Step-by-Step Instructions to Install Python on Linux and Plot the Histograms for Assignment-1

Step 1: Update Your Linux System and Install Python

1.1 Update your system

Always ensure your Linux system is up-to-date to avoid compatibility issues. Open your terminal and run:

```
sudo apt update
sudo apt upgrade
```

This updates your package lists and installs the latest versions of installed packages.

1.2 Install Python

Install Python 3 and pip (Python's package manager) system-wide:

```
sudo apt install python3 python3-pip
```

Python 3 is the default version in most modern Linux distributions.

1.3 Verify Python installation

Check if Python and pip are installed correctly by running:

```
python3 --version
pip3 --version
```

You should see the installed versions displayed. If there are errors, recheck the installation step.

Helpful Resources

- Official Python Downloads
- Linux Python Installation Guide

Step 2: Install Matplotlib

2.1 Use apt to install matplotlib

Matplotlib is a popular Python library for plotting data. Install it using:

```
sudo apt install python3-matplotlib
```

2.2 Verify Matplotlib installation

Run the following command to check if Matplotlib works:

```
python3 -c "import matplotlib.pyplot as plt; print('Matplotlib is working')"
```

If the output is `Matplotlib is working`, the installation was successful. Otherwise, troubleshoot by ensuring Python and pip are properly installed.

Additional Resource

- Matplotlib Documentation

Step 3: Prepare the "Histogram" Folder

3.1 Create the ‘Histogram’ directory

Create a new folder `Histogram`. Ensure that the Python script (`plot_histograms.py`) and the folder `Histogram` are in the same directory.

3.2 Add your .txt files

Place six `.txt` files representing histogram data into the `Histogram` folder. Each file should use the following format for the data. Please check the given sample files folder.

```
Bin [0] ----> Count: 476
Bin [1] ----> Count: 550
Bin [2] ----> Count: 681
```

3.3 Verify the folder contents

To list the files in the `Histogram` folder, use:

```
ls Histogram
```

The output should list the six `.txt` files

Step 4: Run the Python Script

Run the script to process the `.txt` files and generate the histogram PDF:

```
python3 plot_histograms.py
```

Ensure that the script (`plot_histograms.py`) is in the same directory as the `Histogram` folder.

Step 5: Verify the Output

1. The script processes all six `.txt` files in the `Histogram` folder.
2. It generates a PDF file named `histograms.pdf` in the same directory as the script.
3. Open the PDF to verify the plotted histograms.

Notes for Students

- **Correct File Format:** Ensure that your `.txt` files follow the exact format (e.g., `Bin [0] ----> Count: 476`). Mismatches in formatting may cause the script to fail.
- **Histogram Folder:** The `Histogram` folder must contain exactly six `.txt` files for the script to work correctly.
- **Verify Installations:** Double-check that Python, pip, and matplotlib are installed and working properly before running the script.

Helpful Links

- Python for Beginners
- Using pip