



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with
'A++' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University,
Chennai



DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT213- IoT SYSTEM ARCHITECTURE

II ECE / IV SEMESTER

UNIT 2 – MICROCONTROLLER AND INTERFACING TECHNIQUES FOR IoT

DEVICES

Digital Sensor Interfacing



Interfacing programs on Arduino using LED



1. **Blinking an LED**
2. **Toggle the state of LED using Switch**
3. **Traffic light simulation for pedestrians**
4. **Create Dimmable LED using Potentiometer**

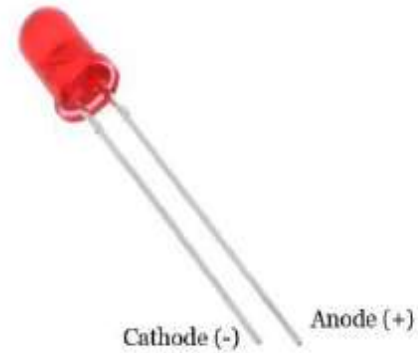


Blinking an LED



**Components
required**

1-LED, 1-K Ω resistor, Jumper wires, Breadboard



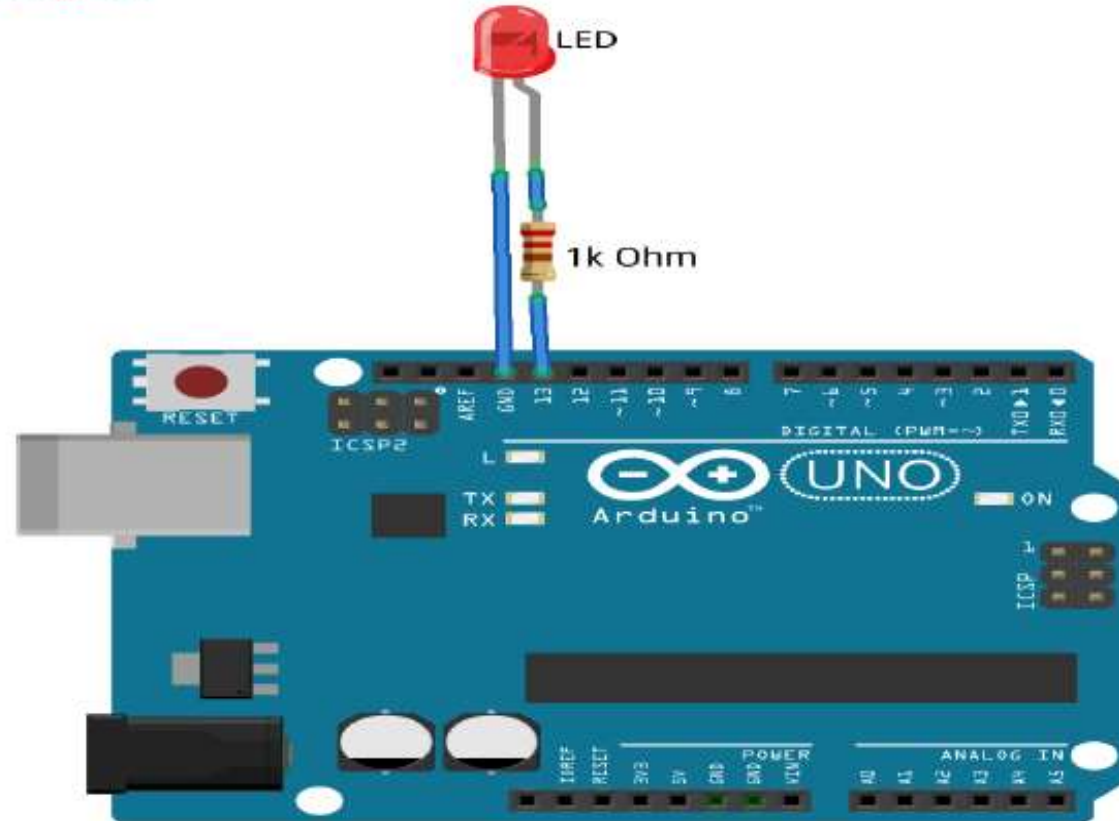
The longest lead is the anode and the shortest is the cathode.



Blinking an LED



Circuit Diagram





Blinking an LED



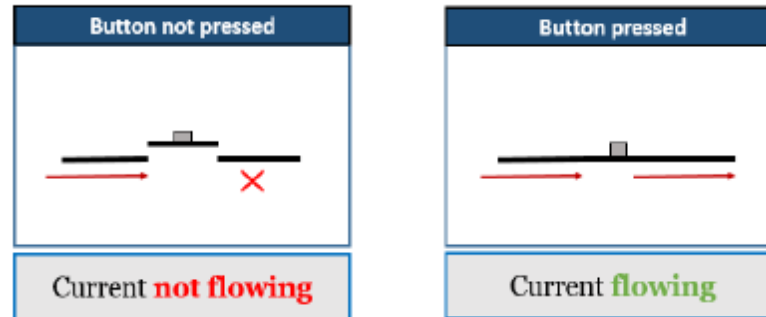
Code

```
/*The Function setup runs only once when Arduino board is first powered up
or a reset button the board is pressed */
void setup()
{
pinMode(13, OUTPUT); //pin 13 is set as an OUTPUT pin
}
//loop function iterates forever
void loop() {
digitalWrite(13, HIGH); //Sets LED to HIGH voltage
delay(1000); //delay by a second
digitalWrite(13, LOW); //Sets LED to LOW voltage
delay(1000); //delay by a second
}
```



Toggle the state of LED using Switch

Components required **1-LED, 1-K Ω resistor, 1-push button, Jumper wires, Breadboard**



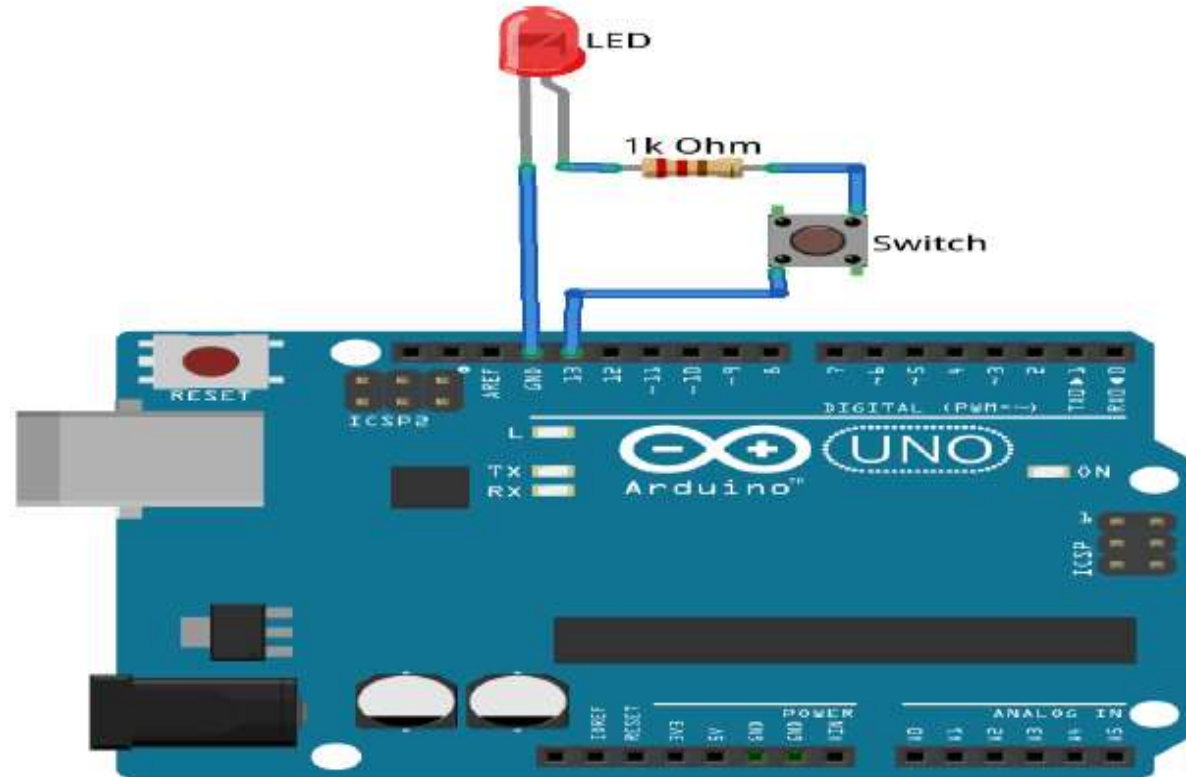
Here an **open pushbutton** mechanism is used. In Normal state(not pushed) of the button current doesn't flow, only when button is pushed flow of current is allowed



Toggle the state of LED using Switch



Circuit diagram





Toggle the state of LED using Switch



Code

```
/*The Function setup runs only once when Arduino board is first
powered up or a reset button the board is pressed */
void setup()
{
pinMode(13, OUTPUT); //pin 13 is set as an OUTPUT pin
}
//loop function iterates forever
void loop()
{
digitalWrite(13, HIGH); //Sets LED to HIGH voltage when a button is
//pressed else it remains LOW
//delay by a second
delay(1000);
}
```




Traffic light Simulation for Pedestrians

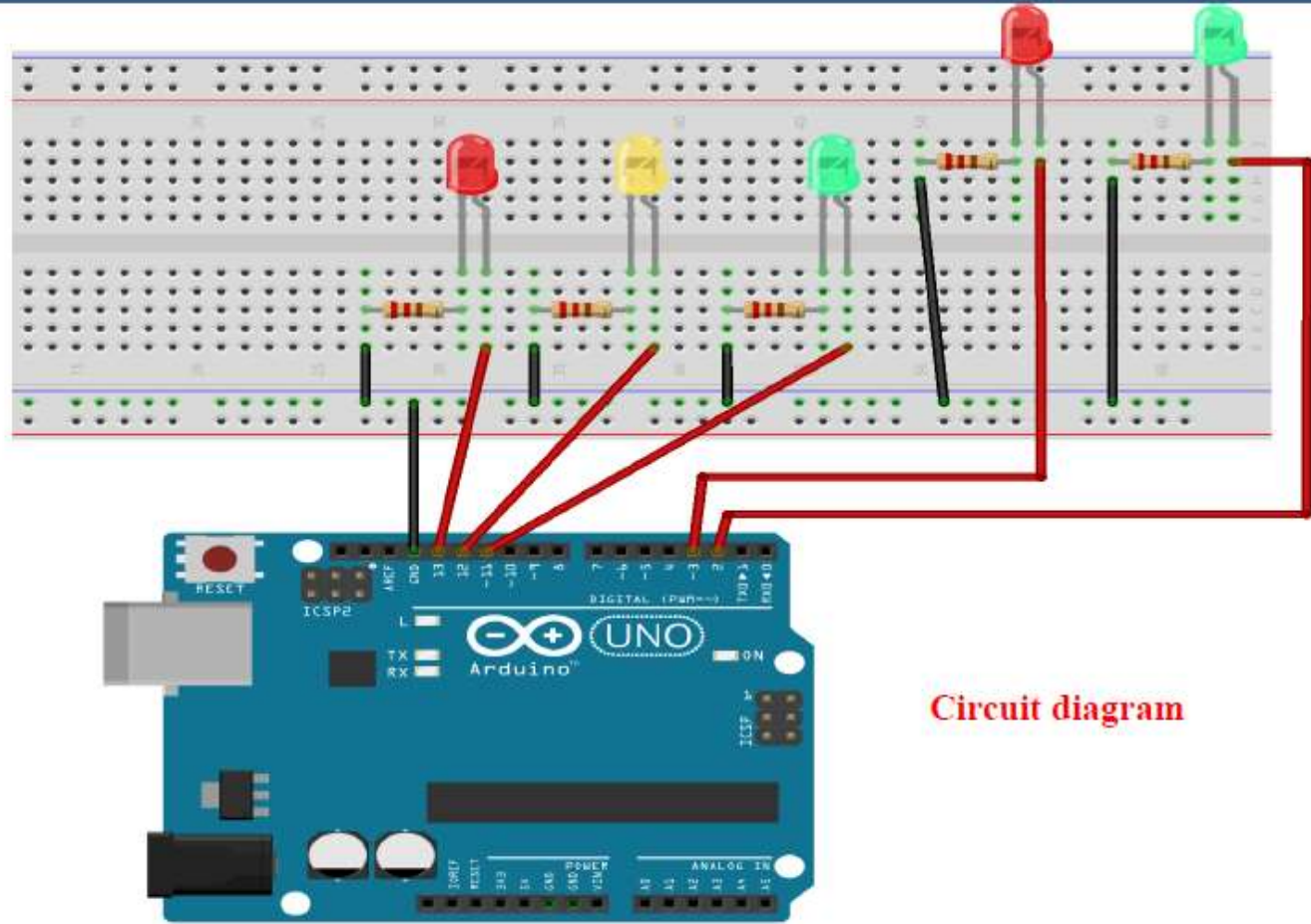


**Components
required**

**2-Red LED, 2-Green LED, 1-Yellow LED, 5-220Ω
resistor, Jumper wires, Breadboard**



Traffic light Simulation for Pedestrians



Circuit diagram

fritzing



Traffic light Simulation for Pedestrians



Code

```
// Declare the variables for different colors of LEDs.
int red_vehicle = 13;
int yellow_vehicle = 12;
int green_vehicle = 11;
int green_Pedestrian = 2;
int red_Pedestrian = 3;
void setup( )
{
// Initialize the pins for output
pinMode(red_vehicle, OUTPUT);
pinMode(yellow_vehicle, OUTPUT);
pinMode(green_vehicle, OUTPUT);
pinMode(red_Pedestrian, OUTPUT);
pinMode(green_Pedestrian, OUTPUT);
}
```



Traffic light Simulation for Pedestrians



```
void loop()  
{  
digitalWrite(green_Vehicle, HIGH); // green LED turns ON  
digitalWrite(red_Pedestrian, HIGH);  
delay(5000);  
digitalWrite(green_Vehicle, LOW); // green LED turns OFF  
digitalWrite(yellow_Vehicle, HIGH); // Yellow LED turns ON for 2second.  
delay(2000);  
digitalWrite(yellow_Vehicle, LOW); // yellow LED will turn OFF  
digitalWrite(red_Pedestrian, LOW);  
digitalWrite(red_Vehicle, HIGH); // Red LED turns ON for 5 seconds  
digitalWrite(green_Pedestrian, HIGH);  
delay(5000);  
digitalWrite(red_Vehicle, LOW); // Red LED turns OFF  
digitalWrite(green_Pedestrian, LOW);  
}
```