

Experiment No - 08

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Date

Name: Ujjwal Lade

Class : TE

Div : B Roll no 06

Aim:- Write an application using Raspberry-Pi Beagle board to control the operation of a Hardware simulated traffic signal.

Theory:

Attaching the Traffic Lights

The Low Voltage Labs traffic lights connect to the Pi using four pins. One of these needs to be ground, the other three being actual GPIO pins used to control each of the individual LEDs.

Before powering up the Pi attach the traffic lights so that the pins connect to the GPIO pins highlighted in red:

Programming the traffic lights

first you need to install a couple of extra software packages needed to allow you to download my code and to give Python access to the GPIO pins.

How it works.

The code for this is very simple It starts by importing the RPI GPIO library plus time which gives us a times wait function sign at that allows us to trap the signal sent when the user

tries to quite the program & sys so we can send an appropriate exit signal back to the operating system before terminating.

```
import RPi.GPIO as GPIO
import time
import signal
import sys
```

Next we put the GPIO library into "BCM" or "Broadcom" mode (so we can refer to pins by the same number as

Setup

```
GPIO.setmode(GPIO.BCM)
GPIO.setup(9, GPIO.OUT)
GPIO.setup(10, GPIO.OUT)
GPIO.setup(11, GPIO.OUT)
```

Turn off all lights when user ends demo

```
GPIO.output(9, False)
GPIO.output(10, False)
GPIO.output(11, False)
GPIO.cleanup()
```

```
sys.exit(0)
```

```
signal.signal(signal.SIGINT, all_lights_off)
```

Conet

The main body of the code then consists of an infinite while loop that turns on the red light (Pin 9), waits, turns on the amber light (Pin 10), waits then cycles through the rest of the traffic light pattern by turning the appropriate LEDs on & off when control-C is pressed or interrupt signal SIGINT is sent. This is handled by all lights off functions that switches all the lights off tidies up the GPIO Library state & exits cleanly back to the operating system.

Conclusion

Thus we have implemented the application for traffic signals using Raspberry Pi.