

P542 Hardware System Design II

Lab Report 1

Enrique Areyan

Description of development issues and missing information

Our first assignment of lighting the LEDs was fine; all relevant information was there on the lab wiki.

The first issue was to initialize the structure for the user button. At first it was not clear to me how to do it even though I had already made the LEDs work. Only with further assistance from the instructor was I able to relate the information about initializing the GPIO structure as it applies to the user button. This design pattern will repeat in the future so I recorded here for future reference:

- Setup the clock
- Define the GPIO structure
- Initialize the Structure (GPIO_StructInit)
- Select PIN
- Select Mode
- Select other component particular options, e.g., Speed in the case of LED
- Initialize component (GPIO_Init)

Unlike the previous issue (which I see more as API related), the following issue was more of a logical problem. The issue was that the LEDs would not turn off and on even though I had the while and one delay in place. The solution was to have balanced delays, i.e., turn on-delay-turn off-delay, otherwise the lights just went on and off so quickly that I couldn't see what was going on.

The final issue was also a logical issue. Once I had the LED working in a sequence, it was not obvious how to set them up so that hitting the user button would make them stop in a particular LED of the sequence. The solution came by analyzing where the program was most of the time, i.e., the delay function, and adding a condition that when the user is NOT hitting the button (Bit_RESET) then the function would decrement enough to exit the delay.

Finally, programming the drivers was also fine. The only detail is that there might be native functions from the processor's vendor that might be more efficient than what I have. For instance, I was told there is an option to turn all the LEDs on by setting `GPIOE->BSRR = 0X8800`, but this never worked for me. For now, I just did a loop to turn all lights on or off, which works fine.