machines. They **may misinterpret finer nuances of human communication** such as those given below.

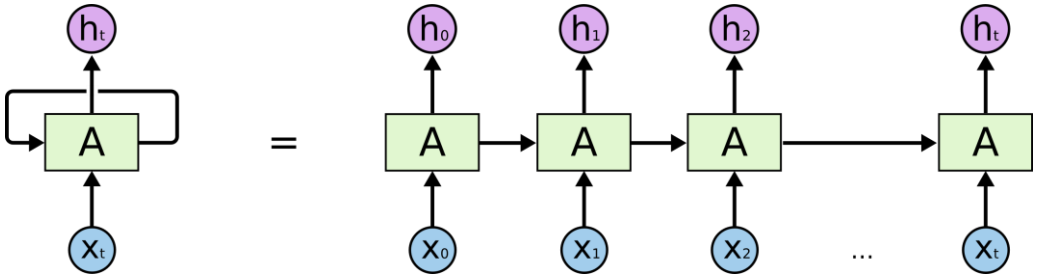
- Irony & Sarcasm
- Negation
- Multipolarity



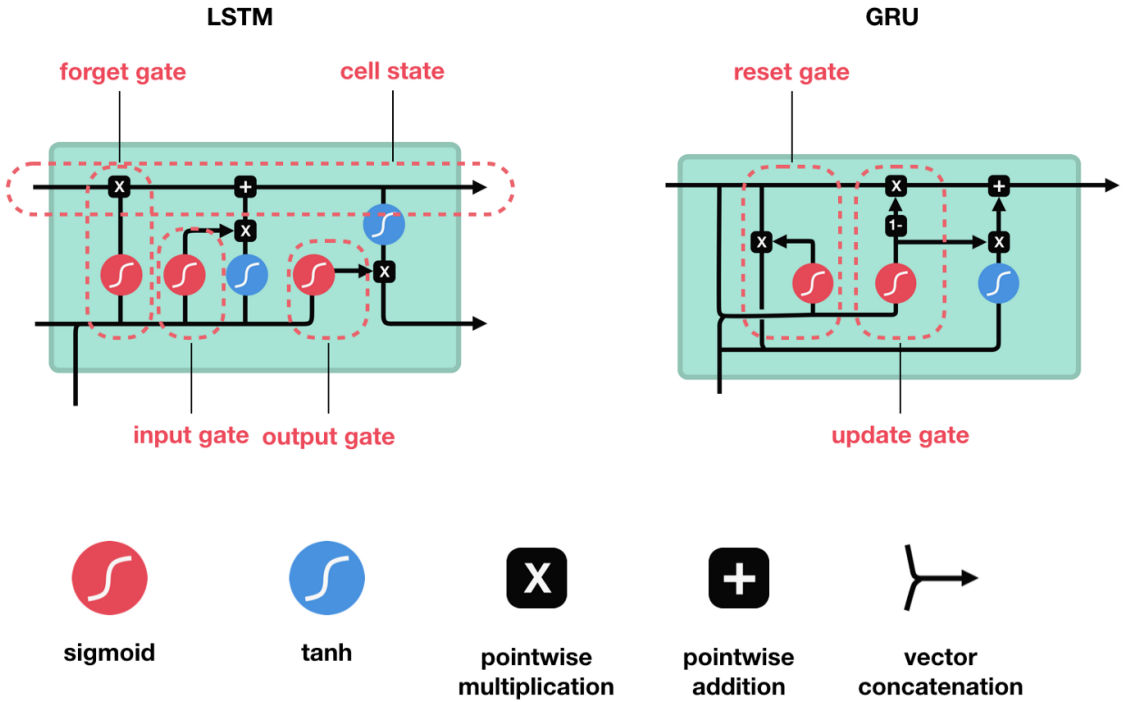
Recurrent Neural Network

What is Recurrent Neural Network (RNN) ?

A recurrent neural network (RNN) is a type of artificial neural network which **uses sequential data or time series data**. These deep learning algorithms are **commonly used for ordinal or temporal problems, such as language translation, natural language processing (nlp), speech recognition, and image captioning**; they are incorporated into popular applications such as Siri, voice search, and Google Translate.



What is GRU ?


LSTM
forget gate
cell state
input gate
output gate
GRU
reset gate
update gate
1-
sigmoid
tanh
pointwise multiplication
pointwise addition
vector concatenation

Python Code Example

Thank You