Experiment – 7

Aim: Design a circuit that uses concept of Staircase

Components

- Arduino Uno R3
- Small Breadboard
- Jumper cable
- Bulb
- Slides Switch

Theory

1. **Arduino Uno R3**
   An open-source microcontroller board used to control electronic components and execute programmed instructions.

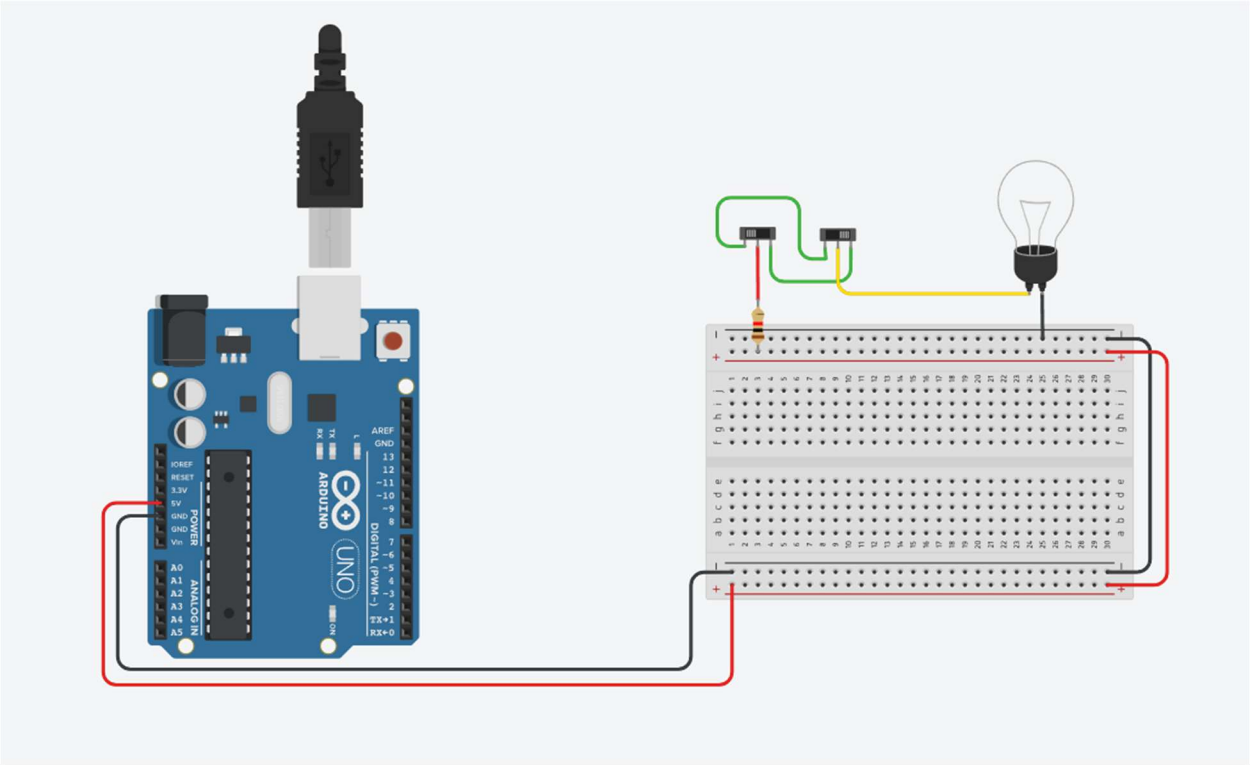
2. **Small Breadboard**
   A compact, reusable board for prototyping circuits without soldering, allowing easy component connections.

3. **Jumper Cable**
   Flexible wires used to establish electrical connections between components on a breadboard or to an Arduino.

4. **Bulb**
   An output component that emits light when powered, commonly used for indication or illumination in circuits.

5. **Slide Switch**
   A switch with a sliding mechanism that toggles between two positions to control circuit connections.

Circuit Design



Procedure to Design a Light-Controlled Circuit using a Slide Switch and Arduino on Tinkercad

Step 1: Add Components to the Workspace

1. Search for **Arduino Uno R3** and add it to the workspace.
2. Search for a **small breadboard** and place it next to the Arduino.
3. Search for a **bulb** and place it on the breadboard.
4. Search for a **slide switch** and position it on the breadboard.
5. Use **jumper cables** to connect all components properly.

Step 2: Build the Circuit Connections

Power Supply Connections:

1. Connect the **5V pin** of the Arduino to the positive rail of the breadboard.
2. Connect the **GND pin** of the Arduino to the negative rail of the breadboard.

Slide Switch Connections:

1. The **common terminal** of the slide switch → Connect to one side of a **10kΩ resistor** (which then connects to GND) and to the **positive rail** (VCC).
2. **Terminal 1** → Connect to one end of the bulb (through a jumper cable).
3. **Terminal 2** → Connect to the other terminal of the bulb (through a jumper cable).

Bulb Connections:

1. One terminal of the **bulb** → Connect to **Terminal 1** of the slide switch.
2. Other terminal of the **bulb** → Connect to the **negative rail (GND)** of the breadboard.

Step 3: Testing the Circuit

1. Power ON the **Arduino Uno** using a USB cable.
2. **Slide the switch** to one position – the **bulb should turn ON**.
3. Slide the switch to the other position – the **bulb should turn OFF**.
4. This confirms that the **slide switch controls the bulb** by toggling the circuit connection.

Conclusion:

This experiment demonstrates how a **slide switch** can be used as a simple **manual control mechanism** to turn a **bulb ON and OFF**. By changing the switch's position, the electrical connection is either completed or broken, allowing or stopping the flow of current to the bulb.