SOLUTION

1. (5 points) We are interested in knowing if the joystick's **up button** in our discovery kit was **pressed**. This button is connected to **pin 3 of GPIO port A**. Every time we need to read some input, we will need to use a bitwise operation to check the corresponding bit, inside an if-statement. Complete the code below in order to verify if **bit 3** in `GPIOA->IDR` is equal to **1**. In other words, if the statement below is true, the up button was pressed!

Hint: You only need to write an **hexadecimal** mask inside the parentheses. Remember, bits and pins start counting from 0.

```
if(GPIOA->IDR & (0x08) != 0x00);
```

2. (5 points) Complete the code below to configure **pin 10 of GPIO port B** as **push-pull**.

Hint: You only need to write an **hexadecimal** mask inside the parentheses.

```
GPIOB->OTYPER &= ~(0x0400);
```

3. (5 points) Write a single line of C code that would **enable the clocks of GPIOs port A, B and E**. **Hint:** You should **set** the correct **bits** from the correct **register**.

```
RCC->AHB2ENR |= 0x13;
```

5. (10 points) Write a complete C program to set up and turn ON both the green and red LEDs (PB.2 and PE.8) at the same time in our discovery kit.

Hint: Your C program should include the correct `#include` library, main function, and dead loop. Use the code from Lecture 1, Slide 32 as your template, and the code from Lecture 2, Slide 39 to help you.

Note: Write all masks in **hexadecimal** format!

```c
#include "stm32l476xx.h"

int main(void) {
    RCC->AHB2ENR |= 0x12;   // Enable clock of Port B and E

    // Set up GPIO B
    GPIOB->MODER &= ~(3<<4); // Clear mode bits

    GPIOB->MODER |=   1<<4;  // Set mode to output

    GPIOB->OTYPE &= ~(1<<2); // Select push-pull output

    // Set up GPIO E
    GPIOE->MODER &= ~(3<<16); // Clear mode bits

    GPIOE->MODER |=   1<<16;  // Set mode to output

    GPIOE->OTYPE &= ~(1<<8); // Select push-pull output

    while(1) {
            GPIOB->ODR |= 1 << 2;  // Output 1 to turn on red LED
            GPIOE->ODR |= 1 << 8;  // Output 1 to turn on green LED
    }
}
```