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/*
 * File:   main.c
 * Author: MicroEmbedded
 *
 * Created on October 15, 2016, 4:35 PM
 */


#include <pic18f4550.h>
#include <stdio.h>

#define LCD_EN LATAbits.LA1
#define LCD_RS LATAbits.LA0
#define LCDPORT LATB

unsigned char str[16];

void lcd_delay(unsigned int time)
{
 unsigned int i , j ;

   for(i = 0; i < time; i++)
   {
     for(j=0;j<100;j++);
   }
}


void SendInstruction(unsigned char command)
{
    LCD_RS = 0;                 // RS low : Instruction
    LCDPORT = command;
    LCD_EN = 1;                 // EN High
    lcd_delay(10);
    LCD_EN = 0;                 // EN Low; command sampled at EN falling edge
    lcd_delay(10);
}

void SendData(unsigned char lcddata)
{
    LCD_RS = 1;                 // RS HIGH : DATA
    LCDPORT = lcddata;
    LCD_EN = 1;                 // EN High
    lcd_delay(10);
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    LCD_EN = 0;                 // EN Low; data sampled at EN falling edge
    lcd_delay(10);
}

void InitLCD(void)
{
   ADCON1 = 0x0F;
   TRISB = 0x00; //set data port as output
   TRISAbits.RA0 = 0; //RS pin
   TRISAbits.RA1 = 0; // EN pin

   SendInstruction(0x38);      //8 bit mode, 2 line,5x7 dots
   SendInstruction(0x06);       //entry mode
   SendInstruction(0x0C);       //Display ON cursor OFF
   SendInstruction(0x01);      //Clear display
   SendInstruction(0x80);      //set address to 0
}

void LCD_display(unsigned int row, unsigned int pos, unsigned char *ch)
{
   if(row==1)
      SendInstruction(0x80 | (pos-1));
   else
      SendInstruction(0xC0 | (pos-1));

   while(*ch)
      SendData(*ch++);
}

void ADCInit(void)
{
   TRISEbits.RE2 = 1;               //ADC channel 7 input

   ADCON1 = 0b00000111;             //Ref voltages Vdd & Vss; AN0 - AN7 channels Analog
   ADCON2 = 0b10101110;             //Right justified; Acquisition time 4T; Conversion clock
Fosc/64
}

unsigned short Read_Temp(void)
{
   ADCON0 = 0b00011101;      //ADC on; Select channel;
   GODONE = 1;             //Start Conversion

   while(GO_DONE == 1 );    //Wait till A/D conversion is complete
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    return ADRES;                    //Return ADC result
}

int main(void)
{
    unsigned int temp;
    InitLCD();
    ADCInit();
    LCD_display(1,1,"Temperature:");
    while(1)
    {
        temp = Read_Temp();
        temp = ((temp * 500) / 1023);
        sprintf(str,"%d'C  ",temp);
        LCD_display(2,1,str);
        lcd_delay(9000);
    }
    return 0;
}
```