TRAFFIC MANAGEMENT

PHASE-03:DEVELOPMENT

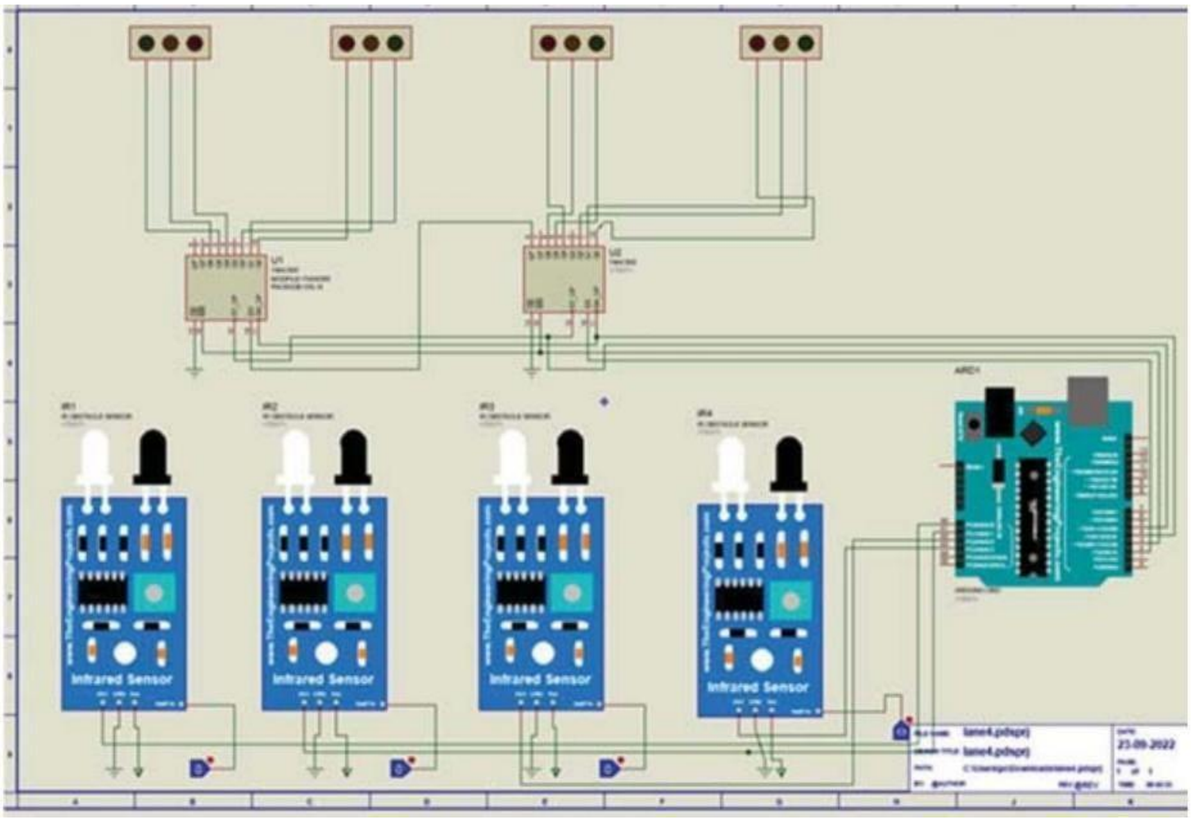
PART 1

HARDWARE COMPONENTS :

Hardware equipment that we need in order to built the project are given below :

1. Arduino with wifi.
2. ESP32.
3. Raspberry pi.
4. Traffic Cameras which are used for monitoring traffic.
5. LED lights which are used for purpose of signalling.
6. Node MCU Microcontroller.

HARDWARE OUTLETS DIAGRAM :



SOURCE CODE:

```
import pyfirmata

import time

comp='COM8'

board = pyfirmata.Arduino(comp)

led_1=board.get_pin('d:2:o')

led_2=board.get_pin('d:3:o')

led_3=board.get_pin('d:4:o')

led_4=board.get_pin('d:5:o')

led_5=board.get_pin('d:6:o')

led_6=board.get_pin('d:7:o')

l1=[0,0]

def

normaltime():

return 2 def

maxtime():

return 10 def

val1():    return

l1[0] def val2():

return l1[1] def

signalamb1():

l1[0]=1    l1[1]=0

led_2.write(0)

led_5.write(0)
```

```
led_3.write(1)
led_4.write(1)
def
signalamb2():
l1[0]=0     l1[1]=1
led_2.write(0)
led_6.write(1)
led_1.write(1)
led_5.write(0)
def signal1():
l1[0]=1
   l1[1]=0
led_2.write(0)
led_5.write(0)
led_3.write(1)
led_4.write(1)
def wait():
l1[0]=0
l1[1]=0
led_2.write(1)
led_3.write(0)
led_4.write(0)
led_5.write(1)
led_1.write(0)
```

```
led_6.write(0)
def signal2():
l1[0]=0
l1[1]=1
led_2.write(0)
led_6.write(1)
led_1.write(1)
led_5.write(0)
def led_norm():
l1[0]=1 l1[1]=0
led_2.write(0)
led_5.write(0)
led_3.write(1)
led_4.write(1)
   time.sleep(5)
led_2.write(1)
led_3.write(0)
led_4.write(0)
led_5.write(1)
time.sleep(1)
l1[0]=1    l1[1]=0
led_2.write(0)
led_6.write(1)
led_1.write(1)
```

```
led_5.write(0)
time.sleep(5)
led_2.write(1)
led_1.write(0)
led_6.write(0)
led_5.write(1)
time.sleep(1) def
signalmax_1():
l1[0]=1
   l1[1]=0
led_2.write(0)
led_5.write(0)
led_3.write(1)
led_4.write(1)
time.sleep(15)
led_2.write(1)
led_3.write(0)
led_4.write(0)
led_5.write(1)
time.sleep(1)
l1[0]=1    l1[1]=0
led_2.write(0)
led_6.write(1)
led_1.write(1)
```

```
led_5.write(0)
time.sleep(15)
led_2.write(1)
led_1.write(0)
led_6.write(0)
led_5.write(1)
time.sleep(1) def
signalmax_2():
l1[0]=1 l1[1]=0
led_2.write(0)
led_5.write(0)
led_3.write(1)
led_4.write(1)
time.sleep(15)
led_2.write(1)
led_3.write(0)
led_4.write(0)
led_5.write(1)
time.sleep(1)
l1[0]=1    l1[1]=0
led_2.write(0)
led_6.write(1)
led_1.write(1)
led_5.write(0)
```

```
time.sleep(15)
led_2.write(1)
led_1.write(0)
led_6.write(0)
led_5.write(1)
time.sleep(1)
   {
import cv2
from signals import *
import time
cascade_src = 'cars.xml'
video_src = 'dataset/test2.mp4'
video_src1 = 'dataset/test3.mp4'
l=[0,0]
cap =
cv2.VideoCapture("dataset/test2.mp4")
cap1 =
cv2.VideoCapture("dataset/test3.mp4")
car_cascade =
cv2.CascadeClassifier(cascade_src)
ret, img = cap.read()
ret1,img1 = cap1.read()
num=0
def returnval():
   return l[:]
def fun1(time1):
   now=time.time()
   timer = 0
   while timer<=time1:
      ret, img = cap.read()
```

```
    ret1,img1 = cap1.read()
    if (type(img) == type(None)):
      break
    if(type(img1)==type(None)):
      break
    gray = cv2.cvtColor(img,
cv2.COLOR_BGR2GRAY)
    gray1 = cv2.cvtColor(img1,
cv2.COLOR_BGR2GRAY)
    #cv2.imshow('video', gray)
    cars =
car_cascade.detectMultiScale(gray, 1.1,
1)
    cars1 =
car_cascade.detectMultiScale(gray1, 1.1,
1)
    for (x,y,w,h) in cars:

cv2.rectangle(img,(x,y),(x+w,y+h),(0,0,255
),2)
    for (x,y,w,h) in cars1:

cv2.rectangle(img1,(x,y),(x+w,y+h),(0,0,25
5),2)
    cv2.imshow('video', img)
    cv2.imshow('video1', img1)
    if(val1()==0):
      l[0]=len(cars)
    if(val2()==0):
      l[1]=len(cars1)
    if cv2.waitKey(33) == 27:
      break
```

```
        end = time.time()
        timer = round(end-now)
        print(timer)
    cv2.destroyAllWindows()
        #return num
}
```