

Power Consumption Estimation Tool

This Python project is a simple web server that allows you to estimate the power consumption of a specific application running on your computer based on its CPU usage. The estimation is made by monitoring the average CPU usage of the specified application over a defined duration (1 second for 2 intervals).

This project is build using HTML, CSS, Bootstrap, Javascript, and Python

Prerequisites

Before using this project, ensure that you have the following prerequisites installed on your system:

- * Python 3.x (<https://www.python.org/downloads/>)
- * psutil library install it by typing “pip install psutil” in your terminal

Usage Instructions

1. Clone or download the project to your local machine.
2. Open a terminal or command prompt and navigate to the project directory.
3. Run the server by executing the following command “python server.py”
4. Once the server is running, this message will appear in your terminal:
“Server is running at http://localhost:8000”
5. Open a web browser and navigate to http://localhost:8000. This will display a simple web page where you can interact with the server.
6. On the web page, you'll see a form where you can input an application name. So, Enter the name of the application you want to estimate power consumption for.

Important Notes describing how to enter the application name:

- Open the application you want to calculate its power consumption
- Open Task manager on your computer (Ctrl+Alt+Delete)
- Open Details section
- You will see the applications which are working at the moment in your computer, Search for the application you want to calculate its power consumption
- Write the application name at the input as written in Task manager window

Examples:

- Google Chrome, Type: chrome.exe
- Visual Studio Code, Type: Code.exe

7. After entering Application Name, click the **Calculate** button.

The server will respond with an estimation of the power consumption for the specified application. The response will be displayed on the web page.

Note: Calculation process will take 3-5 seconds after pressing the button

index.html:

- I have included bootstrap link
- All styling was written by inline CSS and bootstrap
- The page includes some instructions for how to use the calculator
- A Javascript code is included at the bottom of the page which fetch the data from the endpoint and display the result in the html page

server.py:

- This is the server page build by python.
- I used psutil library from python, which is python cross-platform library used to access system details and process utilities. It is used to keep track of various resources utilization in the system. Usage of resources like CPU, memory, disks, network, sensors can be monitored.
- My major use of this library was this function: **psutil.cpu_percent(interval)**
- This function calculates the current system-wide CPU utilization as a percentage. It is recommended to provide time interval (seconds) as parameter to the function over which the average CPU usage will be calculated.
- The Calculation process start by calculate initial power consuming percentage of certain application for 1 sec then stop for 1 second then calculate final power consuming percentage for another 1 second and finally take the average of the 2 percentages.