TRAFFIC MANAGEMENT USING IOT

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IOT_Phase3 : Document submission

PROBLEM TITLE : Traffic management system

PROJECT DEVELOPMENT BASED ON TRAFFIC MANAGEMENT USING ARDUINO UNO AND RASPBERRY PI

Creating a complete traffic management system using an Arduino Uno and a Raspberry Pi is a complex project that involves various components, such as sensors, traffic lights, and communication between devices. Here, I'll provide you with a simplified example of how to create a basic traffic light control system using Python on the Raspberry Pi and an Arduino Uno.

Components Required:

- Raspberry Pi
- Arduino Uno
- LED traffic lights
- Ultrasonic sensor and Buzzer
- Jumper wires
- USB cable for connecting the Arduino to the Raspberry Pi

Software/Tools Required:

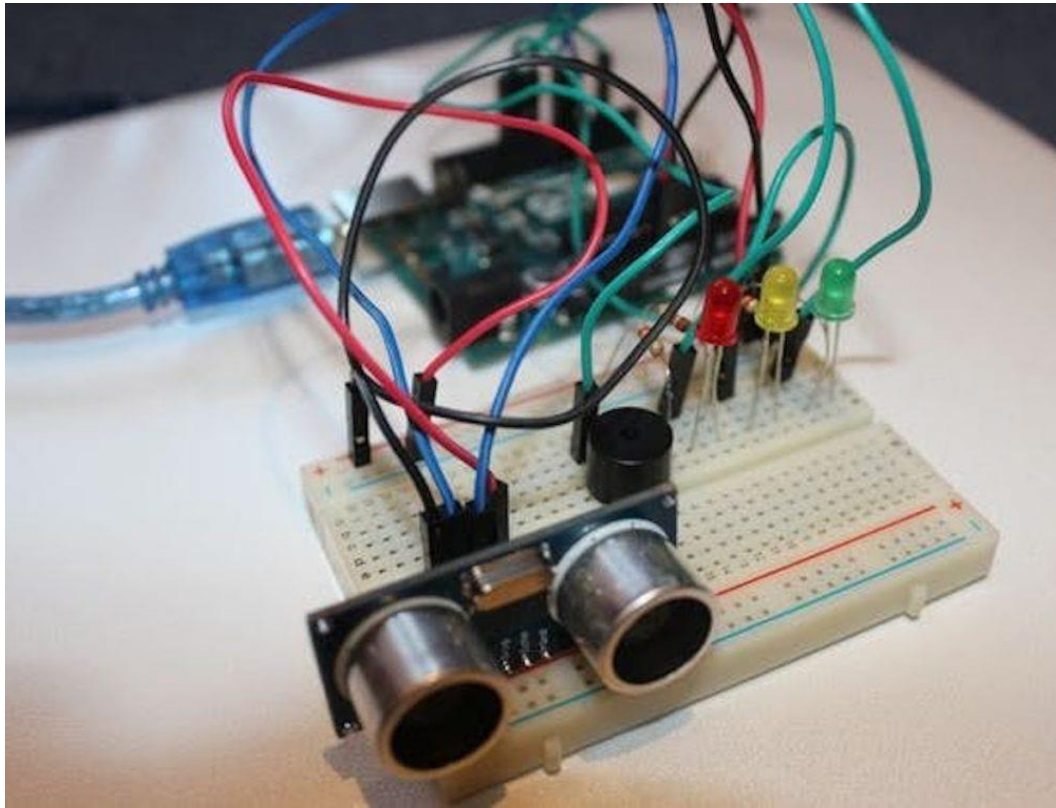
- Python on Raspberry Pi
- Arduino IDE for uploading code to the Arduino
- PySerial library for communication between Raspberry Pi and Arduino

TRAFFIC MANAGEMENT BY USING ARDUINO UN0

sketch_oct18a.ino | ReadMe.adoc

```
int redPin = 9;
int yellowPin = 10;
int greenPin = 11;

void setup() {
  pinMode(redPin, OUTPUT);
  pinMode(yellowPin, OUTPUT);
  pinMode(greenPin, OUTPUT);
}

void loop() {
  // Control traffic lights in a loop
  // Green light for one direction
  digitalWrite(greenPin, HIGH);
  digitalWrite(redPin, LOW);
  delay(5000);  // 5 seconds for green light

  // Yellow light for the same direction
  digitalWrite(greenPin, LOW);
  digitalWrite(yellowPin, HIGH);
  delay(2000);  // 2 seconds for yellow light

  // Red light for the same direction
  digitalWrite(yellowPin, LOW);
  digitalWrite(redPin, HIGH);
  delay(5000);  // 5 seconds for red light

  // Change the direction of the green light
  digitalWrite(redPin, LOW);
  digitalWrite(greenPin, HIGH);
  delay(5000);  // 5 seconds for green light in the other direction
}

```

Designing a traffic management system using Arduino Uno involves creating a system for controlling traffic lights based on specific rules, schedules, or real-time data. Below is an example project outline for a basic traffic management system using Arduino Uno. This project aims to demonstrate how the system can control traffic lights at a simple intersection.



TRAFFIC MANAGEMENT BY USING RASPBERRY PI

main.py

```python
import RPi.GPIO as GPIO
import time
from picamera import PiCamera

# Initialize GPIO pins
GPIO.setmode(GPIO.BCM)
red_pin, yellow_pin, green_pin = 17, 18, 27
GPIO.setup((red_pin, yellow_pin, green_pin), GPIO.OUT)
# Initialize camera
camera = PiCamera()
try:
    while True:
        # Simulate traffic light control
        GPIO.output(red_pin, True)
        time.sleep(10)
        GPIO.output(red_pin, False)
        GPIO.output(green_pin, True)
        time.sleep(10)
        GPIO.output(green_pin, False)
        # Capture images or video from the camera
        camera.capture('image.jpg')
        time.sleep(1)
        # Add distance measurement from the ultrasonic sensor
except KeyboardInterrupt:
    GPIO.cleanup()
    camera.close()
```

Run ▶

Designing a traffic management project using a Raspberry Pi is a complex and multi-faceted task that involves various components, including sensors, cameras, data analysis, and traffic light control. Below is an overview of a project that demonstrates the principles of traffic management using a Raspberry Pi.