CSCI 4950/6950 Assignment 2

In this assignment, you will be working on remove noise from sensor data and implement a simple step counter (pedometer).

Part 1: GitHub Classroom.

We are using GitHub Classroom for assignment and final project.

Follow this link to join GitHub Classroom:
https://classroom.github.com/a/Iaw8PX8M

This link will be a Gihub Fundamentals assignment, which can be used to test out if your github is working or not. You can also familiarize with Github classroom with this assignment. This is not graded. Once you opened this link with your GitHub account, you should choose your name as the identifier, which will be used in the roster.

Cloning the repository: Please clone the starter repository to your computer by following the instructions below. DO NOT download the repo as a .zip folder - doing so will create an unattached copy of the repository to your computer and it will be harder for you to commit and push changes.

- Click the "Clone or download" button on the top-right corner. Copy the link under "Clone with HTTPS".

- On your computer, open Terminal or GitBash for Windows (you would have downloaded GitBash while downloading Git for Windows). Navigate to the folder in which you want your assignment folder to be.

- Clone the repo by running
  ```
  git clone <link you copied earlier>
  ```
  This will create a new folder with the assignment files in it.

Submitting your code: You need to complete the code in the files and **commit and push** it back to Github for me to be able to grade it.

- Make changes to your files and save them. Then, using Terminal or GitBash, navigate to the assignment folder.

- To add any changes to a commit, you need to run either
  `git add <filename>` (to add individual files) or `git add .` (to add all files in the current directory).

- Then, commit these changes by running:
  ```
  git commit -m "<commit message>"
  ```
  Use a concise commit message that describes the changes you have made since the last commit.

- Lastly, push these changes back to Github by running:
  ```
  git push origin main
  ```

- Commit and push your changes periodically. A general good practice is to commit code after each substantial update with a message describing that update. Note that I will only grade your *last commit before the deadline*.

The following parts of the assignment contains two Jupyter notebooks. You are required to add your own code in these notebooks wherever mentioned. Make sure you read each notebook carefully so you don't miss any part of the assignment.

Link to GitHub Part 2:
https://classroom.github.com/a/OZxgum4G

Part 2: Smoothing and Filtering (50 Points)

You will be introduced to time and frequency domain smoothing and filtering techniques, as well as plotting in Jupyter notebooks using matplotlib. You are required to apply some of these filters and plot graphs to complete the notebook.

This part is done in file "smoothing_and_filtering_assignment.ipynb".

Part 3: Step Counting (50 Points)

Apply frequency filters from Notebook 1 and plot signals. Also, design and implement an algorithm to count steps from filtered accelerometer data.

More details are provided in the notebooks at the exact places where your code would go.

This part is done in file "step_counting_assignment.ipynb".