Exercises

1. What are the valid input voltage ranges for your MCU with VDD = 3.3 V? With 5V?

|  |  |  |
| --- | --- | --- |
| VDD | 3.3 | 5 |
| Min VIL | -0.5 | -0.5 |
| Max VIL | 0.99 | 1.5 |
| Min VIH | 2.31 | 3.5 |
| Max VIH | 3.8 | 5.5 |

1. Examine the schematic for your board. How many GPIO ports are there? How many bits are available for each port?

Port 0: 8

Port 1: 8

Port 2: 8

Port 3:8

Port 4: 4

1. Calculate the resistor values needed to limit current through the blue and red LEDs of Figure 8 to 18 mA each. Assume the supply voltage is 3 V.

|  |  |  |
| --- | --- | --- |
| LED Color | Red | Blue |
| VDD | 3 | 3 |
| VLED | 1.8 | 2.7 |
| ILED | 18 mA | 18 mA |
| RSeries | 66.7 Ω | 16.7 Ω |

1. Use a multimeter to measure the actual VDD on your MCU board.

VDD = Approximately 3.3 V

1. What values need to be written to which registers in order to set a port as a digital input, with the resistive pull-up enabled?

For pin P0\_7

In register PRT0\_PC, set PRT\_DM to PRT\_DM\_0\_PU (0x02 << (7 \* 3)). This enables the pull-up resistor.

Set the pin high to enable the pull-up by setting bit 6 in PRT0\_DR

1. Modify the LCD driver code presented in this chapter to use the first port, pins 0-3 for the data bus and pins 4-6 for control lines E, R/~W and RS respectively.

#define P\_LCD\_RS P0\_0

#define P\_LCD\_RW P0\_5

#define P\_LCD\_E P0\_4

#define P\_LCD\_DATA P0\_6