

LAB 5

Group 7:

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Implemented Commands:

“turn on” – turns on display, and shows time
“turn off” – turns off display
“show time” – shows time
“show string [my_string]” – displays the string my_string on the OLED

ESP8266 Development:

Displaying the time is handled the same way as in Lab 3. We define a “My_time” class that contains the necessary parameters and methods to store, increment, and display time. In this lab, we add a boolean value, “display_time”, that is passed into the callback function update_time(). “display_time” determines whether or not the current time will be displayed. Time is incremented regardless of whether or not it is displayed.

The device connects to the “Columbia University” wifi network, and establishes a TCP server, based off of the example in the Micropython documentation. Requests and responses are encoded in the application/x-www-form-urlencoded media type. The parse_command() function takes the request and extracts the necessary parameters: “command” and “string”. “command” is passed through a series of if/elif statements to determine the how to execute the command. The value “status” is 1 if a command is successfully executed, and 0 if no command was executed. A reply consists of the HTTP status code, and a json object that contains the interpreted command, and “status”.

References:

----- Micropython TCP Sockets:

https://docs.micropython.org/en/latest/esp8266/esp8266/tutorial/network_tcp.html#simple-http-server

HTTP Status Codes:

https://en.wikipedia.org/wiki/List_of_HTTP_status_codes

HTTP Responses:

https://www.tutorialspoint.com/http/http_responses.htm

Percent-encoding:

<https://en.wikipedia.org/wiki/Percent-encoding>

Android Development

When the ESP8266 sever is open, the text transformed from the Google API should be sent to the server. In this case, `URLConnection()` is used to send the strings to server, and it can also receive the responses from the server. This method appends the message to the url. To correctly format the command for the smart watch, application/x-www-form-urlencoded format is used.

References:

Speech API Samples:

<https://cloud.google.com/speech/docs/samples>

Android Docs Samples

<https://github.com/GoogleCloudPlatform/android-docs-samples>

Android Networking Training

<https://developer.android.com/training/basics/network-ops/connecting.html>

Android HTTP POST Tutorial

<https://www.youtube.com/watch?v=ryY7Dy3z-7Q>

Android Basic Networking Sample

<https://github.com/googlesamples/android-BasicNetworking/>