push-button circuit using an **Arduino Uno**

Aim:

To create a simple push-button circuit using an **Arduino Uno**, you can follow these steps. This project involves detecting when a button is pressed and toggling an LED accordingly.

**Components Needed:**

1. Arduino Uno
2. Push button
3. 10kΩ resistor (for the pull-down configuration)
4. 220Ω resistor (for the LED)
5. LED
6. Breadboard
7. Jumper wires

**Wiring the Circuit:**

1. **Connect the LED:**
   * Attach the longer leg of the LED (the positive, or anode) to **pin 13** on the Arduino.
   * Attach the shorter leg (the negative, or cathode) to **GND** through a **220Ω resistor**.
2. **Connect the Push Button:**
   * One side of the push button connects to **5V**.
   * The other side of the push button connects to **pin 2** on the Arduino.
   * Also, connect a **10kΩ resistor** between pin 2 and **GND** to act as a pull-down resistor. This keeps the pin LOW when the button is not pressed.

**Arduino Code:**

// Constants for LED and button pin

const int buttonPin = 2; // Pin where button is connected

const int ledPin = 13; // Pin where LED is connected

// Variable to store button state

int buttonState = 0;

void setup() {

// Set LED pin as OUTPUT

pinMode(ledPin, OUTPUT);

// Set button pin as INPUT

pinMode(buttonPin, INPUT);

}

void loop() {

// Read the button state

buttonState = digitalRead(buttonPin);

// If the button is pressed, turn the LED on

if (buttonState == HIGH) {

digitalWrite(ledPin, HIGH); // Turn the LED on

} else {

digitalWrite(ledPin, LOW); // Turn the LED off

}

}

**Results:**

* **pinMode(buttonPin, INPUT);** sets the button pin as an input to read its state.
* **digitalRead(buttonPin);** checks if the button is pressed (HIGH) or not (LOW).
* If the button is pressed, the LED turns on; otherwise, it stays off.