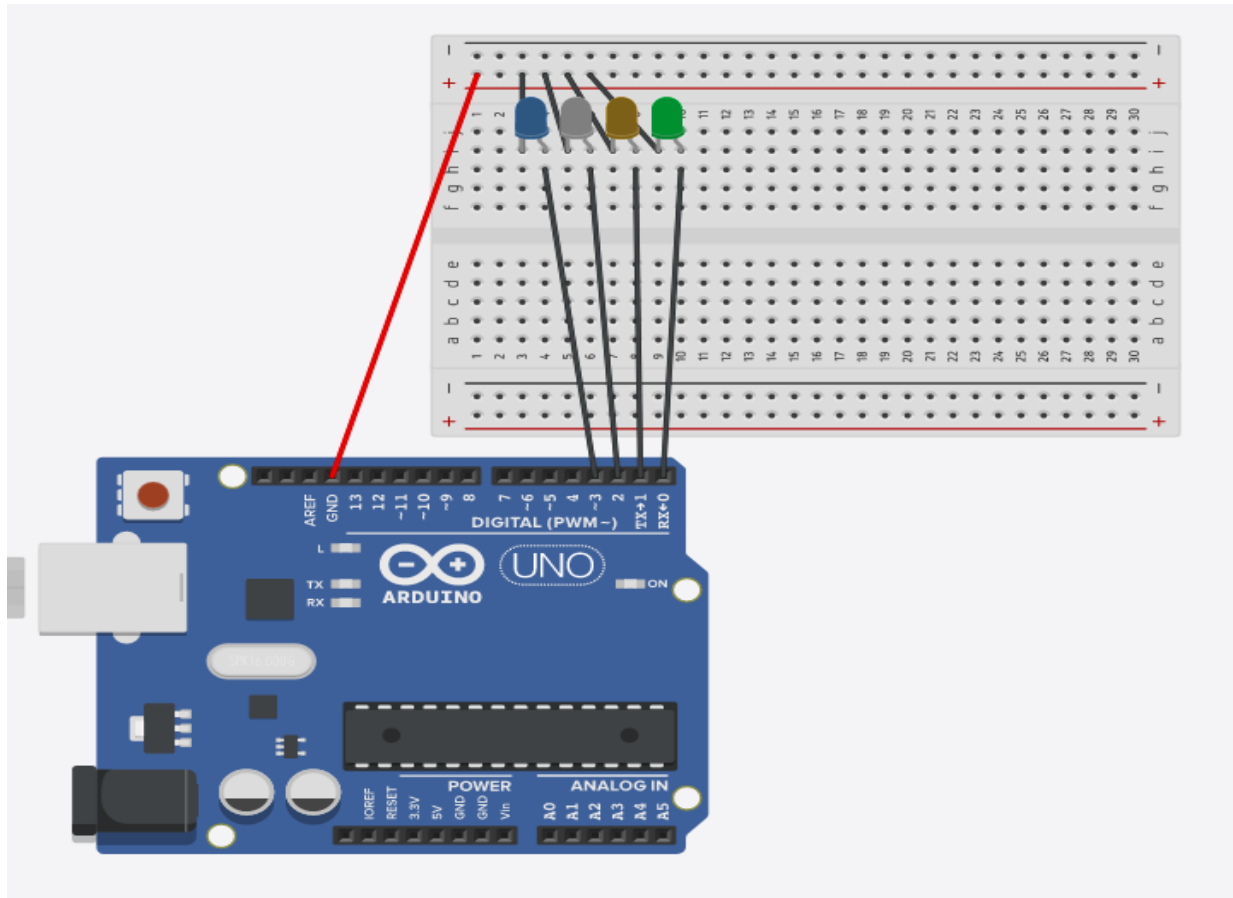


## Exp.1: Design an LED flasher

### Circuit Diagram:



### Theory

### Concept Used:

This experiment involves the flashing of four LEDs one by one using ARDUINO UNO.

For this experiment, the circuit needs to be connected as shown in the circuit diagram.

## **Learning and Observations:**

Following observations were recorded during the experiment:

- The LEDs flash in the pattern set in the sketch of a particular experiment.
- The program uploaded into the ARDUINO UNO starts executing as soon as the power is supplied and goes on executing in a loop till the power is supplied.
- There are certain time delays in between consequent LED flashes which are according to the ones defined in the sketch.
- The ARDUINO UNO circuit can be programmed as per the requirement by just defining a few functions.
- To find the least resistance that needs to be attached to the LED in a circuit to protect the LED from overload can be calculated by the following formula: -  $R_{\min.} = (V_{\text{supplied}} - V_{\text{LED}}) / I_{\max.}$

## **Problems and Troubleshooting:**

The problem faced while performing the experiment was the error in uploading which was the programmer not responding error.

The error was troubleshooted by disconnecting the 0 and 1 pins while uploading the program.

## **Precautions:**

The following precautions need to be considered while performing this experiment:

- The connections of the USB in both the PC and the ARDUINO UNO board should be snug.
- The USB ports of the PC and the ARDUINO UNO should be in a working condition.
- The sketch should be logically and syntactically correct and germane to the experiment that needs to be performed.
- The correct serial port should be selected that is the one through which the ARDUINO UNO has been connected.
- Look for errors during compilation and upload of the executable to the ARDUINO UNO.

- Disconnect the digital 1 and 0 pins while uploading the program to the board.
- Do not open more than one instance of the ARDUINO IDE at a time.

### **Learning outcomes:**

The various learnings as the outcome of performing the above-mentioned experiment are:

- Ability to distinguish between the various parts of the ARDUINO UNO and learn the basics of how the circuit works.
- Ability to write the basic code required for reading or writing digital values from/to a pin.
- Ability to use the ARDUINO IDE that is required for the debugging and writing the code for a particular experiment.
- Ability to distinguish between the setup(), loop(), digitalWrite(), pinMode() and delay() functions and the for loop and their respective working.