AVR Atmega328p Homework 2

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Code

lab4.c

```
1  #include <stdint.h>
2  #include <avr/io.h>
3  #include <avr/interrupt.h>
4
5  /** sets the 7SEG display digit value */
6  #define SETDG(v) DGOUTPORT = ~(nums[v])
7
8  /** turns on the requested digit */
9  #define DGSEL(v) DGSELPORT = digits[v]
10
11 #define BITON(port,pin) port |= _BV(pin)
12 #define BITOFF(port,pin) port &= ~_BV(pin)
13 #define SETPORT(port,mask,value) port = ((port & ~(mask)) | value)
14 #define TOGGLEBIT(port,bit) port ^= _BV(bit)
15
16 //--CONSTANTS----------------------------------
17 //--END CONSTANTS------------------------------
18
19 /**
20  * @brief clock interupt service routine
21  *
22  * toggles PC3
23  *
24  * void
25  * @return void
26  *
27  */
28 ISR(TIMER0_COMPA_vect)
29 {
30         TOGGLEBIT(PORTC,PORTC3);
31 }
32
33 /**
34  * @brief sets up the timer0 to CTC mode for 4.8ms
35  *
36  * @return void
37  *
38  */
39 void setupclk(void)
```

```
40 {
41         /** disable the interrupt before config */
42         BITOFF(TIMSK0,OCIE0A);
43
44         /** set the operation mode to CTC */
45         SETPORT(TCCR0A,0xFF,_BV(WGM01));
46
47         /** setup prescaler to 256*/
48         SETPORT(TCCR0B,0x0F,_BV(CS02));
49
50         /** set output compare register to 150 */
51         SETPORT(OCR0A,0xFF,150);
52
53         /** set counter */
54         SETPORT(TCNT0,0xFF,0);
55
56         /** enable interrupt */
57         BITON(TIMSK0,OCIE0A);
58 }
59
60 int main(int argc, char const *argv[])
61 {
62         //set PC3 to be output
63         BITON(DDRC,DDC3);
64
65         //enable global interrupts (must be done for interrupt to work, see
66         //7.7 of datasheet for details)
67         sei();
68
69         //start running the timmer/interrupt
70         setupclk();
71
72         while(1);
73
74         return 0;
75 }
```