Practice Set 1 – Let me, “ASCII” ya name!

Flavor:

Student A: “Why is the microwave not starting?”

Student B: “Dude, look at the display, it says 67 76 79 83 69”

Student A: “What? No it doesn’t – it says CLOSE.”

Student B: “Yea, that’s what I said.”

They are everywhere: seven segment displays. From alarm clocks and microwaves to radios and stoves (some cases the movies =\). Seven segment displays are used by hardware to reach out and contact us – to let humans know what might be or what is about to happen.

Assignment:

Your assignment is to create an array of chars that contain the UPPERCASE ASCII equivalent of your name. For example, “CHRISTOPHER”, would be: {67,72,82,73,83,84,79,80,72,69,82}.

Afterwards, you’ll pass the array to a function, whereby iterating (looping) through each individual char. Each char will then be fed into another special “helper” function called write7\_alpha() – an arduino50 library (kind of like cs50 library) function built to easily display characters on a seven segment display.

You will also be asked to do the same using an array of numbers, but this time, you will be using the write7\_digit() function to display a numerical digit, zero through nine.

Inventory:

1 Arduino Uno

1 USB

1 Breadboard

1 Seven Segment LED

11 Jumper Cables

Schematic:

Library Reference

pinMode()

delay()

Instructions:

1. Download the Arduino50 library from the reference page.
2. Inside of the home folder, there should be a “sketchbook” directory. Inside the sketchbook directory, there should be a “libraries” directory. If there is no libraries directory, create one by opening the terminal and typing <i>mkdir ~/sketchbook/libraries</i> .
3. Once libraries folder is created, unzip the Arduino50 library by either double clicking on the downloaded file in the GUI or using the terminal’s unzip command: <i>unzip ~/sketchbook/libraries/Arduino50v1.zip</i>.
4. Assuming you have built your schematic already, based on the images in the Schematic page, download the available Sketch in the “Sketch” directory and open it.
5. The first //TODO asks you to create two #defines (pound defines or constants) to avoid “Magic Numbers”. You should create one for the length of the name array and one for the length of the numbers array. Make the constant names' CAPITAL so folks can easily identify it: For “CHRISTOPHER”, I would have something like: #define NAME\_LEN 11
6. The second //TODO asks you to create an array of UPPERCASE chars, using your name. If you haven’t already, go to <http://www.asciitable.com/> to figure out what your name is in ASCII.
7. When you are done, you should have something like: <i>char name[NAME\_LEN] = {67,72,82,73,83,84,79,80,72,69,82};</i>
8. The third //TODO will ask you to do the same, however, this time with numbers. You should be able to get that one on your own =).
9. The fourth //TODO asks you to set up the pinMode() for all the pins that you will be sending OUTPUT to. Hint: You’ll need to call this 8 times – for now, you don’t need to use a loop or anything.
10. The fourth and fifth //TODO asks you to pass your array to the relevant function. For instance, because I called my name array, “name”, it would look like the following: <i>showLetters(name);</i>. You should do the same with the showNumbers() function too, but instead of the name array, use your numbers array.
11. The sixth and seventh //TODO asks you to loop through the letters array, accessing each individual char and then passing it to the write7\_alpha() function, which takes a char as an argument. <b>Remember! You’ll need to set a “delay(1000)” right underneath this function else we won’t see everything display one at a time.</b>
12. The eighth and ninth //TODO ask you to do the same as above, but this time for the showNumbers() function. And, instead of using write7\_alpha(), you’ll instead use write7\_digit(), which takes an integer argument.

Sketch: