**Health Monitoring System**

**19Z604 - Embedded Systems Lab Report**

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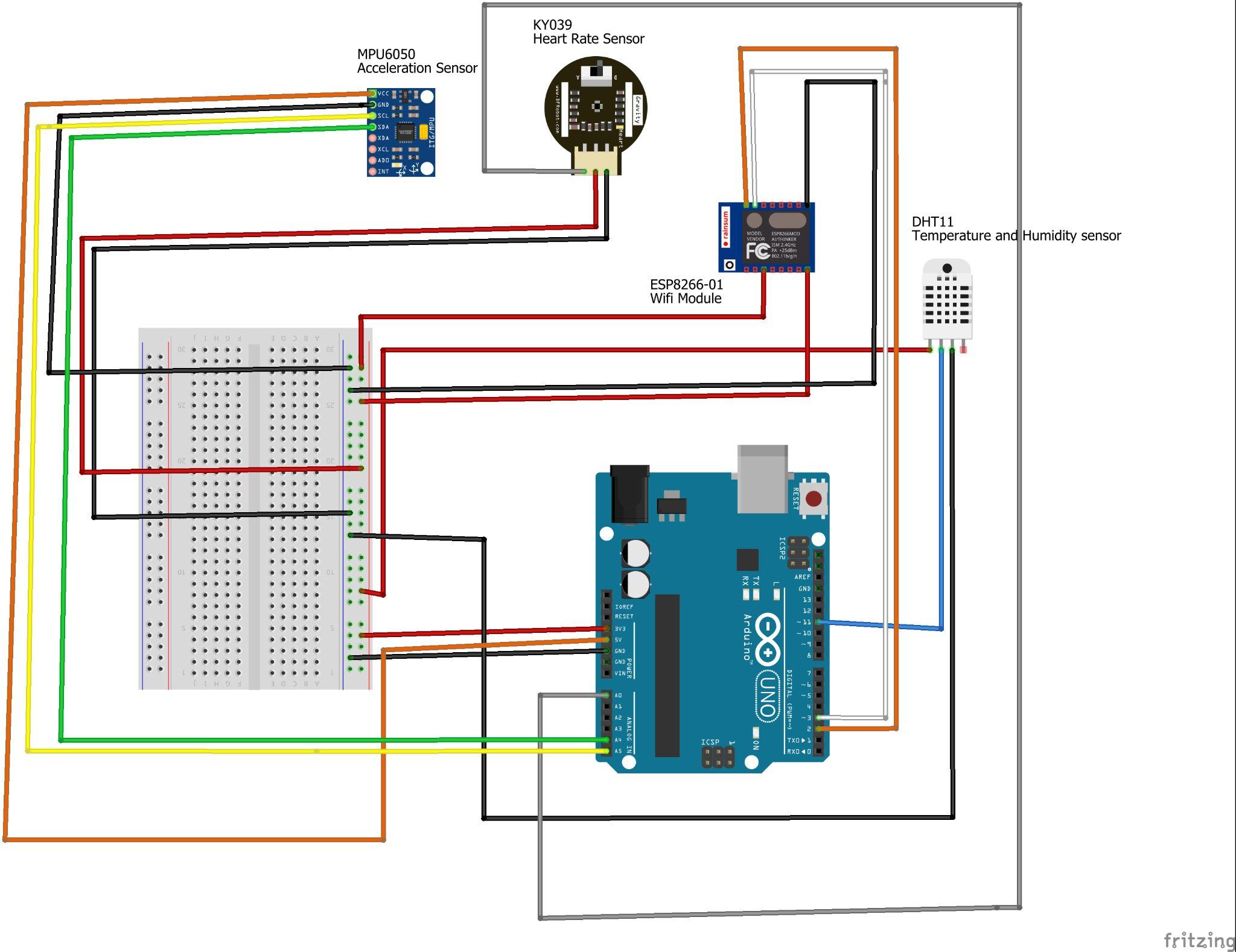
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## **PROBLEM STATEMENT:**

Considering the demographic shift towards an aging population and the escalating demand for continuous health monitoring among individuals grappling with critical conditions, a challenge surfaces in the realm of healthcare delivery. In the current medical field, it is found that healthcare systems are ill-equipped to provide real-time, remote monitoring of vital signs, causing delays in crucial interventions and heightening the vulnerability of patients to adverse outcomes. Furthermore, the inherent complexity and prohibitive costs associated with prevailing monitoring solutions serve to further impede their widespread adoption and scalability.

Hence, there arises an urgent need for the development of an accessible, intuitive, and comprehensive health monitoring framework. This framework must possess the capability to seamlessly track a multitude of vital parameters, encompassing heart rate, temperature, and motion, all the while facilitating remote accessibility and timely intervention by caregivers and medical professionals. By harnessing the power of alert mechanisms, this envisioned system aims to usher in a new era of proactive healthcare management, predicated on early anomaly detection and swift intervention, thereby fostering enhanced patient outcomes and alleviating strains on healthcare resources.

**SCHEMATIC DIAGRAM:**

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*Fig 1: Schematic diagram of Elderly people monitoring system project*

Components used in this project:

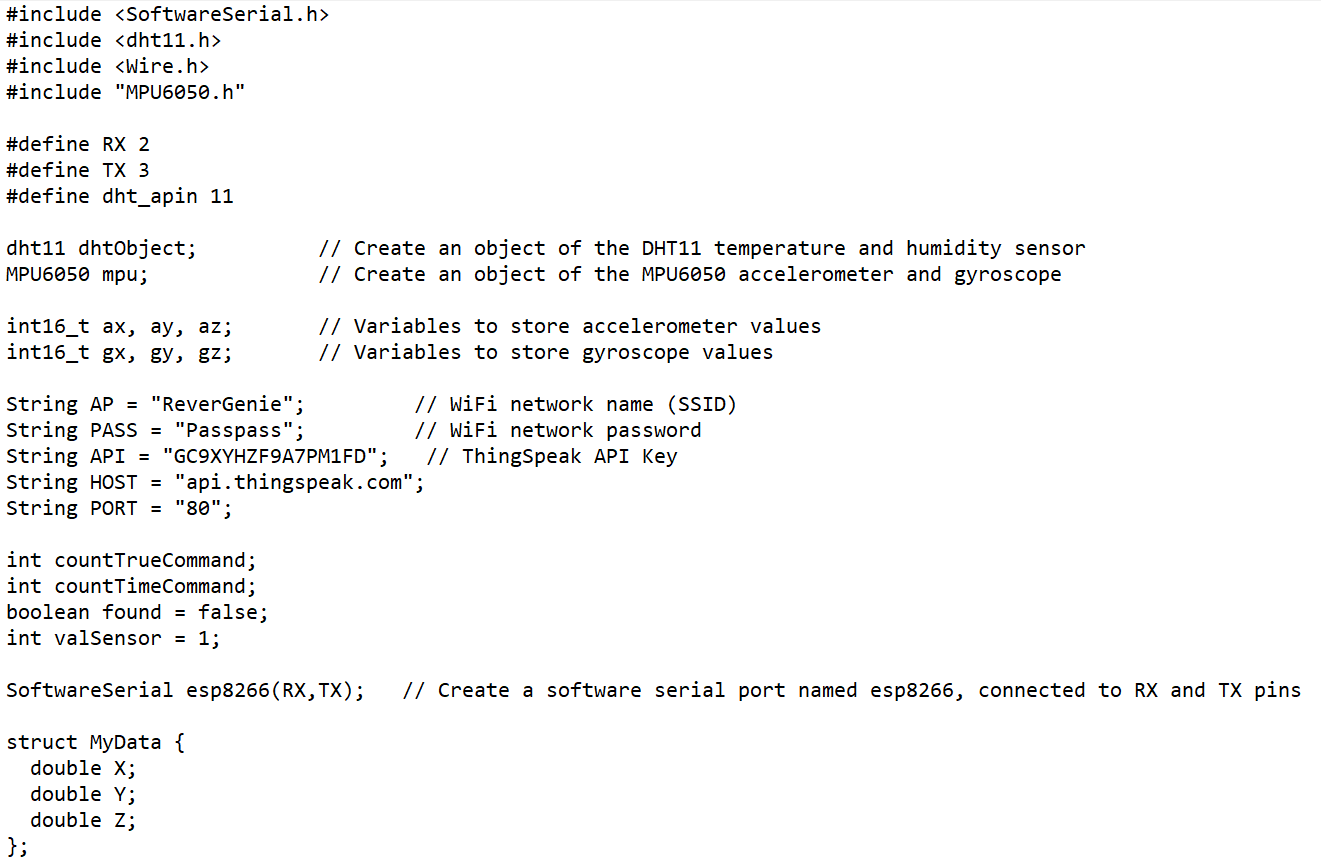
* Communication
  + ESP8266-01 wifi module
* Sensors
  + DHT11 Temperature and Humidity sensor
  + MPU6050 Acceleration and Gyro sensor
  + KY039 Heartbeat sensor

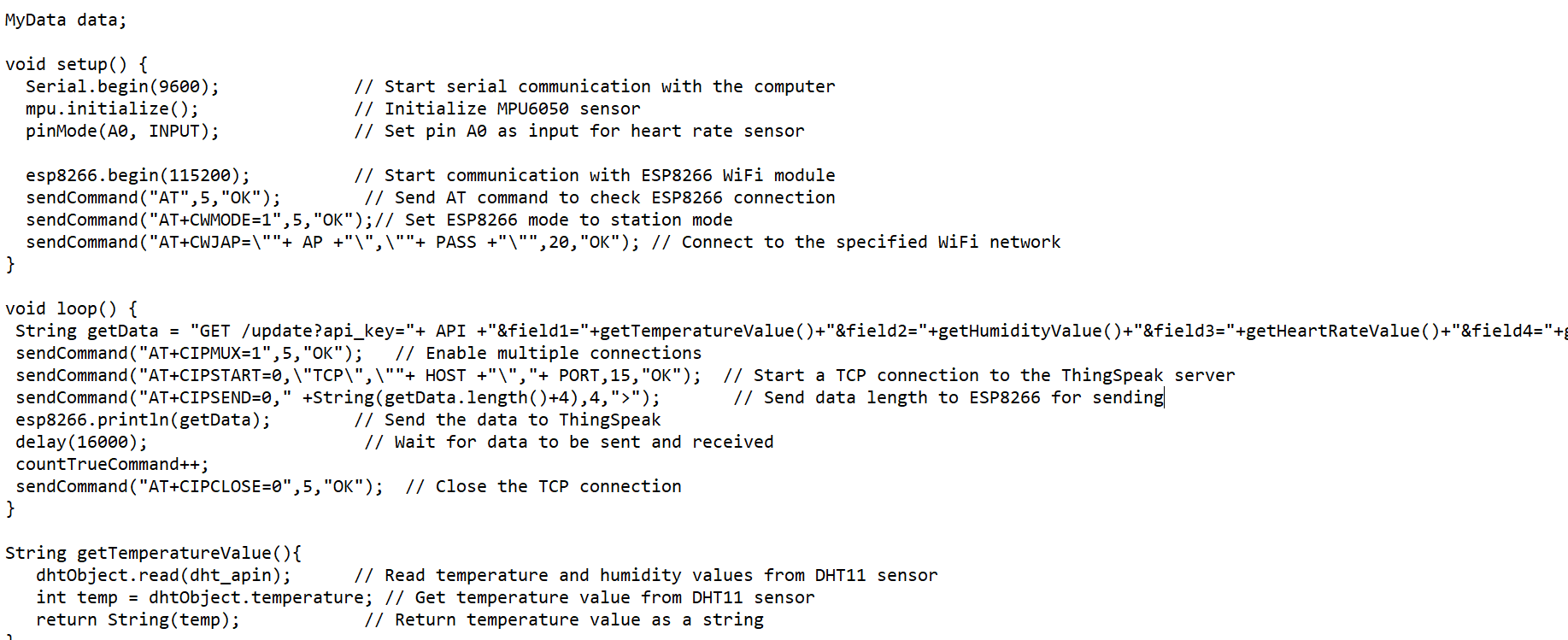
These components are connected to the Arduino Uno board as specified in *Fig 1.* The sensors take the values from the environment and display them in the serial monitor for debug purposes. The data sensed by the sensor is sent to the ThingSpeak server (using the API Write key) which acts as the cloud from where using the API Read key the data is read and displayed in the web interface.

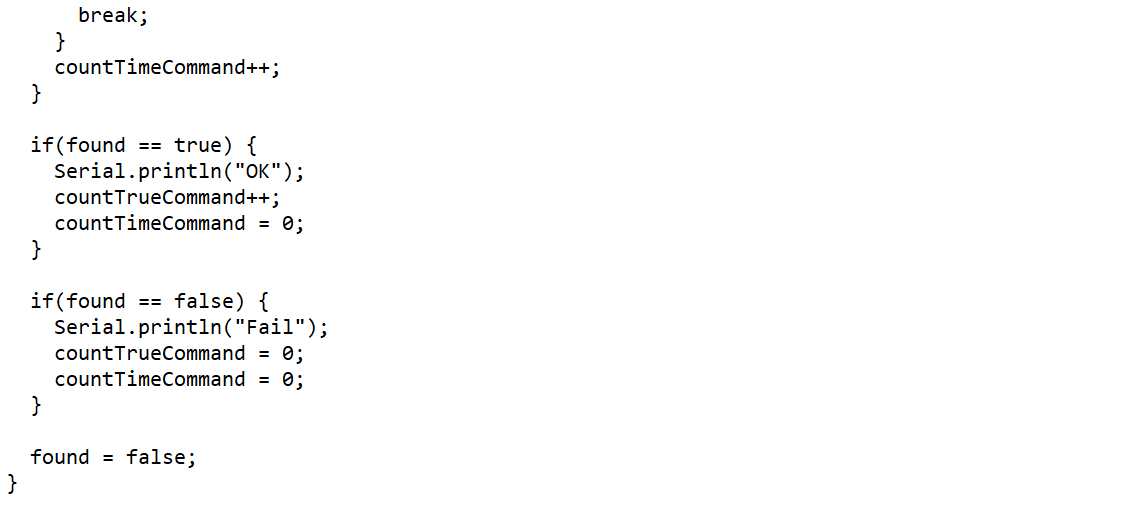
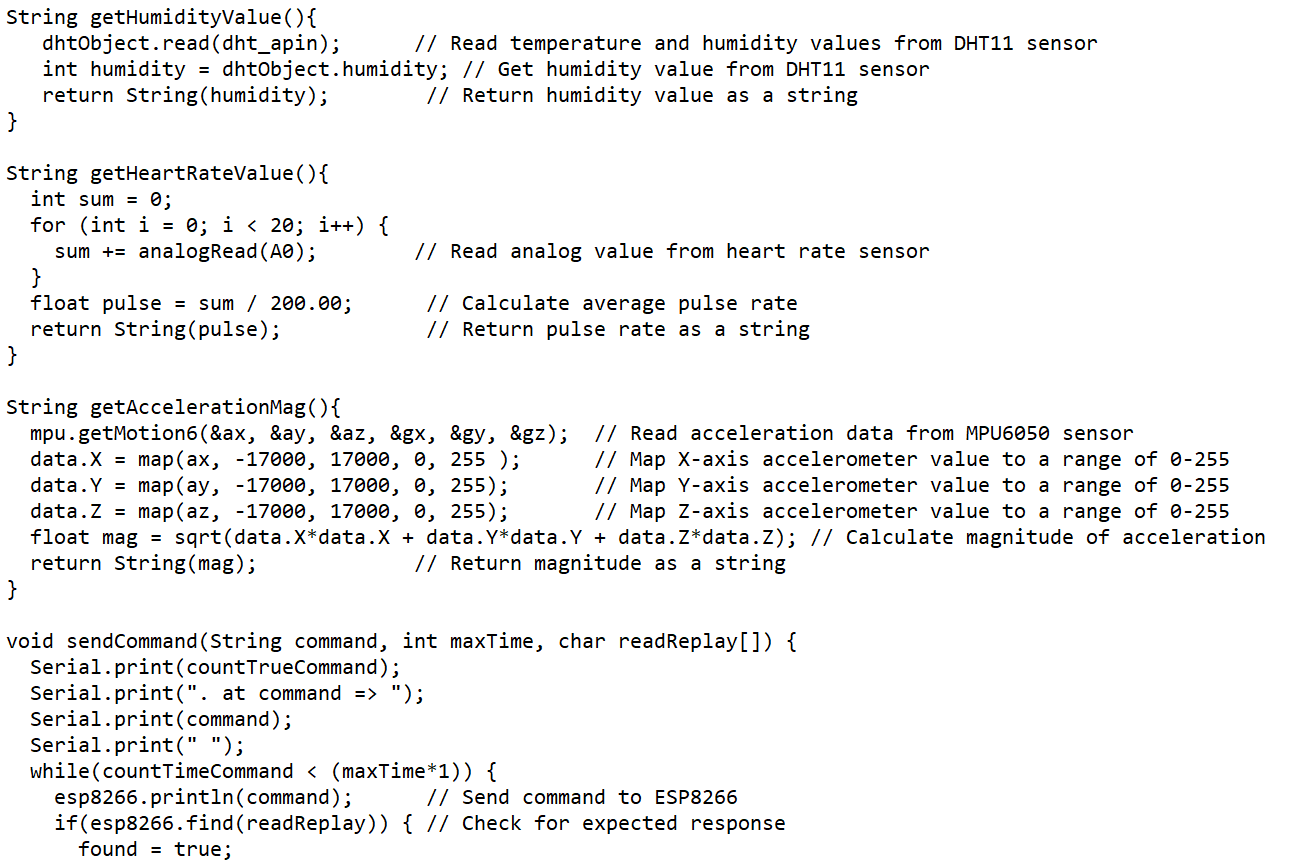
Note:

* Due to the unavailability of the exact components in the Fritzing software, the RHT sensor has been used instead of the DHT, ESP8266 (16 pin model) instead of the 8 pin model, and another Heartbeat sensor has been used in the schematic diagram.
* Any update in realtime data takes a minimum of 16k msec to be shown in the ThingSpeak server.

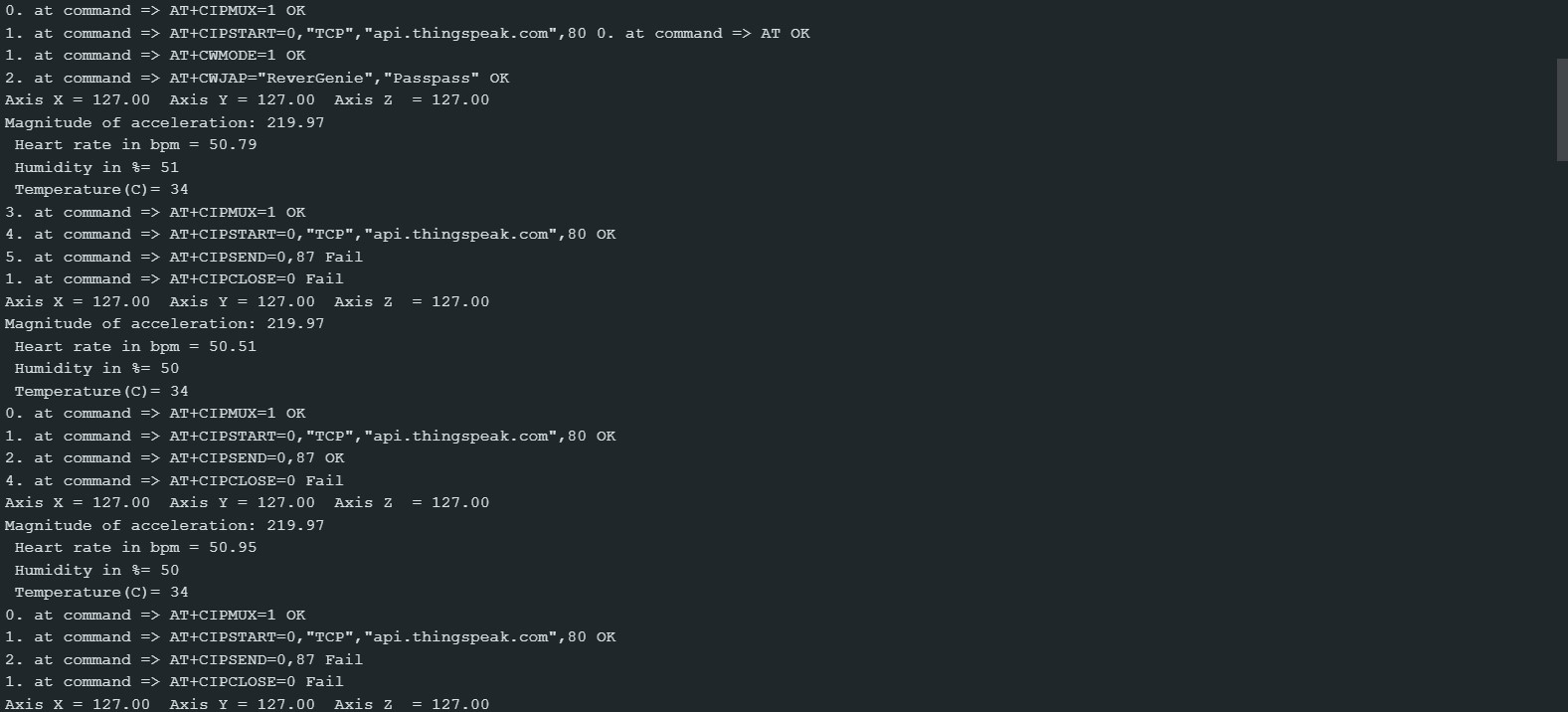
**C CODE:**





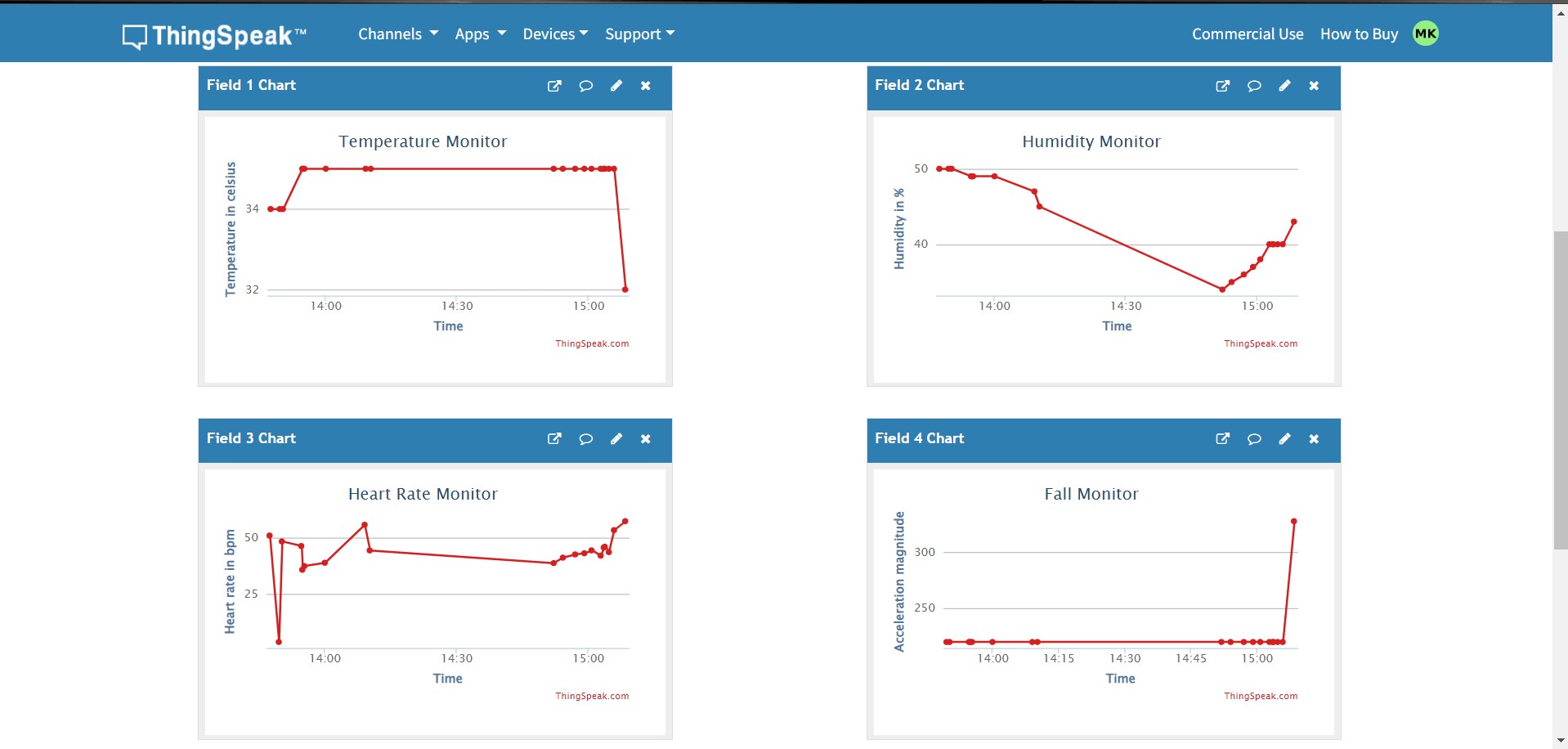
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**PROJECT OUTPUT:**

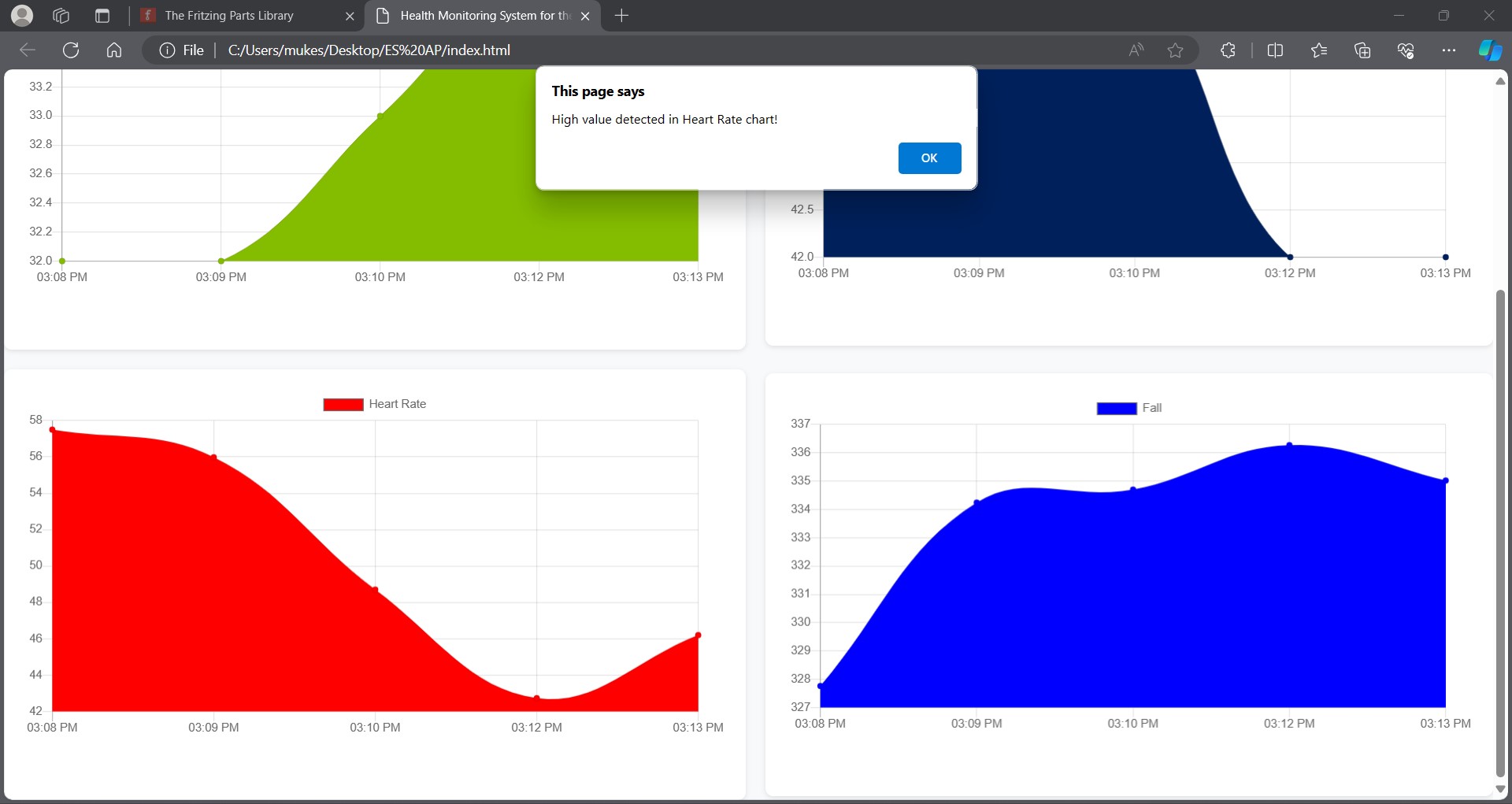


*Fig 2. Serial monitor output for debug purpose*

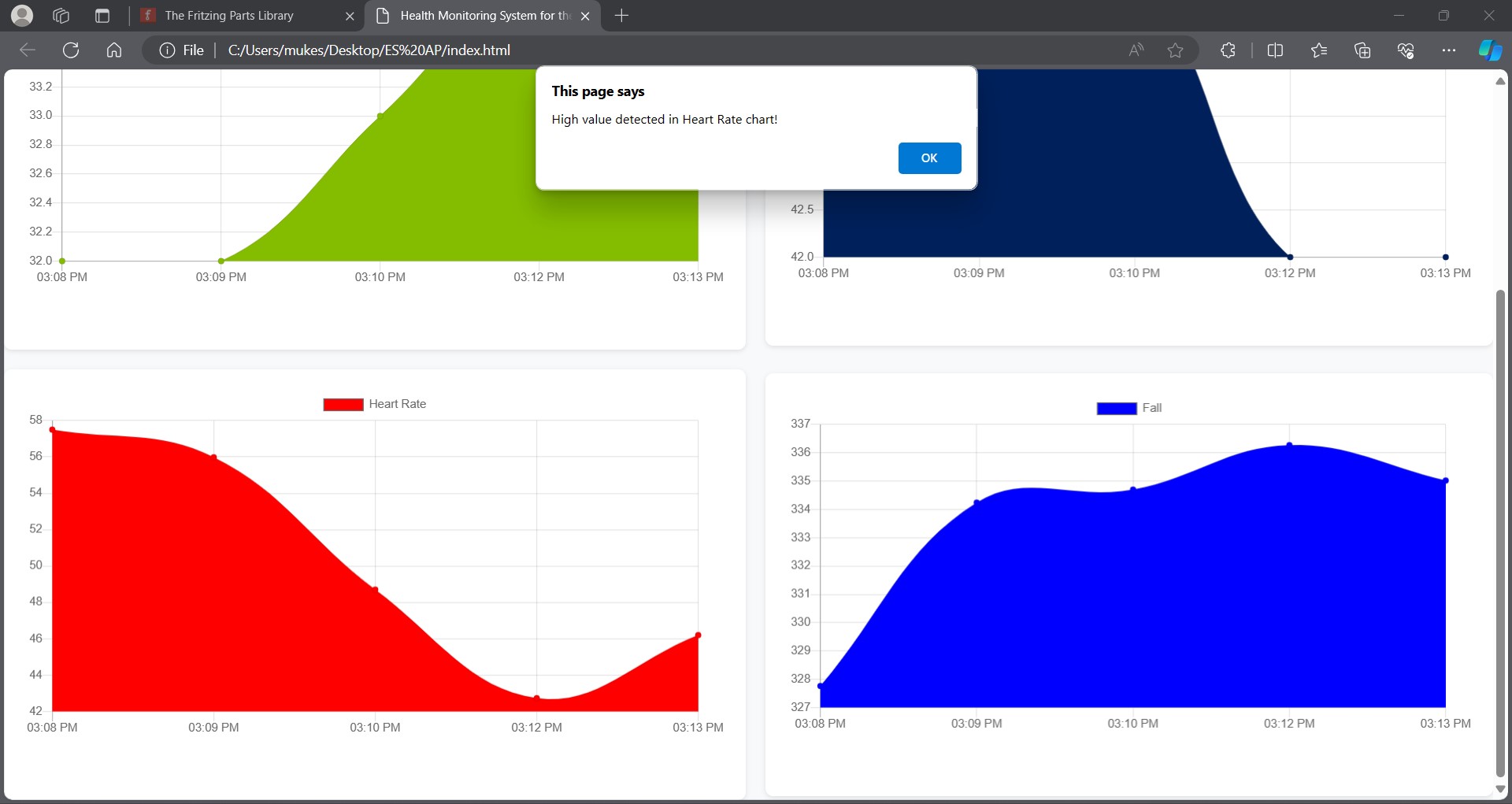


*Fig 3. Serial monitor output for debug purpose*

*Fig 4. ThingSpeak cloud*



*Fig 5. High acceleration alert on web interface*



*Fig 6. High heart rate alert on web interface*