Objective

The purpose of this lab is to implement logic functions in a real circuit by using the GPIO pins on our Raspberry Pi. The tactile switches act as the input to the logic gates while the LED wil react to your implementation.

Pre-Lab

1. Logic Statement- if (conditions) then (something true/false)
2. Logical Inverse- type of conditional sentence which is an immediate inference made from another conditional sentence
3. Logic Complement- an operation that takes a proposition p to another proposition "not p", written ¬p, which is interpreted intuitively as being true when p is false, and false when p is true.
4. Truth Table- a diagram in rows and columns showing how the truth or falsity of a proposition varies with that of its components
5. if-then-else statement- compares two or more sets of data and tests the results. If the results are true, the THEN instructions are taken; if not, the ELSE instructions are taken
6. python “print” function- Directly shows the phrase, word, letters, numbers, etc after running code

A	B	A AND B
0	0	0
0	1	0
1	0	0
1	1	1

A	B	A OR B
0	0	0
0	1	1
1	0	1
1	1	1

A	B	A XOR B
0	0	0
0	1	1
1	0	1
1	1	0

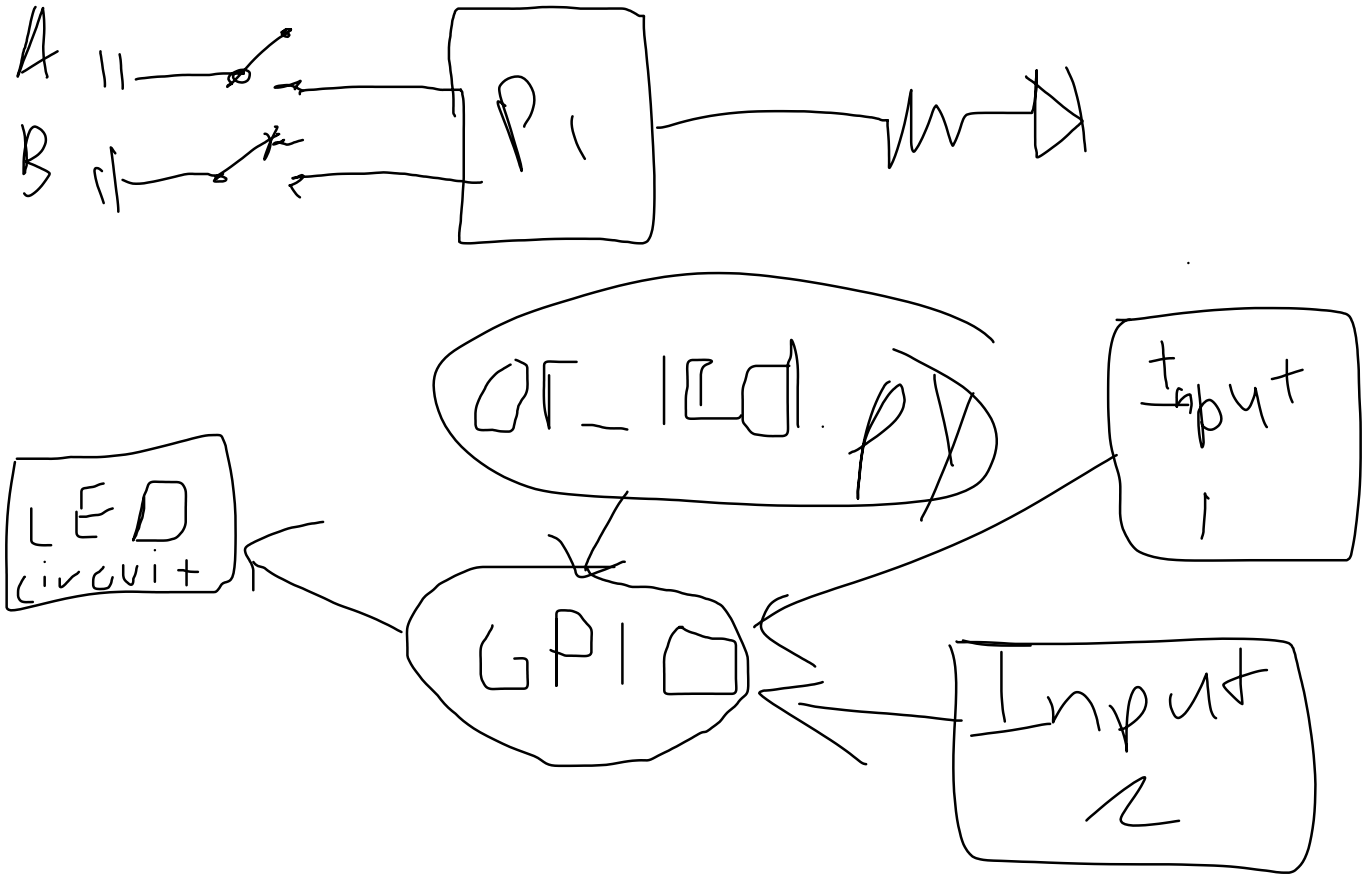
A	B	NOT[A AND B]
0	0	1
0	1	1
1	0	1
1	1	0

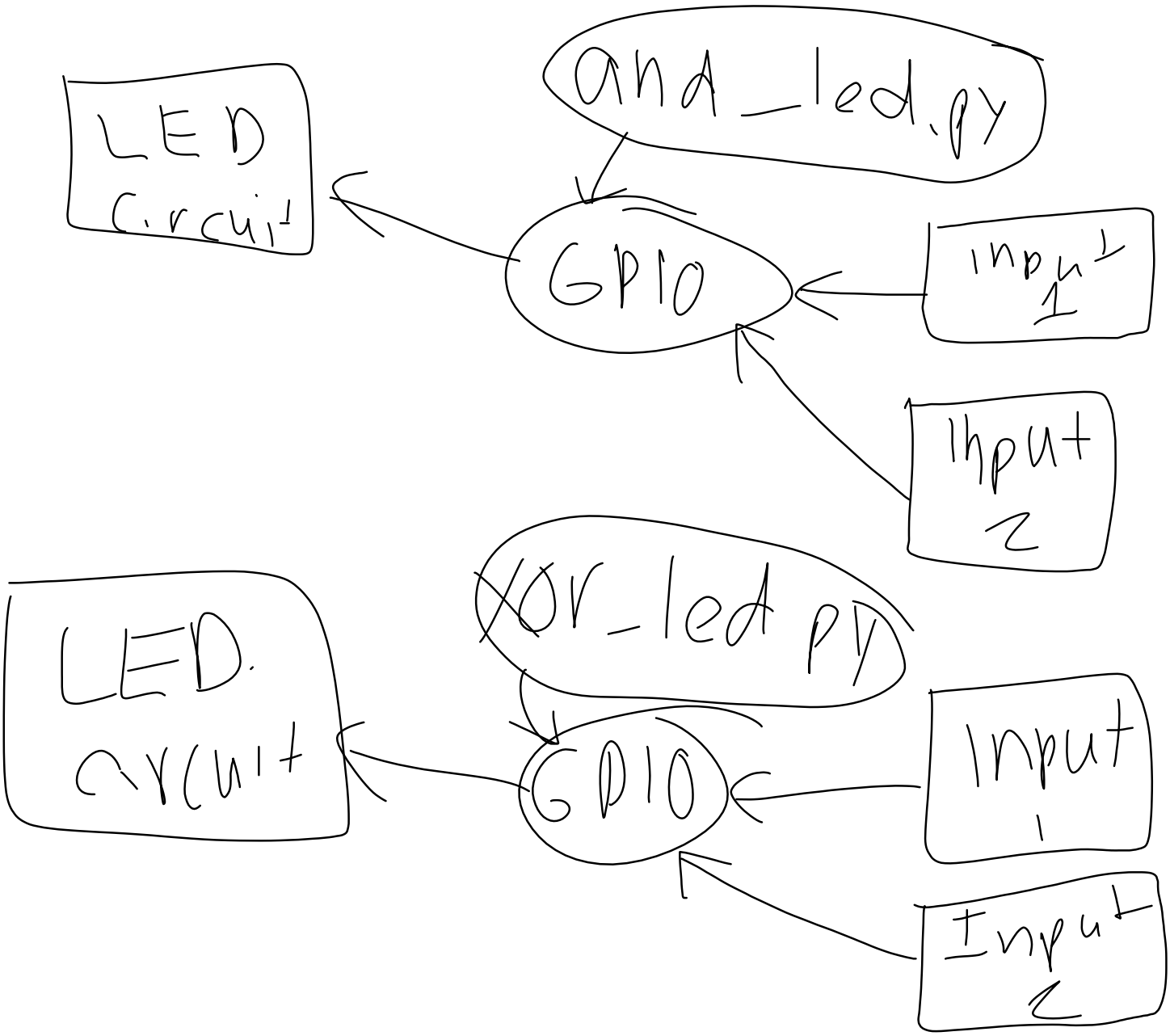
A	B	C	A AND B AND C
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

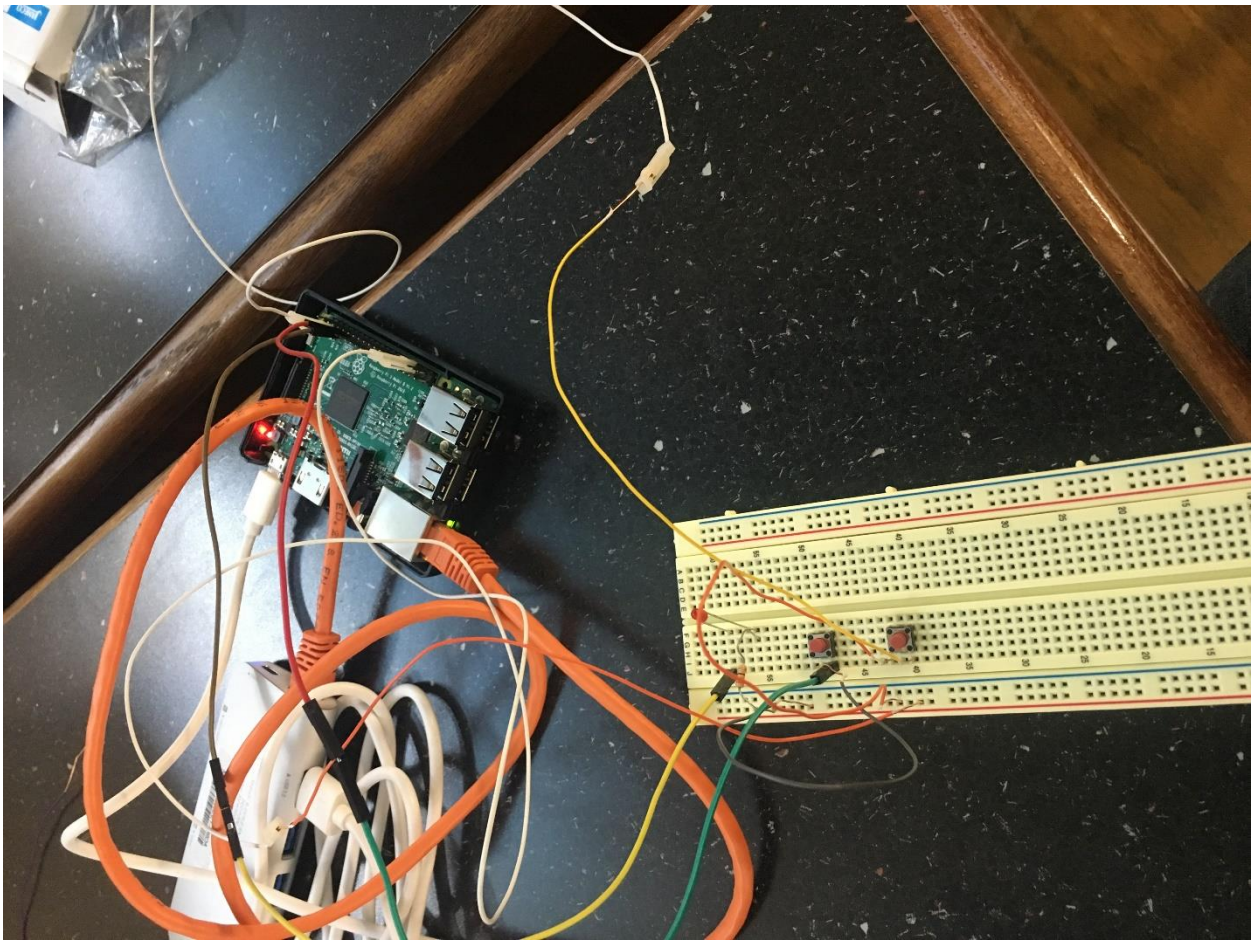
Procedure

1. Set up the circuit.
2. Open your code through your raspberry pi and edit your code to implement a certain logic gate using correct syntax. One for or and one for and.
3. Run Code and Test the switches to see if the LED correctly reacts with the binary states.

Data/Pictures/Schematic/Block Diagram




and_led.py
LED
Circuit
GPIO
input
1
Input
2
XOr_led.py
LED.
cyclit
GPIO
Input
1
Input
2



Conclusion

To implement a logic gate, you need to make sure everything is precise. One wrong wire in the circuit or one wrong line of code will mess throw the raspberry pi off and the led wont work. Patience is key when creating code while debugging is your friend. Since I do not know much about python, it was mostly trial and error until I could figure it out. The software and hardware must work together to successfully achieve the specific outcome. By putting our circuit analysis as well as our logic computation, we could program our pi to turn on the LED when either switch was pressed or when both had to be pressed at the same time.