Kettering University
College of Engineering
Department of Electrical and Computer Engineering

Laboratory Report

Course No. & Title: *Intro to Mobile Robotics (CE-442-02L)*

Instructor's Name: *Dr. Girma Tewolde*

Lab Title: *Basic Robot Navigation Using Sensors*

Date Submitted: *February 5th, 2020*

Team Members:

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INSTRUCTOR SECTION

Comments:____

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Grade: Team Member 1: ____________________

Team Member 2: ____________________

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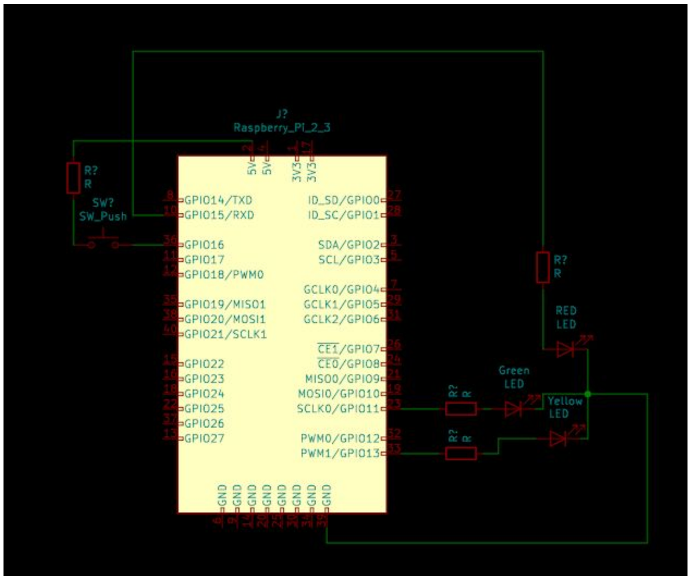
Tasks

Task 1: Install the OS

In this section we had to install the OS for the raspberry PI. This is the backbone software that is running on the device to allow us run scripts and other programs. Along with this we practiced some linux commands to help get familiar. We created new folders, and also installed some new libraries that will later be used on in other projects. We then set up the pi to be remote SSH, a way to talk with the device without having to connect a mouse, keyboard, and screen to it.

Task 2: Python Programming on the PI



Task two was to recreate the traffic light from lab one using python, one of the easiest languages for the PI to run scripts on. We used the pin headers just like with the arduino to create a traffic like that would run the green LED 4 seconds long, then the yellow for 1 sec, the red 4 seconds long and then repeat until a push button was pressed. Once pressed it changed it to just blink a red LED one second on and one second off.

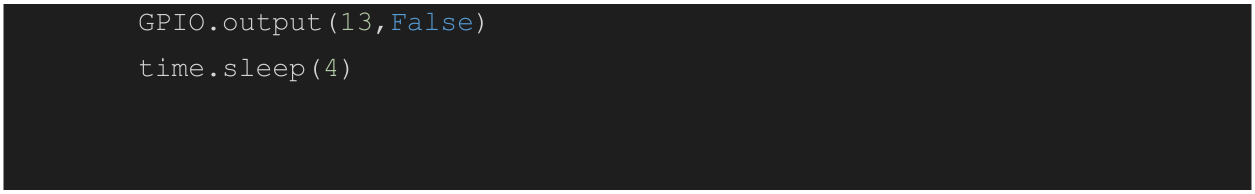
```
import time
import RPi.GPIO as GPIO

GPIO.setmode(GPIO.BOARD)
GPIO.setwarnings(False)

GPIO.setup(11, GPIO.OUT)#Green
GPIO.setup(13, GPIO.OUT)#Yellow
GPIO.setup(15, GPIO.OUT)#Red

GPIO.setup(16, GPIO.IN, pull_up_down=GPIO.PUD_DOWN)#button

while(1):#always run
    GPIO.output(11,False)
    GPIO.output(13,False)
    GPIO.output(15,False)
    if GPIO.input(16) == GPIO.HIGH:#If the button is pressed
        GPIO.output(11,False)
        GPIO.output(13,False)
        GPIO.output(15,True)
        time.sleep(1)
        GPIO.output(15,False)
        time.sleep(1)
    else:#Button is not pressed
        #Yellow Red off
        GPIO.output(13,False)
        GPIO.output(15,False)
        #Green on Red Yellow off
        GPIO.output(11,True)
        time.sleep(4)
        #Yellow on Green Red off
        GPIO.output(13,True)
        GPIO.output(11,False)
        time.sleep(1)
        #Red on Yellow Green off
        GPIO.output(15,True)
```



```
        GPIO.output(13,False)
        time.sleep(4)
```

Figure 1: *Code to run the traffic light*

CONCLUSION

After completing lab 4 the raspberry pi should be usable for tasks that require vision processing. This is useful because it enables the robot to complete tasks that require more processing power than the arduino has on its own. It also grants access to a huge amount of processing intensive libraries and software like opencv that are only available on more complicated platforms.