Project: Fake News Detection Model using TensorFlow

- **Objective: Develop a deep learning model using TensorFlow to classify news articles as FAKE or REAL based on their text content.**
- **Dataset: Fake News Dataset**

Project Goals:

1. Importing Libraries and Dataset:

- **Load required Python libraries:**
  - **NumPy for mathematical operations.**
  - **Pandas for handling datasets.**
  - **TensorFlow for deep learning model creation.**
  - **Sklearn for train-test split and model evaluation.**
- **Load the dataset using Pandas and explore its structure.**

2. Preprocessing Dataset:

- **Convert text data into numerical format using Tokenization.**
- **Remove stopwords, punctuation, and special characters.**
- **Convert labels (FAKE, REAL) into binary values (0,1).**
- **Split dataset into training and testing sets (80%-20%).**

3. Generating Word Embeddings:

- **Use Word2Vec or TF-IDF to create word embeddings.**
- **Convert news text into a format suitable for deep learning models.**

4. Model Architecture:

- **Define a Sequential Deep Learning Model using TensorFlow:**
  - **Input Layer (Embedding Layer).**
  - **LSTM (Long Short-Term Memory) Layer for text processing.**
  - **Dense Layers for classification.**
  - **Activation function: Sigmoid for binary classification.**
- **Compile the model using Binary Crossentropy Loss and Adam Optimizer.**

- **Train the model on training data.**

5. Model Evaluation and Prediction:

- **Evaluate model performance using:**
  - **Accuracy**
  - **Precision**
  - **Recall**
  - **F1-score**
- **Test the model on new unseen news articles.**

Conclusion:

- **This model helps identify fake news with high accuracy using deep learning.**
- **Future improvements can include attention mechanisms or transformers (BERT) for better performance.**