MOBILE HEALTH MONITOR

Activity Overview

Our heart is one of the most important organs of our body. Blood is pumped to all the parts of the body through the heart.

Measuring the heart rate is useful for several activities like:

- Planning an exercise
- Detecting Blood pressure
- Measuring anxiety levels

The project initiative is to create a heart rate monitor that will measure the heart beats of a person using a pulse sensor and a Genuino 101. We will reflect the graph of our heartbeat live on our mobile app and an LED module which will blink at the same rate of your heartbeats.

SUBJECTS	TIME REQUIRED	AGE LEVEL
Science, Computing	2 Hours	11 - 18 Years

What Shall We Learn?

- How to measure pulse rate and send data through Genuino 101
- How to integrate Genuino 101 with a mobile App.
- How to lit LED based on heartbeats.

Activity Objective

A lot of problems can be solved and detected once we know the heartrate of a person. The objective is to find a way to detect the heartbeat of people and then take measures if required.

Components Needed

These are the components we need to create our heart rate monitor :

Genuino 101

This is the brain of your heart rate monitor it will receive data from the pulse sensor and activate the LED and show the heart rate on your mobile app.

Heart Rate Sensor

It will detect your pulse and send data to the Genuino 101 board.

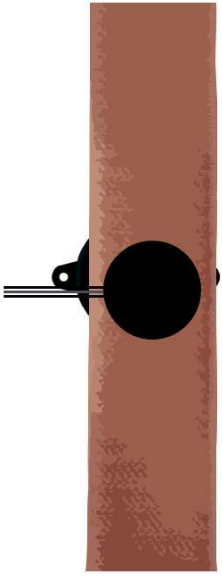
LED

It will blink at the same rate as your heart beats.

Power Supply

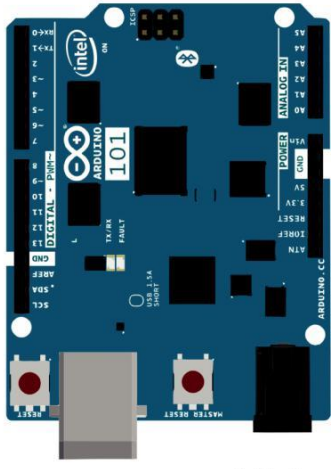
It runs our heart rate monitor.

LED



HEART RATE SENSOR

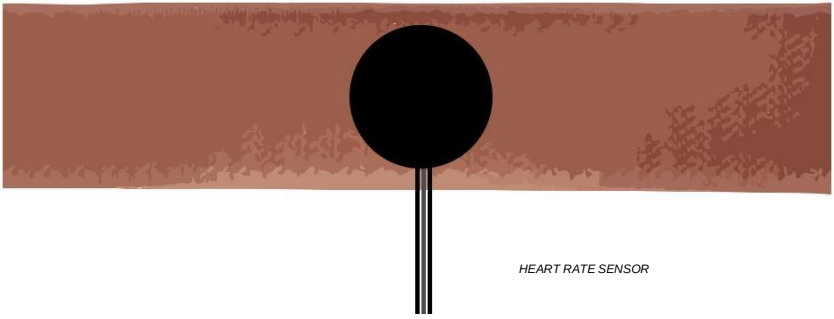
POWER SUPPLY



GENUINO 101 fritzing

Understanding Sensors

The heart rate is measured using a pulse sensor. The pulse sensors measures the flow of your blood and detect the heartbeat.
An Led in the pulse sensor reflects the light through your fingertip and checks the blood flow and measures your pulse on the basis of light reflected through the finger tip.



HEART RATE SENSOR

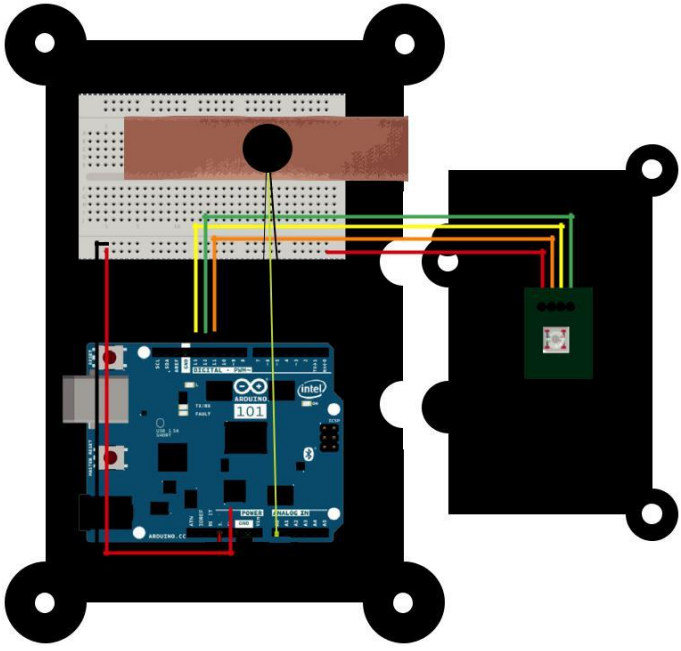
Connecting Your Sensors

We will create a heart rate monitor by assembling and programming our components.

Let us begin by mounting the LED module on the Genuino 101.

Gently plug in the LED module on the Genuino 101.

Connect the Pulse rate sensor with your Genuino 101. There are connectors where you can plug the male wires from your pulse rate sensor.



TOP VIEW

Once we have connected the LED module and Pulse rate sensor to the Genuino 101 we will give it power by connecting it with the laptop. And once the power is connected we shall begin with our programming.

Programming Your Sensors

Download and open the code from *bit.ly/MobileHealthMonitor* and upload the code on your Genuino 101 .

Click the upload button and once your code has been uploaded wear the pulse rate sensor on your fingertip and the LED will begin blinking at the same rate as your heartbeat.

Upload Button
(Top Left)

Connecting Genuino 101 to Mobile App

We will now connect the Genuino 101 with our mobile app using Bluetooth and read our heartbeat graph on our mobile phones.

Set up your Mobile App using the following steps:

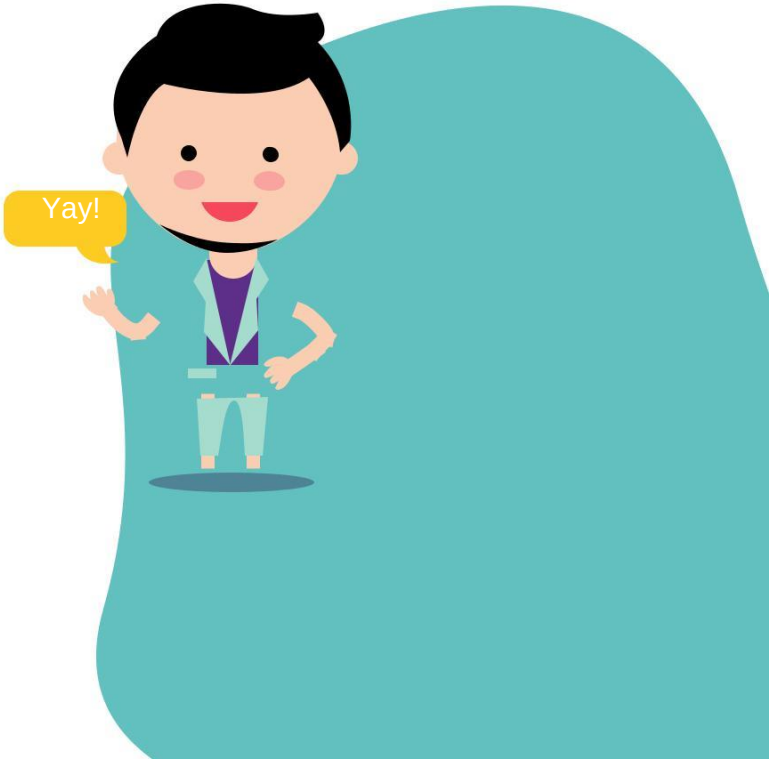
.Turn on bluetooth on your mobile phone.

.Download the nRF Toolbox for BLE app for Android or for iOS.

.Click on HRM button from the icons.

.Then connect to “HRM monitor” by clicking on the connect button.

Yaay! You have successfully made your device.



Model Cretaion

Before we begin with the model creation make sure you have:

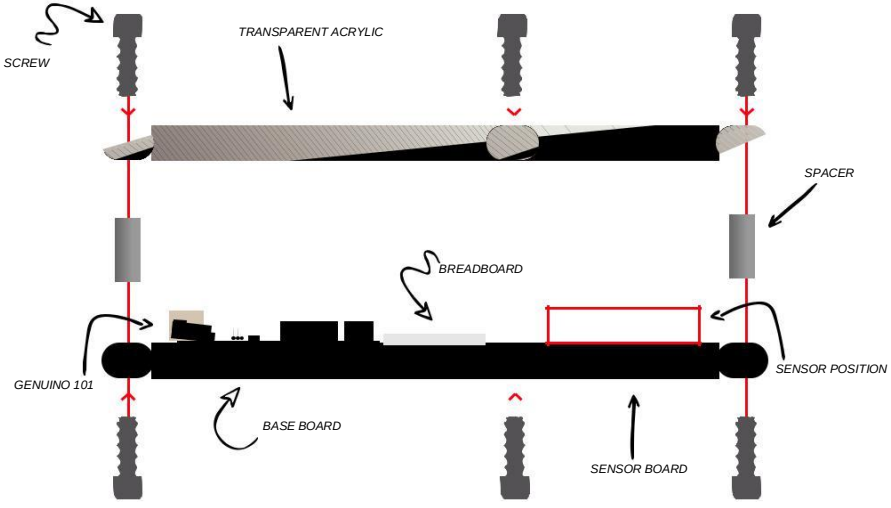
6 Spacers
12 Screws
Transparent acrylic board.

We will now arrange all the components in a case and make it look cool and easy to use.

We will begin by connecting the pulse sensor module to the base module. The breadboard and Arduino 101 are on the base module while your pulse sensor is on the pulse sensor module.
Now insert the spacers on the cutouts which are given in the activity kit and tighten them using the screws provided to you.

We have our modules attached and spacers set up, now gently place the transparent acrylic board on the spacers and tighten it using the screw.

Once everything is ready, ensure all your screws are tightened and your modules are connected properly. It should look something like this:



SIDE VIEW

Impact Analysis

Heart is the engine of our body. If we understand how many times our heart beats in a minute we can use it to detect several diseases and monitor activities like anxiety levels.

An average person's heart beats 72 times in a minute. Imagine we find someone whose heart beats 53 times in a minute it means there is a problem with him and we need to detect the problem.

Future Scope

We can add a lot more sensors to turn out heart rate monitor into health monitor. We can add a Pulse Oximeter which helps us to detect the oxygen level in our blood, or we can incorporate a respiration sensor which gives us the number of breaths taken within a minute.

Think of other possibilities which we can create. Possibilities are endless and so is scope of innovation.