# Exercises

1. Examine the schematic for your board. How many GPIO port bits are available for Port 0? Port 1? Port 2? Port 3?

Port 0: 12

Port 1: 12

Port 2: 12

Port 3: 6

1. What is the difference between open-drain and push-pull?

In the circuitry level, push-pull is implemented by two transistors whereas open-drain is implemented by one (without the top one). Push-pull turns quicker and can source more current. Open-drain allows wired-OR connection.

By default, the GPIO pins are configured as push-pull.

1. Use a multimeter to measure the actual VDD, 5V and 3V on your MCU board.

VDD = Approximately 3.29V

5V = Approximately 4.7 V

3.3V = Approximately 3.29 V

1. Explain the following code, which port and pin it is operating and what is the configuration result? Is that working as GPIO?

LPC\_IOCON->R\_PIO0\_11 |= 0x0A;

Set PIO0\_11 to AD mode and pull down the pin. No, it is working as ADC input.

1. Explain the following code, which port and pin it is operating and what is the configuration result?

LPC\_GPIO1->DIR |=(1UL<<7);

Set the GPIO direction as output, if PIO1\_7 is working as GPIO.

1. Find out the begining address for GPIO1 registers, you may use the Keil to help you find the definition in CMSIS files.

LPC\_AHB\_BASE (0x50000000UL)

define LPC\_GPIO1\_BASE (LPC\_AHB\_BASE + 0x10000)

Therefore the address is: 0x5000\_0000+0x0001\_0000=0x5001\_0000.