**Approach Used**

**Data Preprocessing:**

* Combined **news title and article body** into one text input.
* Converted text to **lowercase** and removed **punctuation, numbers, and stopwords**.
* Applied **lemmatization** to retain meaningful words.

**Feature Representation & Model Training:**

* Used **Tokenization and Padding** (max sequence length = 500).
* Implemented an **LSTM-based deep learning model** with an embedding layer.
* **Trained the model for 5 epochs** using the **Binary Cross-Entropy loss** function.

**Deployment using Flask & HTML Interface:**

* Built a **Flask web app** (app\_lstm.py) where users can input news articles.
* The model **predicts whether the news is real or fake** based on the text input.

**Challenges Faced**

**Training Time & Resource Limitations:**

* LSTM models require more **training time** and **compute power** compared to simpler classifiers (e.g., Naïve Bayes).

**Handling Long News Articles:**

* Some articles exceeded **500 words**, so **padding and truncation** were applied to maintain a fixed input length.

**Model Performance & Improvements**

**Accuracy Achieved:** **High accuracy >90%**, indicating the model effectively distinguishes between fake and real news.  
**Possible Improvements:**  
**Try Transformer Models (e.g., BERT)** for better contextual understanding.