Lab Task 1

Course Name: Microprocessors and Microcontrollers Laboratory

Course Code: CSE 4326

Section: D

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Lab Task 1

LED Blink Control via Serial Monitor Input

Objective:

The user will input an integer value to the Serial Monitor, and the LED should blink that number of times.

Equipment:

- Arduino Uno R3
- Arduino IDE (Compiler)
- Proteus (Simulator)

Introduction:

The experiment aims to demonstrate the interaction between an Arduino microcontroller, an LED, and a Serial Monitor using the Proteus software. The objective is to develop a program that allows the user to input an integer value through the Serial Monitor. This value will determine the number of times the LED connected to the Arduino blinks. The experiment showcases the ability of Arduino to receive input from an external source and control an output device accordingly, providing a hands-on demonstration of basic input and output operations in a simulated environment.

Components and its Functions:

1. **Arduino Uno:** The Arduino is the main component of this experiment, responsible for receiving input from the Serial Monitor and controlling the LED based on the input received.
2. **LED (Light Emitting Diode):** The LED is a small electronic component that emits light when an electric current passes through it. In this experiment, the LED is used as the output device to visually represent the blinking action.
3. **Serial Monitor:** The Serial Monitor is a tool used for communication between the Arduino and the computer. It allows the user to send data from the computer to the Arduino and receive data from the Arduino, making it ideal for user interaction in this experiment.

4. **Proteus Software:** Proteus is a simulation software that provides a virtual environment for designing, testing, and simulating electronic circuits. It allows us to create a virtual representation of the Arduino board, the LED, and the Serial Monitor, enabling us to test and verify the functionality of our program without physical hardware.
5. **Jumper Wires:** Jumper wires are used to establish electrical connections between the components. They connect the Arduino's digital pin to the LED, allowing the Arduino to control the LED's on and off states.

Circuit Diagram:
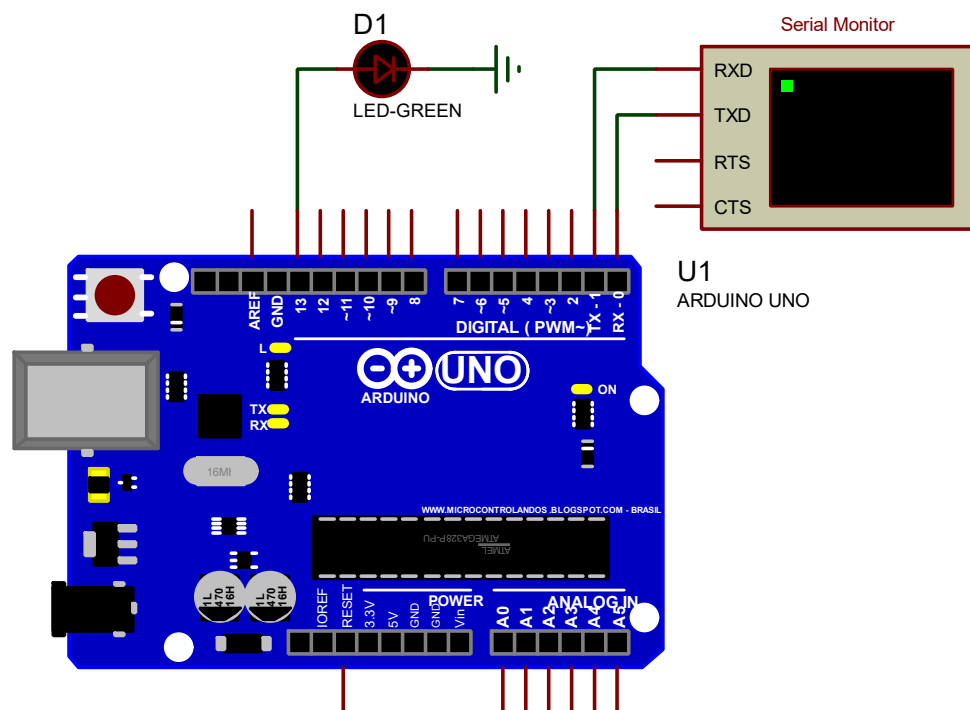
Arduino Code:

```
int ledPin = 13;
int inputValue = 0;

void setup() {
  pinMode(ledPin, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  if (Serial.available() > 0) {
    inputValue = Serial.parseInt();
    for (int i = 0; i < inputValue; i++) {
      digitalWrite(ledPin, HIGH);
      delay(500);
      digitalWrite(ledPin, LOW);
      delay(500);
    }
  }
}
```