

# Sentiment Analysis



# Outline

- ❖ Introduction
- ❖ Need of Sentiment Analysis
- ❖ Application
- ❖ Approach for Sentiment Analysis
- ❖ Implementation
- ❖ Advantages
- ❖ Conclusion
- ❖ Bibliography



# What is Sentiment Analysis

- ✓ Sentiments are feelings, opinions, emotions, likes/dislikes, good/bad
- ✓ Sentiment Analysis is a *Natural Language Processing and Information Extraction task* that aims to obtain writer's feelings expressed in positive or negative comments, questions and requests, by analyzing a large numbers of documents.
- ✓ Sentiment Analysis is a study of human behavior in which we extract user opinion and emotion from plain text.
- ✓ Sentiment Analysis is also known as Opinion Mining.



# Sentiment Analysis contd....

- ✓ It is a task of identifying whether the opinion expressed in a text is positive or negative.
- ✓ Automatically extracting opinions, emotions and sentiments in text.
- ✓ Language-independent technology that understand the meaning of the text.
- ✓ It identifies the opinion or attitude that a person has towards a topic or an object.



# Example

## ✓ User's Opinions :

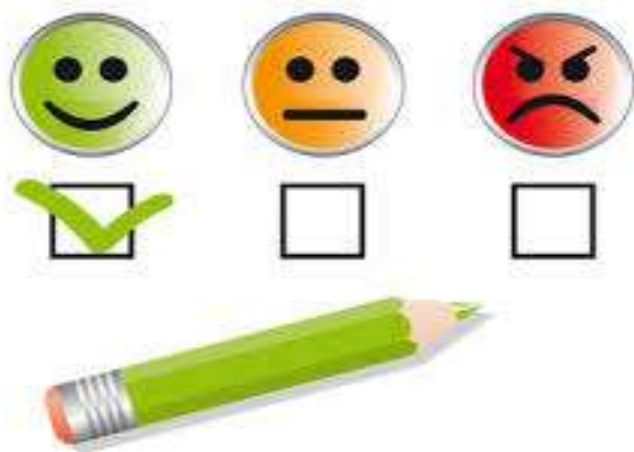
Sameer : It's a great movie (Positive statement)

Neha : Nah!! I didn't like it at all (Negative statement)

Mayur : The new iOS7 is awesome..!!!(Positive statement)

## ✓ Polarity :

- Positive
- Negative
- Complex





# Example





# Need of Sentiment Analysis

- ✓ Rapid growth of available subjective text on the internet
- ✓ Web 2.0
- ✓ To make decisions



# Applications

## ✓ **Businesses and Organizations :**

- ❑ Brand analysis
- ❑ New product perception
- ❑ Product and Service benchmarking
- ❑ Business spends a huge amount of money to find consumer sentiments and opinions.

## ✓ **Individuals : Interested in other's opinions when...**

- ❑ Purchasing a product or using a service
- ❑ Finding opinions on political topics ,movies,etc.





# Applications

## ✓ **Social Media :**

Finding general opinion about recent hot topics in town

## ✓ **Ads Placements :**

Placing ads in the user-generated content

- ☐ Place an ad when one praises a product.
- ☐ Place an ad from a competitor if one criticizes a product.



# Approach

## ✓ NLP

- ❑ Use semantics to understand the language.
- ❑ Uses SentiWordNet

## ✓ Machine Learning

- ❑ Don't have to understand the meaning
- ❑ Uses classifiers such as Naïve Bayes, SVM, etc.



# Machine Learning

- ✓ Machine learning is a branch of artificial intelligence, concerns the construction and study of systems that can learn from data.
- ✓ Focuses on prediction based on known properties learned from the training data.
- ✓ Requires training data set.
- ✓ Classifier needs to be trained on some labelled training data before it can be applied to actual classification task.



# Contd...

- ✓ Various datasets available on Internet such as twitter dataset, movie reviews data sets, etc.
- ✓ Language independent.



- ✓ Natural language processing is a field of computer science, artificial intelligence, and linguistics concerned with the interactions between computers and human (natural) languages.
- ✓ SentiWordNet provides a sentiment polarity values for every term occurring in the document.
- ✓ Each term  $t$  occurring in SentiWordNet is associated to three numerical scores  $\text{obj}(t)$ ,  $\text{pos}(t)$  and  $\text{neg}(t)$ .



# Contd...

## ✓ **Apple Iphone Review**

Sameer : Apple Iphone is great phone. It is better than any other phone I have bought.

Great = **Positive**

Better = **Positive**

Total Positives = 2

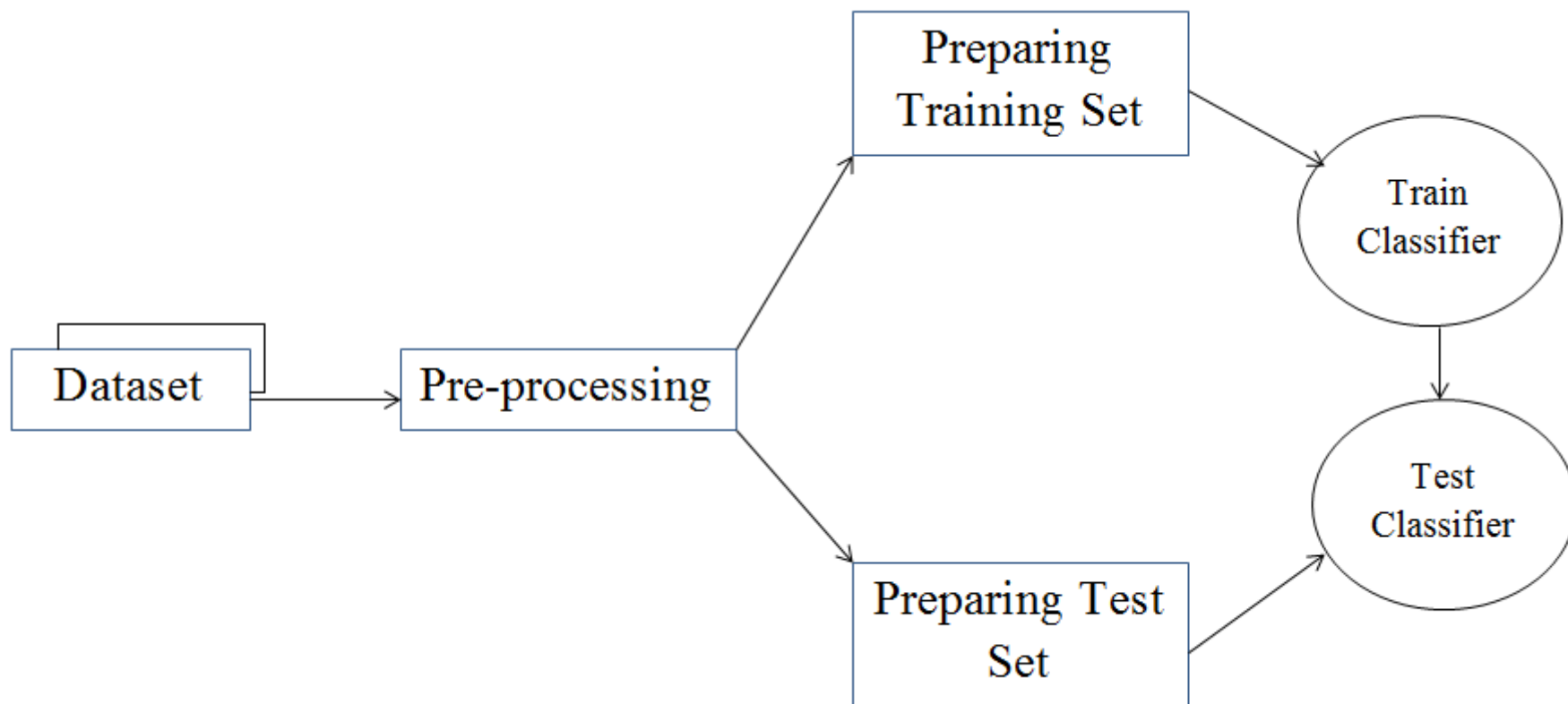
Total Negatives = 0

Net score =  $2 - 0 = 2$

Hence, Review is **Positive**.



# Implementation





# Pre-Processing

## ✓ Tokenization

- ❑ Unigram : considers only one token

e.g. It is a good movie.

{It, is , a , good, movie}

- ❑ Bigram : considers two consecutive tokens

e.g. It is not bad movie.

{It is, is not, not bad, bad movie}

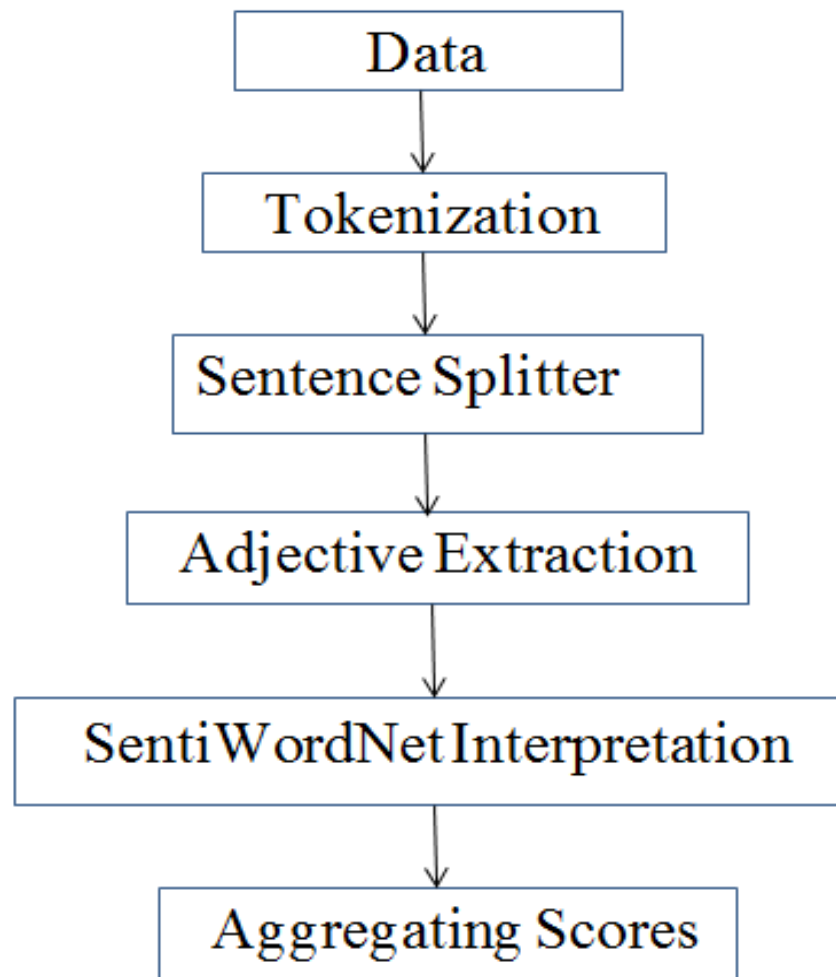
## ✓ Case Conversion

## ✓ Removal of punctuation (filtration)





# Implementation





# Advantages

- ✓ A lower cost than traditional methods of getting customer insight.
- ✓ A faster way of getting insight from customer data.
- ✓ The ability to act on customer suggestions.
- ✓ Identifies an organisation's Strengths, Weaknesses, Opportunities & Threats (SWOT Analysis) .
- ✓ As 80% of all data in a business consists of words, the Sentiment Engine is an essential tool for making sense of it all.
- ✓ More accurate and insightful customer perceptions and feedback.



# Conclusion

We have seen that Sentiment Analysis can be used for analyzing opinions in blogs, articles, Product reviews, Social Media websites, Movie-review websites where a third person narrates his views. We also studied NLP and Machine Learning approaches for Sentiment Analysis. We have seen that is easy to implement Sentiment Analysis via SentiWordNet approach than via Classifier approach. We have seen that sentiment analysis has many applications and it is important field to study. Sentiment analysis has Strong commercial interest because Companies want to know how their products are being perceived and also Prospective consumers want to know what existing users think.



# Bibliography

- ✓ V.K. Singh, R. Piryani, A. Uddin, P. Waila, “Sentiment Analysis of Movie Reviews and Blog Posts”, 3rd IEEE International Advance Computing Conference (IACC), 2013
- ✓ Mostafa Karamibekr, Ali A. Ghorbani, “Sentiment Analysis of Social Issues”, International Conference on Social Informatics, 2012
- ✓ Alaa Hamouda, Mohamed Rohaim, “Reviews Classification Using SentiWordNet Lexicon”, The Online Journal on Computer Science and Information Technology (OJCSIT), Volume 2, August-2011
- ✓ <http://sentiwordnet.isti.cnr.it/>

Thank You!