

ELEC 2220 Computer Systems
Homework #17
Due: Wednesday, July 19

Since the Final Project requires that the User Button generate interrupt requests, the purpose of this assignment is to practice setting up that button to trigger interrupts and to execute an interrupt handler. This will be done by modifying the design of Homework #15 as follows.

1. When the board first resets, perform any required initialization of variables, GPIO ports, etc.
2. Turn OFF all four LEDs and “do nothing” *until an interrupt is triggered by the user button*, and then go to Step 3.
3. Turn on one LED every half-second in a clockwise pattern as follows:
Green ON
Green-Orange ON
Green-Orange-Red ON
Green-Orange-Red-Blue ON (PD12-13-14-15)
All OFF
Repeat this pattern *until the next user button interrupt*, and then go to Step 4.
4. Turn on one LED every second in a counter-clockwise pattern as follows:
Blue ON
Blue-Red ON
Blue-Red-Orange ON
Blue-Red-Orange-Green ON (PD15-14-13-12)
All OFF
Repeat this pattern *until the next user button interrupt*, and then go back to Step 2.

Steps 2-4 are to be repeated continuously.

As with previous programs, partition the program into subroutines, with each subroutine performing a specific function (LED_ON, LED_OFF, DELAY, etc.).

Note that the previous “Check Button” function will need to be revised to make it an interrupt handler. Also – the button may have to be “debounced” to ensure that there is only one action taken for each button press.

Deliverables:

1. Submit a printout of the source program in class.
2. Bring your board to my office when you submit your program (before the due date/time) to demonstrate the operation of the program. I will connect it to my computer to power the board, which should execute the program in its flash memory.

Alternatively, you can send me a video that demonstrates the above behavior. I must see you in the video, describing the operation of the board.