

Lab Assignment 8**Report due: week of 4/16/07****Goal:**

Students will take known assembly language programming techniques and apply them towards programming an Atmel microcontroller using C programming.

Generate C code to mimic the given assembly code to operate the TekBot™ in the same working order as the assembly code given for Lab 7.

Procedure:

Generate C code to mimic the given assembly code to operate the TekBot™ in the same working order as the assembly code given for Lab 7. The LCD will display your name upon reset.

Given:**Print_char();****LCD initialization code**

```
// LCD initialization
delay_ms( 1 );    // wait for initial power on to complete
PORTA = 0b00000000; // output start of initialization sequence
delay_ms( 1 );    //
PORTA = 0b00000011; // send 3 once
enable_lcd();
delay_ms( 1 );    //
PORTA = 0b00000011; // send 3 twice
enable_lcd();
delay_ms( 1 );    //
PORTA = 0b00000011; // send 3 three times
enable_lcd();
delay_ms( 1 );    //
PORTA = 0b00000010; // set up LCD for 4 bit mode
enable_lcd();
delay_ms( 1 );    //
lcd_cmd( 0x28 );
lcd_cmd( 0x06 );
lcd_cmd( 0x0f );
lcd_cmd( 0x01 );
lcd_cmd( 0x80 );
//PORTA = 0;
//enable_lcd();
lcd_cmd( 0x01 );
```

```

void print_char( unsigned char b ) // print a character to the LCD display
{
    unsigned char a;
    a = b;
    b = b / 0x10;
    PORTA = b & 0x0f;
    PORTA.6 = 1; // select this is an anstruction (RS)
    PORTA.5 = 0; // select this is a write operation (R/W)
    enable_lcd();
    PORTA = a & 0x0f;
    PORTA.6 = 1; // select this is an anstruction (RS)
    PORTA.5 = 0; // select this is a write operation (R/W)
    enable_lcd();

    //PORTA = 0x00; // restore original value of PORTA

    return;
}

```

Include this page with your report

1. Bumpers must be interrupt driven with the motors will be controlled in interrupt service routines.

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2. Output to the LCD display must have print string functionality.

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3. An endless loop will read the DIP switches and show the DIP switch settings on the LEDs.

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4. The TekBot™ will operate the same with the c code generated program as with the given assembly code program of Lab 7.

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