**OPTIMIZED PHISHING DETECTION THROUGH URL ANALYSIS BY A GRADIENT BOOSTING -RNN ENSEMBLE**

**NEEDED SOFTWARE & LIBRARIES:**

**1. Software Requirements:**

* **Visual Studio Code (IDE: Microsoft Visual Studio 2022-V.17.9)**
  1. Download: <https://code.visualstudio.com/>
* **Python (V: 3.10)**
  1. Download: <https://www.python.org/downloads/>
* **Pip** **(V: 25.0.1)**
* **Git for version control** **(V: 2.48)**
  1. Download: <https://git-scm.com/>

**2. Python Packages to Install:**

By using the following command in Terminal to install all necessary packages:

pip install numpy, matplotlib,joblib, seaborn, pandas,xgboost,catboost, tensorflow, flask, scikit-learn

* numpy – For numerical operations
* matplotlib – For plotting graphs
* joblib- For saving and loading machine learning models
* seaborn – For heatmaps and advanced visualization
* pandas – For handling data structures
* xgboost-For classification and regression tasks.
* catboost- For handling categorical features
* tensorflow – For building and using deep learning models
* flask – For creating the web interface
* scikit-learn – For model evaluation, data splitting, and computing class weights

**3. Extensions for VS Code:**

Install via the **Extensions** tab in VS Code:

* Python
* Flask Snippets
* HTML/CSS Support.