📌 Should I use **Pull-up** or **Pull-down**?

✅ **It depends on the nature of the signal you expect on the pin**:

Switch Wiring / Signal Behavior	GPIO Configuration
Switch connects to **GND** when pressed (active low)	**Pull-up**
Switch connects to **VCC** when pressed (active high)	**Pull-down**

Example:

- If you have a **button between GPIO and GND**, use:
  - **GPIO: Input with Pull-up**
  - EXTI triggers on **falling edge** when button is pressed.
- If you have a **button between GPIO and VCC**, use:
  - **GPIO: Input with Pull-down**
  - EXTI triggers on **rising edge** when button is pressed.

⚡ How Pull-up / Pull-down Impacts EXTI:

1. **Prevents Floating Inputs:**
   - Without pull-up/pull-down, the pin is **floating** when unconnected or the button is unpressed → random EXTI triggers (false interrupts).
2. **Defines Idle State:**
   - Pull-up → Pin is normally **high**.
   - Pull-down → Pin is normally **low**.
3. **Affects Edge Selection:**
   - You choose **rising** or **falling** edge in EXTI depending on the idle state:
     - Pull-up → use **falling edge**.
     - Pull-down → use **rising edge**.

PROF

🚦 Practical Rule:

- If you **don't have external resistors**, enable the **internal pull-up or pull-down** in CubeMX (in GPIO settings).
- If you **do have external resistors**, disable the internal pull resistors.

✅ **Example CubeMX Setup for Button on PC13:**

Setting	Value
GPIO Mode	**GPIO_EXTI13**
GPIO Pull-up/Pull-down	**Pull-up** (if button to GND)
EXTI Trigger	**Falling edge**