

Homework # 7 (due on 3/24/17 in class)

In this homework, you are to repeat homework 6, displaying each (bit) pattern $B(l)$ in the component, IO_LED, and inserting a software delay between patterns. You are to run your program in “real-time,” i.e., **not in the single-step mode**. Use the following set-up (you may allocate more memory variables as necessary).

LEDS	DS.B	1
Initial	DC.B	2,4

- In order to access and configure the components, use the pull-down menu “Component” in the Real-time debugger window choosing the button “Open” in the menu. Double-click on the IO_LED component to be interfaced to your program. In order to set up (specify the port address) the component, right-click within the component window. Type in a numerical port address (e.g., “0” for Port A). Use Port A for IO_LED.
- The IO_LED component consists of 8 LED’s. In order to display a pattern in the IO_LED component, you need to output the one-byte number corresponding to the pattern to the port to which the IO_LED component is connected.
- Insert a proper software delay between two successive patterns to be displayed so that you can “see” each pattern. The software-delay subroutine `delay` can be implemented nesting loops.
- In the beginning of each subroutine, specify (comment) the parameters to be passed.
- Initialize the stack pointer to \$2000.

Assemble the program and execute it using the Start/Continue button (NOT in the single-step mode) with the contents of the variables displayed in the data and memory windows. The variable LEDES should be displayed in binary as before (in the data window). Make sure first that your program works for any initial pattern including $B(7)$ and $B(0)$, and then do screen-captures (the source, data, register and memory windows) including the IO_LED component at the following time instances:

- Right after the IO_LED component is set up and is configured as an output port (i.e., DDRA is programmed).
- When $B(l_{max})$ in the sequence for the initial pattern $B(2)$ is displayed.
- When $B(l_{min})$ in the sequence for the initial pattern $B(2)$ is displayed.
- When $B(l_{max})$ in the sequence for the initial pattern $B(4)$ is displayed.
- When $B(l_{min})$ in the sequence for the initial pattern $B(4)$ is displayed.
- Note that you can stop execution of the program temporarily by clicking on the Halt button.

Submit the list file of your well-commented code with the 5 sets of screen-captures attached.