Log Book

Activity 1:

1.1

- Voltage behavior at input:
  - When the button is not pressed, the input pins are 5V because the pin are now connected to the Voltage Source
  - When the button is pressed, the input pins' voltage is 0V because the pins are now measuring two pointes between the button, with no connection to the source.
- Voltage behavior at output:
  - If no button is pressed, out put's voltage is 0V.
  - If either or both buttons are pressed, the output's is 5V.
  - It's an OR gate.
- Summary: It is pull-up configuration because it "pulls" the input voltage up to 5V(equal source) when the button is not pressed(default.)

1.2

- Voltage behavior at input:
  - When the button is not pressed, the input pins are 0V because the pins are connected to ground and not through V source.
  - When the button is pressed, the input pins' voltage is 5V because the pins are connected through V source through pressed buttons.
- Voltage behavior at output:
  - When both push buttons are pressed, the output shows 0V
  - When either of none of the button is pressed, the output is 5V
  - It is an NAND gate
- It is the "pull-down" configuration because the input voltage is pulled down to 0V when the buttons are not engaged (not pushed).

1.3

- Pull-up: resistors connect gate's inputs to source, hence the default signal is High
  - Pull-down: resistors connect gate's input to ground, make the signal Low

- Due to different signal output, it is based on purpose of use to implement whether pull-up or down configuration:
- Record button behaviors –> Pull down
- Pause the flow of current upon pressing button -> Pull up

Activity 2:

2.1

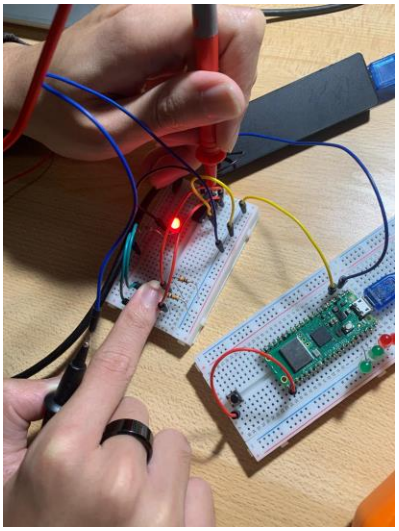
$V_{forward} = 2V$

$V_R = 3V$

$I_{branch} = 9mA$

2.2

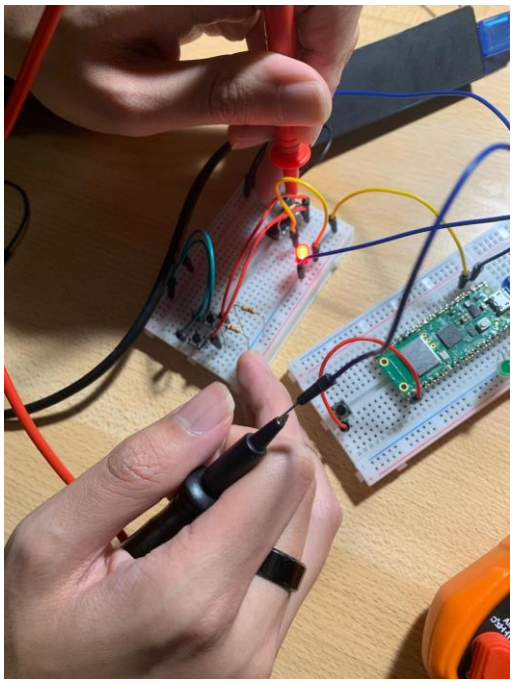
- The LED on when the output of the NAND gate is true because the LED is fed directly by the output of the gate, so it will be lit when the signal output of the gate is high (1 or true).
- $V_{out} = +5V$ $I_{LED} = 9mA$ move the R3 side and toward ground side.

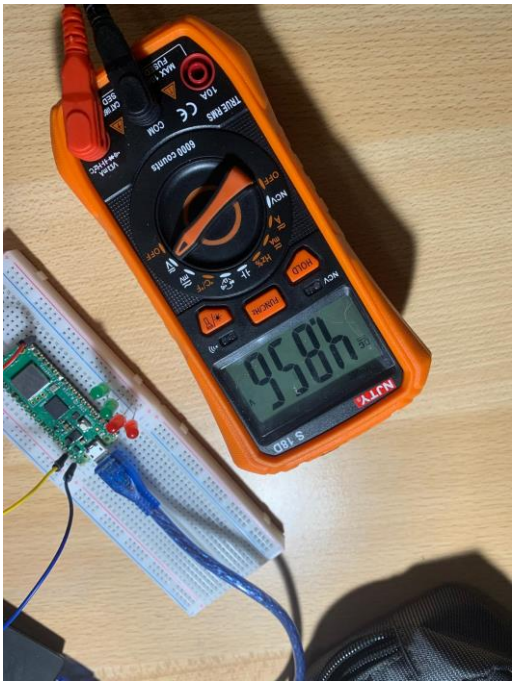


2.3

- The LED on when the out put of the NAND gate is low due to the fact that the output pin with act as a ground pin it self when the signal of the gate is low, which let the current flow through the LED

- V_{out} = 0V I_{LED} = 9mA current goes from resistor side and toward the output pin of the logic gate





2.4

- The main difference is the role of the gate's out put pin: in 2.2 configuration, it acts as a source of power that light the led whilst in 2.3 configuration, the pin is ground, sinking the current.