

Digital Lab 4:

Experiment 1:

GPIO Control Design

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Class: 電機三全英班

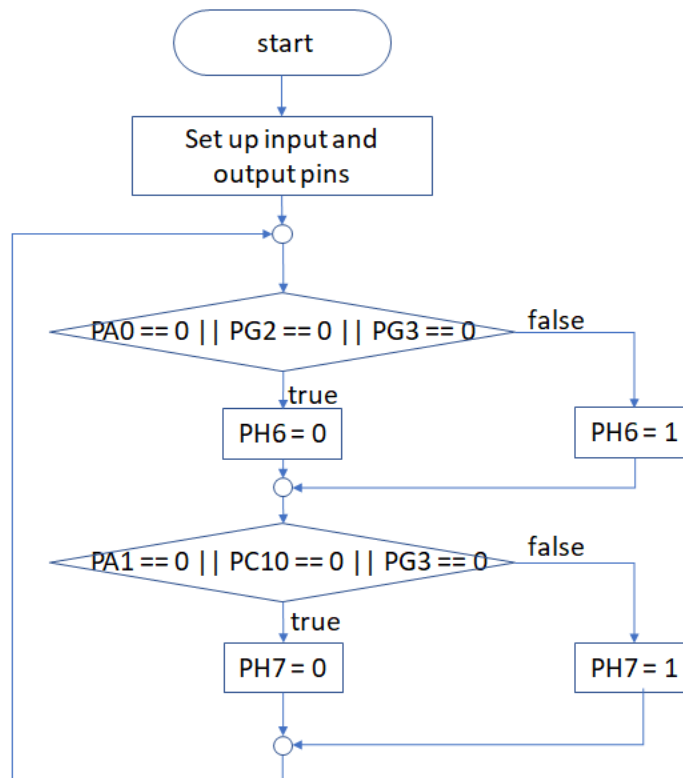
Group: Group 11

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I. Annotated Code

```
1  #include "M480.h"
2
3  int32_t main(void)
4  {
5
6      // Input Pin set
7      GPIO_SetMode(PA, BIT0, GPIO_MODE_INPUT); // SW1
8      GPIO_SetMode(PA, BIT1, GPIO_MODE_INPUT); // SW2
9      GPIO_SetMode(PG, BIT2, GPIO_MODE_INPUT); // Joystick Up
10     GPIO_SetMode(PC, BIT10, GPIO_MODE_INPUT); // Joystick Down
11     GPIO_SetMode(PG, BIT3, GPIO_MODE_INPUT); // Joystick Center
12
13     // Output Pin set
14     GPIO_SetMode(PH, BIT6, GPIO_MODE_OUTPUT); // LEDR1
15     GPIO_SetMode(PH, BIT7, GPIO_MODE_OUTPUT); // LEDG1
16
17     // Always check
18     while(1) {
19
20         PH6 = (PA0 == 0 || PG2 == 0 || PG3 == 0) ? 0 : 1; // when SW1 is on or joystick either up or center,
21                                                         // LEDR1 lighted up
22
23         PH7 = (PA1 == 0 || PC10 == 0 || PG3 == 0) ? 0 : 1; // when SW2 is on or joystick either down or center,
24                                                         // LEDG1 lighted up
25
26     }
27 }
28
29
```

II. Program Flow



III. Thoughts

In this electrical engineering experiment, we had the opportunity to use the NuMaker-PFM-M487 series processor board and the Keil uVision development tool software, and completed a simple task using the C language. Although I had some background in C++ and Python, I still felt somewhat unfamiliar with how to accomplish tasks using C language in this environment.

The task was to control the LEDs on the board by manipulating the joystick to toggle the LEDs. While the task was relatively straightforward, it was a great starting point for me. Through this experiment, I became more familiar with the basic syntax and logical structures of the C language, and began to understand how to apply this knowledge in embedded systems.

During the experiment, I encountered some challenges, especially with the unfamiliarity of the Keil uVision software interface. However, by reading documentation and seeking help from teachers and classmates, I gradually overcame these difficulties. I also realized the importance of learning through practice, and through trial and error, I gained a deeper understanding of these tools and languages.

In the upcoming electrical engineering experiments, I look forward to further improving my skills and becoming more familiar with additional tools and technologies. I believe this experiment has laid a solid foundation for me, allowing me to tackle future challenges with more confidence.