CPE301 – FALL 2019

Design Assignment 2C

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Primary Github address: <https://github.com/kirkster96/submission_da>

Directory: <https://github.com/kirkster96/submission_da/tree/master/DesignAssignment/DA2_b>

1. **COMPONENTS LIST AND CONNECTION BLOCK DIAGRAM w/ PINS**

Atmega328PB

Multi-function Shield

Block diagram with pins used in the Atmega328P

1. **AVR C DEVELOPED CODE OF TASK 1**

#define F\_CPU 16000000UL

#include <asf.h>

#include <avr/io.h>

#include <util/delay.h>

int main (void)

{

board\_init();

/\* Insert application code here, after the board has been initialized. \*/

DDRB |= (1<<DDB3); //output PB3

TCCR0A = 0;//NORMAL OPERATION

TCNT0=0x06;

//START THE TIMER

TCCR0B |= (1<<CS02)|(1<<CS00);

//set prescaler to 64 and start the timer

while(1){

for(int j = 0; j < 1000; j++){

for(int i =0; i<625; i++){

while((TIFR0 & 0x01) == 0);

}

}

PORTB ^= (1<<DDB3); //output PB2 on

TCNT0=0x06;

TIFR0=0x01;//reset the overflow flag

}

return 1;

}

1. **AVR C DEVELOPED CODE OF TASK 2**

//#define F\_CPU 16000000UL

#include <asf.h>

#include <avr/io.h>

//#include <util/delay.h>

#include <avr/interrupt.h>

int OFcount = 0;

int main (void)

{

board\_init();

DDRB |= (1<<DDB3); //output PB3

TCNT0=0x00;//timer|count register

TCCR0A = 0x00;//configuration register NORMAL MODE

TCCR0B |= (1<<CS01)|(1<<CS00); //configuration register

//PRESCALER 64

TIMSK0 |= (1 << TOIE0);//enable timer0 overflow interrupt

sei();

//START THE TIMER

//set prescaler to 64 and start the timer

while(1){

//MAIN LOOP

}

}

ISR (TIMER0\_OVF\_vect)

{

OFcount++;

if (OFcount == 625)

{

PORTB ^= (1<<DDB3); //output PB3 on

OFcount = 0;

}

}

1. **AVR C DEVELOPED CODE OF TASK 3**

#define F\_CPU 16000000UL

#include <asf.h>

#include <avr/io.h>

#include <avr/interrupt.h>

int OFcount = 0;

int main (void)

{

/\* Insert system clock initialization code here (sysclk\_init()). \*/

board\_init();

DDRB |= (1<<DDB3); //output PB3

OCR0A = 0x62;

TCNT0 = 0;

TCCR0A = (1<<WGM01);//configuration register CTC MODE

TCCR0B |= (1<<CS01)|(1<<CS00); //configuration register

//PRESCALER 64

TIMSK0 |= (1 << OCIE0A);//enable timer0 overflow interrupt

sei();

//START THE TIMER

//set prescaler to 64 and start the timer

while(1){

//MAIN LOOP

}

}

ISR (TIMER0\_COMPA\_vect)

{

OFcount++;

if (OFcount == 1000)

{

PORTB ^= (1<<DDB3); //output PB3 on

OFcount = 0;

}

//PORTB ^= (1<<DDB3); //output PB3 on

TIFR0 |= (1<<OCF0A);

}

1. **VIDEO LINKS OF EACH DEMO**

AVR C Task 1 Demo

<https://drive.google.com/open?id=16EVKj1zvpUIm8muoFsPTeWGZcquixiJA>

AVR C Task 2 Demo

<https://drive.google.com/file/d/16Pn5RDHXC9UAFN_YBO1z0aXSfQg1VXvY/view?usp=sharing>

AVR C Task 3 Demo

<https://drive.google.com/file/d/16ZrMIWeaFrbAEzqfVbQnb44QLgiOhHaG/view?usp=sharing>

1. **GITHUB LINK OF THIS DA**

**Student Academic Misconduct Policy**

<http://studentconduct.unlv.edu/misconduct/policy.html>

“This assignment submission is my own, original work”.

NAME OF THE STUDENT