

BLG351E Experiment 2 “7-Segment Display and Interrupt Subroutine” REPORT	CRN	11477
	Group	17
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Q1) (40 pts.) Explain the given values in the **init_INT** subroutine in the code.

PxIE enables interrupt request of bit which is 1. We want to enable interrupt at 6. bit of PORT 2 , we assigned #040h (00100000) P2IE.

PxSEL and PxSEL2 is used to function of port is I/O if pins are assigned to 0. So we assigned #0BFh (11011111) into P2SEL and P2SEL2 which means set only 6. bit as 0.

PXIES, called interrupt edge registers, selects the transition where the interrupt occurred. In order to set interrupt flag as high-to-low mode, bits are set with 1. So we assigned #040h into P2IES to set 6. bit as high-to-low transition for I/O pin.

We clear bits of P2IFG using clr operation which means reset bits.

Finally, we used eint operation to enable interrupt.

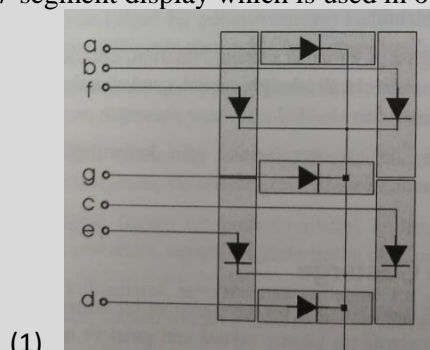
Q2) (20 pts.) Why did we selected the value #07A00h to wait broadly one second?

The microprocessor MSP430 we use should have the capacity to process 07A00h operations in hexadecimal in one second. Because as long as the R15 register is not equal the zero, it should perform a decrement operation.

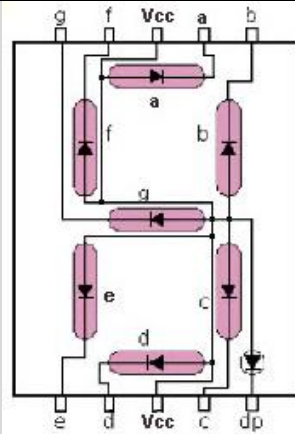
Q3) (10 pts.) Why did we use the line “clr &P2IFG”?

It clears the bits of P2IFG using CLR operation which means reset bits. The interrupt is reseted.

Q4) (30 pts.) A scheme for the 7-segment display which is used in our experiments is given below.



However, there is also another kind of 7-segment display.



(2)

Explain the difference between their design principles. What should we change when using the second one?*

Inputs a, b, c, d, e, f, g, must be reversed. Because the diodes on the cables where the inputs are connected are reversed.

*The images are taken from (1) Mikrobilgisayar Temelli Gerçek Zaman Dizgeleri, Eşref Adalı and (2) <https://www.microcontroller-project.com/> .