Dataintelliage

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LED CONTROL USING FINGERS

Project Overview

The "LED Control Using Fingers" project aims to create an innovative and interactive system that allows users to control LED lights through hand gestures. This project leverages gesture recognition technology to provide a hands-free and user-friendly interface for controlling lighting systems.

In a world driven by technological advancements, the integration of interactive and intuitive interfaces has become increasingly essential. The "LED Control Using Fingers" project represents a pioneering venture into the realm of gesture-based control systems, offering a novel and engaging method for managing LED lighting. By harnessing the power of gesture recognition technology, this project seeks to redefine the way individuals interact with their surroundings, providing a seamless and hands-free experience in controlling LED lights.

Hardware Components

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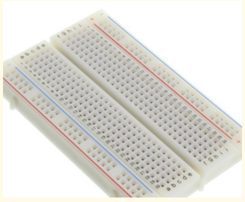


3

4

1. Arduino UNO
2. LED Light (5-pcs)
3. Breadboard
4. Jumper Wire

Software Components

1. Visual Studio

- mediapipe
- cvzone
- pyfirmata

2. Arduino IDE

- firmata library

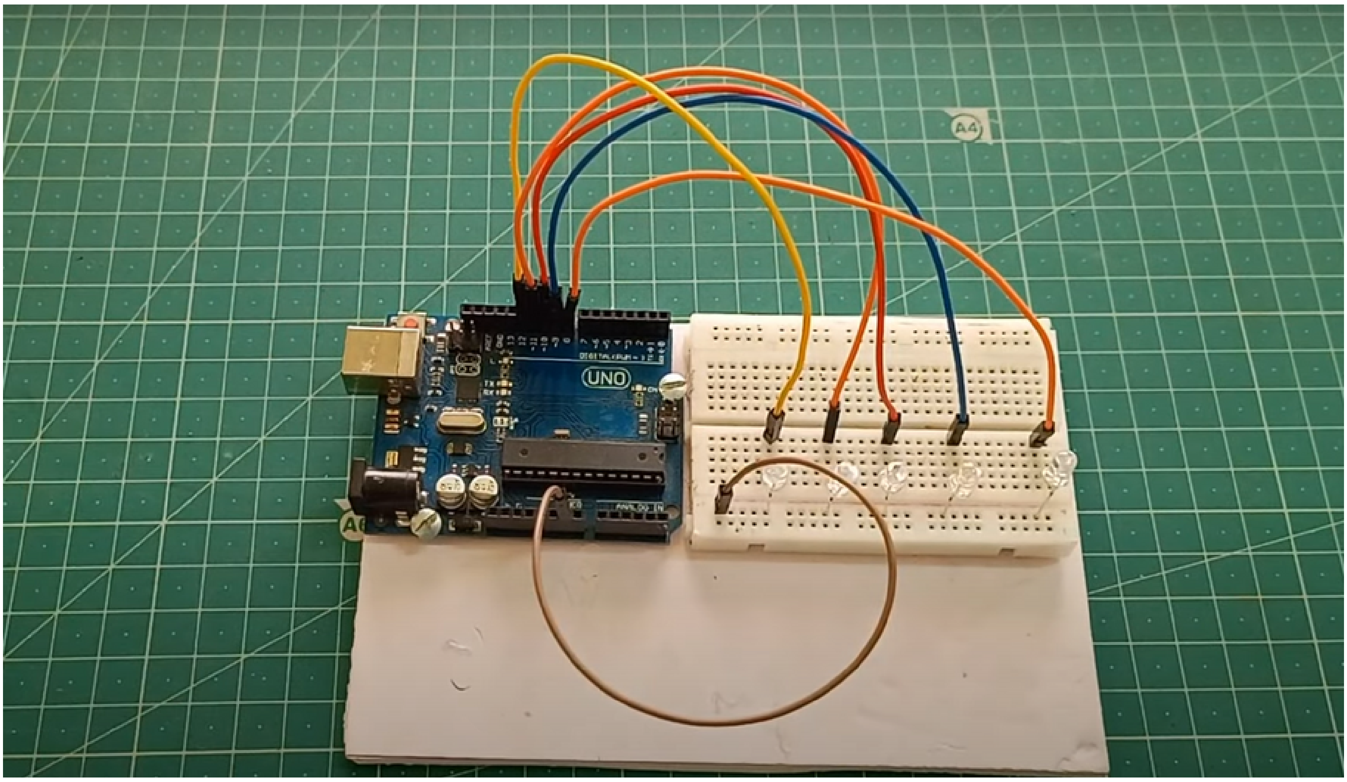
Connections

Arduino UNO - BreedBoard

- **-ve To GND**
-

5- LED Light - BreedBoard

- **Long Leg (ANODE) +ve TO Centre**
- **Short Leg (CATHODE) +ve TO -ve side**



: Circuit Diagram

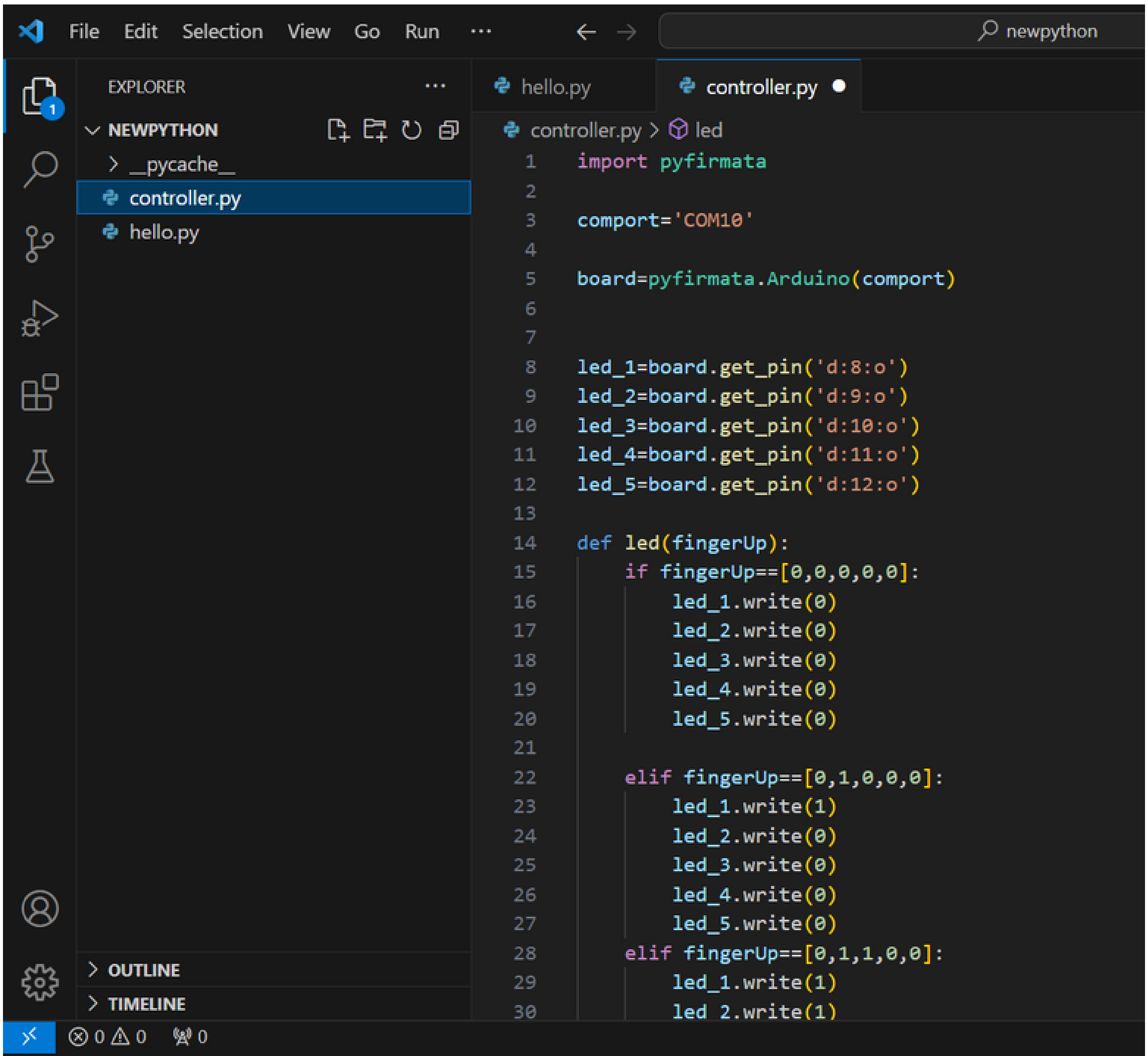
Usage

- **Home Automation:** Control lighting in different rooms with a wave of the hand.

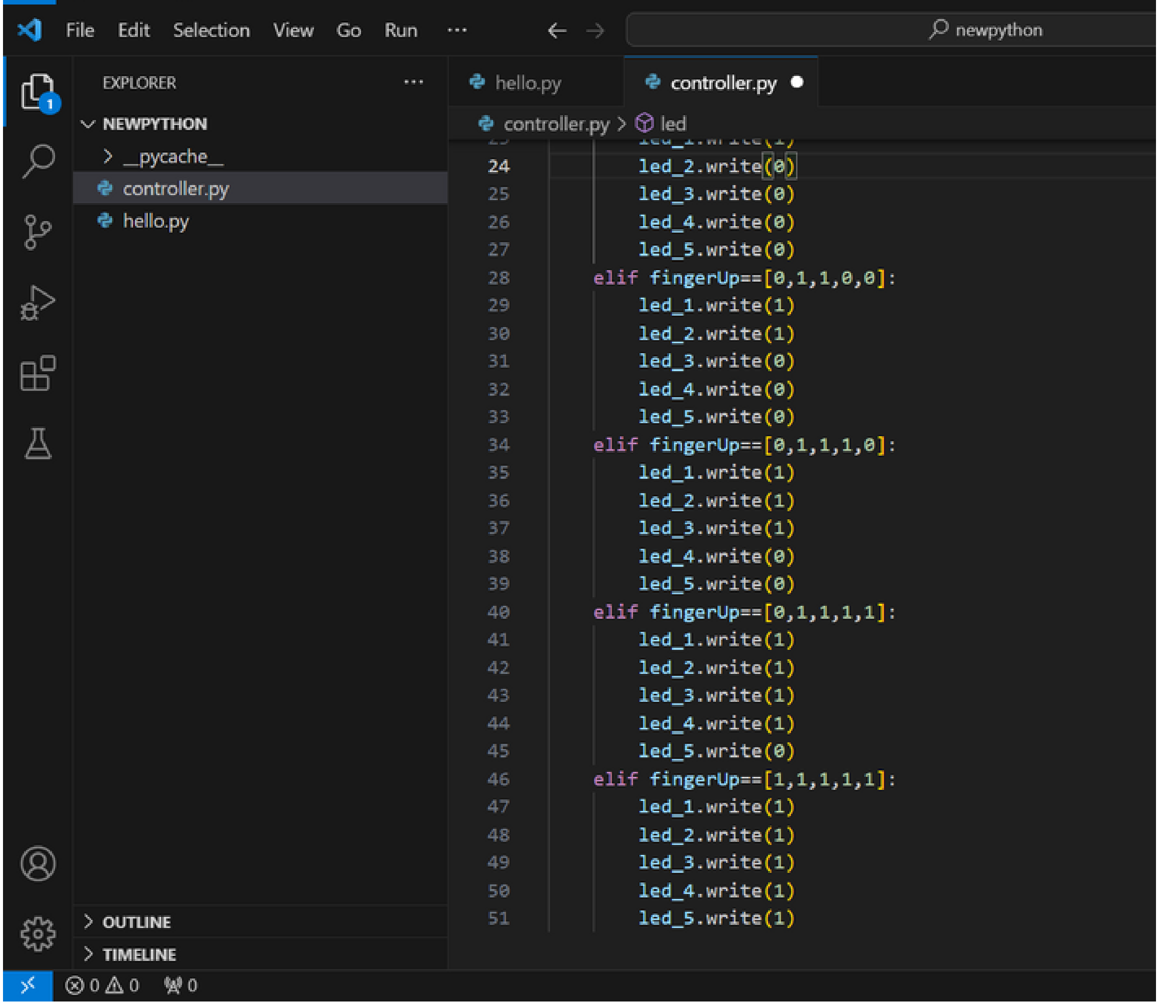
- **Art Installations:** Create interactive and visually appealing light displays in public spaces or galleries.

- **Entertainment:** Enhance gaming experiences by incorporating gesture-based controls for ambient lighting.

Source Code :

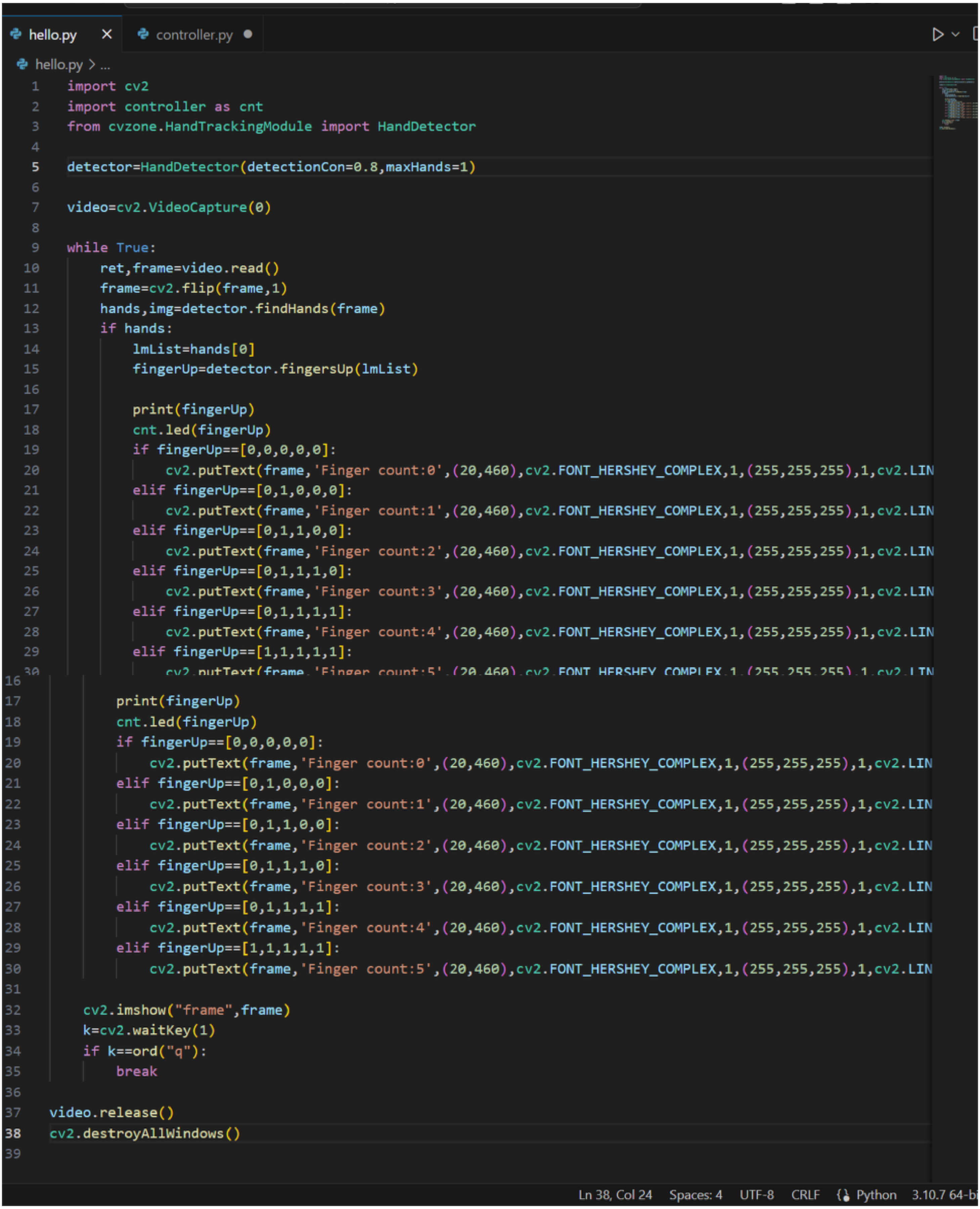


```python
import pyfirmata

comport='COM10'

board=pyfirmata.Arduino(comport)


led_1=board.get_pin('d:8:o')
led_2=board.get_pin('d:9:o')
led_3=board.get_pin('d:10:o')
led_4=board.get_pin('d:11:o')
led_5=board.get_pin('d:12:o')

def led(fingerUp):
    if fingerUp==[0,0,0,0,0]:
        led_1.write(0)
        led_2.write(0)
        led_3.write(0)
        led_4.write(0)
        led_5.write(0)

    elif fingerUp==[0,1,0,0,0]:
        led_1.write(1)
        led_2.write(0)
        led_3.write(0)
        led_4.write(0)
        led_5.write(0)
    elif fingerUp==[0,1,1,0,0]:
        led_1.write(1)
        led_2.write(1)
```



```python
        led_2.write(0)
        led_3.write(0)
        led_4.write(0)
        led_5.write(0)
    elif fingerUp==[0,1,1,0,0]:
        led_1.write(1)
        led_2.write(1)
        led_3.write(0)
        led_4.write(0)
        led_5.write(0)
    elif fingerUp==[0,1,1,1,0]:
        led_1.write(1)
        led_2.write(1)
        led_3.write(1)
        led_4.write(0)
        led_5.write(0)
    elif fingerUp==[0,1,1,1,1]:
        led_1.write(1)
        led_2.write(1)
        led_3.write(1)
        led_4.write(1)
        led_5.write(0)
    elif fingerUp==[1,1,1,1,1]:
        led_1.write(1)
        led_2.write(1)
        led_3.write(1)
        led_4.write(1)
        led_5.write(1)
```

hello.py



```
import cv2
import controller as cnt
from cvzone.HandTrackingModule import HandDetector

detector=HandDetector(detectionCon=0.8,maxHands=1)

video=cv2.VideoCapture(0)

while True:
    ret,frame=video.read()
    frame=cv2.flip(frame,1)
    hands,img=detector.findHands(frame)
    if hands:
        lmList=hands[0]
        fingerUp=detector.fingersUp(lmList)

        print(fingerUp)
        cnt.led(fingerUp)
        if fingerUp==[0,0,0,0,0]:
            cv2.putText(frame,'Finger count:0',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[0,1,0,0,0]:
            cv2.putText(frame,'Finger count:1',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[0,1,1,0,0]:
            cv2.putText(frame,'Finger count:2',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[0,1,1,1,0]:
            cv2.putText(frame,'Finger count:3',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[0,1,1,1,1]:
            cv2.putText(frame,'Finger count:4',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[1,1,1,1,1]:
            cv2.putText(frame,'Finger count:5',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
```

```

        print(fingerUp)
        cnt.led(fingerUp)
        if fingerUp==[0,0,0,0,0]:
            cv2.putText(frame,'Finger count:0',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[0,1,0,0,0]:
            cv2.putText(frame,'Finger count:1',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[0,1,1,0,0]:
            cv2.putText(frame,'Finger count:2',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[0,1,1,1,0]:
            cv2.putText(frame,'Finger count:3',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[0,1,1,1,1]:
            cv2.putText(frame,'Finger count:4',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
        elif fingerUp==[1,1,1,1,1]:
            cv2.putText(frame,'Finger count:5',(20,460),cv2.FONT_HERSHEY_COMPLEX,1,(255,255,255),1,cv2.LIN
```

```

    cv2.imshow("frame",frame)
    k=cv2.waitKey(1)
    if k==ord("q"):
        break

video.release()
cv2.destroyAllWindows()

```

Arduino Code :

Step 1 :

Install firmata Library from,
INCLUDE LIBRARY ---> MANAGE LIBRARY

Step 2 :

File --> Examples --> Firmata --> Standard Firmata

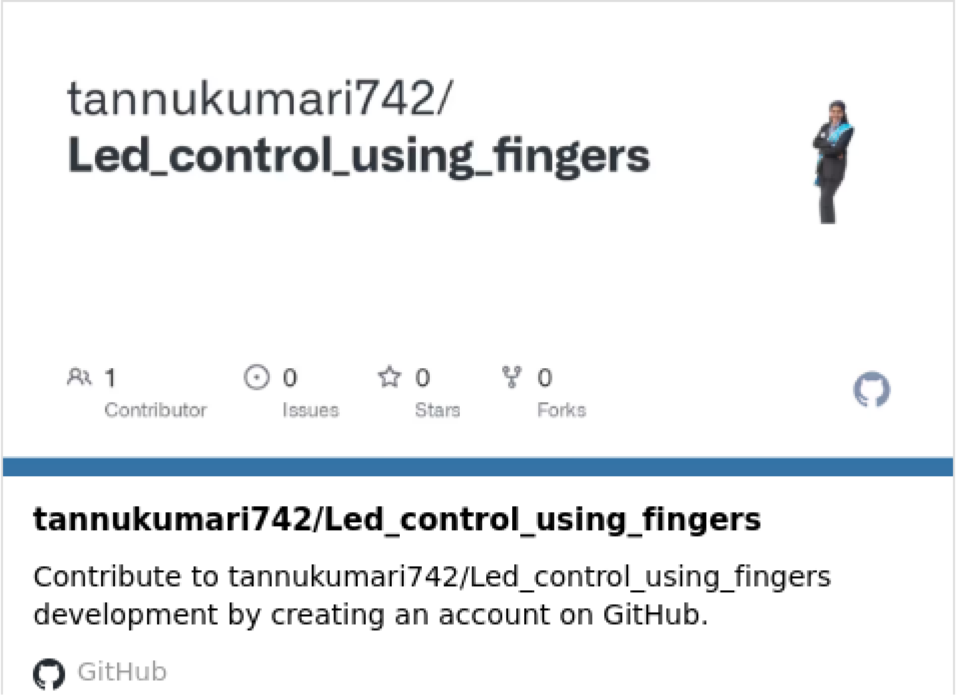
Step 3 :

Connect the Port and Board.

Step 4 :

Upload the Code.

References :



tannukumari742/
Led_control_using_fingers

1 Contributor
0 Issues
0 Stars
0 Forks

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Contribute to tannukumari742/Led_control_using_fingers development by creating an account on GitHub.

GitHub