

## Tutorial 7: MCU

1. In GPIO configuration, what's the difference between output 'push-pull' and output 'open-drain'? To connect LEDs, which one to choose? How about connecting I2C devices? Why?
2. In GPIO configuration, under which circumstances, we need to configure the GPIO as 'pull-up', 'pull-down', or 'no pull-up or pull-down'? To connect LEDs, which one to choose? How about connecting I2C device? Why?
3. If external interrupt has been configured to 'preemption priority' 1, timer interrupt has been configured to 'preemption priority' 0, Which interrupt has higher priority?
4. Suppose clock source = 16MHz, the timer clock = 8KHz, To create an timer output period = 100ms, what is 'Prescaler (PSC) value' and 'AutoReload value (ARR)'?
5. Let's design a timer using 'PWM generation mode'. Suppose the clock source = 72MHz, PSC=7199, We want to trigger two interrupts, one triggers every 3 s, the other one triggers every 10s, how to configure the 'pulse' and 'counter period (ARR)'?
6. What's the difference between UART, SPI and I2C? Hint: full duplex? Half duplex? Transmission Speed? Connect to PC or peripherals?