마이크로 컨트롤러 5주차 과제

BUZZER Project No. 2

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순서

[SourceCode 2](#_Toc113543576)

[Implementation 3](#_Toc113543577)

# Source Code

#include <avr/io.h>

#define F\_CPU 16000000UL

#include <util/delay.h>

#include <avr/interrupt.h>

#define NULL 0x00

#define BIT4\_LINE2\_DOT58 0x28

#define DISPON\_CUROFF\_BLKOFF 0x0C

#define DISPOFF\_CUROFF\_BLKOFF 0x08

#define DISPCLEAR 0x01

#define INC\_NOSHIFT 0x06

#define CUR1LINE 0x80

#define CUR2LINE 0xC0

#define OFF 10

#define ON 11

int state = OFF;

void CLCD\_cmd(char);

void CLCD\_data(char);

void CLCD\_puts(char \*);

ISR(INT4\_vect)

{

    \_delay\_ms(60);

    if((PINE & 0x10) == 0x10) return;

    EIFR |= 1 <<4;

    if(state == OFF) state = ON;

    else state = OFF;

}

char motto1[] = "Life Companion";

char motto2[] = "JUST Do IT";

int main(void){

    DDRC = 0xff;

    DDRD = 0xff;

    \_delay\_ms(50);

    CLCD\_cmd(BIT4\_LINE2\_DOT58);

    CLCD\_cmd(DISPON\_CUROFF\_BLKOFF);

    CLCD\_cmd(INC\_NOSHIFT);

    CLCD\_cmd(DISPCLEAR);

    \_delay\_ms(2);

    CLCD\_cmd(CUR1LINE);

    CLCD\_puts(motto1);

    CLCD\_cmd(CUR2LINE);

    CLCD\_puts(motto2);

    DDRE = 0x00;

    EICRB = 0x0a;

    EIMSK = 0x30;

    SREG |= 0x80;

    while(1)

    {

        if(state == ON) CLCD\_cmd(DISPON\_CUROFF\_BLKOFF);

        else CLCD\_cmd( DISPOFF\_CUROFF\_BLKOFF);

    }

}

void CLCD\_data(char data){

    PORTD = 0x04;

    \_delay\_us(1);

    PORTD = 0x14;

    PORTC = data & 0xf0;

    PORTD = 0x04;

    \_delay\_us(2);

    PORTD = 0x14;

    PORTC = (data << 4) & 0xf0;

    PORTD = 0x04;

    \_delay\_ms(1);

}

void CLCD\_puts(char \*ptr){

    while(\*ptr != NULL)

        CLCD\_data(\*ptr++);

}

void CLCD\_cmd(char cmd){

    PORTD = 0x00;

    \_delay\_us(1);

    PORTD = 0x10;

    PORTC = cmd & 0xf0;

    PORTD = 0x00;

    \_delay\_us(2);

    PORTD = 0x10;

    PORTC = (cmd << 4) & 0xf0;

    PORTD = 0x00;

    \_delay\_ms(1);

}

# Implementation

