**Lab 1**

**Basic Inputs and Outputs**

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**Part 1**

Text

Description automatically generated

A picture containing text

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**Part 2**

Text

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A screenshot of a computer

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**\*\*After completing this question you showed us how to use Python callback functions - no more while loops!\*\***

**Part 3**

Text

Description automatically generatedA picture containing text, electronics

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YouTube link - <https://youtube.com/shorts/HFdowc_YBH4?feature=share>

**Critical Reflection**

IoT devices can be used in many ways and come in many forms. Receiving input and using that to control outputs can have large implications for automation control systems, infrastructure control systems and, of course, the security of those systems.

I had limited knowledge of current, voltage and resistance due to previous electronic experience; but this lab made things much clearer(eg. voltage differential causes current flow). I also had very limited experience with GPIO on the RPi from Semester 2, but this lab gave me more experience manipulating I/O devices (buttons, switches, LEDs, resistors).

Some problems I encountered in P2 was getting my program to run continuously while also being able to accept input signals at any time. My first solution to this problem was to move the conditional statements outside the while-loop, which failed. Then I devised a conditional statement inside the while-loop that would only print my chosen statement the first time the conditional met, reducing output to the terminal, and allowing for a much cleaner appearance. After solving the problem in this manner, you introduced me to callback functions, and I used that solution in P3(so much better!). I also had a problem in P3 using variables in different functions, but Jack Chen showed me how to make a variable global in Python, allowing me to use it to time from button press to release and print the button-depression time.