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CMPE 443 PRINCIPLES OF EMBEDDED SYSTEMS DESIGN

PRELAB #003 “GPIO”

1) User LED

There are some user LEDs on the board. The LED that you will use in this lab is connected to PA9 which means Port: GPIO A Pin:9.

2) Register Definitions

In order to write a readable code, you need to define the registers and use these definitions. For this prelab, you need to define RCC_AHB2ENR, GPIO_MODER and GPIO_ODR registers. You can find the address of the registers from RM0438 (https://www.st.com/resource/en/reference_manual/dm00346336-stm32l552xx-and-stm32l562xx-advanced-arm-based-32-bit-mcus-stmicroelectronics.pdf)

- What is the address of the RCC_AHB2ENR register: 0x4002104C
- What is the address of the MODER register for LED GPIO: 0x42020000
- What is the address of the ODR register for LED GPIO: 0x42020014
- Define these registers on the code:

```
#define RCC_AHB2EN  *((uint32_t*)( 0X40021000 + 0x04C))
#define GPIOA_MODER *((uint32_t*)( 0x42020000 + 0x00))
#define GPIOA_OUT   *((uint32_t*)( 0x42020000 + 0x14 ))
```

3) Blinking LED

In this prelab, you need to Turn On / Off LED.

- Enable Clock for GPIO:

```
    RCC_AHB2EN |= 0x01;
```

- Configure Pin as General purpose output mode:

```
    GPIOA_MODER &= ~(0x01 << 19);
```

- Turn On LED:

```
    GPIOA_OUT |= (0x01 << 9);
```

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- Turn Off LED:

```
GPIOA_OUT &= ~(0x01 << 9);
```

- Which user LED is blinking? (R G or B)

- R

4) Submission

You will submit one zip file which contains this document and your project (all the files with the last configuration)

The naming of the zip file should be:

PRELAB<exp num>_<StudentID>.zip

5) Related Videos and Links

STM32 GPIO Registers:

https://www.youtube.com/watch?v=vdY0VN21ZOI

STM32 GPIO Registers Bit Shifts:

https://www.youtube.com/watch?v=R25Jm8zbAfo