**Push Button Counter with DebouncingCode.ino**

**Embedded System Design using Microcontroller**

This project implements a simple counter that increments each time a push button is pressed. The system includes:

**Debouncing** to ensure accurate counting

**Display** on an **LCD** (or Serial Monitor for debugging)

**ATmega328P Microcontroller** (Arduino Uno compatible)

**Components Required:**

Microcontroller (ATmega328P/Arduino Uno)

Push Button

10kΩ Resistor (Pull-up for the button)

16x2 LCD (or Serial Monitor for output)

Breadboard & Jumper Wires.

**Connections:**

| **Component** | **Microcontroller Pin** |
| --- | --- |
| Push Button | PD2 (Digital Pin 2) |
| LCD RS | PB0 (Digital Pin 8) |
| LCD EN | PB1 (Digital Pin 9) |
| LCD D4-D7 | PB2-PB5 (Pins 10-13) |

**3. Working Principle**

**Button Press Detection:**

The button is connected with a **pull-up resistor** (internal in INPUT\_PULLUP mode).

When pressed, it reads LOW; when released, it reads HIGH.

**Debouncing:**

Mechanical switches "bounce" when pressed, causing multiple false triggers.

A **50ms delay** ensures only **one count per press**.

**Counting & Display:**

The counter increments only after a **stable button press**.

Output is shown on **Serial Monitor** or **LCD**.

**4. Expected Output**

**Serial Monitor:**

Push Button Counter

Count: 0

Count: 1

Count: 2

**LCD Display:**

Push Counter:

Count: 3

**5. Enhancements (Optional)**

Add **reset functionality** (another button to zero the count).

Use **interrupts** for more efficient button detection.

Store count in **EEPROM** to retain after power-off.