/\*

ATmega 16 UART using interrupt

http://www.electronicwings.com

\*/

#define *F\_CPU* 8000000UL /\* Define frequency here its 8MHz \*/

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h>

#define LCD\_Data\_Dir DDRB /\* Define LCD data port direction \*/

#define LCD\_Command\_Dir DDRA /\* Define LCD command port direction register \*/

#define LCD\_Data\_Port PORTB /\* Define LCD data port \*/

#define LCD\_Command\_Port PORTA /\* Define LCD data port \*/

#define RS PA5 /\* Define Register Select (data/command reg.)pin \*/

#define RW PA6 /\* Define Read/Write signal pin \*/

#define EN PA7 /\* Define Enable signal pin \*/

unsigned char ch;

void LCD\_Command(unsigned char cmnd)

{

LCD\_Data\_Port= cmnd;

LCD\_Command\_Port &= ~(1<<RS); /\* RS=0 command reg. \*/

LCD\_Command\_Port &= ~(1<<RW); /\* RW=0 Write operation \*/

LCD\_Command\_Port |= (1<<EN); /\* Enable pulse \*/

*\_delay\_us*(1);

LCD\_Command\_Port &= ~(1<<EN);

*\_delay\_ms*(3);

}

void LCD\_Char (unsigned char char\_data) /\* LCD data write function \*/

{

LCD\_Data\_Port= char\_data;

LCD\_Command\_Port |= (1<<RS); /\* RS=1 Data reg. \*/

LCD\_Command\_Port &= ~(1<<RW); /\* RW=0 write operation \*/

LCD\_Command\_Port |= (1<<EN); /\* Enable Pulse \*/

*\_delay\_us*(1);

LCD\_Command\_Port &= ~(1<<EN);

*\_delay\_ms*(1);

}

void LCD\_Init (void) /\* LCD Initialize function \*/

{

LCD\_Command\_Dir = 0xFF; /\* Make LCD command port direction as o/p \*/

LCD\_Data\_Dir = 0xFF; /\* Make LCD data port direction as o/p \*/

*\_delay\_ms*(20); /\* LCD Power ON delay always >15ms \*/

LCD\_Command (0x38); /\* Initialization of 16X2 LCD in 8bit mode \*/

LCD\_Command (0x0C); /\* Display ON Cursor OFF \*/

LCD\_Command (0x06); /\* Auto Increment cursor \*/

LCD\_Command (0x01); /\* Clear display \*/

LCD\_Command (0x80); /\* Cursor at home position \*/

}

void LCD\_String (char \*str) /\* Send string to LCD function \*/

{

int i;

for(i=0;str[i]!=0;i++) /\* Send each char of string till the NULL \*/

{

LCD\_Char (str[i]);

}

}

void LCD\_String\_xy (char row, char pos, char \*str)/\* Send string to LCD with xy position \*/

{

if (row == 0 && pos<16)

LCD\_Command((pos & 0x0F)|0x80); /\* Command of first row and required position<16 \*/

else if (row == 1 && pos<16)

LCD\_Command((pos & 0x0F)|0xC0); /\* Command of first row and required position<16 \*/

LCD\_String(str); /\* Call LCD string function \*/

}

void LCD\_Clear()

{

LCD\_Command (0x01); /\* clear display \*/

LCD\_Command (0x80); /\* cursor at home position \*/

}

int main()

{

TCCR1A|=(1<<COM1A1)|(1<<COM1B1)|(1<<WGM11); //NON Inverted PWM

TCCR1B|=(1<<WGM13)|(1<<WGM12)|(1<<CS11)|(1<<CS10); //PRESCALER=64 MODE 14(FAST PWM)

ICR1=4999; //fPWM=50Hz (Period = 20ms Standard).

DDRD = 0XFF;

DDRC = 0X00;

while(1)

{

// OCR1B=425; //0 degree ----------For the checking purpose

if ((PINC &= 0b00000001)) // check if 0 pin of port C is high or not

{

OCR1A=316; //90 degree

PORTD = 0x01;

LCD\_Init(); /\* Initialize LCD \*/

LCD\_String("Authorized"); /\* write string on 1st line of LCD\*/

LCD\_Command(0xC0); /\* Go to 2nd line\*/

LCD\_String("Welcome Ahsan"); /\* Write string on 2nd line\*/

*\_delay\_ms*(400);

OCR1A=97; //0 degree

}

else if ((PINC &= 0b00000010))

{

OCR1A=316; //90 degree

PORTD = 0x02;

LCD\_Init(); /\* Initialize LCD \*/

LCD\_String("Authorized"); /\* write string on 1st line of LCD\*/

LCD\_Command(0xC0); /\* Go to 2nd line\*/

LCD\_String("Welcome Majid"); /\* Write string on 2nd line\*/

*\_delay\_ms*(400);

OCR1A=97; //0 degree

}

else

{

OCR1A=97; //0 degree

LCD\_Init(); /\* Initialize LCD \*/

LCD\_String("Sorry"); /\* write string on 1st line of LCD\*/

LCD\_Command(0xC0); /\* Go to 2nd line\*/

LCD\_String("Not Authorized"); /\* Write string on 2nd line\*/

*\_delay\_ms*(400);

}

};

}