

ASSIGNMENT 3

PYTHON CODE TO BLINK AN LED AND TRAFFIC LIGHT CONTROL

Assignment Date	30 September 2022
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Maximum Marks	2 Marks

QUESTION:

Write python code for blinking LED and Traffic lights for Raspberry pi. Only python code is enough, no need to execute in raspberry pi.

Solution: “BLINKING LED”

COMPONENTS REQUIRED:

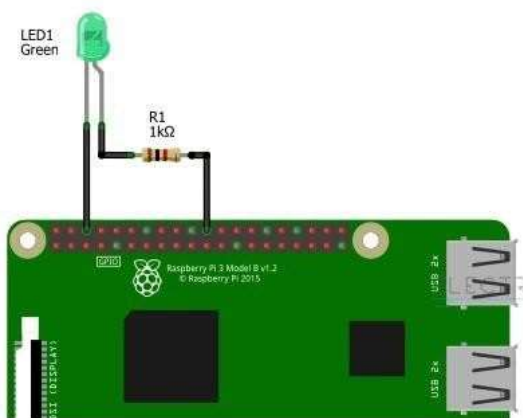
- Raspberry Pi 3 Model B
- 5mm LED x 1
- 1K Ω Resistor (1/4 Watt) x 1
- Connecting wires
- Miscellaneous (Computer, Ethernet cable, Power Supply for Raspberry Pi etc.)

CONNECTION:

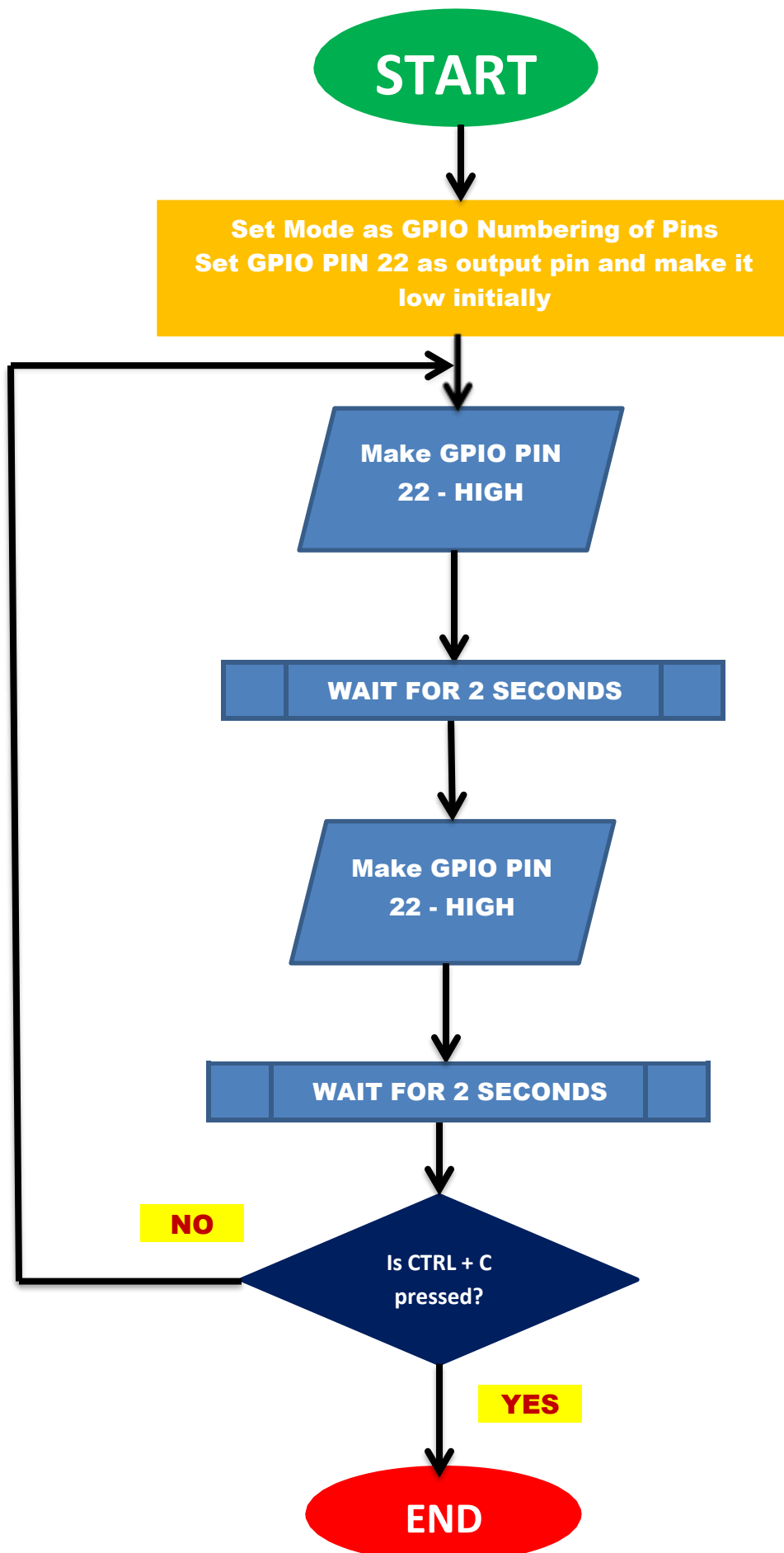
The anode of the LED is connected to GPIO25 (Physical Pin 22) through a 1K Ω current limiting resistor. The cathode of the LED is connected to the GND Pin.

In this circuit, the GPIO Pins will act as source and provides with 3.3V when it is activated.

CIRCUIT DIAGRAM:



FLOW CHART:



PYTHON CODE:

```
import RPi.GPIO as GPIO # RPi.GPIO can be referred as GPIO from now

import time

ledPin = 22 # pin22

def setup():
    GPIO.setmode(GPIO.BOARD) # GPIO Numbering of Pins
    GPIO.setup(ledPin, GPIO.OUT) # Set ledPin as output
    GPIO.output(ledPin, GPIO.LOW) # Set ledPin to LOW to turn Off the LED

def loop():
    while True:
        GPIO.output(ledPin, GPIO.HIGH) # LED On
        time.sleep(2.0) # wait 2 sec
        GPIO.output(ledPin, GPIO.LOW) # LED Off
        time.sleep(2.0) # wait 2 sec

def endprogram():
    GPIO.output(ledPin, GPIO.LOW) # LED Off
    GPIO.cleanup() # Release resources

if __name__ == '__main__': # Program starts from here
    setup()
    try:
        loop()
    except KeyboardInterrupt: # When 'Ctrl+C' is pressed, the destroy() will be executed.
        endprogram()
```

CONCLUSION:

Thus the Python code for LED Blinking is successfully executed.

“TRAFFIC LIGHTS”

SOLUTION:

COMPONENTS REQUIRED:

- Raspberry Pi 3 Model B
- Red 5mm LED x 1
- Green 5mm LED x 1
- Yellow 5mm LED x 1
- 75Ω Resistor x 3
- Connecting wires
- Miscellaneous (Computer, Ethernet cable, Power Supply for Raspberry Pi etc.)

CONNECTION: 11 13 15

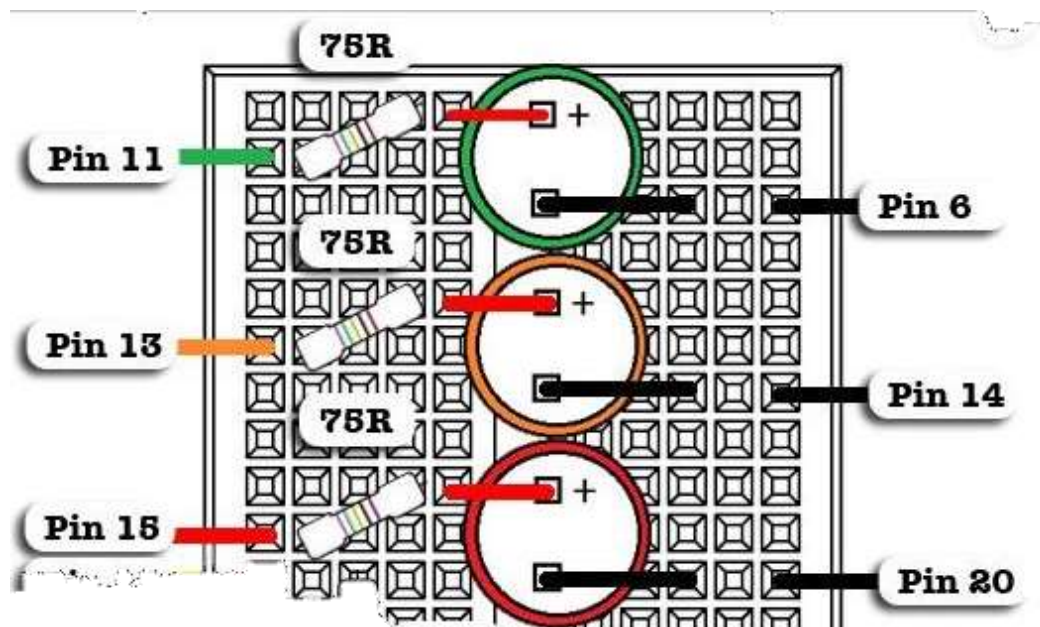
The anode of the Red LED is connected to Physical Pin 11 through a 75Ω current limiting resistor. The cathode of the LED is connected to the GND Pin 6.

The anode of the Green LED is connected to Physical Pin 13 through a 75Ω current limiting resistor. The cathode of the LED is connected to the GND Pin 14.

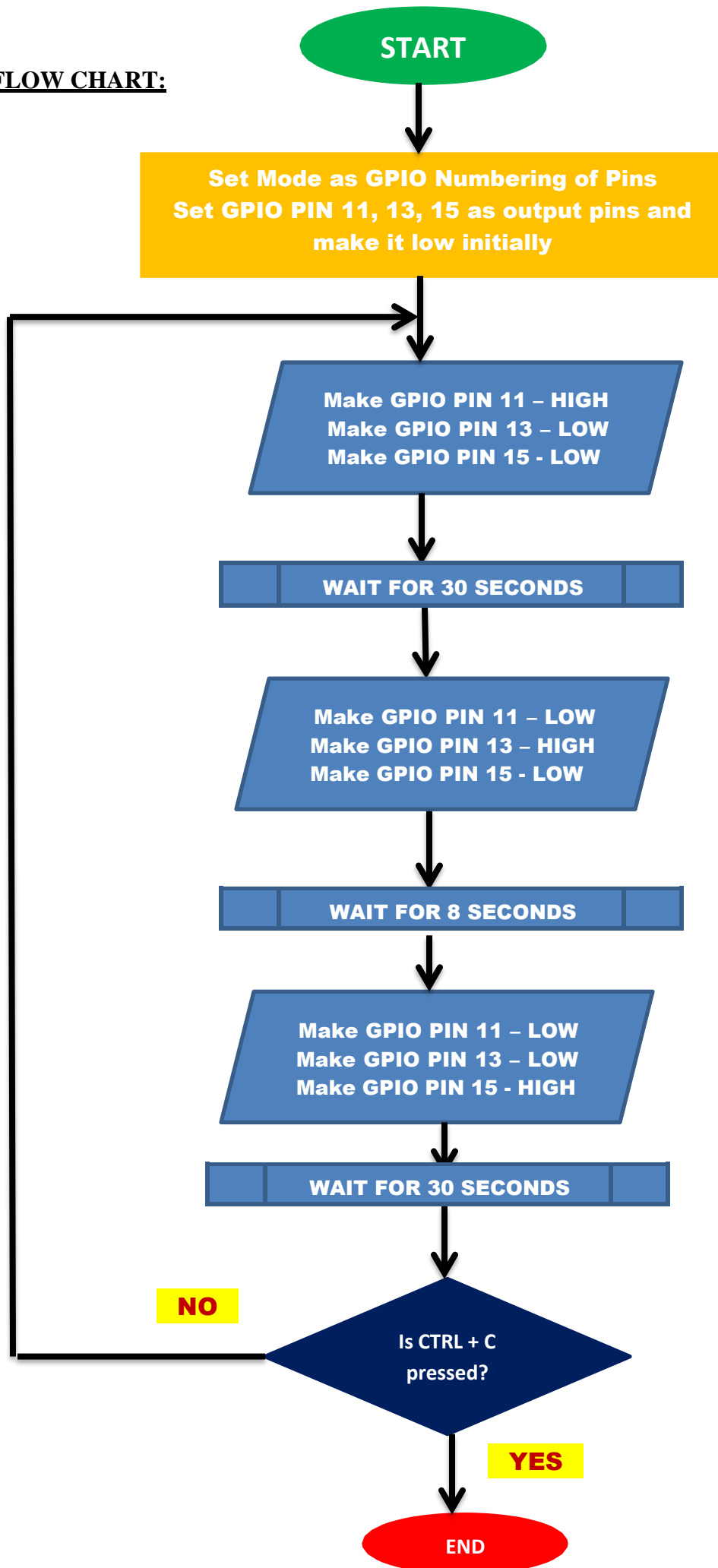
The anode of the Yellow LED is connected to Physical Pin 15 through a 75Ω current limiting resistor. The cathode of the LED is connected to the GND Pin 20.

In this circuit, the GPIO Pins will act as source and provides with 3.3V when it is activated.

CIRCUIT DIAGRAM:



FLOW CHART:



PYTHON CODE:

```
import RPi.GPIO as GPIO # RPi.GPIO can be referred as GPIO from now
import time
```

```
red_led = 11 # pin11
```

```
yellow_led = 13 # pin13
```

```
green_led = 15 # pin15
```

```
def setup():
```

```
    GPIO.setmode(GPIO.BOARD) # GPIO Numbering of Pins
```

```
    GPIO.setup(red_led, GPIO.OUT) # Set red_led as output
```

```
    GPIO.setup(yellow_led, GPIO.OUT) # Set yellow_led as output
```

```
    GPIO.setup(green_led, GPIO.OUT) # Set green_led as output
```

```
    GPIO.output(red_led, GPIO.LOW) # Set red_led to LOW to turn Off the Red LED
```

```
    GPIO.output(yellow_led, GPIO.LOW) # Set yellow_led to LOW to turn Off the
Yellow LED
```

```
    GPIO.output(green_led, GPIO.LOW) # Set green_led to LOW to turn Off the Green
LED
```

```
def loop():
```

```
    while True:
```

```
        #RED LED ON
```

```
        GPIO.output(red_led, GPIO.HIGH) #RED LED On
```

```
        GPIO.output(yellow_led, GPIO.LOW) # YELLOW LED Off
```

```
        GPIO.output(green_led, GPIO.LOW) # Green LED Off
```

```
        time.sleep(30) # wait 30 seconds
```

```
        #YELLOW LED ON
```

```
        GPIO.output(red_led, GPIO.LOW) #RED LED Off
```

```
        GPIO.output(yellow_led, GPIO.HIGH) # YELLOW LED On
```

```
        GPIO.output(green_led, GPIO.LOW) # GREEN LED Off
```

```

        time.sleep(8)          # wait 8 seconds

        #GREEN LED ON

        GPIO.output(red_led, GPIO.LOW) #RED LED Off

        GPIO.output(yellow_led, GPIO.LOW) # YELLOW LED Off

        GPIO.output(green_led, GPIO.HIGH) # GREEN LED On

        time.sleep(30)         # wait 30 seconds

def endprogram():

    GPIO.output(red_led, GPIO.LOW)  # LED Off

    GPIO.output(yellow_led, GPIO.LOW)  # LED Off

    GPIO.output(green_led, GPIO.LOW)  # LED Off

    GPIO.cleanup()                # Release resources

if __name__ == '__main__':        # Program starts from here

    setup()

    try:

        loop()

    except KeyboardInterrupt: # When 'Ctrl+C' is pressed, the destroy() will be executed.

        endprogram()

```

CONCLUSION:

Thus the Python code for Traffic Light Control is successfully executed.