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ECE 342: Junior Design II

Executive Summary

The system is a contactless, intuitive, miniature body temperature scanner. It is operable by any phone via a remote website accessed by a QR code. From there, the user can enter a desired unit of measurement, enter a unique ID (such as their ONID or employee number), and activate the scan. While the reading is progressing, the user can view their readout on the OLED screen, and they may receive an audiovisual warning of a fever. After this process is finished, all recorded temperatures are viewable by anybody on a public database.

The project's backbone is an Arduino Nano microcontroller, in communication with a Python database handler working in conjunction with a remote Debian server that hosts the website. The external database is held on a Google Sheets document that is accessed via APIs from both the Debian server and the Python script. This system is built to be powered through a USB connection on a local machine which would allow the serial communication of data between the remote server, the database, and the device.

The highlight of the project is the implementation of the QR code and the communication between the website, the database, and the device. It was simple to use the different electronic components (ie. infrared sensor, OLED display, Arduino Nano) because they were relatively close to plug and play. The last component to be set up was that key connection between everything. APIs played a big role in allowing the remote server, Google Sheets file, and Arduino Nano to communicate with each other.

On another note, the project did have plenty of obstacles and things that would be changed in a later revision of the device. Some of the components that we selected for the project were relatively cheap, but simple to set up. For example, with the OLED display (SSD1306), we had at least three burn out during the course of the project. The infrared temperature sensor (MLX90614) was also a component that had to be replaced twice because of very odd readings and a limited range of accurate reading. To be accurate, our project required the user to be within 1 to 2 cm of the temperature sensor which could be inconvenient. An upgrade to the project would be to use a Raspberry Pi instead of the Arduino Nano and to implement a wireless transmission of the data instead of using wired serial communication.

Time Report

Our group used a Gantt chart on our shared drive that allowed us to keep track of each teammate's contributed time. We usually worked on the project together and had regular meetings in the library. This along with our organization of tasks, our team was able to keep the contributed hours relatively equal. The figure below shows a snippet of the Gantt chart that we used, and the hours spent on each step.

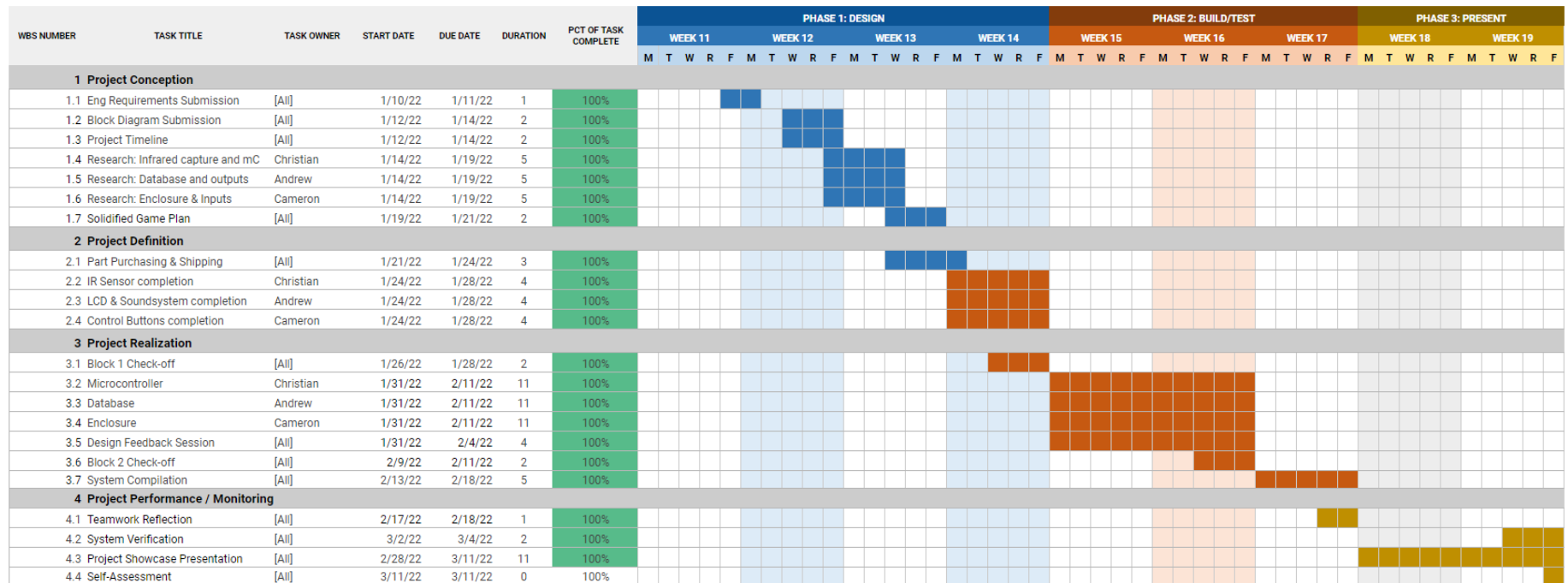


Figure 1: A screenshot displaying the hourly contributions of each member from our team's Gantt Chart.