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 | -0.3 |
| Max VIL | - | - |
| Min VIH | - | - |
| Max VIH | 4 | 7 |

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

Port A: 16

Port B: 16

Port C: 16

Port D: 16

Port E: 16

Port H: 2

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 | 2.9 | 2.9 |
| 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 2.9 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 PA0

GPIOA->MODER=0;

GPIOA->PUPDR|=2;

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 PA0

#define P\_LCD\_RW PA5

#define P\_LCD\_E PA4

#define P\_LCD\_DATA PA6