Lab 7: Noise Canceling Application, Heart Rate Analysis, and Red Alert Game.

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Part 1: Nosie Canceling Application

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Packages that need to be installed

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There will be three packages that need to be installed to run the program successfully. Those three packages are numpy, scipy, and matplotlib.

How to install packages in Python

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To install those packages, you will type “pip install numpy” in Anaconda Powershell Prompt” program as shown in below:

Text

Description automatically generated

Then, you will do the same thing for the other two packages.

After installing all the packages, you will be able to run the program in Python.

How to execute the program:

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After hitting the run button, you will receive four graphs as shown below:

Graph 1: Sum of three different frequencies.

Chart, scatter chart

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Graph 2: The graph of three different frequencies before filtering out.

Chart, histogram

Description automatically generated

Graph 3: Graph of three different frequencies be filtering out (blue line is output signal, and orange line is filter signal.)Chart, scatter chart

Description automatically generated

Graph 4: Only one frequency left after filtering out.

Chart, histogram

Description automatically generated

Part 2: Heart Rate Analysis

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Packages that need to be installed

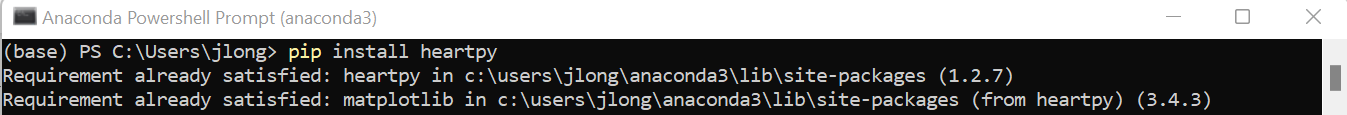
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There will be two packages that need to be installed to run the program successfully. Those two packages are heartpy and matplotlib.

How to install packages in Python

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To install two packages mentioned above, you will type “pip install heartpy” in Anaconda Powershell Prompt” program as shown in below:



Then, you will do the same thing for the matplotlib package.

After installing all the packages, you will be able to run the program in Python.

How to execute the program:

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After hitting the run button, you will receive two graphs and measurements in console section.

Graph 1: Graph of heart rate from csv file.

A picture containing object, antenna

Description automatically generated

Graph 2: Graph of heart rate signal peak detection.

A picture containing chart

Description automatically generated  
Measurements in console section:

Text

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Part 3: Game development – Red Alert:

How to install pgzrun package

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To install the package in Python, you will type “pip install pgzrun” in “Anaconda Powershell Prompt” program as shown below:



Moreover, you will do the same thing for pygame and pgzero to run the game successfully.

How to execute the program:

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After hitting the run button for the code, a window below will show up for you to play the game.

Moreover, you will hear the background music when running the code.

A picture containing text, star, outdoor object, night sky

Description automatically generated

How to play the game

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To win this game, you will need to right click on the red snowflake as soon as possible when you see them. If you hit it right on all the level, it will show up a window as shown below.

A picture containing text, outdoor object, star, night sky

Description automatically generated

However, if you miss one, the game over screen will show up as shown below.

Graphical user interface

Description automatically generated with medium confidence

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