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# Twitter Sentiment Prediction Python Package

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This project focuses on predicting the sentiment of Twitter posts using Natural Language Processing (NLP) techniques. It is an end-to-end machine learning project that includes data preprocessing, model building, hyperparameter tuning, and deployment.

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## How I built this package

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[Download code packaging process.pdf](#)

## Features

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- **ETL Pipeline:** Extract, transform, and load (ETL) processes implemented using PySpark and SQL.
  - **Text Processing:** Cleaned text data using regex, removed special characters, and vectorized text using TF-IDF.
  - **Model Building:** Implemented Logistic Regression and Multinomial Naive Bayes for sentiment prediction.
  - **Hyperparameter Tuning:** Optimized models using GridSearchCV.
  - **Experiment Tracking:** Logged experiments with MLflow for efficient performance comparison.
  - **Model Packaging:** Prepared reusable model packages using `sdist` and `wheel`.
  - **Deployment Ready:** Plan to host the project on Render for public access.
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## Installation

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1. Clone the repository:

```
bash git clone https://github.com/vijaytakbhate2002/sentiment_prediction_python_package.git
```
  2. Install the package using pip:

```
bash pip install git+https://github.com/vijaytakbhate2002/sentiment_prediction_python_package.git
```
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## Usage

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### Prediction Example

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To predict the sentiment of a Twitter post, you can use the following Python code:

```
from sentiment_prediction import predict
predict.predictor("this is a negative tweet")
```

This will return:

```
[ 'Negative' ]
```

### Sentiment Classes

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The prediction function supports four sentiment classes:

- **Positive**

- Negative
- Neutral
- Irrelevant

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## Project Structure

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```
sentiment_prediction_python_package/  
├──  
│   ├── sentiment_prediction/                # Main package directory  
│   │   ├── config/  
│   │   │   └── config.py                    # Configuration file  
│   │   └──  
│   │       ├── data_manipulation/           # Model training and prediction scripts  
│   │       │   ├── data_handling.py         # Training pipeline  
│   │       │   ├── data_processing.py       # Prediction pipeline  
│   │       │   └── text_filer.py            # Text filtering utilities  
│   │       └──  
│   │           ├── trained_models/          # Trained models and metadata  
│   │           │   ├── classifier.pkl        # Classifier model  
│   │           │   ├── vectorizer.pkl       # Vectorizer model  
│   │           │   └── encoder.pkl          # Encoder model  
│   │           └──  
│   │               ├── dist/                # Distribution packages (generated)  
│   │               └──  
│   │                   ├── build/            # Build files (generated)  
│   │                   └──  
│   │                       ├── sentiment_prediction.egg-info/ # Egg-info metadata (generated)  
│   │                       └──  
│   │                           ├── .gitignore # Excluded files and folders  
│   │                           ├── MANIFEST.in # Configuration file with paths and constants  
│   │                           ├── README.md  # Project documentation  
│   │                           ├── requirements.txt # Project dependencies  
│   │                           └── setup.py    # Package metadata and configuration
```

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## Contribution

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Feel free to submit issues or pull requests. Contributions are welcome!

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## License

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This project is licensed under the MIT License.

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## Author

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GitHub Repository: [Twitter Sentiment Prediction Python Package](#)

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