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Project Preliminary Report  
 Our project is using voice control technology via smartphones to change LED states (ON/OFF) by using both a 1SHEELD module as well as a Arduino UNO microcontroller. The 1SHEELD module allows for the communication of this microcontroller and a smartphone voice control application so that LED’s, as well as other hardware components such as sensors and motors, can be controlled with such devices. Furthermore, our expanded goal for the project is to not only change LED states, but to eventually branch out and use more hardware such as sensors (with the 1SHEELD module) so that other tasks such as security alerts by, for example, an opening door, can be created and tested in this project.   
The applications of this project constitute what is referred to as Smart Home technologies and has a very high demand in modern society. Most households in our society are starting to use more and more Smart Home appliances (if not already) and this trend will continue for the unforeseeable future due to more and more technological innovations and the need for easy and convenient devices that are useful for everyday, common people living in houses. Therefore, I chose this type of technology for my project as I thought that it would have real life use and would be applicable to the industry of future embedded systems.   
 My objectives and learning outcomes, which are covered below, are similar and overlap for this project: So far, over the past week, my partner and I have been setting up the 1SHEELD module to communicate and interface with the Arduino UNO. First, we set up the Arduino IDE and configured the UNO board. After this, we got 1SHEELD up and running and was able to connect and communicate with the Arduino. We also were able to download and install the voice control application on a smartphone, and afterwards connected the 1SHEELD with the smartphone application.

All of these tasks cover my learning outcomes and objectives, because I wanted to learn more about Smart Home technologies and use the wireless technologies such as Bluetooth, which is already implemented in the libraries of the 1Sheeld module, to connect different embedded system devices. Another personal goal of mine for this project was to use different types of functionalities with hardware such as voice control with LED’s, as well as sensor control, to solve some Smart Home problem or make an every day task simpler. I believe so far this project has accomplished many of these objectives based on all of the knowledge I have learned so far.

Despite all that my partner and I accomplished so far with this project, there were still some significant difficulties we encountered. First, the Arduino UNO board is completely new to us and is based on the ATmega328P. This is different than our original AStar ATmega32U4 board, so it took a lot of time and research using the data sheet and online references to figure out how to configure and set up the UNO board. Furthermore, the 1SHEELD module has many different libraries and it was trial and error before we found the right set up and libraries to use for the interfacing between the UNO and 1SHEELD devices. Lastly, it took a little while troubleshooting the voice control 1SHEELD application on the smartphone to connect with everything as well.

Nevertheless, we have learned a lot and hope to work with LED’s and sensors this coming week to explore our Smart Home technology goals for this project. This means that we will begin to test out and write the specific code to accomplish these tasks. Once we can get the LED voice control to work correctly, we can explore and expand our goals to other Smart Home device functionalities such as door security, music playing, color detection, etc.