



模块 8

活动：连接输入和输出

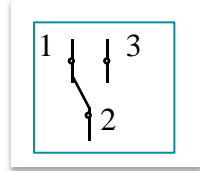


活动：连接输入和输出

问题1

您将获得一个双极开关，它有三个引脚，分别标记为1、2和3。如果开关没有按下，引脚1和2连接（ 0Ω 阻力），引脚2和3未连接（阻值无穷大）。如果开关被按下，引脚2和3连接（ 0Ω 阻力），引脚1和2未连接（阻值无穷大）。引脚1和引脚3从来没有连接（这是一个先断开后连接的开关）。将此开关连接到单片机上，如果按下开关，则输入高电平（3.3V）；如果不按下开关，则输入低电平（0V）。

您不需要对开关去抖。标记所有芯片编号和电阻值。不需要软件。最好的解决方案不需要任何电阻。



问题2

在没有外部电阻器的情况下将正逻辑开关连接到P1.5。编写代码，根据需要配置端口1的bit5。编写等待触摸开关的代码，然后释放。

a部分) 假设开关没有去抖，开发一个解决方案。

b部分) 假设有2ms的开关去抖，开发一个解决方案。

问题3

在没有外部电阻器的情况下将负逻辑开关连接到P2.6。编写代码，根据需要配置端口2的位6。编写等待触摸开关，然后释放的代码。

a部分) 假设开关没有去抖，开发一个解决方案。

b部分) 假设有2ms的开关去抖，开发一个解决方案。

问题4

连接需要1 mA，2.5 V的LED。微控制器上的数字输出高电平会打开LED。假设 $V_{OH} = 3.2V$ 。即，这个接口是正逻辑。

问题5

连接需要2mA，2.0 V的LED。微控制器上的数字输出低电平打开LED，即，该接口为负逻辑。由于与微控制器直接连接，您应该使用3.3V来为LED供电(而不是5V)。假设 $V_{OL} = 0.3V$ 。

问题6

连接需要15 mA，2.5 V的LED。使用LM7405驱动器和限流电阻。当这个接口是正逻辑时，微控制器上的数字输出高电平将打开LED。LM7405输出电压 V_{OL} 为0.5V。在这种电流下，你可以安全地使用3.3V或5V为LED供电。

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