USER GUIDE

System Requirements

1. Operating System

- **Windows**: Version 10 or later
- **MacOS**: Version 10.15 (Catalina) or later
- **Linux**: Ubuntu 18.04 or later

2. Python

- **Python 3.8 or later**
- Ensure Python is installed and available in your system's PATH.

3. Required Python Libraries

The following Python libraries are required:

- `streamlit` (Version 1.25 or later)
- `numpy` (Version 1.26 or later)
- `scikit-learn` (Version 1.3 or later)
- `matplotlib` (Version 3.7 or later)
- `GPyOpt` (Version 1.2.6)
- `GPy` (Version 1.13.2)

Install all dependencies by running:

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

4. GPyOpt Installation

GPyOpt may require specific installation steps. Run the following commands:

```
pip install GPy
pip install GPyOpt
```

How to Run the Code

1. Navigate to the Project Folder

Place all project files in a folder of your choice. Open a terminal or command prompt and navigate to the folder:

```
cd path/to/your/folder
```

2. Install Python Dependencies

Ensure all required Python libraries are installed:

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

3. Run the Streamlit Application

Start the Streamlit server by running:

```
streamlit run streamlit_app.py
```

4. Access the Application

Opens in your web browser at: http://localhost:8501

OR

1. Navigate to the Project Folder

Place all project files in a folder of your choice. Open a terminal or command prompt and navigate to the folder:

```
cd path/to/your/folder
```

2. Install Python Dependencies

Ensure all required Python libraries are installed:

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

3. Run Python Files Independently

Each step can also be executed independently by running the corresponding Python file:

- **Workload Characterization**:

  ```
  python workload_characterization.py
  ```

- **Important Knobs Determination**:

```
python knob_importance.py
```

- **Workload Mapping**:

```
python workload_mapping.py
```

- **Configuration Recommendation**:

```
python configuration_recommendation.py
```

Step-by-Step Instructions

Step 1: Workload Characterization

- Input workload metrics or use default metrics.
- Click **Run Workload Characterization**.
- View the representative metrics for workload clusters.

Step 2: Important Knobs Determination

- Click **Run Important Knobs Determination**.
- View the list of important knobs and their interactions.

Step 3: Workload Mapping

- Enter current workload metrics or use defaults.
- Click **Run Workload Mapping**.
- View the **Best Matching Workload Index**.

Step 4: Configuration Recommendation

- Click **Run Configuration Recommendation**.
- View the **Best Configuration**, **Objective Value**, and **Convergence Plot**.
- Click **Done** to return to the home screen (Double Click **Start** to go to Step 1).

Troubleshooting

Common Issues

- **Missing Packages**: Ensure all required libraries are installed:

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

- **ModuleNotFoundError**:
  - For `GPyOpt`, reinstall the package:

```
pip install GPy
pip install GPyOpt
pip install pandas
```

  - For `Streamlit`, install:

```
pip install streamlit
```

Support

For any issues, contact the project owner at `apatel392@student.gsu.edu`.