Fake News Detection Using Machine Learning

Team Members:

Team Number: 3

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Aim:

The aim of this project is to build a machine learning model that can classify news articles as real or fake by analyzing textual content. The goal is to reduce misinformation spread by providing an automated and efficient fake news detection system.

Why We Chose This Project:

Fake news has become a major issue in today's digital world. The rapid spread of misinformation through social media platforms and news websites has led to significant consequences in society. By building this project, we aim to contribute to a more reliable and trustworthy information system.

Technologies Used:

- Python (Pandas, NumPy, Scikit-Learn, NLTK)
- Natural Language Processing (NLP)
- Machine Learning Algorithms (Passive Aggressive Classifier)
- Flask for Web Development
- HTML, CSS, JavaScript for Frontend

Web Development Approach:

We use Flask as the backend framework to serve the machine learning model. The frontend is designed
with HTML, CSS, and JavaScript to allow users to input news articles and receive classification results in real time.

Approaches to Build the Model:

1. Data Collection: We use a dataset containing real and fake news articles.
2. Feature Extraction: Convert text into numerical format using TF-IDF vectorization.
3. Model Training: Implement Passive Aggressive Classifier to learn patterns from the data.
4. Performance Evaluation: Measure accuracy, precision, recall, and F1-score to validate results.

Preprocessing Steps:

1. Removing special characters, numbers, and punctuation.
2. Converting text to lowercase to maintain consistency.
3. Tokenizing text and removing stopwords.
4. Applying TF-IDF vectorization to convert text into numerical format.

Output:

After training the model, we achieved an accuracy of approximately 95%. When a user submits a news article, the system predicts whether it is real or fake based on textual analysis.

Conclusion:

This project successfully implements a machine learning-based fake news detection system.
With an efficient model and web interface, users can quickly verify the authenticity of news articles.
Future
improvements may include deep learning models like LSTMs or BERT for enhanced accuracy.