Simulator User Manual

Instructions:

1. Upon startup, an alert box will pop up notifying the user that their data has been used to create a new and unique music sample.
2. A new screen is displayed with three buttons:
   a. The top button ("Play Normal Sample") plays the original music sample without any altering.
   b. The middle button ("Play My Daily Sample") plays the altered music sample based on data taken from the JSON file.
   c. The bottom button ("What Does My Sample Mean?") takes the user to a screen that visually displays the user's average heart stats used to alter the music sample versus average heart health statistics.
3. While on the "Daily Report" screen, clicking the mouse uses text-to-speech to tell the user that they can press any key to hear their report.
4. While on the "Daily Report" screen, pressing any key uses text-to-speech to read the user their report.
5. The JSON file heart_health.json includes a wide range of potential data relating to a user's heart health. Changing which user is used for the simulation produces unique music samples since they have different combinations and values of their parameters.

Instruction Notes:

- To change the music sample used in the simulator, go to line 49 in Ohlinger_Maia_Proj4.pde and change the name of the music file to the name of the file that you want to use.
  - The file must be in .WAV format.
  - Put any music files you want to use with the simulator into the "data" folder.
- To change which user's data is pulled from the JSON for the simulator, go to line 7 in Server.pde and change the variable "x" to a valid index in the JSON object array.
  - The JSON file is named heart_health.json and it is located in the "data" folder.
- Use heart_health.json to create more users and data or alter current users and their data.
- If the top button is pressed after the middle button was pressed and while the altered sample is being played, it will switch to the normal sample and continue playing the sample. If the middle button is pressed after the top button was pressed and while the normal sample is being played, it will switch to the altered sample and continue playing the sample.

Sonification Scheme:

- Heartrate:
  - A lower-than-average average heartrate slows down the speed of the music sample by half.
  - An average heartrate within average range does not change the speed of the music sample.

- - A higher-than-average average heartrate speeds up the speed of the music by two times.
- Blood Pressure:
  - A lower-than-average blood pressure adds a high-pass filter to the music sample.
  - A blood pressure within average range does not add a filter to the music sample.
  - A higher-than-average blood pressure adds a low-pass filter to the music sample.
- Heart Rhythm:
  - An abnormal heart rhythm causes the music sample to be played backwards.
  - A normal heart rhythm causes the music sample to be played forwards.
- Number of Times Purged:
  - The number of times the user has purged throughout the day is multiplied by 0.2. This value is used as the level of late reverb applied to the music sample.
  - If the user has not purged that day, there is no late reverb applied to the music sample.
- Number of Heart Flutters:
  - The number of times the user experiences heart flutters (aka heart palpitations) throughout the day is multiplied by 0.1. This value is used as the level of damping applied to the music sample.
  - If the user has not experienced any heart flutters that day, there is no damping applied to the music sample.

Sonification Scheme Notes:

- The average heartrate is between 60 beats per minute and 100 beats per minute.
- The average blood pressure is between 90/50 mmHg to 120/90 mmHg.
- The normal heart rhythm is a sinus rhythm.
  - Abnormal heart rates include bradycardia (slow heartrate), tachycardia (fast heartrate), atrial fibrillation, atrial flutter, and ventricular fibrillation.
- As of writing this, there are 122 different indices in the JSON that can be loaded in the simulator to produce uniquely altered music samples based on their individual parameters.