**Gujarati Sentiment Analysis using Ensemble Learning (SVM+RF+LR and accuracy 81.40%)**

**Project Overview**

This project implements a **Gujarati Sentiment Analysis** model using an **ensemble learning approach** combining **Support Vector Machine (SVM), Random Forest, and Logistic Regression**. The model predicts the sentiment (positive, negative, or neutral) of Gujarati text.

Additionally, a **user-friendly web interface** allows users to input Gujarati text for sentiment analysis.

**Features**

✅ Supports only **Gujarati text input** (other languages are restricted).  
✅ Uses **TF-IDF** for feature extraction.  
✅ Applies **ensemble learning** for improved accuracy.  
✅ **Interactive Webpage** with two buttons:

* **Sentiment Analysis:** Predicts sentiment for user input.
* **Re-enter Sentence:** Allows users to re-input text.

**Technology Stack**

* **Python (Flask)**
* **Machine Learning (SVM, Random Forest, Logistic Regression)**
* **Natural Language Processing (TF-IDF)**
* **HTML, CSS, JavaScript (for UI)**
* **Pickle (Model Serialization)**

**Project Structure**

📂 Gujarati-Sentiment-Analysis

│── 📄 FinalModel3.ipynb # Jupyter Notebook (Model Training)

│── 📄 app.py # Flask Backend

│── 📄 gujarati\_sentiment\_model.pkl # Trained ML Model

│── 📄 tfidf\_vectorizer.pkl # TF-IDF Vectorizer

│── 📂 templates/

│ ├── index.html # Web Interface

│── 📄 requirements.txt # Python Dependencies

│── 📄 README.md # Project Documentation

**Installation & Usage**

1. **Clone the Repository**

git clone https://github.com/your-username/Gujarati-Sentiment-Analysis.git

cd Gujarati-Sentiment-Analysis

1. **Install Dependencies**

pip install -r requirements.txt

1. **Run the Web Application**

python app.py

✅ Open http://127.0.0.1:5000/ in your browser.

**Example Usage**

| **Input (Gujarati)** | **Predicted Sentiment** |
| --- | --- |
| આ ફિલ્મ બહુ સરસ છે! | Positive 😊 |
| આ એફએમ કંઈ ખાસ ન હતું. | Negative 😠 |
| હવામાન ઠીક છે. | Neutral 😐 |

**Future Improvements**

* Expand dataset for better accuracy.
* Implement **deep learning models (LSTMs, Transformers)**.
* Enhance **UI/UX** for a smoother experience.