

MOTION-SENSITIVE LIGHTS

Economical & Eco-Friendly Lighting system

Group Members

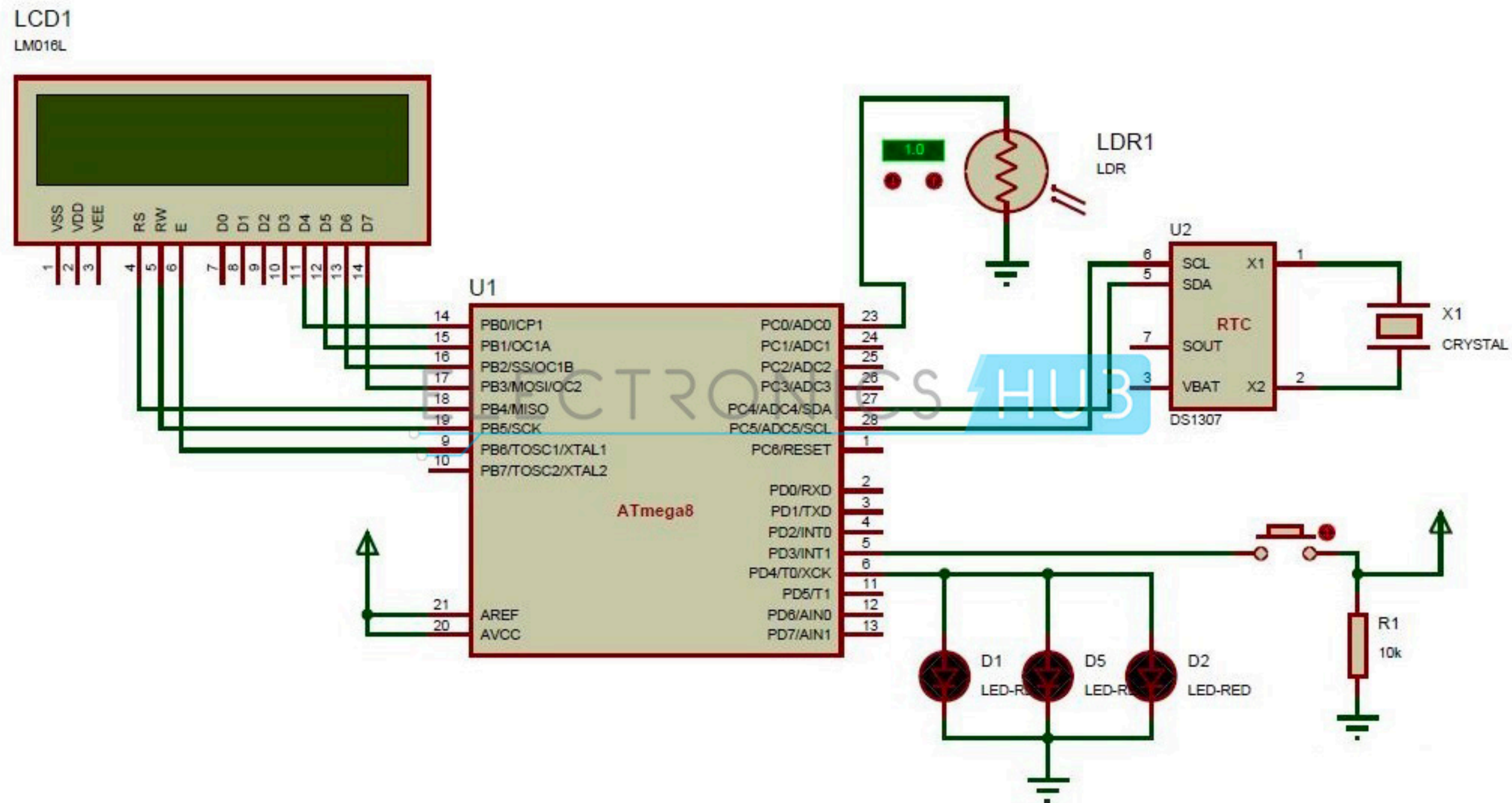
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INTRODUCTION

Energy can neither be created nor destroyed. It can only be converted from one form to another. Therefore it must be saved efficiently and utilised to its utmost potential.

We see the application of street lights every night making our city look colourful every night. The light energy emanating from these light should be used efficiently in order to save energy.

On our planet earth the resources available naturally are depleting gradually every day, so we must look for secondary options reliable enough to uphold the future.

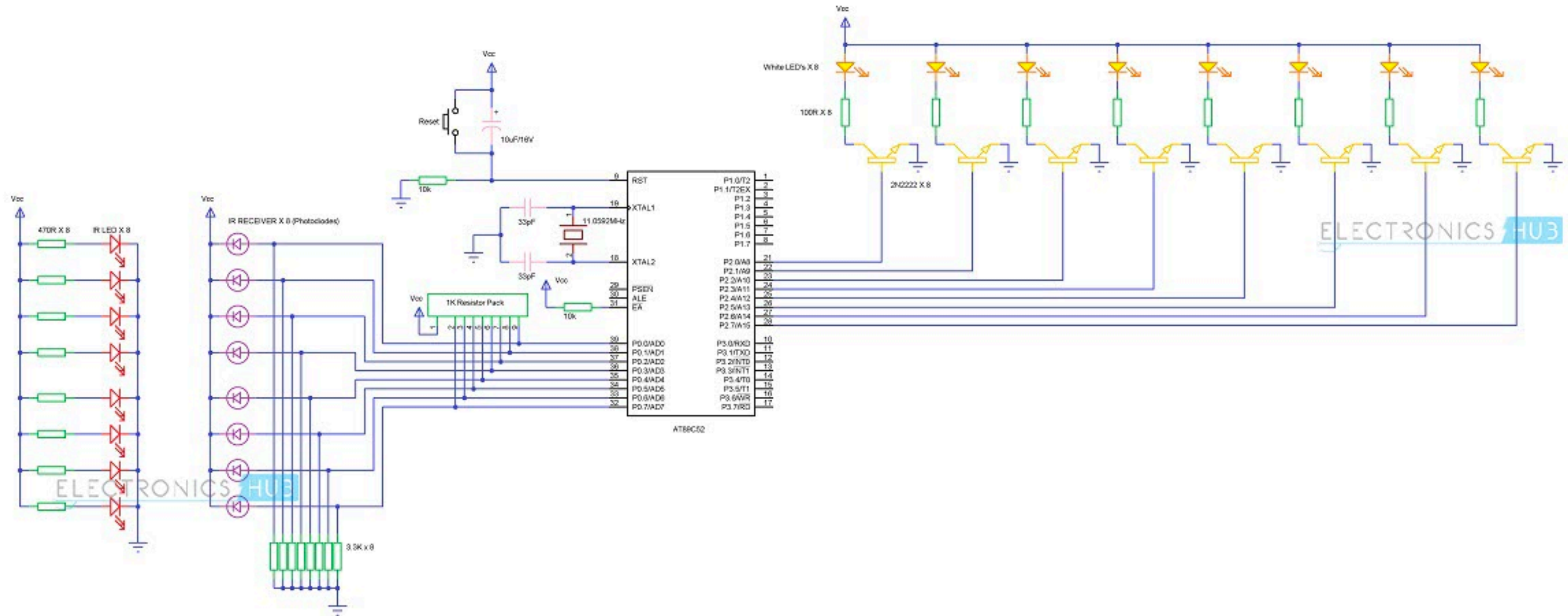


**MOTION-DETECTING LIGHTS USING AVR MICROCONTROLLER
(ATMEGA8 MICROCONTROLLER)
CIRCUIT DIAGRAM**



CIRCUIT COMPONENTS

- ATmega8 microcontroller
- DS1307 IC
- PIR Sensor
- LDR
- LCD
- LED array



**MOTION-DETECTING LIGHTS USING 8051 & IR SENSOR
(AT89C52 MICROCONTROLLER)
CIRCUIT DIAGRAM**



CIRCUIT COMPONENTS

Microcontroller Section

- AT89C52 Microcontroller
- AT89C52 Programmer Board
- 11.0592 MHz Quartz Crystal
- 22pF Ceramic Capacitor
- 2 x 10K Resistor
- 10uF Electrolytic Capacitor
- Push Button

IR Transmitter and Receiver Section

- 8 x IR LED (IR Transmitters)
- 8 x 470R Resistor
- 8 x Photo Diode (IR Receivers)
- 8 x 3.3K Resistor
- 1K x 8 Resistor Pack

Load Section

- 8 x 2N2222 NPN Transistors
- 8 x 100R Resistor
- 8 x White LEDs

COMPONENTS DESCRIPTION

1.REAL TIME CLOCK(DS1307 IC):

- It employs I2C transmission protocol.(2 way data transmission -master to slave, slave to master) between any two separate devices.
- The first and second pins are interfaced with the oscillating crystal.
- The third pin is connected to battery source.
- Sixth pin is connected to PC5 of microcontroller.
- Fifth pin is connected to PC4 pin of microcontroller.

2.Liquid Crystal Display(LCD):

- The only role of a LCD is to display characters(16 letters x 2 rows).
- The information from the Real time clock is shown here.
- This process is continuous till it approaches a fixed time (5 am/6am)

COMPONENTS DESCRIPTION

3. Light Dependent Resistor(LDR):

- They have low resistance in morning and a very high resistance in the dark.
- It is interfaced with the microcontroller through ADC0 pin of the ATmega8 microcontroller.
- LDR creates analog information(waves) which are then converted into digital information by the Analog Digital Converter (ADC).

4. ATmega8 (8051 microcontroller AVR):

- The microcontroller needs an external clock to be activated.
- Within the reset region of the microcontroller, the following components are embedded:-
- 10 microfarad capacitor
- 10 kilo ohms resistor
- Push button for active high or active low condition
- The provision of an external pin is to get external memory while grounded. Therefore this pin is connected to VCC via 10 kilo ohm resistor.

COMPONENTS DESCRIPTION

5. IR MODULE:

- This is the most crucial section of the apparatus
- There are two main components involved:-
- IR Transmitter
- IR receiver
- The job of the transmitter is to continuously transmit Infrared rays until an obstruction comes forward.
- 8 IR Transmitters along with corresponding 470 ohm current limiting resistor (CLR) is connected to power supply.
- Light emitting diodes:
- Finally the LED's have to be interfaced with the microcontroller through Port 2.
- The base of the 2n2222 transistors are connected to the LED's whereas the emitter of the transmitters are grounded.
- One LED along with a series 100 ohms current limiting resistor is interfaced with the collector terminal of the corresponding transistors.

STEPS TO OPERATE THE CIRCUIT

- Initially power the circuit.
- LCD displays the time read from RTC.
- Place the LDR in darkness. Street light is switched ON.
- The microcontroller continuously checks the time. Street Light is switched on for fixed timings written in code. Afterwards they're switched off automatically.
- Place your hand in front of PIR sensor, this switches the lights on again, indicating that on detection of any object moving the light turns ON.
- After 2-3 seconds delay, lights are again switched off automatically

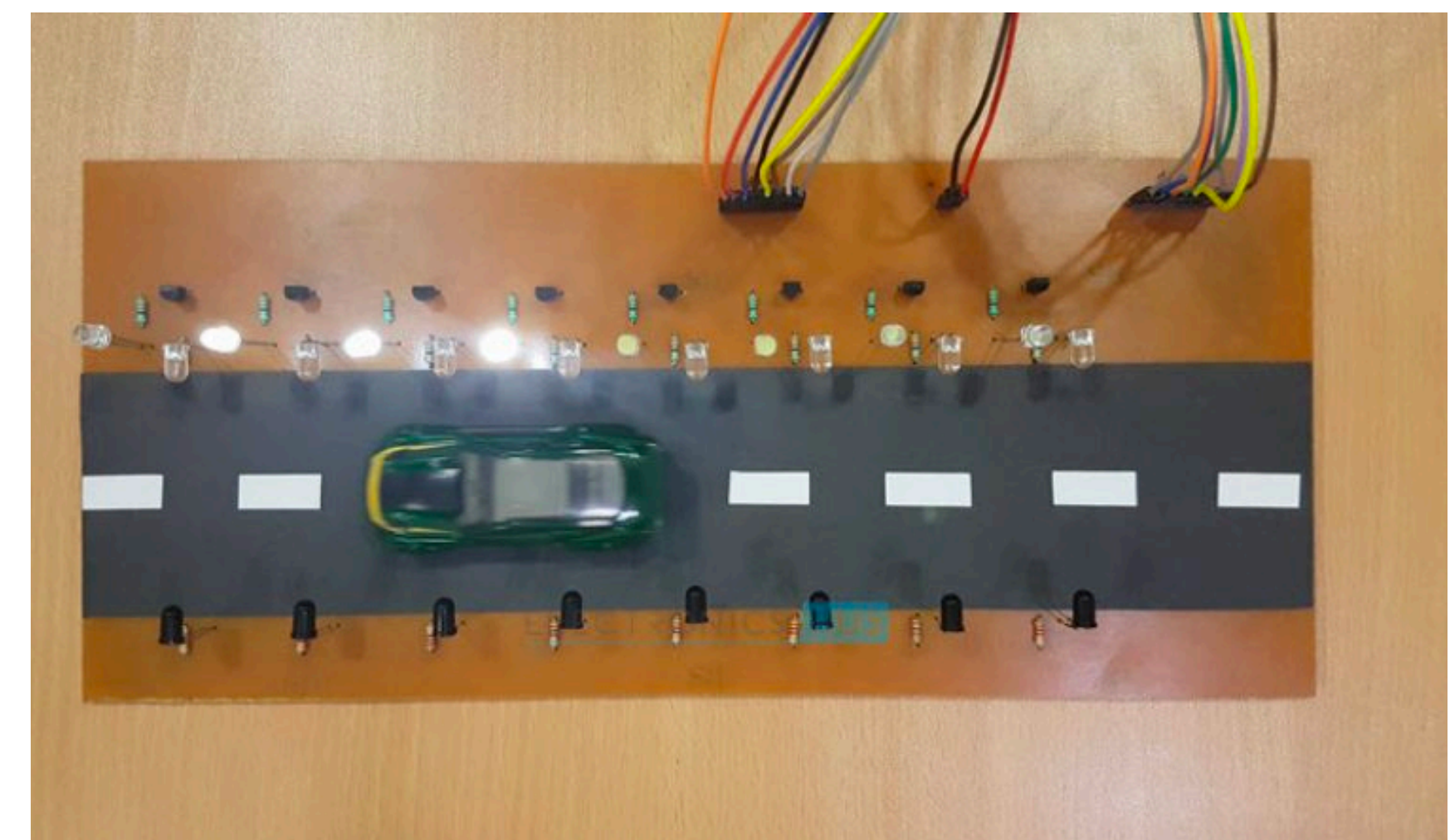
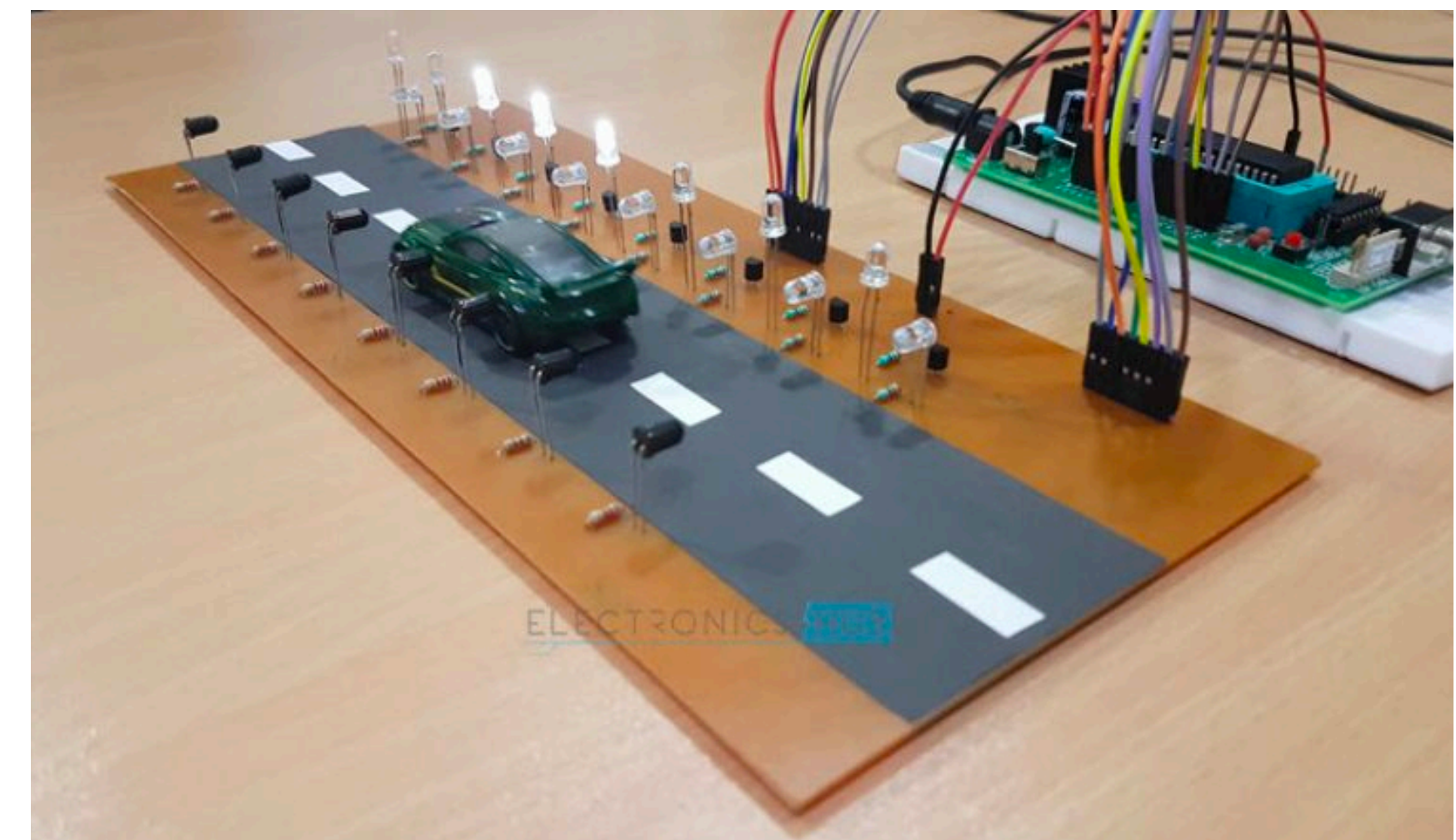
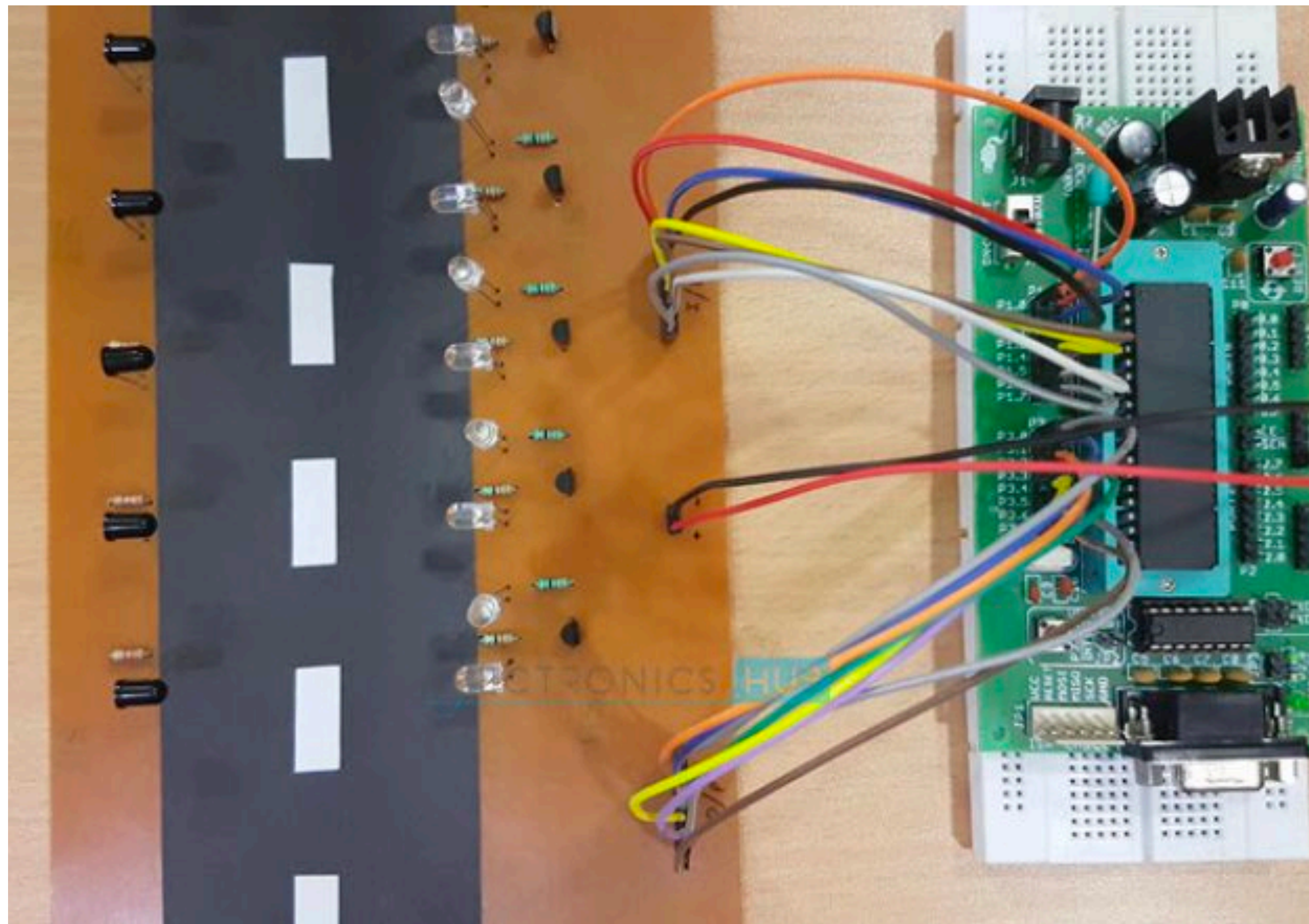
PRINCIPLE OF OPERATION

The principle behind the working of the project lies in the functioning of IR Sensor. We are going to use a Transmissive type IR Sensor in this project.

In Transmissive IR Sensor, the IR transmitter and receiver are placed facing each other so that IR receiver always detects IR Rays emitted by the IR Transmitter.

If there is an obstacle between the IR Transmitter and Receiver, the IR Rays are blocked by the obstacle and the IR Receiver stops detecting the IR Rays.

This can be configured to turn ON or OFF the LEDs (or street lights) with the help of microcontroller.



EXPECTED WORKING MODEL