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Body Shamming Tweets Detection Using Machine Learning Algorithm

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ABSTRACT: Sarcasm can be considered as a type of expression where people say or write the things that are entirely opposite than what they meant. Sarcasm is extremely difficult to detect due to its obscurity. An irony is a form of sarcasm. One of the most common uses of sarcasm is to express criticism. Sarcasm is commonly used to convey one's thoughts or emotions, especially on social networking media sites as Twitter and Facebook. The accuracy of sentiment analysis can be improved by a rigorous analysis and interpretation of sarcasm sentences. Sentiment analysis is the study of people's or society's feelings or thoughts regarding a specific occurrence or subject. Twitter is an online social networking website that has more than 300 million members, providing a vast volume of information each day. Twitter's most essential feature is its capacity for users to tweet about events, circumstances, sentiments, views, or even something new in real-time. There is no system of accuracy or trustworthiness in place: Anyone can say just anything. It may be an easy method to attack your detractors for them to attack, the type of Twitter battle. The performance of six machine learning algorithms, namely Random Forest (RF), Naive Bayes (NB), Bayesian Network (BN), Support Vector Machine (SVM), K-Nearest Neighbour (KNN), and Multi-Layer Perceptron (MLP) and one deep learning algorithm which is Recurrent Neural Network (RNN) are evaluated. Different test options are used, namely cross validation and percentage split tests. Results show that RF predicts the best result with lowest error rate and highest classification accuracy rate with different test options comparing to all algorithms.

Keywords: K-nearest neighbours (KNN), Random Forest (RF), Naive Bayes (NB), Application programming interface (API), Online social networks (OSNs).

I. INTRODUCTION

Many People may share their idea and viewpoints on a variety of thoughts, including emotion, activities, people, and goods, through social networking websites. Social networking platforms have grown in popularity as a means of exchanging information and interacting with people all around the world. Facebook, for example, claims of having 1.59 billion monthly active users, each with 130 connections. Similarly, Twitter has over 500 million users, with 332 million of them currently utilising the site.

People begin tweeting, writing reviews, making comments, and other forms of social media activity when an incident or product is launched. People use social media sites to read product reviews from other customers before deciding whether or not to buy it. Organizations often depend on these platforms to gauge consumer reaction to their offerings and, as a result, use the reviews to develop them. Seeking and testing the validity of opinions or ratings, on the other hand, is a difficult challenge. It's impossible to manually go through all of the feedback to figure out which ones are sarcastic. Furthermore, the average human reader will struggle to recognise sarcasm in tweets or product reviews, which can contribute to them being misled.

Online promotion or messaging has grown in importance over the years, owing to the fact that social media is the only medium to reach out to young people and to express sentiment as a person's attitude toward a particular target. It can be time consuming to manually label sarcastic posts on social media. However, also with computer programmes, the most difficult part is identifying the existence of satire. In a tweet or a summary, the user's exact inclination can be conveyed or not, i.e., it can be communicated in a sarcastic way. Sarcasm is a form of sentiment that can be used to alter the meaning of any message. 'I like being missed #sarcasm,' for

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example. In this case, love reflects an optimistic emotion in an otherwise pessimistic situation. As a result, the tweet is considered ironic. Unlike pure negations, sarcastic tweets use encouraging or sometimes intensified positive words to express a cynical or conversely optimistic perspective. In order to predict their exact orientation, this necessitates the rapid study of large quantities of reviews, comments, or feedback messages. Furthermore, each tweet can be subjected to a series of algorithms in order to be classified correctly.

Sarcasm can be considered as a type of expression where people say or write the things that are entirely opposite than what they meant. Sarcasm is extremely difficult to detect due to its obscurity. An irony is a form of sarcasm. One of the most common uses of sarcasm is to express criticism. Sarcasm is commonly used to convey one's thoughts or emotions, especially on social networking media sites as Twitter and Facebook. The accuracy of sentiment analysis can be improved by a rigorous analysis and interpretation of sarcasm sentences. Sentiment analysis is the study of people's or society's feelings or thoughts regarding a specific occurrence or subject. We attempted to detail the general architecture of sarcasm detection in this article, as well as current techniques, ensemble learning methods, similar work performed by researchers in the context of sarcasm detection on Twitter and future scope. In a tweet or a summary, the user's exact inclination can be conveyed or not, i.e., it can be communicated in a sarcastic way. Sarcasm is a form of sentiment that can be used to alter the meaning of any message. 'I like being missed sarcasm,' for example. In this case, love reflects an optimistic emotion in an otherwise pessimistic situation. As a result, the tweet is considered ironic. Unlike pure negations, sarcastic tweets use encouraging or sometimes intensified positive words to express a cynical or conversely optimistic perspective. In order to predict their exact orientation, this necessitates the rapid study of large quantities of reviews, comments, or feedback messages. Furthermore, each tweet can be subjected to a series of algorithms in order to be classified correctly the limited knowledge of facts with the toxic nature of OSNs often translates into ignominy or financial loss or both for the victim. Unenthusiastic speech in the form such as hate speech, bullying, profanity, flaming, trolling, etc., in OSNs, is well studied in the literature.

On the other hand, public shaming, which is the condemnation of someone who violates acceptance norms to arouse feelings of guilt in him or her, has not attracted much attention from a computational perspective. Nevertheless, these events are constantly being increasing for some years. The immense volume of comments which is often used to shame an almost unknown victim speaks of the viral nature of such events. For example, when Justine Sacco, a public relations person for American Internet Company tweeted "Going to Africa. Hope I don't get AIDS. Just kidding. I'm white!" she had just 170 followers. Soon, a barrage of criticisms started pouring in, and the incident became one of the most talked-about topics on Twitter and the Internet, in general, within hours. She lost her job even before she landed in South Africa. Jon Ronson's "So You've Been Publicly Shamed" presents an account of many online public shaming victims. The observation that the author made from these diverse set of events about the victims that are subjected to punishments disproportionate to the level of crime they have committed.

Deep learning is a form of machine learning aims to solve perceptual problems such as speech and image recognition. A deep learning model is designed to analyse data with a logic structure similar to how a human's brain work. To achieve this, deep learning uses a layered structure of algorithms called an Artificial Neural Network (ANN). Deep ANNs contain multiple hidden layers to recognise patterns and structure in large datasets. Each layer learns a concept from the data from subsequent layers. The core difference between machine learning and deep learning lies on the feature engineering. In machine learning, feature engineering can be done manually while deep learning does not depend on prior data processing and automatically extracts features. Twitter is one of the most popular social communication tool, where millions of users participate and discuss everything including their mood, news and events around them through a simple interface that enables the post of messages, photos and videos, you find in the trend many of the topics that may contain spam messages. Due to the popularity of Twitter, it becomes an attractive platform for spammers to spread spam. It has become a severe issue on Twitter.

II. RELATED WORK

In [2], Yi Tay, Tuan & Cheung developed an approach for detecting and classifying hateful speech that uses content produced by self-identifying hateful communities from Twitter. Results from their experiments showed that Naive Bayes classifier achieved significantly better performance than existing methods in hate speech detection algorithms with precision, recall, and accuracy values of 70.69% and 85.25% respectively.

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In this paper, Sarcasm is a different type of evaluation that consists of words that generally mean something opposite to what you really want to say and may be used in a variety of situations to offend, upset, or be witty. Sarcasm is occasionally used inside a message to communicate understood information. Sarcasm, like analysis or a joke, may be utilised in a variety of ways. In any case, sarcasm is incredibly difficult for individuals to identify in any situation. As a result, detecting sarcasm leads to a better comprehension of the user's sentiment analysis, which is based on data acquired from websites like Twitter and Facebook. The benefits of detecting sarcasm for opinion mining have sparked interest in automated sarcasm Identification as a research topic.

The software tries to determine if a text is sarcastic or neutral in Automated sarcasm recognition. There are two parts to the study article. It extracts characteristics linked to feelings and punctuation in the first phase, and then uses the chi-square test to identify the most useful characteristics. To discover sarcastic material inside a tweet, the second phase extracts 200 top tf-idf characteristics and combines them with emotions and punctuation-related characteristics. The Support Vector Machine method achieves the greatest accuracy of 74.59 percent in the first method, while the voting classifier achieves the highest accuracy of 83.53 percent in the second method [1]. was done to classify the tweets according to the polarity of user sentiment towards the specific topics, focusing on the content of the tweet. Various functions have been proposed. They include presence of diagrams [10], frequency and non-text features such as emoticons [1] [2]. The author [3], defines framework that learns to classify the words and that words emotions of context.

By using pragmatic particles and POS marks in the function sets, Fersini.et.al used an ensemble technique to spot sarcasm and cynicism in the document. Ensemble models include Support Vector Machines, Decision Trees, Naive Bayes and Bayesian Networks. Pragmatic particles were found to be better at identifying sarcasm, whereas POS tags were better at identifying irony [3].

Author [4] applied the feature reduction approach – Principal Component Analysis to a twitter dataset of product feedback and tested it with Support Vector Machine and Nave Bayes in this article. The use of PCA resulted in an improvement in precision. In the article [5,17], author proposes a modified solution for K-means clustering system by reducing number of features using Principal Component Analysis, and finds that the modified algorithm takes significantly less time than the K-mean algorithm when applied to a large number of data sets. Jothe eswaran. et.al [6] suggested a way for improving the performance of the classifier on tweets by utilising a feature reduction method called Principal Component Analysis, and discovered that the proposed random forest tree-based feature reduction method increased the classifier's accuracy, recall and precision.

Since there is no static form for sarcasm in the data stream. As a result, utilising Machine Intelligence to forecast sarcasm in Twitter (or every other semi-structured knowledge format) is challenging. As opposed to other heuristics that use pattern match or context dependent, this is a more challenging yet thorough assignment. In the paper, As the with et al. [11] demonstrated how various digital technologies can be utilized to combat societal issues and constructs which impede free speech. It is shown by the usage of the classification schemes for description and the tweets classification. It was accomplished using a hyperbolic feature set. The project's potential analysis will involve resolving semantic uncertainty utilising a radical Recurrent Neural Network paradigm. Feed the network with the functionality and metadata created by the current model to accomplish this. Bidirectional LSTMs can be considered for the context identification and the VADER library can be used to perform a comprehensive emotion search. In paper [12], a method for detecting sarcasm in bilingual texts that uses a variety of feature extraction categories and NLP is presented. The method extracts functionality from bilingual or interpreted corpora. Pragmatic, lexical, syntactic, idiosyncratic, prosodic NLP characteristics were all listed. To test the feature groups, a non-linear SVM was used for classification purpose for the sarcasm detection (used on their own and in combination). The proposed model outperformed the others as compared to a baseline function. Ilavarasan.et.al [13] have provided a review of previous sarcasm detection work, an architecture for detecting sarcasm, various types of sarcasm, various sarcasm detection techniques, and certain sarcasm detection challenges. The complexity present in sarcasm renders things a more difficult task and raises the chances of finding jobs. The bulk of study into sarcasm detection is done in English. Future analysis should focus on detecting sarcasm in other languages. New datasets, features sets, and consideration of different types of sarcasm, among other aspects, were proposed for future research.

The tweets are pre-processed, and feature extraction is done followed by classification by three algorithms namely SVM, RF, NB. The shamming and non-Shamming tweets are predicted and the shammer is blocked after three attempts. Public shaming in online social networks and related online

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public forums like Twitter has been increasing in recent years. These events are known to have devastating impact on the victim's social, political and financial life. This implementation is aimed at a real time Detection, Analysis, and Mitigation of this kind of Shaming tweets.

If the language to be detected is being given in multiple language or is given outside of the dataset being provided to our project, then it gives an error that will impact on the detection of the tweets.

III. PROPOSED SYSTEM

Sarcasm can take many different forms, including verbal and literary sarcasm. Spoken sarcasm is a term that refers to sarcasm that happens in conversation. Verbal sarcasm has characteristics such as pitch level and variety, speech time and speed, and acoustic characteristics (intensity, volume, and frequency). To demonstrate their ironic characteristics, this kind of sarcasm uses tones and movements such as eyes and hands expression. Printed sarcasm, on the other hand, is used in places like official letters, emails, product reviews and social medias. On the other hand, because of the inconsistencies between its subtle and formal meanings in a sentence, sarcasm is difficult to detect using data mining techniques as it is used in conversation.

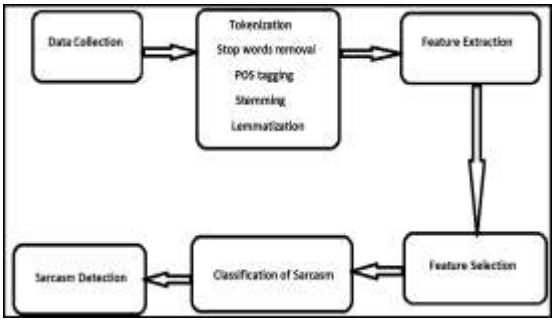

Figure-1: Phases of Sarcasm detection

The general design for sarcasm detection method can be seen in Figure 4.1. Data discovery or data analysis, data pre-processing, extraction of features and feature selection, sarcasm classification, and sarcasm identification are the key stages.

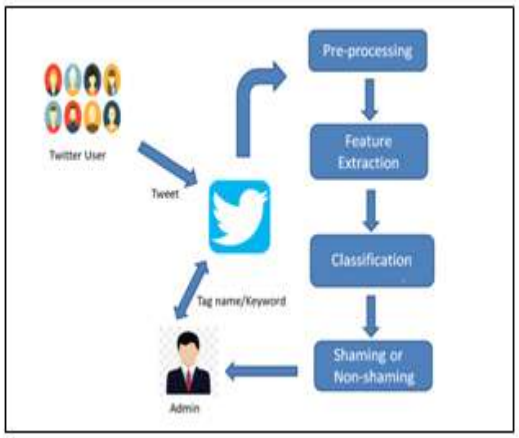

Figure-2: System Architecture

There are various trends emerging in the era of sentiment analysis, which analyses people's attitudes and opinions in social media, such as Facebook, Twitter, and blogs. The fundamental goal of sentiment analysis is to determine if a text is good, negative or neutral. Sarcasm is a form of sentiment that has the capacity to change the polarity of the text. The use of irony to mock or communicate contempt is defined as sarcasm. Sarcasm is a sophisticated style of sentiment expression in which the speaker expresses his or her thoughts in the opposite direction of what they mean. To recognise sarcastic tweets, a difference between a good mood term and a negative scenario is used [1].

Because there are so many people on Twitter, it's a hot topic, millions of tweets on which sentiment analysis can be applied to understand them and classify them. In twitter generally, people use informal language and there is also a word limit so it is hard to understand the opinion of people and such analysis is difficult. Opinion mining mostly used in the context of social media to measure the inclination of public opinion. [2]. Sarcasm is often used by people on social networking such as twitter. Since it is known that sarcasm is hard to understand and sentiment analysis provides a way to understand it so it can be employed to classify a sarcastic and nonsarcastic sentence. Consider the sentence-" Thanks for inviting me" Here the user does not directly say the other person is stupid but he thinks about him in that way. This is
one of the trivial examples of sarcasm and it is hard to understand.

The main challenges in understanding sarcasm are:
Polarity.
Emojis.
Idioms.

sarcasm as a linguistic concept and its theories are not widely studied or used in the past research. Few works which studied the linguistic

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theories related to sarcasm have proposed very interesting insights which can be used to build better sarcasm detection models. Mood analysis and opinion mining rely on emotional words to detect their polarity in a text (that is, whether it relates to ”positivity” or “negativity” in its thread). However, the text appearance can lead to confusion. [5] [6]. The aim of this project is to propose a system to automatically detect a sarcastic tweet.

The system has the major components of the present system, which are:

• Step 1: Twitter Data collection using twitter streaming API and Facebook
comments collection using online tools like extract comments.com, etc.
• Step 2: Tweets/Data cleaning like removal of duplicate tweets, stop words.
• Step 3: Data normalization using porter stemming algorithm.
• Step 4: Data loading on Dataset
• Step 5: Design and Implementation of map reduce program for per day tweets analysis (volume analysis).
• Step 6: Design and Implementation of program for per hour frequency of tweets (volume analysis).
• Step 7: Design and Implementation of program for geolocation wise frequency of tweets (volume analysis).
• Step 8: Design and Implementation of map reduce program for trending views using Random Forest algorithm
• Step 9: Tweet Classification.
• Step 10: Block the user after three attempts.

IV. ALGORITHUM DETAIL

In this paper we have performing analysis using three different algorithms like KNN, NB, RF.

1. **KNN:** K-Nearest Neighbours (KNN) algorithm is a type of supervised ML algorithm which can be used for both classification as well as regression predictive problems. However, it is mainly used for classification predictive problems in industry.

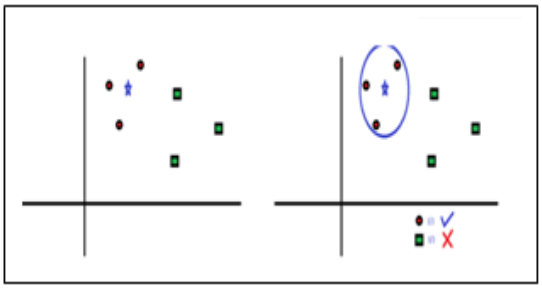

Figure – 3 : K-nearest neighbors (KNN) Example

KNN algorithm is a supervised machine learning algorithm which is used for classification and regression problem-Nearest Neighbours is one of the most basic yet essential classification algorithms in Machine Learning. It belongs to the supervised learning domain and finds intense application in pattern recognition, data mining and intrusion detection.

• Step 1: Let m be the number of training data samples. Let p be an unknown point.
• Step 2: Store the training samples in an array of data points arr[]. This means each element of this array represents a tuple (x, y).
• Step 3: for i=0 to m: Calculate Euclidean distance d(arr[i], p).
• Step 4: Make set S of K smallest distances obtained. Each of these distances corresponds to an already classified data point.
• Step 5: Return the majority label among S.

RF: Random Forest Modified algorithm is one of the supervised learning algorithms which is used for classification as well as regression but however, it is mainly used for classification problems. As I know that a forest is made up of trees and more trees means more robust forest. Similarly, random forest algorithm creates decision trees on data samples and then gets the prediction from each of them and finally selects the best solution by means of Twitter. It is an ensemble method which is better than a single decision tree because it reduces the over-fitting by averaging the result. Working of Random Forest Algorithm:

• Step 1: First, start with the selection of random samples from a given Twitter dataset.
• Step 2: Next, this algorithm will construct a decision tree for every sample. Then it will get the prediction result from every decision tree.
• Step 3: In this step, Twitter will be performed for every predicted result.
• Step 4: At last, select the emotion prediction result as the final prediction result.

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Input:

Training dataset T,

F= (f_1, f_2, f_3,.., f_n) // value of the predictor variable in testing dataset.

Output:

A class of testing dataset.

Step:

1. Read the training dataset T;
2. Calculate the mean and standard deviation of the predictor variables in each class;
3. Repeat

   Calculate the probability of f_i using the gauss density equation in each class;

   Until the probability of all predictor variables (f_1, f_2, f_3,.., f_n) has been calculated.
4. Calculate the likelihood for each class;
5. Get the greatest likelihood;

NB : Naive Bayes Classifier Algorithm

Naive Bayes algorithm is a supervised learning algorithm, which is based on Bayes theorem and used for solving classification problems.

• It is mainly used in text classification that includes a high-dimensional training dataset.

• Naive Bayes Classifier is one of the simple and most effective Classification algorithms which helps in building the fast machine learning models that can make quick predictions.

• It is a probabilistic classifier, which means it predicts on the basis of the probability of an object.

• Some popular examples of Naive Bayes Algorithm are spam

filtration, Sentimental analysis, and classifying articles.

The Naive Bayes algorithm is comprised of two words Naive and Bayes, Which can be described as:

• Naive: It is called Naive because it assumes that the occurrence of a certain feature is independent of the occurrence of other features. Such as if the fruit is identified on the bases of color, shape, and taste, then red, spherical, and sweet fruit is recognized as an apple. Hence each feature individually contributes to identify that it is an apple without depending on each other.

• Bayes: It is called Bayes because it depends on the principle of Bayes' Theorem.

Bayes' Theorem:

• Bayes' theorem is also known as Bayes' Rule or Bayes' law, which is used to determine the probability of a hypothesis with prior knowledge. It depends on the conditional probability.

• The formula for Bayes' theorem is given

$$P(A|B) = (P(B|A)\,P(A)) / P(B) \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

• Where, P(A—B) is Posterior probability: Probability of hypothesis A on the observed event B.

• P(B—A) is Likelihood probability: Probability of the evidence given that the probability of a hypothesis is true.

• P(A) is Prior Probability: Probability of hypothesis before observing the evidence.

• P(B) is Marginal Probability: Probability of Evidence.

Here, we developed Shaming Detection on Twitter using Machine Learning and Flask. the purpose is to develop a system to detect shaming events committed by tweeter users by analyzing shaming-related tweets from Twitter. Twitter is not just a platform for broadcasting information but an informative interaction. In order to stop shaming, people have now adopted sophisticated mechanisms with the help of various modern technologies.

Online social networks (OSNs) are often flooded with scathing remarks against individuals or businesses on their perceived wrongdoing.

The Motivation of this project is to categorize shaming tweets and helps to block shamers. The Code is written in Python 3.8.5 If you don't have Python installed you can find it here. If you are using a lower version of Python, you can upgrade using the pip package, ensuring you have the latest version of pip. To install the required packages and libraries, run this command in the project directory after cloning the repository:

Data Set Field

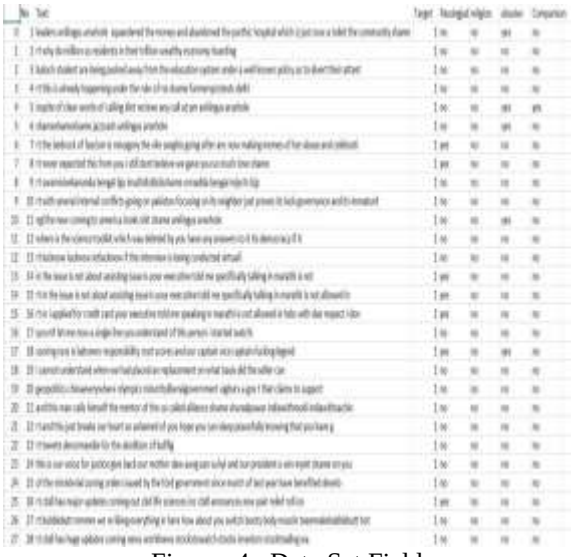

Figure -4 : Data Set Field

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V. RESULT

We have imported the data set and calculate the accuracy using the 3 algorithm and analysed the result

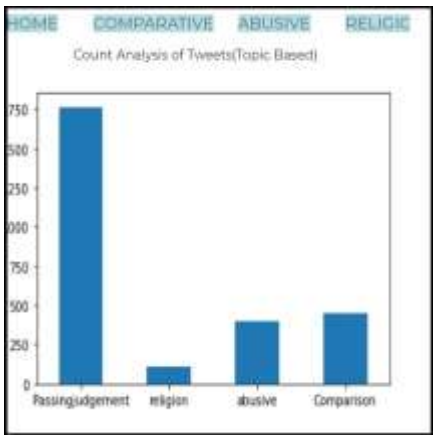

Figure-5: Count Analysis Of Tweets

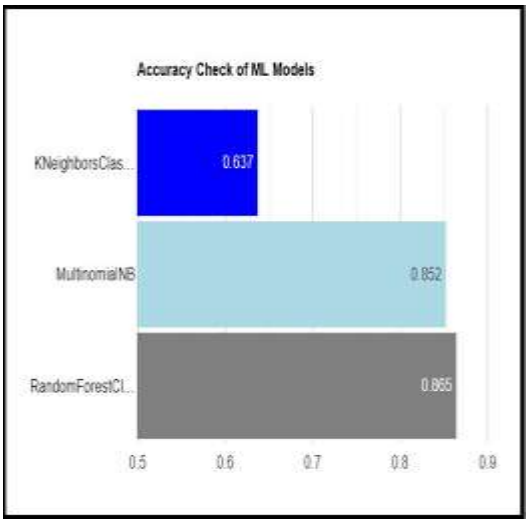

Figure -6 : Accuracy Calculation

The text and opinion mining area includes Twitter sentiment analysis management report in Python. It focuses on assessing the sentiments of tweets and feeding the data to a machine learning model to train it and then test its correctness, so that we can use this model in the future based on the results. Data gathering, text pre-processing, sentiment detection, sentiment classification, model training, and testing are all steps in the process. This study issue has progressed over the last decade, with models reaching efficiencies of almost 85% to 90%. However, it still lacks the dimension of data diversity. It also has a lot of application concerns due to the slang and abbreviated forms of words utilised. When the number of classes is raised, many analysers perform poorly. Also, the model's accuracy for topics other than the one under discussion has yet to be tested. As a result, sentiment analysis has a lot of room for growth in the future.

VI. CONCLUSIONS

Overall, the application is a pressing requirement, as the number of online social networks grows, as does the number of public shaming events, and as comments against site owners' callousness get louder. This research examines several applications of machine learning and hate speech identification to make shammers and shamming tweets easier to identify. After reviewing the literature, a new system can be presented that is capable of categorising humiliating comments into distinct categories and blocking specific tweets if they are detected as humiliating.

The majority of study into sarcasm detection is done in English. Sarcasm detection in different languages is a significant direction for future study. New datasets, function sets, and consideration of different ways of sarcasm, among other aspects, may be used in future research. In future, we would like to try out different deep learning methods and look at more conceptually oriented functionality.

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