Lab Activity

Terms

Pressure Sensing Mat

It is a rectangular mat that is fitted with pressure sensors for recording the activity on its surface. The mat can be represented by a matrix of dimensions 42 x 25. Each cell in the matrix is a value representing the intensity of pressure at that particular point. The mat samples data at fixed time intervals. For example if this time interval is 1 ms, then it means that the sensors will record new values in the matrix after every 1 milli second.

Task

1.

Your task consists of creating a program that reads input from a file containing data recorded from Mat in a format given in the attached file. Each matrix in the file represents reading from the mat taken at regular intervals as indicated by the time stamps. Most of the values are 0 and represent that there is not activity on the surface of the mat. However, some values are non zero and represent that pressure has been applied at those cells on the surface of the mat. In this case the pressure is being applied by waliking over the mat, therefore the non zero value also represent the areas where the foot has been placed. If you scroll down in the attached file, you will observe that the non zero values shift their position indicating that a person is walking over the mat.

The output should consists of the following:

1. **Stride Length:** The distance of the first placement of the foot and the second placement of the same foot
2. **Stride Velocity:** Stride length divided by the time taken
3. **Cadence:** Number of steps per minute

2.

We have taken 3 mats (say m1, m2 and m3) each of dimensions 42 x 25 and connected them together to create a single mat of dimesion 126 * 25.
Create a program to consolidate the readings from the three mats as if it were a single mat of dimension 126 * 25 and output *String Length*, *Stride Velocity* and *Cadence* for the consolidated mat.

NOTE:

- You can choose any input and output format, however, you need to mention the format you have chosen in a README.md file
- For any ambiguity, you are free to interpret it as per your will, however, you need to clearly specify the assumpation in the README file.
- Use the Markdown script in the README file and do not write it in the form of plain text.
- All the files for your programs should be inside a folder with its name as your Roll

Number.

- Zip the file as <roll_num>.zip
- <roll_num>.zip
    - <roll_num>
        - project file here