Exp:5

//Include Controller specific header file

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#include <lpc214x.h> //Includes LPC2148 register definitions

#define LCD\_RS\_HIGH() IO0SET = (1<<16) //Function to select data

port on LCD

#define LCD\_RS\_LOW() IO0CLR = (1<<16) //Function to select

command port on LCD

#define LCD\_RW\_HIGH() IO0SET = (1<<17) //Function to select

read operation on LCD

#define LCD\_RW\_LOW() IO0CLR = (1<<17) //Function to select

write operation on LCD

#define LCD\_EN\_HIGH() IO0SET = (1<<18) //Function to Enable LCD

#define LCD\_EN\_LOW() IO0CLR = (1<<18) //Function to

disable LCD

// "1234567890123456"

unsigned char String1[]={" LCD Interface "};

unsigned char String2[]={" Test Program "};

void delay\_ms(unsigned char time) //This Function is used to cause

delay between LED ON and OFF events

{

unsigned int i, j;

for (j=0; j<time; j++)

for(i=0; i<8002; i++);

}

void LCD\_Command(unsigned char command)

{

unsigned char temp=0;

LCD\_RW\_LOW();

LCD\_RS\_LOW();

temp = (command & 0xF0) >> 4;

IO0CLR = 0xF <<19; // Clear LCD Data lines

IO0SET = temp << 19;

LCD\_EN\_HIGH();

delay\_ms(1);

LCD\_EN\_LOW();

temp = (command & 0x0F);

IO0CLR = 0xF <<19; // Clear LCD Data lines

IO0SET = temp << 19;

LCD\_EN\_HIGH();

delay\_ms(1);

LCD\_EN\_LOW();

}

void LCD\_Data(unsigned char data)

{

unsigned char temp=0;

LCD\_RW\_LOW();

LCD\_RS\_HIGH();

temp = (data & 0xF0) >> 4;

IO0CLR = 0xF <<19; // Clear LCD Data lines

IO0SET = temp << 19;

LCD\_EN\_HIGH();

delay\_ms(1);

LCD\_EN\_LOW();

temp = (data & 0x0F);

IO0CLR = 0xF <<19; // Clear LCD Data lines

IO0SET = temp << 19;

LCD\_EN\_HIGH();

delay\_ms(1);

LCD\_EN\_LOW();

}

void LCD\_Init()

{

LCD\_RW\_LOW();

LCD\_RS\_LOW();

IO0CLR = 0x0F <<19; // Clear LCD Data lines

IO0SET = 0x03 << 19;

LCD\_EN\_HIGH();

delay\_ms(1);

LCD\_EN\_LOW();

IO0CLR = 0x0F <<19; // Clear LCD Data lines

IO0SET = 0x03 << 19;

LCD\_EN\_HIGH();

delay\_ms(1);

LCD\_EN\_LOW();

IO0CLR = 0x0F <<19; // Clear LCD Data lines

IO0SET = 0x02 << 19;

LCD\_EN\_HIGH();

delay\_ms(1);

LCD\_EN\_LOW();

LCD\_Command(0x28);

delay\_ms(20);

LCD\_Command(0x28);

delay\_ms(20);

LCD\_Command(0x0C);

delay\_ms(20);

LCD\_Command(0x06);

delay\_ms(20);

LCD\_Command(0x01);

delay\_ms(20);

}

LCD\_DisplayString(unsigned char \*string)

{

while(\*string) //Check for End of String

LCD\_Data(\*string++); //sending data on LCD byte by byte

}

int main(void)

{

float temp = 0;

unsigned int ADC\_Result=0;

unsigned char i, Thousands,Hundreds,Tens,Ones;

PINSEL0 = 0x00000000;

PINSEL1 = 0x00040000; // P0.25 as ADC0 CH4 input

PINSEL2 = 0X00; //Configure PORT1 as GPIO

IO0DIR = 0x7F <<16; // Set P0.16, P0.17, P0.18,

P0.19, P0.20, P0.21, P0.22 as Output

LCD\_Init(); //Initialize LCD 16x2

LCD\_DisplayString("LM35 Interface");

LCD\_Command(0xc0);//second line

LCD\_DisplayString("TEMP OUT=");

/\* Configure ADC0 for following

ADC Channel = AD0.2

ADC Clock = 3 MHz

Clock Selection = 11 Clock Cycles/10bit

Start Condition = No start

Power Down = 1, EDGE = 0, BURST = 0 \*/

AD0CR = 0x01200410;

while (1)

{

AD0CR |= 1<<24; //Start ADC

//Wait for the conversion to be completed

while((AD0DR4&0x80000000)==0);

ADC\_Result = AD0DR4; //Store converted data

ADC\_Result = (ADC\_Result>>6) & 0x3FF;

LCD\_Command (0xCA); //Goto 10th place on second

line of LCD

temp = ((float)ADC\_Result \* 3.3 )/1024;

ADC\_Result = (unsigned int) (temp \* 1000);

i = (ADC\_Result%1000)/100; //Get the Hundreds place

Hundreds = i + 0x30; // Convert it to ASCII

LCD\_Data (Hundreds); //Display Hundreds place

i = ((ADC\_Result%1000)%100)/10; //Get the Tens place

Tens = i + 0x30; // Convert it to ASCII

LCD\_Data (Tens); //Display Tens place

LCD\_Data ('.'); //Display Tens place

i = ADC\_Result%10 ; //Get the Ones place

Ones = i + 0x30; // Convert it to ASCII

LCD\_Data (Ones); //Display Ones place

LCD\_Data (0xDF); //Display Tens place

LCD\_Data ('C'); //Display Tens place

delay\_ms(250); //Delay between two conversions

}}