

# Fake News Detection Using NLP

## Phase-1 Documentation Submission



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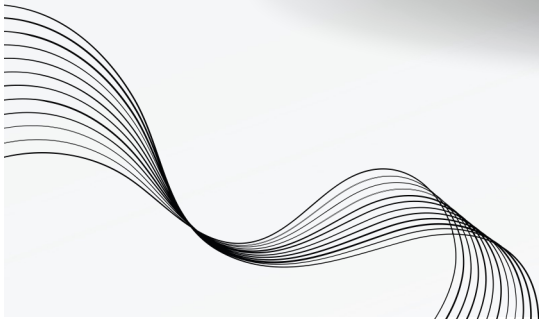
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## INTRODUCTION:

- This project aims to develop a machine learning model that can distinguish between genuine and fake news articles.
- The model will analyze the titles and text of news articles and classify them as either genuine or fake.

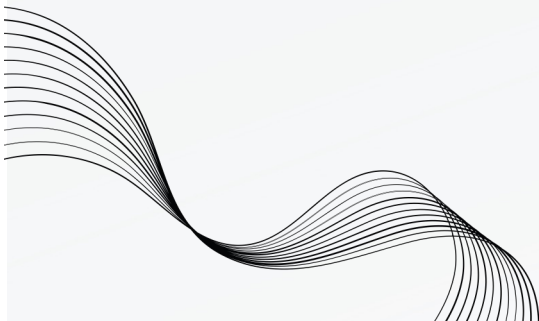


## Data Description:

- The dataset used in this project is obtained from Kaggle.

<https://www.kaggle.com/clmentbisailon/fake-and-real-news-dataset>

- It contains news articles along with their labels indicating whether they are genuine or fake.



# Modules

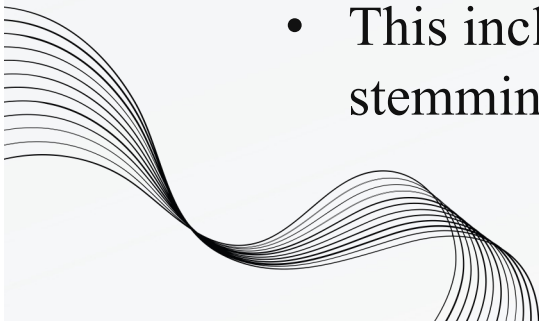
- 01** Data Collection Module
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### **Data Collection Module:**

- This module involves collecting the dataset from Kaggle. The dataset contains news articles along with their labels (genuine or fake).

### **Data Preprocessing Module:**

- This module involves cleaning and preprocessing the textual data to prepare it for analysis.
- This includes tasks such as tokenization, stop word removal, stemming, etc.



## **Feature Extraction Module:**

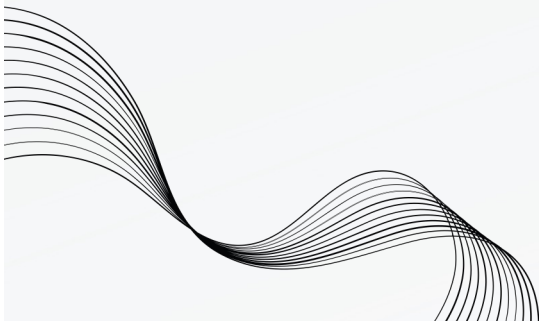
- This module involves converting the preprocessed text into numerical features that can be used by a machine learning algorithm.
- Techniques like TF-IDF (Term Frequency-Inverse Document Frequency) or word embeddings can be used for this purpose.



## Model Building Module:

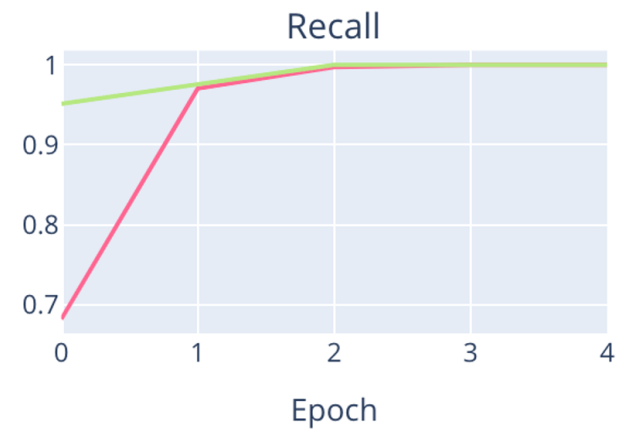
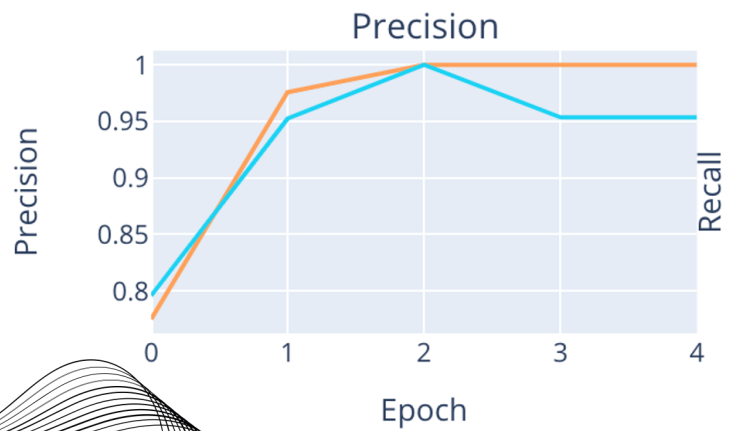
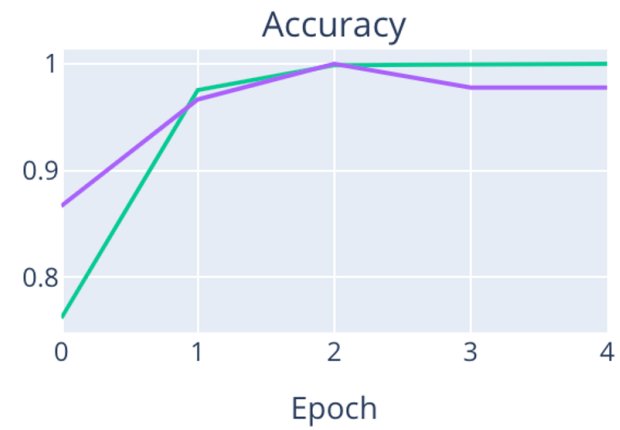
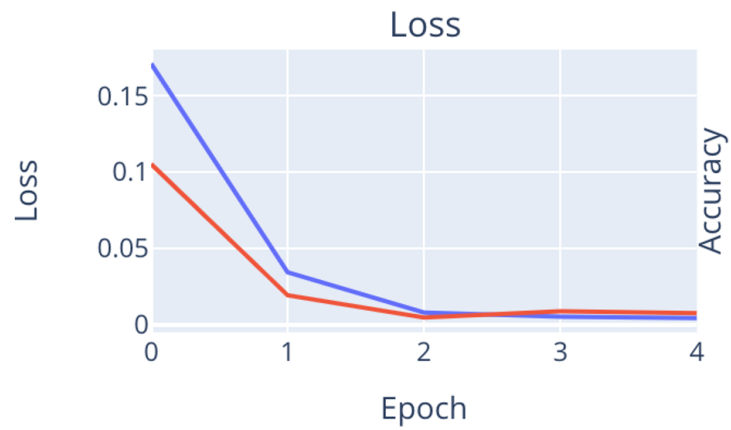
- This module involves selecting a suitable machine learning algorithm for the task (e.g., Logistic Regression, Random Forest, or Neural Networks) and training it on the preprocessed data.

```
Epoch 1/5
102/102 [=====] - 204s 1s/step - loss: 0.1709 - Accuracy: 0.7617 - Precision: 0.7751 - Recall: 0.6818 - val_loss: 0.1052 - val_Accuracy: 0.8667 - val_Precision: 0.7959 - val_Recall: 0.9512
Epoch 2/5
102/102 [=====] - 151s 1s/step - loss: 0.0343 - Accuracy: 0.9753 - Precision: 0.9758 - Recall: 0.9706 - val_loss: 0.0192 - val_Accuracy: 0.9667 - val_Precision: 0.9524 - val_Recall: 0.9756
Epoch 3/5
102/102 [=====] - 152s 1s/step - loss: 0.0079 - Accuracy: 0.9988 - Precision: 1.0000 - Recall: 0.9973 - val_loss: 0.0048 - val_Accuracy: 1.0000 - val_Precision: 1.0000 - val_Recall: 1.0000
Epoch 4/5
102/102 [=====] - 109s 1s/step - loss: 0.0052 - Accuracy: 1.0000 - Precision: 1.0000 - Recall: 1.0000 - val_loss: 0.0087 - val_Accuracy: 0.9778 - val_Precision: 0.9535 - val_Recall: 1.0000
Epoch 5/5
102/102 [=====] - 108s 1s/step - loss: 0.0043 - Accuracy: 1.0000 - Precision: 1.0000 - Recall: 1.0000 - val_loss: 0.0075 - val_Accuracy: 0.9778 - val_Precision: 0.9535 - val_Recall: 1.0000
```



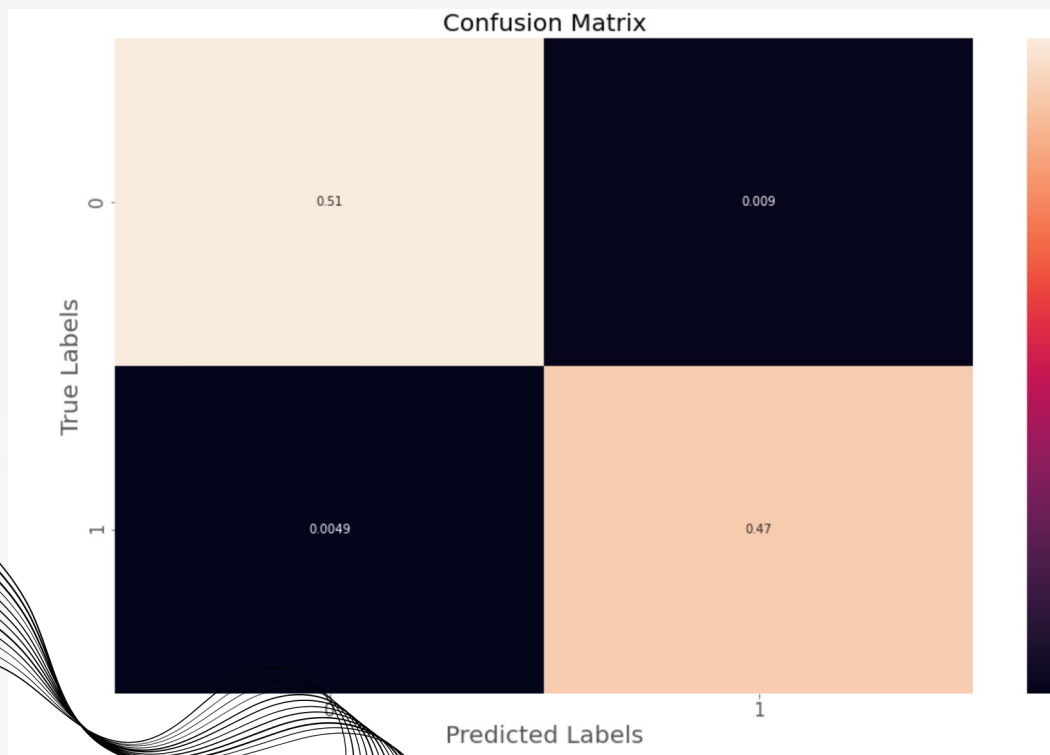


## Model Training History



## Evaluation Module:

- This module involves evaluating the performance of the trained model using metrics like accuracy, precision, recall, F1-score, and ROC-AUC.



- **Accuracy on testing set:** 0.9860801781737194
- **Precision on testing set:** 0.9812413154238073
- **Recall on testing set:** 0.9897220275636534