# MPCA PROJECT

DENSITY BASED TRAFFIC CONTROL SYSTEM

ABSTRACT:

This project is designed to develop a density based traffic signal system where its signal timing changes automatically after sensing the traffic density at the intersection. Traffic density is defined as the amount of vehicle congested at a certain place, in this case an intersection. The more vehicles available, the higher the traffic density is. This increasing number of vehicles on the road will produce many problems such as traffic jammed thus will also drive to road accidents. Conventional traffic light uses fixed time which cause difficulties in controlling the traffic itself. In order to resolve this problem, design of this traffic light will help to reduce traffic jammed at a particular location. This traffic light uses an Arduino MEGA microcontroller to create an automation function together with an Infrared sensor (IR sensor) to detect the density of the traffic. All vehicles pass through the traffic light is measured and processed accordingly to delays. By using this, all vehicles will be counted and interacted with the system thus increase delay period for the green light at each traffic light which may have high density of traffic. Thus, it will reduce problems which might rooted from traffic congestion at the intersection.

The working of the project is divided into three steps

- If there is traffic at all the signals, then the system will work normally by controlling the signals one by one using the default timer.
- If there is no traffic near a signal, then the system will skip this signal and will move on to the next one. For example, if there is no vehicle at signal 2, 3 and currently the system is allowing vehicles at signal 1 to pass. Then after signal 1, the system will move on to signal 4 skipping signal 2 and 3.
- If there is no traffic at all the 4 signals, system will stop at the current signal and will only move on the next signal if there will be traffic at any other signal.
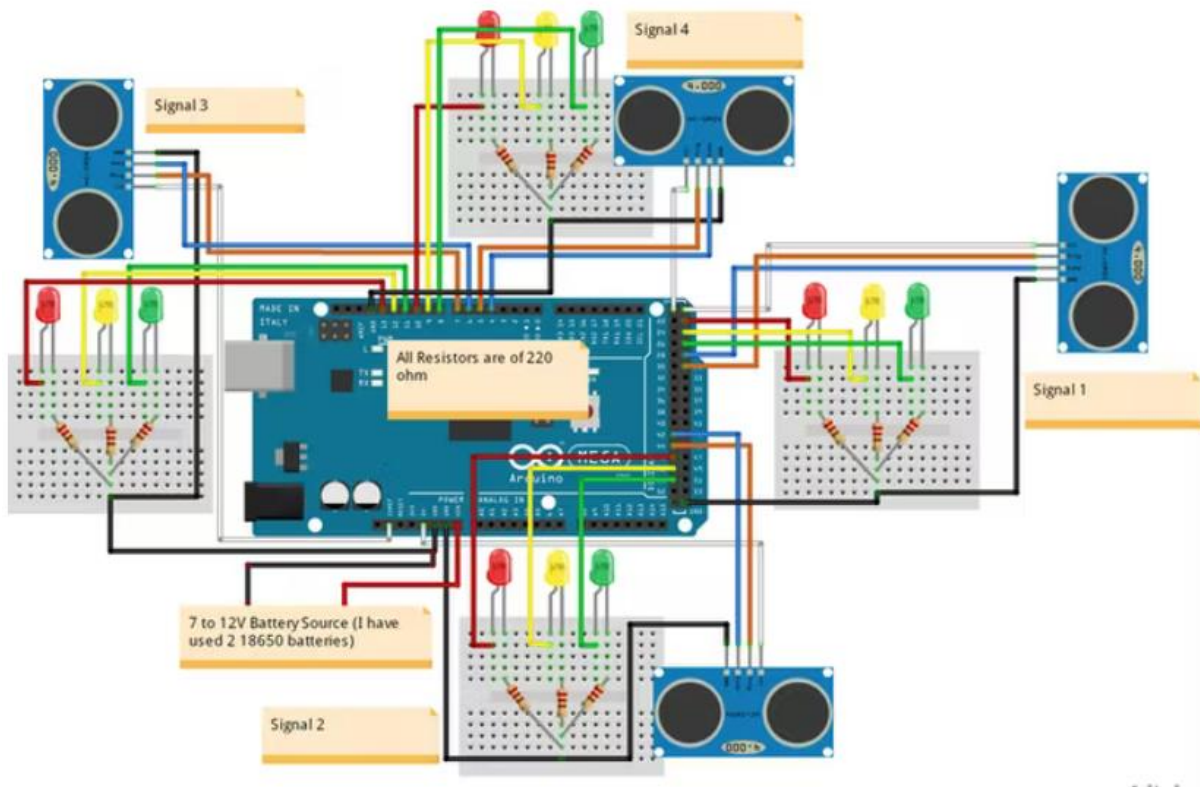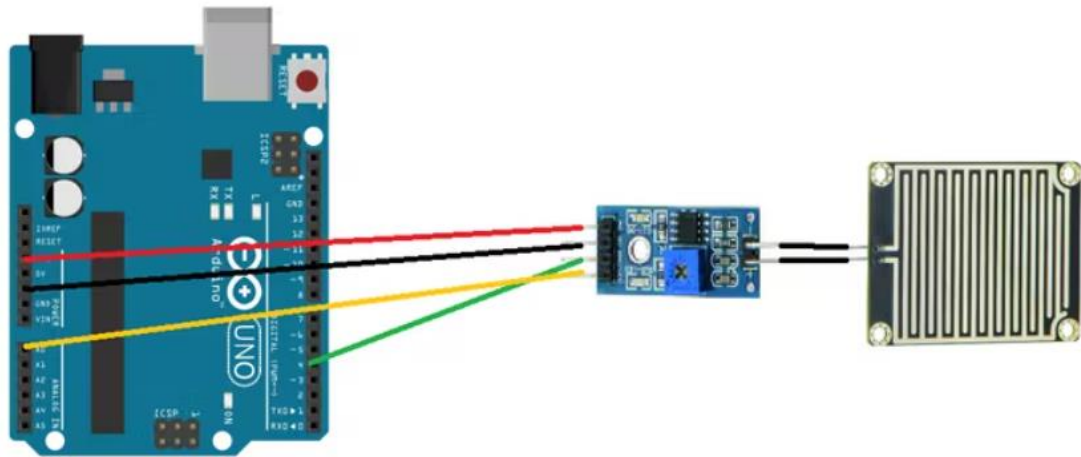
SENSORS:

1) IR SENSORS

Active infrared sensors emit low-level infrared energy into a specific zone to detect vehicles. When that energy is interrupted by the presence of a vehicle, the sensor sends a pulse to the traffic signal to change the light.
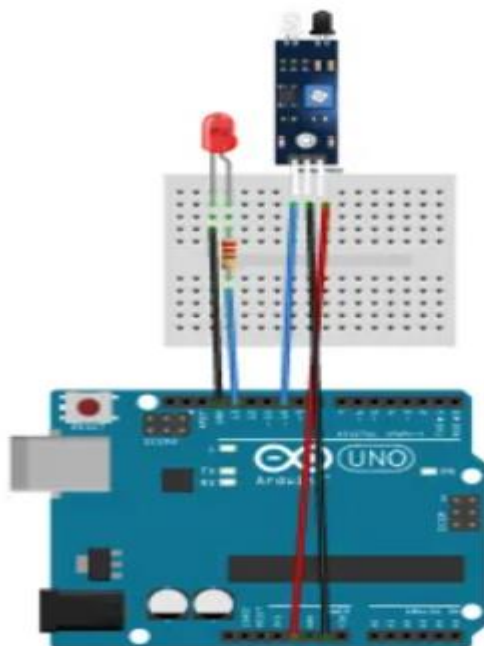
2) RAIN SENSORS

The rain sensor detects water that comes short circuiting the tape of the printed circuits.

The sensor acts as a variable resistance that will change status, the resistance increases when the sensor is wet and the resistance is lower when the sensor is dry.


3) SMOKE SENSOR

The voltage that the sensor outputs changes accordingly to the smoke/gas level that exists in the atmosphere. The sensor outputs a voltage that is proportional to the concentration of smoke/gas.
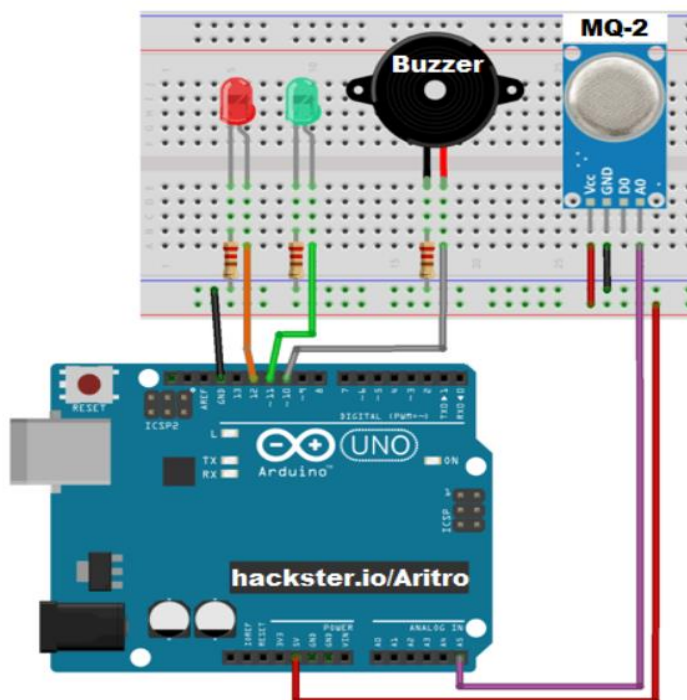
4) **SPEED SENSOR**

Vehicles over speeding can be in check using these sensors. The speed of the vehicles on road are detected accordingly and in case of over-speeding a buzzer goes off giving the driver a warning.
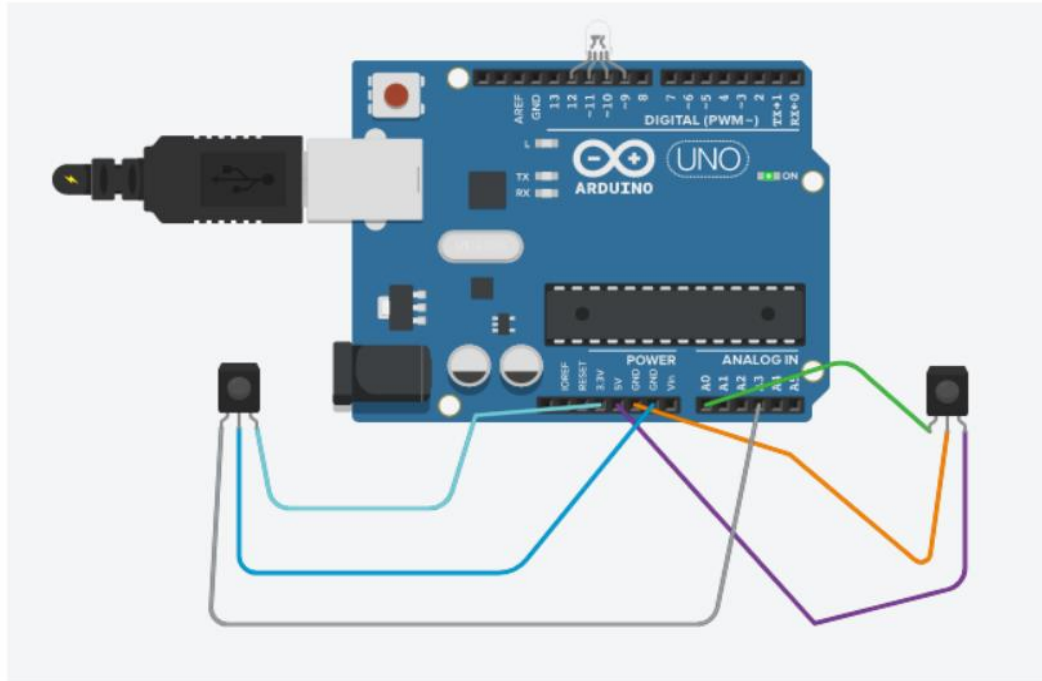
TEAM MEMBERS:

NEERAJA N   PES2UG20CS528

RITHIKA A   PES2UG20CS539

SUMEDA PUJA   PES2UG20CS562