EXPERIMENT

SMART STREET LIGHT SYSTEM BASED ON ARDUINO

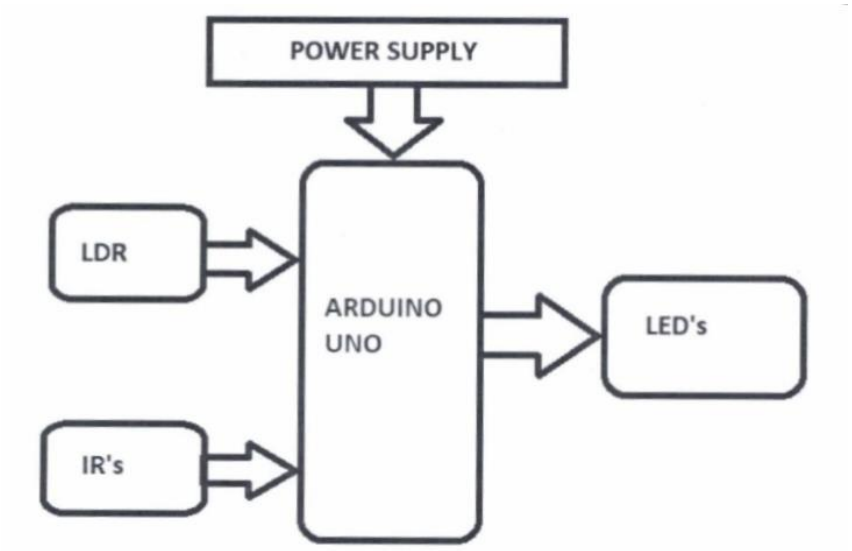
AIM:

To making an automatic street light is to save the power and as the light turns ON & OFF according to the requirement it saves the power & also decreases our work.

APPPARATUS REQUIRED:

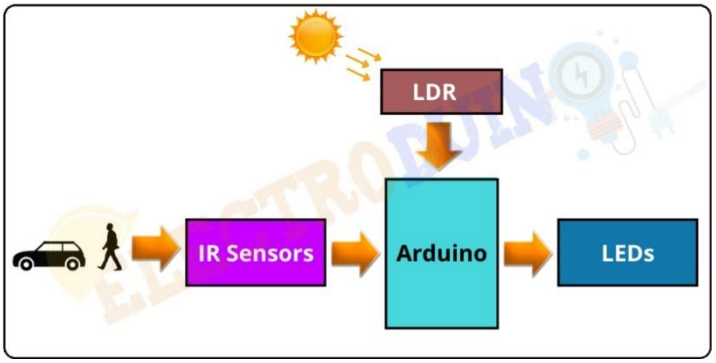
S. No	Name of the equipment	Specifications	Quantity
1	Arduino	UNO	1
2	IR Sensor Jumper wires		3
3	LDR Sensor Module		1
4	Breadboard		1
5	Computer with Arduino IDE software	IDE 1.8.14	1
6	LED		3

BLOCK DIAGRAM:



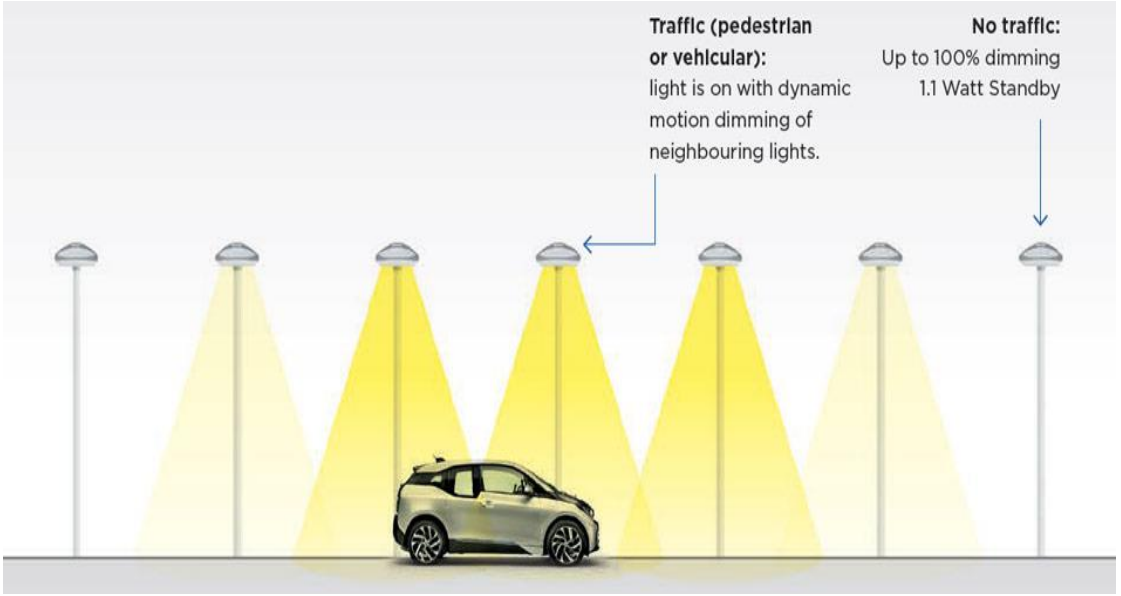
Working of Model:

Automation plays a very important role in the global economy and in everyday life. Automatic systems are preferred over handmade programs of any kind. We can also call it the "SMART STREET LIGHT SYSTEM". The smart light sensor refers to public street light, which is familiar with the movement of pedestrians, cyclists, and motorists. street lights, also called adaptive streetlights, dim when no work is available but light up when movement is detected. Research shows an automatic control of traffic lights, which may save some energy. In terms of industrial development, automation goes a step further than machinery. Functional muscle needs, automation greatly reduces the need for human mental and sensory needs. Basically, street lighting is one of the most important parts. The number of roads is increasing rapidly due to the congestion of many vehicles. Keywords: Light Dependent Resistors (LDR), Light Emitting Diode (LED), Infrared Sensor (IR), Internet Of Things (IOT).



Working of Model:

Initially, it is necessary to make connections according to the wiring diagram. The code is very important to use all equipment. In recent days, the Smart Street Light system is a key part of a smart city infrastructure. An important function is to illuminate city streets using sensors to save current or energy. In the current system that uses standard street lights, it requires more energy and is more expensive, so we should use LED lights to save energy and the minimum amount of energy required. The use of the IoT system type is worldwide. It is used to control the types of urban areas. The whole project is divided into five main categories listed below.



- ARDUINO UNO
- IR SENSOR
- LDR SENSOR
- LIGHT EMITTING DIODE

ARDUINO UNO:

The Arduino Uno comes with USB interface, 6 analog input pins, 14 I/O digital ports that are used to connect with external electronic circuits. Out of 14 I/O ports, 6 pins can be used for PWM output. It allows the designers to control and sense the external electronic devices in the real world.

The Arduino UNO is a standard board of Arduino. Here UNO means 'one' in Italian. It was named as UNO to label the first release of Arduino Software. It was also the first USB board released by Arduino. It is considered as the powerful board used in various projects. Arduino.cc developed the Arduino UNO board. Arduino UNO is based on an ATmega328P microcontroller. It is easy to use compared to other boards, such as the Arduino Mega board, etc. The board consists of digital and analogy Input/Output pins (I/O), shields, and other circuits.

Fig:1 Arduino Uno

IR SENSOR:

An Infrared sensor is an electronic module which is used to sense certain physical appearance of its surroundings by either emitting and/or detecting infrared radiation. IR sensors are also capable of determining the heat being emitted by an object and detecting motion.

Here an IR sensor is used for detecting obstacles. IR transmitter transmits IR signal, as that signal detects any obstacle in its path, the transmitted IR signal reflects back from the obstacle and received by the receive

PINOUT:

1. VCC: 3.3V-5V power input pin
2. GND: 0V power pin
3. OUT: Digital Output Pin

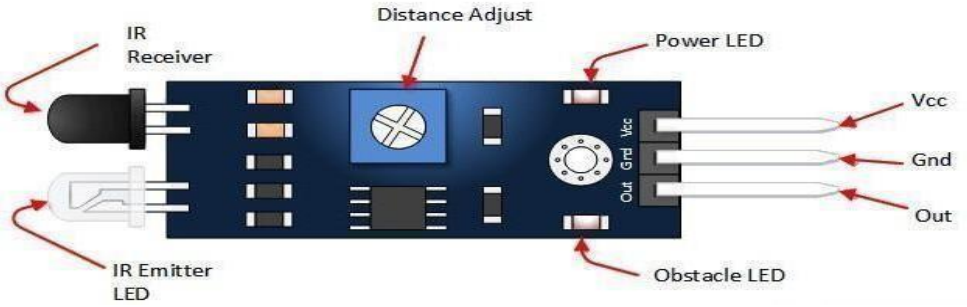


Fig:2 Infrared sensor

LIGHT DEPENDENT RESISTANCE:

For LDRs or Light Dependent Resistors they are very useful, especially for light / dark sensor circuits. Normally the LDR resistance is very high, sometimes up to 1000000 ohms, but when lighted up the resistance decreases significantly. Electronic devices in sensors are tools that change their electrical characteristics, where there is visible or invisible light. The most well-known devices of this type are light dependent resistor (LDR), photodiode, and phototransistors. The light-dependent resistor, as the name implies, depends on the light on depends on the switching switch.

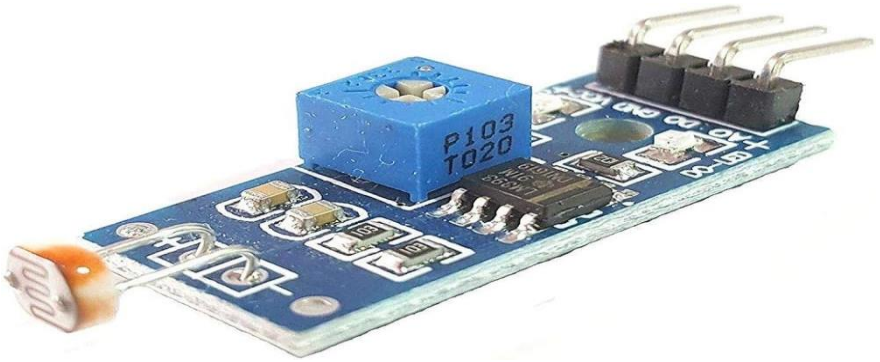


Fig :3 LDR Sensor Module

LIGHT EMITTING DIODE:

A light-emitting diode (LED) is a two-conductor semiconductor light source. This is a pn junction diode that emits light when is on. The long terminal is positive and the short terminal is negative. When adequate current is applied to conductors, electrons are able to recombine with electron holes in the device, releasing energy in the form of photons. This effect is called electroluminescence, and the color of the light (corresponding to the energy of the photon) is determined by the band gap energy of the semiconductor. LEDs are generally small and integrated Optical components can be used to shape the radiation pattern

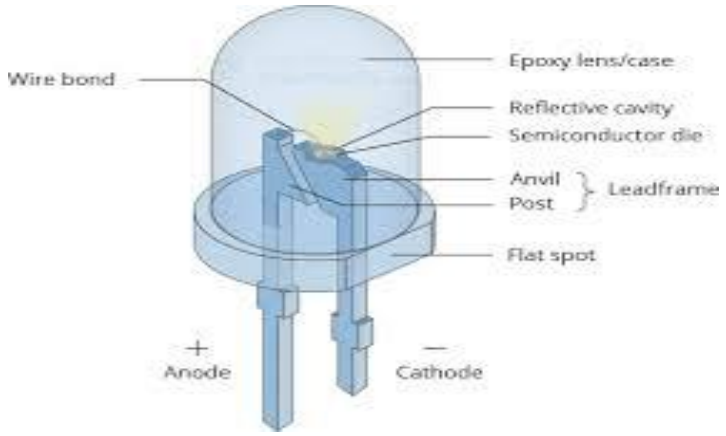
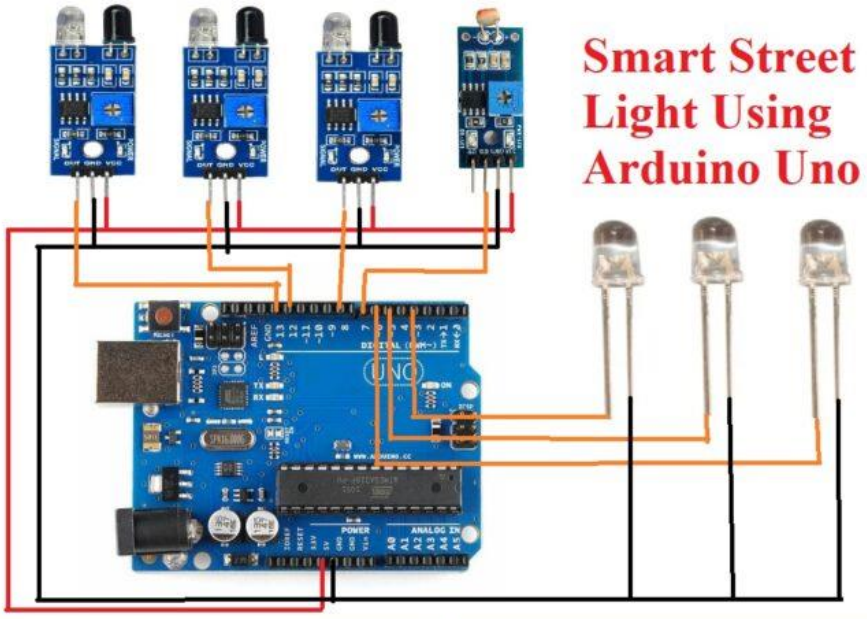


Fig:4 Light Emitting Diode

Circuit Diagram:



Code/Programme:

```
int IR1 = 8;
int IR2 = 12;
int IR3 = 13;
int LDR = 7;
int led1 = 3;
int led2 = 5;
int led3 = 6;
int val1;
int val2;
int val3;
int val4;


void setup()
{
```

```
pinMode(IR1,INPUT);
pinMode(IR2,INPUT);
pinMode(IR3,INPUT);
pinMode(LDR,INPUT);
pinMode(led1,OUTPUT);
pinMode(led2,OUTPUT);
pinMode(led3,OUTPUT);

}

void loop() {
val1 = digitalRead(IR1);
val2 = digitalRead(IR2);
val3 = digitalRead(IR3);
val4 = digitalRead(LDR);

if(val1==1&&val4==0&&val2==1&&val3==1)
{
digitalWrite(3,LOW);
digitalWrite(5,LOW);
digitalWrite(6,LOW);

}
else if(val1==1&&val4==1&&val2==1&&val3==1)
{
analogWrite(3,20);
analogWrite(5,20);
analogWrite(6,20);
}

else if(val1==0&&val4==1&&val2==1&&val3==1)
{
analogWrite(3,500);
analogWrite(5,20);
analogWrite(6,20);
}
else if(val1==1&&val4==1&&val2==0&&val3==1)
{
analogWrite(3,20);
analogWrite(5,500);
analogWrite(6,20);
}
else if(val1==1&&val4==1&&val2==1&&val3==0)
{
analogWrite(3,20);
analogWrite(5,20);
analogWrite(6,500);
}
```

RESULT: