809T Homework 5

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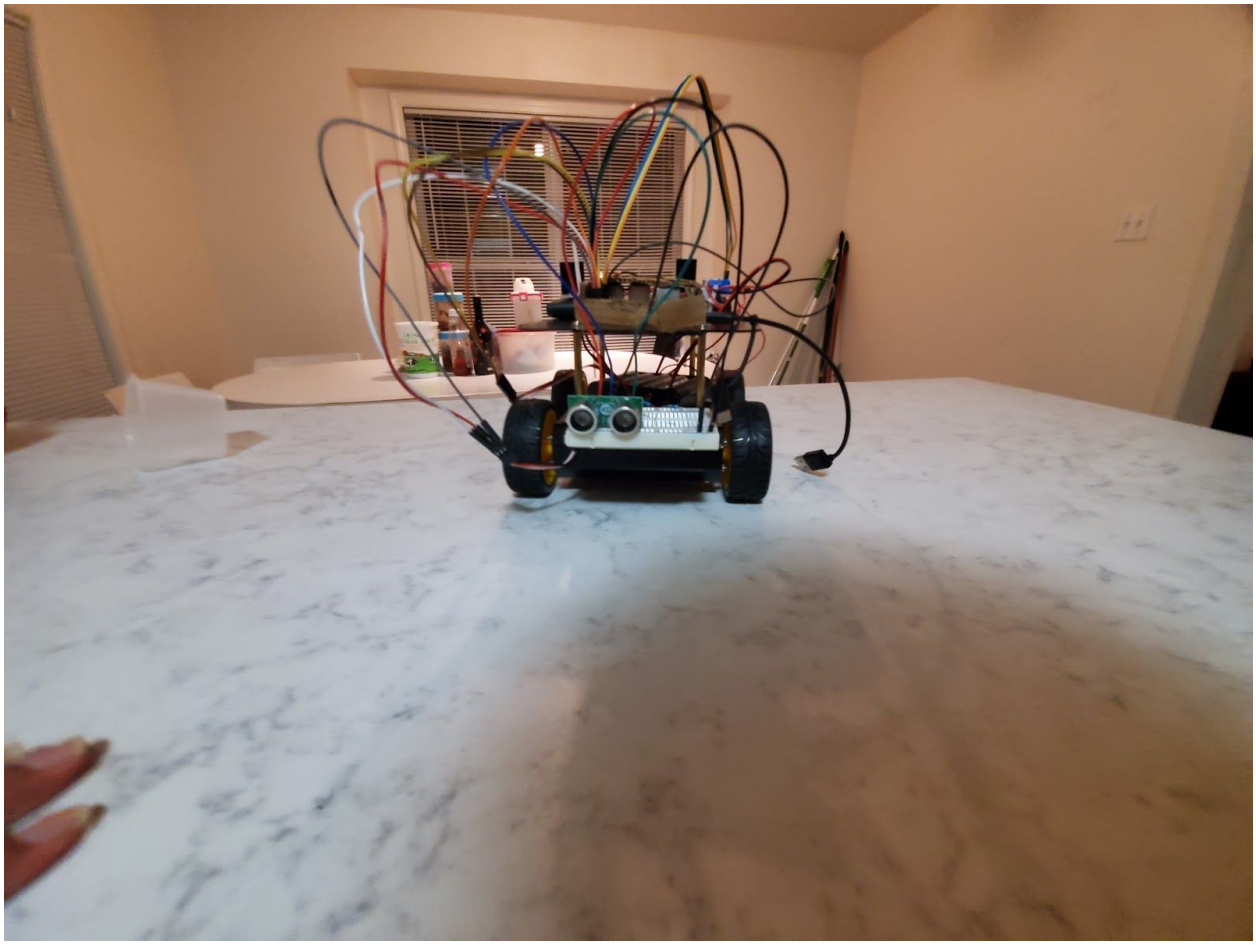
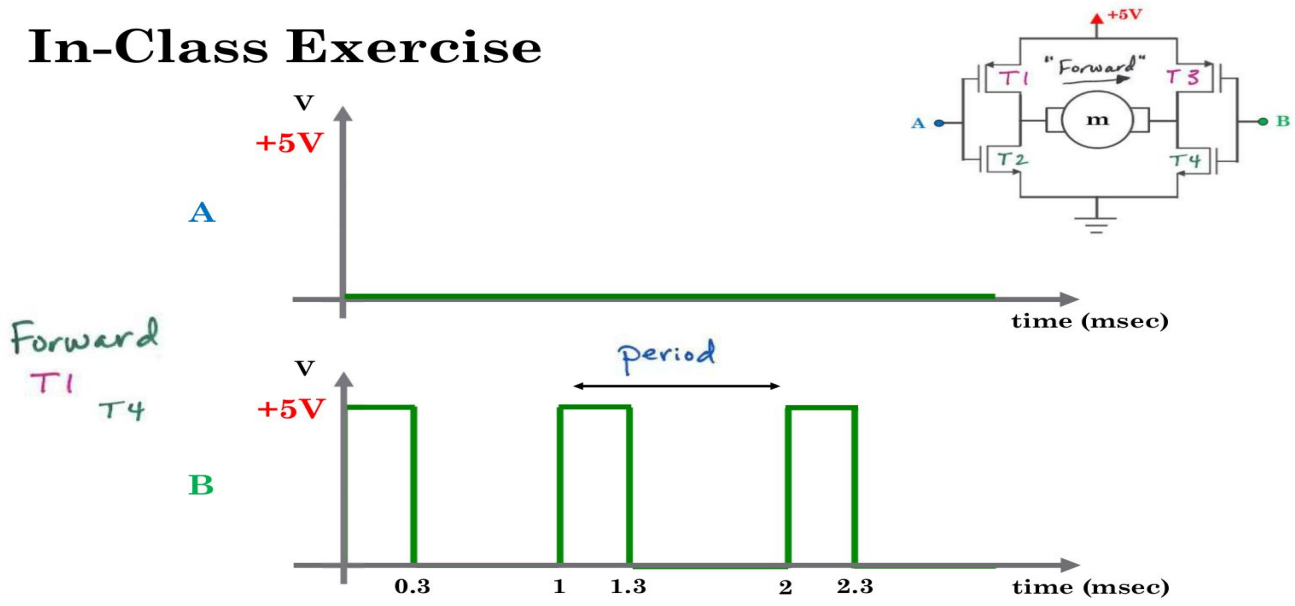
The project involves assembling the robot connecting all the electrical parts and integrating them with the Raspberry Pi and running them to check the connections.

1. **Connecting the Robot**

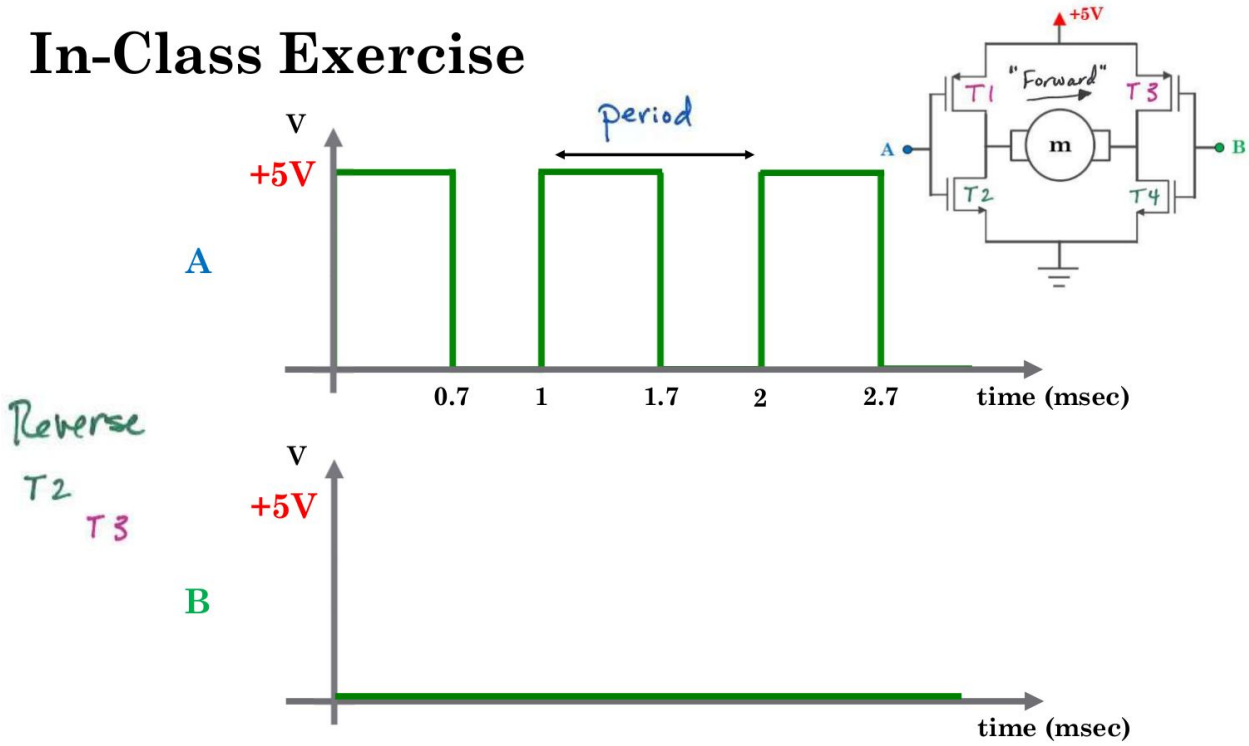
The connections were done and integrated with the robot. The images of the robot with the sensor and the connections with the Raspberry Pi are shown below



2. **<u>In Class exercise 1:</u>**



Since It is assumed to be voltage is proportional to the speed of the motor, to drive the motor in the Forward direction ie the clockwise direction at 30 percent of the full speed, the power is supplied to B for of 0.3 ms for every 1 ms, and the A is not supplied with any trigger signal.



Since It is assumed to be voltage is proportional to the speed of the motor, to drive the motor in the Reverse direction ie the counterclockwise direction at 70 percent of full speed, the power is supplied to A for 0.7 ms for every 1 ms, and the B is not supplied with any trigger signal.

3. In Class exercise 2:

The Second in class exercise is to write code to control the robot for reverse, pivot left and pivot right using the H-Bridge. The code with the key input is shown below.

```
import time
import RPi.GPIO as gpio

def init():
        gpio.setmode(gpio.BOARD)
        gpio.setup(31,gpio.OUT) # in1
        gpio.setup(33,gpio.OUT) # in2
        gpio.setup(35,gpio.OUT) # in3
        gpio.setup(37,gpio.OUT) # in4

def game_stop():
```

```
        #Setting all the pins to low
        gpio.output(31,False)
        gpio.output(33,False)
        gpio.output(35,False)
        gpio.output(37,False)

def forward(tf):
        init()
        print("Forward")
        #For the left wheels
        gpio.output(31,True)
        gpio.output(33,False)
        #For the right wheels
        gpio.output(35,False)
        gpio.output(37,True)
        # Wait
        time.sleep(tf)
        #Stop all execution
        game_stop()
        #print("stopping")
        gpio.cleanup()

def right(tf):
        init()
        print("Right")
        #For the left wheels
        gpio.output(31,True)
        gpio.output(33,False)
        #For the right wheel
        gpio.output(35,True)
        gpio.output(37,False)
        #wait
        time.sleep(tf)
        #stop and cleanup
        game_stop()
        #print("Stopping")
        gpio.cleanup()

def left(tf):
        init()
        print("Left")
        #For the left wheels
        gpio.output(31,False)
```

```
        gpio.output(33,True)
        #For the right wheel
        gpio.output(35,False)
        gpio.output(37,True)
        #wait
        time.sleep(tf)
        #stop and cleanup
        game_stop()
        #print("Stopping")
        gpio.cleanup()

def reverse(tf):
        init()
        print("Reverse")
        #For the left wheels
        gpio.output(31,False)
        gpio.output(33,True)
        #For the right wheel
        gpio.output(35,True)
        gpio.output(37,False)
        #wait
        time.sleep(tf)
        #stop and cleanup
        game_stop()
        #print("Stopping")
        gpio.cleanup()

def key_init(event):
        init()
        print("key :",event)
        tf = 1

        if event.lower() == 'w':
                # print("Forward")
                forward(tf)
        elif event.lower() == 's':
                # print("Backward")
                reverse(tf)
        elif event.lower() == 'a':
                # print("Left")
                left(tf)
        elif event.lower() == 'd':
                # print("Right")
```

```
            right(tf)
        else:
            print("Wrong Keys press 'w','a','s','d', or 'p' to quit")


while True:
        key_input = input("Select Driving Keys :")
        if key_input == "p":
            break
        key_init(key_input)
```

4. Video Link:

The video link of the motor control of the robot is
https://www.youtube.com/watch?v=pEkw3sByR0s