#include <delay.h>

#include <mega128.h>

#define LCD\_WDATA PORTA

#define LCD\_WINST PORTA

#define LCD\_CTRL PORTG

#define LCD\_RDATA PINA

#define LCD\_EN 0

#define LCD\_RW 1

#define LCD\_RS 2

#define RIGHT 1

#define LEFT 0

void LCD\_PORT\_Init(void)

{

DDRA = 0xFF;

DDRG = 0x0F;

}

void LCD\_Data(unsigned char ch)

{

LCD\_CTRL |= (1 << LCD\_RS);

LCD\_CTRL &= ~(1 << LCD\_RW);

LCD\_CTRL |= (1 << LCD\_EN);

delay\_us(50);

LCD\_WDATA = ch;

delay\_us(50);

LCD\_CTRL &= ~(1 << LCD\_EN);

}

void LCD\_Comm(unsigned char ch)

{

LCD\_CTRL &= ~(1 << LCD\_RS);

LCD\_CTRL &= ~(1 << LCD\_RW);

LCD\_CTRL |= (1 << LCD\_EN);

delay\_us (50);

LCD\_WINST = ch;

delay\_us(50);

LCD\_CTRL &= ~(1 << LCD\_EN);

}

void LCD\_Delay(unsigned char ms)

{

delay\_ms(ms);

}

void LCD\_Char(unsigned char c)

{

LCD\_Data(c);

delay\_ms(1);

}

void LCD\_Str(unsigned char \*str)

{

while(\*str != 0) {

LCD\_Char(\*str);

str++;

}

}

void LCD\_Pos(unsigned char x, unsigned char y)

{

LCD\_Comm(0x80|(x\*0x40+y));

}

void LCD\_Clear(void)

{

LCD\_Comm(0x01);

LCD\_Delay(2);

}

void LCD\_Display\_Shift(unsigned char p)

{

if(p == RIGHT) {

LCD\_Comm(0x1C);

LCD\_Delay(1);

}

else if(p == LEFT) {

LCD\_Comm(0x18);

LCD\_Delay(1);

}

}

void LCD\_Cursor\_Shift(unsigned char p)

{

if(p == RIGHT) {

LCD\_Comm(0x14);

LCD\_Delay(1);

}

else if(p == LEFT) {

LCD\_Comm(0x10);

LCD\_Delay(1);

}

}

void Cursor\_Home(void)

{

LCD\_Comm(0x02);

LCD\_Delay(2);

}

void LCD\_Init(void)

{

LCD\_PORT\_Init();

LCD\_Comm(0x38);

LCD\_Delay(4);

LCD\_Comm(0x38);

LCD\_Delay(4);

LCD\_Comm(0x38);

LCD\_Delay(4);

LCD\_Comm(0x0e);

LCD\_Delay(2);

LCD\_Comm(0x06);

LCD\_Delay(2);

LCD\_Clear();

}