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CS 4590 Homework 2

Sounds:

* Heartbeat – Pound sound
  + I used the pound sound since it is not very loud but successfully represent the heart beat sound since it is just like in real life. It does not distract the user but yet signifies the rate of the heartbeat.
  + The heartbeat rate ranges from 0.1 to 1 which represents close to a real person’s heart rate.
* Respiration – Pen clicking sound
  + There are two sounds for respiration. Clicking in and out of the pen.
  + Since breathing involves inhaling and exhaling, I tried to find something that is similar, and the pen sound seemed to be a great choice since just like the heartbeat sound, it is not as loud but is still able to signal the user of the rate of respiration.
  + The respiration rate changes from 0.1 to 3 and represents close to a real person’s respiration rate. The time between inhaling and exhaling also speeds up.
* GSR Alert – Beep sound
  + The GSR represents an emotional response which may or may not be important. Thus with the beep sound, it signifies to the user that attention is needed but the content is neutral.
  + The GSR alert will sound when the difference between the respiration and heart rate is greater than heartrate \* 3 +- 0.5.
  + The volume of the sound depends on the difference. The larger the difference, the louder the alert.
* Truth Alert – Announcement sound
  + It sounds like when there is an announcement to make in the cabin of an aircraft. It sounds pleasant and gives a notification that does not sound serious and that there is truth from the person who is being tested.
  + The Truth Alert will sound when the rate of the respiration is close to the rate of heartbeat. The closer they are, the louder the alert.
* Lie Alert – Annoying sound
  + The lie alert uses an annoying buzz which signifies something negative is happening and is loud enough to alert the user that the person is telling a lie. This is important as it has to catch the attention of the user since the purpose of the polygraph is to detect when the person is telling a lie.
  + The lie alert triggers when the difference between the respiration and heartbeat rate is very large.

Sliders:

* Heart beat and Respiration rate sliders
  + The volume slider controls the volume of them respectively.
* GSR, Truthful, Lie sliders
  + The sliders can be controlled manually.
  + They change according to the difference in value of the sliders as mentioned above when the buttons below are clicked on.

Buttons:

* Calm button
  + When the calm button is pressed, the heart rate and respiration rate sliders should move but only within a small range (very low rate).
  + This is because a “calm” person often has low respiration and heart rate.
  + The Truthful alert might sound since the range is very small (both are very low).
* Excited (True) button
  + When this button is pressed, the heart rate gets a random value that is below half the max rate, and same goes for respiration rate.
  + The Truth alert should trigger since the difference between the two rates should be very small.
* Excited (Lie) button
  + When this button is pressed, the respiration rate gets a random low value and the heart rate gets a random high value. Since the difference between the two values is large, it should trigger the Lie Alert.
* Moderate (GSR) button
  + When this button is pressed, the heart rate and respiration rate can be anywhere but still have a medium size gap between them of 0.5 to trigger the alert.

Notes:

Assumptions made:

* Truthful – Both rates are low and are close to each other.
* Lie – The difference between the two rates is huge (1+) (Both the Lie and GSR alerts can trigger at the same time)
* GSR – The difference between the two rates is moderate (0.5)
* Excited (True) – The person is excited and telling the truth when the heart rate and respiration rate increase but to a limited extent (less than half of max rate)
* Excited (Lie) – The person has a low respiration rate but a fast heart rate.
* Calm – Very low for both rates.

The triggers are set in a way so that they only trigger once. They have to be reset in order to trigger again. In most scenarios, it can be done by moving the slider (heart rate and respiration rate) out of range of the triggers. E.g. To reset the Truthful alert, move the rates apart. To reset the Lie trigger, move the rates close to one another.