Button-Triggered Delay Blinker Project

■ Project Overview:
This project toggles an LED on and off with a delay whenever a button is pressed.
It uses simple digital input handling with basic debounce logic in Arduino.

■ Components Required:
- Arduino UNO/Nano
- Push Button
- LED (built-in or external)
- Resistor (220Ω for external LED)
- Jumper wires
- Breadboard

■ Wiring Diagram:
- Button one leg ➜ Arduino pin 2
- Button other leg ➜ GND
- LED anode ➜ Pin 13 (or any other digital pin)
- LED cathode ➜ GND (via resistor)

■ Key Features:
- Debounced button input
- Toggles blinking mode on each press
- Blinks LED with 500 ms ON/OFF delay

■■ Note:
Uses internal pull-up on button pin to simplify wiring (no need for external pull-up resistor).

Arduino Code: Button Delay Blinker

```
// Arduino Code for Button Delay Blinker
const int buttonPin = 2;    // Push button connected to digital pin 2
const int ledPin = 13;      // Built-in LED on pin 13

int buttonState = 0;
bool blinking = false;
unsigned long lastDebounceTime = 0;
unsigned long debounceDelay = 50;

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

void loop() {
  int reading = digitalRead(buttonPin);

  if (reading == LOW && (millis() - lastDebounceTime) > debounceDelay) {
    blinking = !blinking;
    lastDebounceTime = millis();
    Serial.println(blinking ? "Blinking ON" : "Blinking OFF");
    delay(200);
  }

  if (blinking) {
    digitalWrite(ledPin, HIGH);
    delay(500);
    digitalWrite(ledPin, LOW);
    delay(500);
  } else {
    digitalWrite(ledPin, LOW);
  }
}
```