User Manual

Overview

This document provides detailed instructions on how to install, configure, and use the intelligent bug severity classification tool developed in this project. The tool leverages **TF-IDF**, **SMOTE**, and **Logistic Regression** to classify software bug reports automatically.

Installation

Step 1: Clone the Repository

Clone the repository to your local machine:

```
git clone https://github.com/superggfun/BugSeverityClassifier
cd yourrepository
```

Step 2: Set Up Python Environment

It is recommended to create a new virtual environment to avoid dependency conflicts.

On Windows:

```
python -m venv env
.\env\Scripts\activate
```

On Linux or MacOS:

```
python -m venv env
source env/bin/activate
```

Step 3: Install Dependencies

Install all required packages using the provided `requirements.txt`:

```
pip install -r requirements.txt
```

How to Run

You can run different models using the following commands:

1. Baseline Naive Bayes with TF-IDF

```
python baseline_nb_tfidf.py
```

2. Logistic Regression with TF-IDF (without SMOTE)

```
python multiclass_lr_tuning.py
```

3. Logistic Regression with TF-IDF and SMOTE (recommended method)

```
python multiclass_lr_tuning_smote.py
```

Results

After running any of the scripts above, results such as accuracy, macro F1-score, confusion matrices, and classification reports will be printed directly to the console, and the figures (such as confusion matrices)