Department of Computer Science & Engineering

Course Title : peripheral and Interfacing Lab

Course Code : CSE 316

Lab Report : 01

Experiment Name : Turning on LED Lights using Arduino Uno

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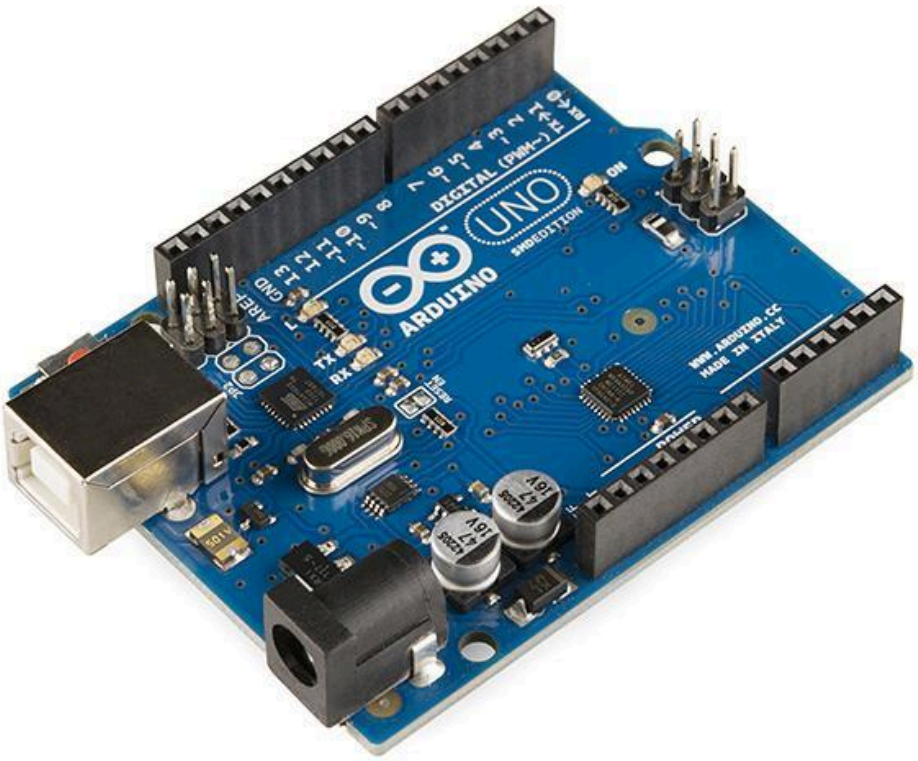
Title: Turning on LED Lights using Arduino Uno.

Description:

What is Arduino?

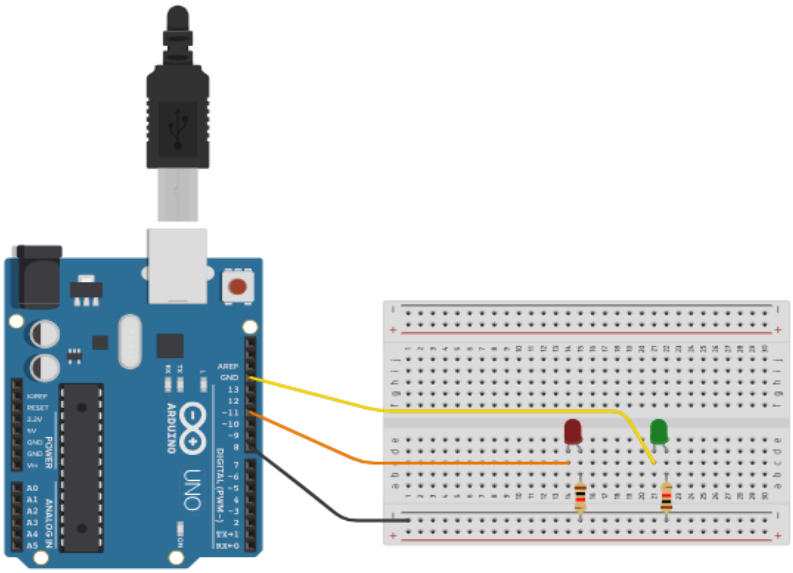
Arduino is an open-source electronics platform based on easy-to-use hardware and software. It allows users to create interactive projects by programming microcontrollers to control devices like sensors, lights, and motors.



Arduino Uno

What is Tinkercad?

Tinkercad is a web-based tool designed for 3D modeling, electronics simulation, and coding, created by Autodesk. It provides a beginner-friendly platform where users can design 3D models, simulate electronic circuits, and program devices like Arduino using a simple drag-and-drop interface. Widely used in educational settings, Tinkercad helps teach STEM concepts by allowing users to visualize and build projects without needing advanced skills. It also supports exporting designs for 3D printing and serves as an intuitive space for prototyping electronics.



Turning on 2 LED Lights using Arduino Uno

Components:

1. Arduino uno
2. Breadboard
3. Red LED
4. Green LED
5. Yellow LED
6. Blue LED
7. Resistors (2)
8. Jumper Wire

Arduino Code:

```
const int redLED = 2;   // Red LED connected to digital pin 2
const int greenLED = 3; // Green LED connected to digital pin 3
void setup() {
  pinMode(redLED, OUTPUT);
  pinMode(greenLED, OUTPUT);
}
void loop() {
  digitalWrite(redLED, HIGH);
  digitalWrite(greenLED, LOW);
  delay(1000);
  digitalWrite(redLED, LOW);
  digitalWrite(greenLED, HIGH);
  delay(1000);
}
```

Description of the Circuit:

- This setup includes two LEDs (green and red) mounted on a breadboard, each connected to its own digital pin on the Arduino.
- A resistor is placed in series with each LED to prevent excessive current flow.
- The Arduino, powered via a USB cable, controls the LEDs by sending signals through the assigned pins.
- With the right programming, the Arduino can turn the LEDs on or off, or make them blink. This configuration can be used for projects like traffic light simulations, status indicators, or simple LED patterns.

Discussion:

This Arduino setup showcases the control of two LEDs (green and red) using an Arduino Uno and a breadboard. Each LED is connected to a separate digital pin on the Arduino, with power supplied via jumper wires. Current-limiting resistors are added to protect the LEDs. By programming the Arduino, users can create different LED behaviors, like blinking patterns, simulating traffic lights, or signaling system statuses. This circuit is a popular choice for learning basic programming and hardware interaction in electronics projects.