User Manual

1. Environment Setup

Ensure that Python version 3.8 or above is installed, and that all dependencies listed in requirements.pdf are installed. This project is designed to run in a Jupyter Notebook environment.

2. Code Structure in Jupyter Notebook

The entire workflow is implemented within a single Jupyter Notebook file (bug_report_classification.ipynb). The notebook consists of the following key sections:

- **Data Loading and Preprocessing**: Reads and cleans the dataset.
- **Feature Engineering**: Applies TF-IDF vectorization.
- **Class Balancing**: Implements SMOTE to handle class imbalance.
- **Model Training**: Trains an SVM classifier with optimized hyperparameters.
- **Evaluation and Visualization**: Computes performance metrics and generates graphs.

3. Execution Steps in Jupyter Notebook

1. **Launch Jupyter Notebook**

jupyter notebook

2. **Open bug_report_classification.ipynb** and follow the sequential execution of the notebook cells.
3. **Run Data Preprocessing Cells** to clean and vectorize the dataset.
4. **Execute the Model Training Cells** to train the SVM classifier with SMOTE.
5. **Evaluate the Model Performance** by running the relevant notebook cells, which output precision, recall, F1-score, and confusion matrices.
6. **Visualize the Results** using the provided plots and tables within the notebook.