Nima paryfard   ٩٧٢٠٢٣٠٠٧

we should use ٣ wires:

- VCC
- GND
- AVCC (This should connect to VCC whenever not use)

Note: Top wires are not available in Atmega ١٦ in the proteus because we don't need them to power up the microcontroller.

What is pull up?

In electronic logic circuits, a **pull-up resistor** or **pull-down resistor** is a resistor used to ensure a known state for a signal.[١] It is typically used in combination with components such as switches and transistors, which physically interrupt the connection of subsequent components to ground or to V_{CC}. When the switch is closed, it creates a direct connection to ground or V_{CC}, but when the switch is open, the rest of the circuit would be left floating (i.e., it would have an indeterminate voltage). For a switch that connects to ground, a pull-up resistor ensures a well-defined voltage (i.e. V_{CC}, or logical high) across the remainder of the circuit when the switch is open. Conversely, for a switch that connects to V_{CC}, a pull-down resistor ensures a well-defined ground voltage (i.e. logical low) when the switch is open.

An open switch is not equivalent to a component with infinite impedance, since in the former case, the stationary voltage in any loop in which it is involved can no longer be determined by Kirchhoff's laws. Consequently, the voltages across those *critical* components (such as the logic gate in the example on the right) which are only in loops involving the open switch are undefined, too.

A pull-up resistor effectively establishes an additional loop over the critical components, ensuring that the voltage is well-defined even when the switch is open.

For a pull-up resistor to serve only this one purpose and not interfere with the circuit otherwise, a resistor with an appropriate amount of resistance must be used. For this, it is assumed that the critical components have infinite or sufficiently high impedance, which is guaranteed for example for logic gates made from FETs. In this case, when the switch is open, the voltage across a pull-up resistor (with *sufficiently low* impedance) practically vanishes, and the circuit looks like a wire connected to V_{CC}. On the other hand, when the switch is closed, the pull-up resistor must have *sufficiently high* impedance in comparison to the closed switch to not affect the connection to ground. Together, these two conditions can be used to derive an appropriate value for the impedance of the pull-up resistor but usually, only a lower bound is derived assuming that the critical components do indeed have infinite impedance. A resistor with low resistance (relative to the circuit it's in) is often called a "strong" pull-up or pull-down; when the circuit is open, it will pull the output high or low very quickly (just as the voltage changes in an RC circuit), but will draw more current. A resistor with relatively high resistance is called a "weak" pull-up or pull-down; when the circuit is open, it will pull the output high or low more slowly, but will draw less current.