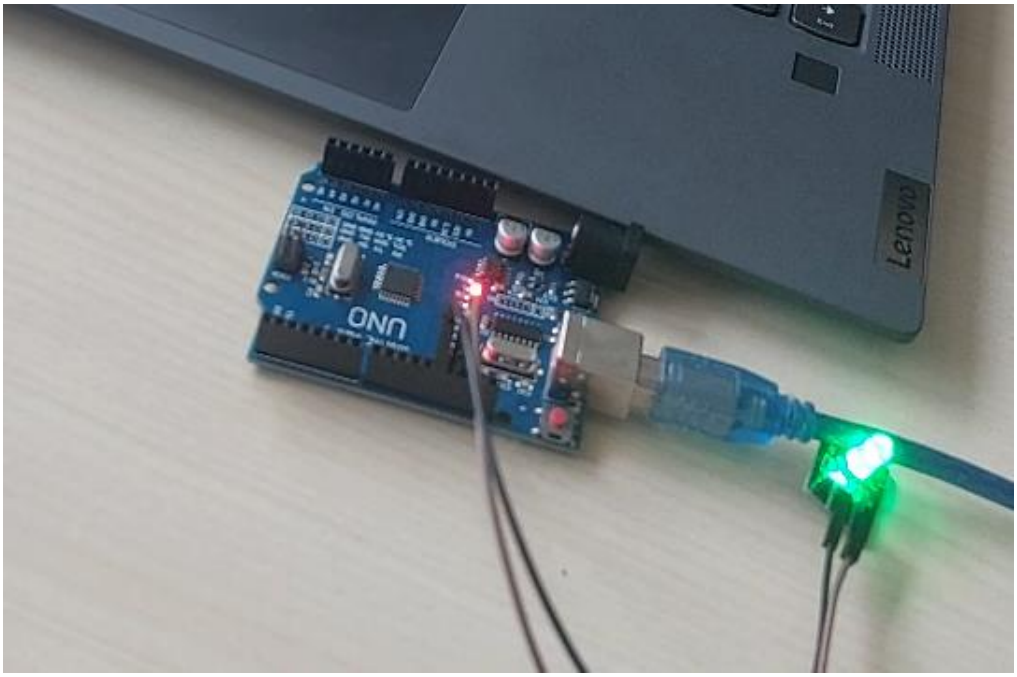
TASK1:

I have used an Arduino with RGB LED board for visualization.



TASK2: Arduino LED blinks at 0.75 duty cycle and waits for serial input.

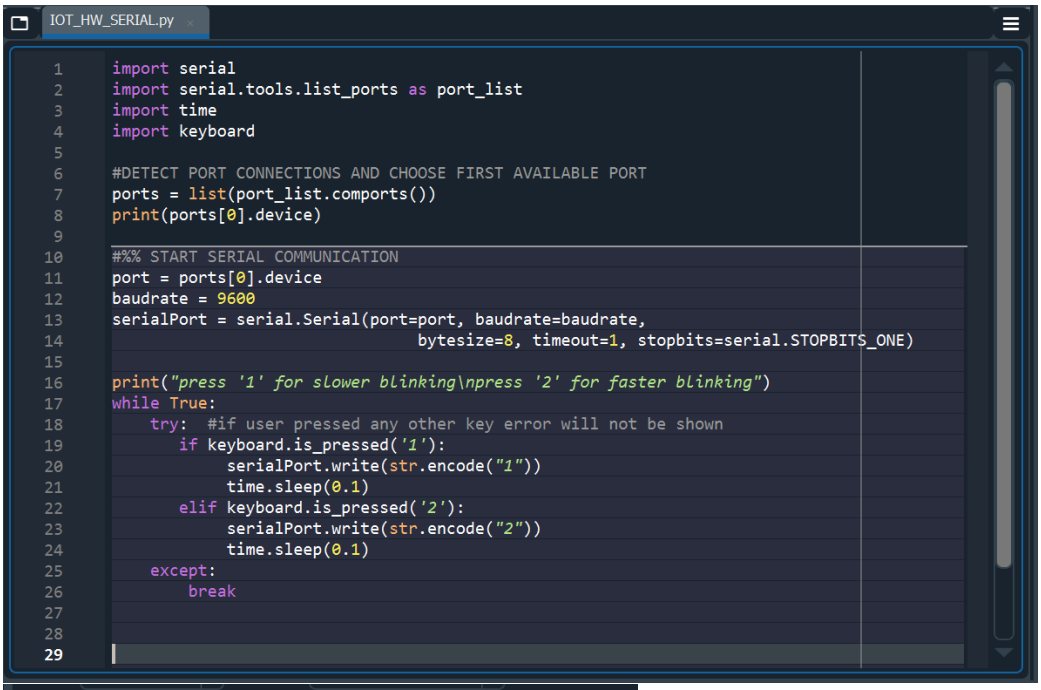
```
int duration=250;
/*
 * Duration is initially ON>750ms
 *                       OFF>250ms
 */

void setup() {
  DDRB = B00100000;   //SETS PIN13 AS OUTPUT
  Serial.begin(9600);
}

void loop() {
  PORTB |= B00100000; //set high then wait
  delay(duration*3);
  PORTB &= ~B00100000; //set low then wait
  delay(duration);
  if (Serial.available()>0){
    byte ch=Serial.read();

    if(ch == 49) // LONGER DURATION
    {
      duration*=2;
    }
    else if(ch == 50)  // SHORTER DURATION
    {
      duration/=2;
    }
  }
}
```

TASK 3-4: Python program to send keyboard inputs as serial communication to the waiting COM port.

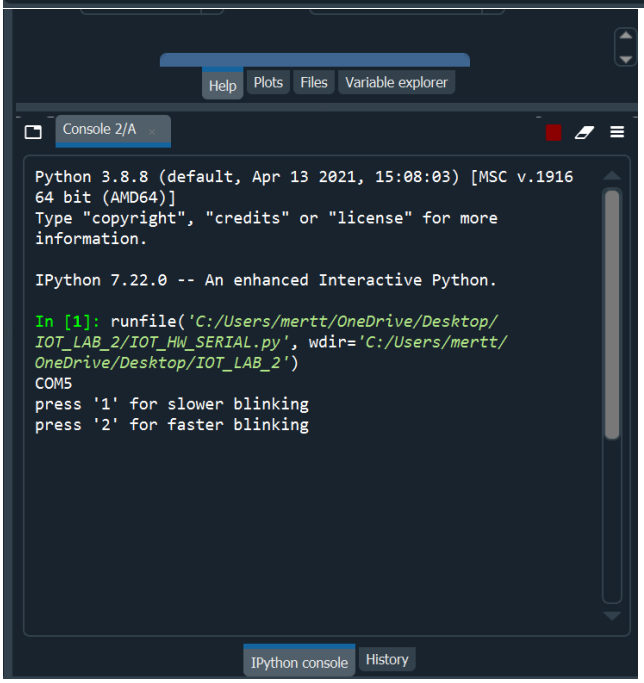


```python
import serial
import serial.tools.list_ports as port_list
import time
import keyboard

#DETECT PORT CONNECTIONS AND CHOOSE FIRST AVAILABLE PORT
ports = list(port_list.comports())
print(ports[0].device)

#%% START SERIAL COMMUNICATION
port = ports[0].device
baudrate = 9600
serialPort = serial.Serial(port=port, baudrate=baudrate,
                           bytesize=8, timeout=1, stopbits=serial.STOPBITS_ONE)

print("press '1' for slower blinking\npress '2' for faster blinking")
while True:
    try:  #if user pressed any other key error will not be shown
       if keyboard.is_pressed('1'):
            serialPort.write(str.encode("1"))
            time.sleep(0.1)
       elif keyboard.is_pressed('2'):
            serialPort.write(str.encode("2"))
            time.sleep(0.1)
    except:
        break
```



```
Help  Plots  Files  Variable explorer

Console 2/A

Python 3.8.8 (default, Apr 13 2021, 15:08:03) [MSC v.1916
64 bit (AMD64)]
Type "copyright", "credits" or "license" for more
information.

IPython 7.22.0 -- An enhanced Interactive Python.

In [1]: runfile('C:/Users/mertt/OneDrive/Desktop/
IOT_LAB_2/IOT_HW_SERIAL.py', wdir='C:/Users/mertt/
OneDrive/Desktop/IOT_LAB_2')
COM5
press '1' for slower blinking
press '2' for faster blinking

IPython console  History
```

PROBLEMS ENCOUNTERED:

1)I could use any serial monitor applications like “hercules” to send the signal but i have chosen to write it on Python for more complex future IOT applications.

2)I changed the duration from “3s on - 1s off” to “0.75s on - 0.25s off” for better visualization.