CSE 223

LAB 4

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Lab partners: Anh Vo, Ri Zhang, Samuel Serea

Introduction: In this lab, we will continue to play with the Raspberry Pi and Java program. That is making a simple circuit and write code to detect when a (physical) button has been pressed. In the experiment in this lab, we used a physical button plugged into the port 14 (ground) and the ports 16 (GPIO 5). Besides, we need to use a multimeter first to be sure you're connecting the proper switch contacts.

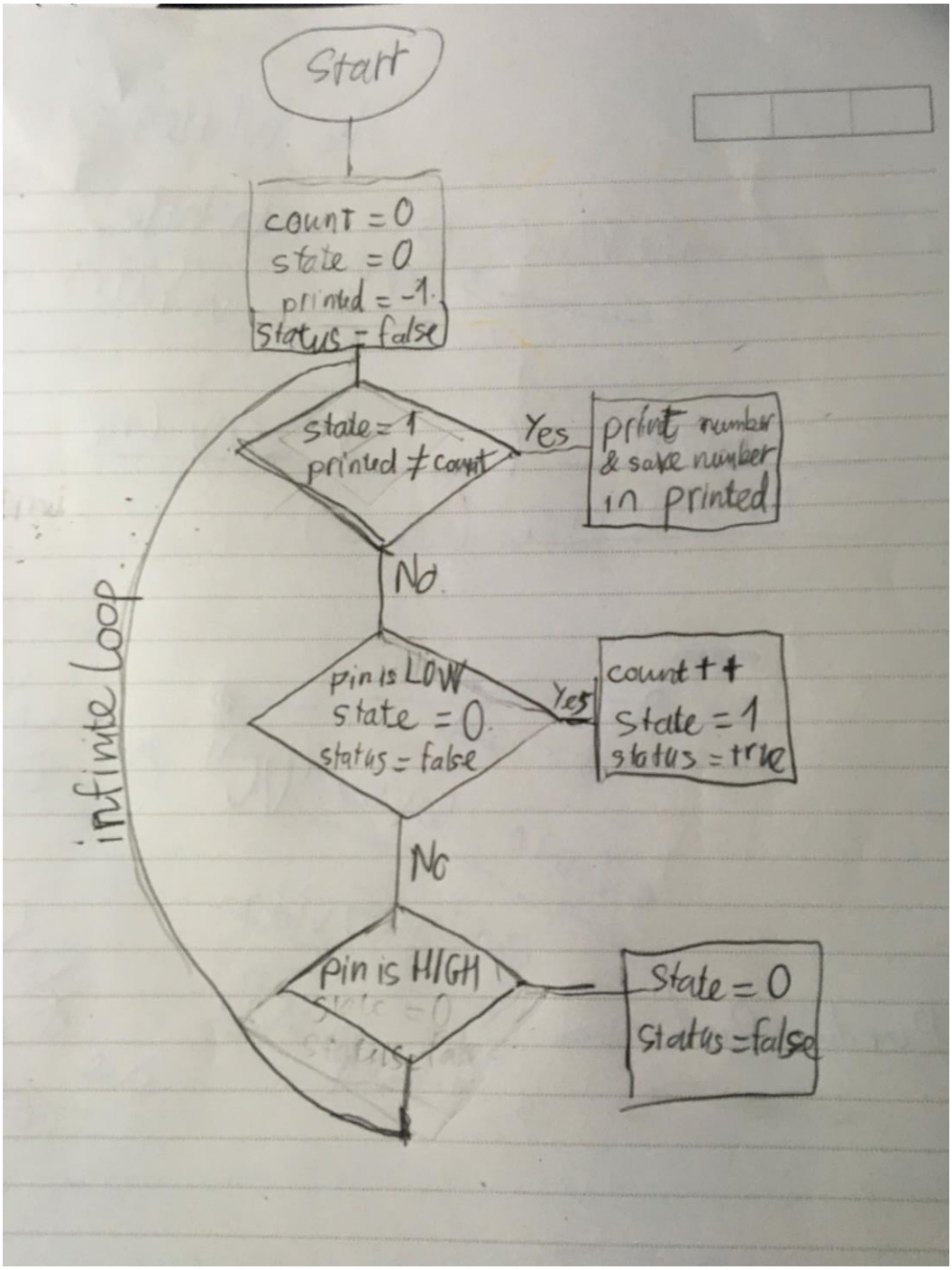
Equipment: USB Raspberry Pi, jumper wire, button, and proto board.

Experiment: In this experiment, we will write the program to detect the button. It will count the number of button presses, and, each time the button is pressed, print that number of presses. This thing requires repeatedly reading the state of the switch from unoppressed to pressed and incrementing and printing a counter.

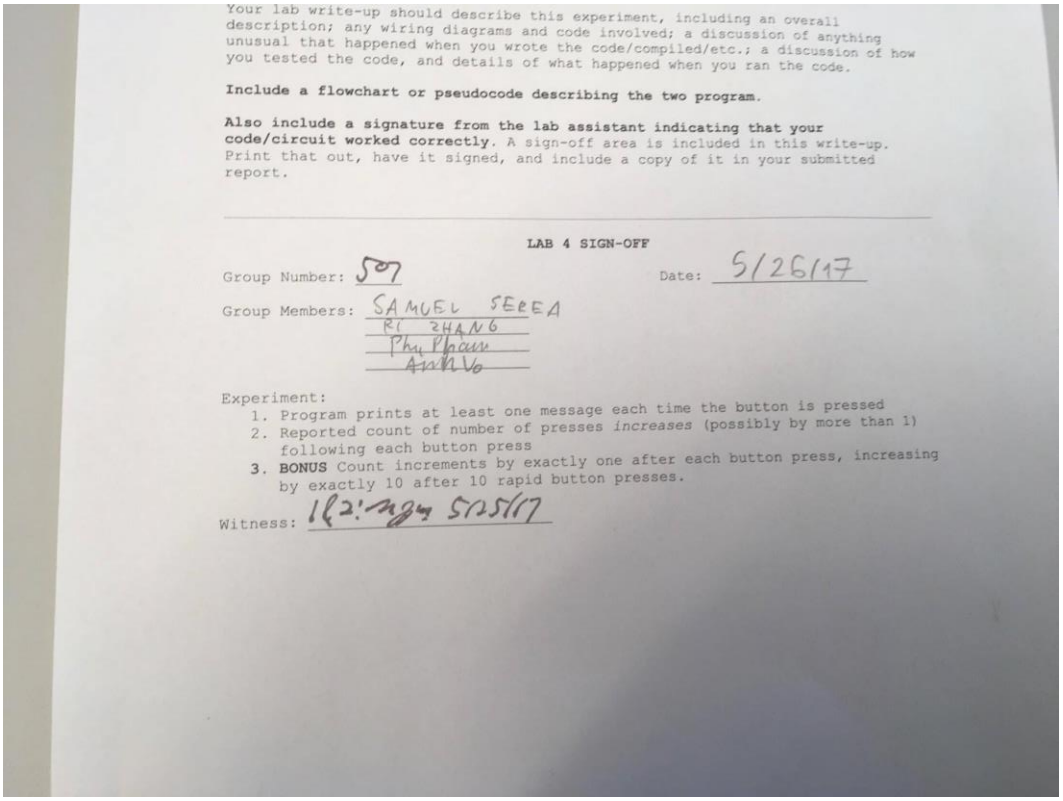
The code for this experiment:

```
import com.pi4j.io.gpio.*;
import java.util.*;
import com.pi4j.wiringpi.*;

public class lab4 {
    public static void main(String[] args){
        int count = 0,                    // declare the values
                state=0,
                printed = -1;
        boolean status = false;
        GpioController gpio = GpioFactory.getInstance();
        GpioPinDigitalInput pin = gpio.provisionDigitalInputPin(RaspiPin.GPIO_04);
        Gpio.pullUpDnControl(4,Gpio.PUD_UP);  // set pins for the for a button

        while(true){    //make infinite loop.
            if(state == 1 && printed != count){ // if state is 1 and printed # count

                    System.out.println("The counted number: " +count); //print out.
                    printed = count; // save it to prited value
                }
                       else{
                    if (pin.getState() == PinState.LOW && status == false){
                        count +=1; // increase the count
                        state = 1; // get the state to 1
                        status = true; // change the status value if pin is low
                    }else{ if(pin.getState() == PinState.HIGH) {
                        state = 0; // change the state.
                        status = false; } // change the status value if pin is high
                    }
                }
            }        }}
```

Pseudo Code:


Start
count = 0
state = 0
printed = -1
status = false
state = 1
printed ≠ count
Yes
print number & save number in printed
No
pin is LOW
state = 0
status = false
Yes
count++
state = 1
status = true
No
pin is HIGH
State = 0
Status = false
infinite loop

Sign off part:



Your lab write-up should describe this experiment, including an overall description; any wiring diagrams and code involved; a discussion of anything unusual that happened when you wrote the code/compiled/etc.; a discussion of how you tested the code, and details of what happened when you ran the code.

Include a flowchart or pseudocode describing the two program.

Also include a signature from the lab assistant indicating that your code/circuit worked correctly. A sign-off area is included in this write-up. Print that out, have it signed, and include a copy of it in your submitted report.

LAB 4 SIGN-OFF

Group Number: 507 Date: 5/26/17

Group Members: SAMUEL SERRA
RI ZHANG
Phy Pham
ANH VO

Experiment:
1. Program prints at least one message each time the button is pressed
2. Reported count of number of presses *increases* (possibly by more than 1) following each button press
3. **BONUS** Count increments by exactly one after each button press, increasing by exactly 10 after 10 rapid button presses.

Witness: 5/26/17

Conclusion: In this lab, I worked on pi4j to detect and count the number of a button has been pressed. This is the first time I play a physical button with some programs, it is really interesting and make me want to learn it more although I got many trouble while doing it.