1 **МИКРОКОНТРОЛЛЕРЫ – Новая эра электроники | Микроконтроллеры с нуля #1**

2 **Avr studiо, proteus, программатор | Микроконтроллеры с нуля #2**

**3 Бит | Байт | Системы счисления | Микроконтроллеры с нуля #3**

4 **Порты ввода-вывода | Первая программа | Микроконтроллеры с нуля #4**

5 **Proteus | AVRDUDE | Отладка и прошивка микроконтроллеров AVR | Микроконтроллеры с нуля #5**

**6 Формирование задержек времени микроконтроллера | Микроконтроллеры с нуля #6**

**7 Светодиодная гирлянда на микроконтроллере | Микроконтроллеры с нуля #7**

**8 Семисегментный индикатор | Микроконтроллеры с нуля #8**

**9 Массивы | Микроконтроллеры с нуля #9**

**10 Логические операции | Микроконтроллеры с нуля #10**

**11 Побитовые операции | Микроконтроллеры с нуля #11**

**12 Таймер-счетчик 0 ATmega8 | Микроконтроллеры с нуля #12**

**13Таймер-счетчик 1, 2 ATmega8 | Микроконтроллеры с нуля #13**

**14 Внешние прерывания микроконтроллера | Микроконтроллеры с нуля #14**

**15Прерывания от таймер-счетчика ATmega8 | Микроконтроллеры с нуля #15**

**16 Кварцевый резонатор | Настройка фьюзов | Микроконтроллеры с нуля #16**

**17 Динамическая индикация | Часть 1 | Программирование микроконтроллеров AVR**

**18 Динамическая индикация | Часть 2 | Программирование микроконтроллеров AVR**

**19 Динамическая индикация | Часть 3 | Программирование микроконтроллеров AVR**

**20 Интересный таймер на микроконтроллере | Программирование микроконтроллеров**

21 **Аналогово-цифрофой преобразователь АЦП | Программирование микроконтроллеров AVR**

**22 Умный ВОЛЬТМЕТР своими руками | Программирование микроконтроллеров AVR**

**23 Широтно-импульсная модуляция AVR | Часть 1 | Программирование микроконтроллеров AVR**

**24 Быстродействующая ШИМ AVR | Часть 2 | Программирование микроконтроллеров AVR**

**25 ШИМ с точной фазой | Часть 3 | Программирование микроконтоллеров AVR**

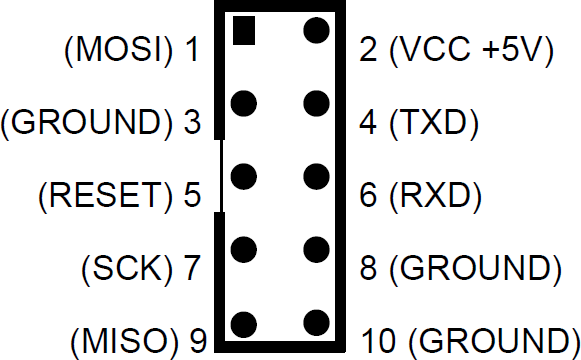
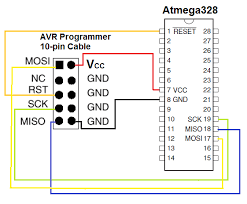
**26 ШИМ с точной фазой и частотой | Часть 4 | Программирование микроконтроллеров AVR**

**27 Урок 27. EEPROM настройки | Часть 1 | Программирование микроконтроллеров AVR**

**28 EEPROM AVR | Часть 2 | Программирование микроконтроллеров AVR**

Github

<https://github.com/>



**Dinamicescaa indicazia prima**

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h>

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

//int r = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

void vse\_numere (unsigned int ma)

{

razr1=ma/1000;

razr2=ma%1000/100;

razr3=ma%100/10;

razr4=ma%10;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

//PORTB=0x1;

//PORTD=0xFF;

while(1)

{vse\_numere(4087);

CIFRE=0x01;NUMERE=go[razr1];

*\_delay\_ms*(500);

CIFRE=0x02;NUMERE=go[razr2];

*\_delay\_ms*(500);

CIFRE=0x04;NUMERE=go[razr3];

*\_delay\_ms*(500);

CIFRE=0x08;NUMERE=go[razr4];

*\_delay\_ms*(500);

}

}

**Dinamicescaa indicazia seconda**

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h>

#define CHISLO PORTD

#define RAZRIAD PORTB

unsigned int chisla[10] ={0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

//unsigned int z = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

unsigned char bc547=0;

void vse\_cislo (unsigned int razbivka\_chisla)

{

razr1=razbivka\_chisla/1000;

razr2=razbivka\_chisla%1000/100;

razr3=razbivka\_chisla%100/10;

razr4=razbivka\_chisla%10;

}

ISR(TIMER0\_OVF\_vect)

{

if(bc547==1);{RAZRIAD=0x01;CHISLO=chisla[razr1];}

*\_delay\_ms*(100);

if(bc547==2);{RAZRIAD=0x02;CHISLO=chisla[razr2];}

*\_delay\_ms*(100);

if(bc547==4);{RAZRIAD=0x04;CHISLO=chisla[razr3];}

if(bc547==8);{RAZRIAD=0x08;CHISLO=chisla[razr4];}

bc547++;

if (bc547>4) bc547=1;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

RAZRIAD=0x01;

CHISLO=0x3F;

TCCR0 |=(1<<1);TCCR0&=~((1<<0)|(1<<2));

TIMSK |=(1<<0);

TCNT0 = 0;

sei ( );

while(1)

{

vse\_cislo(3174);

/\*

{RAZRIAD=0x01;CHISLO=chisla[razr1];

\_delay\_ms(500);

RAZRIAD=0x02;CHISLO=chisla[razr2];

\_delay\_ms(500);

RAZRIAD=0x04;CHISLO=chisla[razr3];

\_delay\_ms(500);

RAZRIAD=0x08;CHISLO=chisla[razr4];

\_delay\_ms(500);}

\*/

}

}

**Dinamicescaa indicazia seconda ---- ANOD**

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h>

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={~0xBF,~0x86,~0xDB,~0xCF,~0xE6,~0xED,~0xFD,~0x87,~0xFF,~0xEF};//Anod

// int r = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

unsigned char bc547=0;

void vse\_numere (unsigned int rasbivca\_go)

{

razr1=rasbivca\_go/1000;

razr2=rasbivca\_go%1000/100;

razr3=rasbivca\_go%100/10;

razr4=rasbivca\_go%10;

}

ISR (TIMER0\_OVF\_vect)

{

if(bc547==1){PORTB=0xE;PORTD=go[razr1];}

*\_delay\_ms*(500); //per la proba

if(bc547==2){PORTB=0xD;PORTD=go[razr2];}

*\_delay\_ms*(500);

if(bc547==3){PORTB=0xB;PORTD=go[razr3];}

*\_delay\_ms*(500);

if(bc547==4){PORTB=0x7;PORTD=go[razr4];}

*\_delay\_ms*(500);

bc547++;

if(bc547>4) bc547=1;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

//PORTB=0x1;

//PORTD=0x3F;

TCCR0 |=(1<<1);TCCR0&=~((1<<0)|(1<<2));

TIMSK |=(1<<0);

TCNT0 = 0;

sei ();

while(1)

{

vse\_numere(4031);

/\*

PORTB=0xE;PORTD=go[razr1];//Anod

\_delay\_ms(1000);

PORTB=0xD;PORTD=go[razr2]; //Anod

\_delay\_ms(1000);

PORTB=0xB;PORTD=go[razr3]; //Anod

\_delay\_ms(1000);

PORTB=0x7;PORTD=go[razr4]; //Anod

\_delay\_ms(1000);

\*/

}

}

**Dinamicescaa indicazia seconda ---- ANOD**

BUTTON---OK

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h>

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={~0xBF,~0x86,~0xDB,~0xCF,~0xE6,~0xED,~0xFD,~0x87,~0xFF,~0xEF};//Anod

unsigned int r = 0;

unsigned int razr1=0,razr2=0,razr3=0;

unsigned char bc547=0;

void vse\_numere (unsigned int rasbivca\_go)

{

razr1=rasbivca\_go/100;

razr2=rasbivca\_go%100/10;

razr3=rasbivca\_go%10;

}

ISR (TIMER0\_OVF\_vect)

{

if(bc547==1){PORTB=0xE;PORTD=go[razr1];}

if(bc547==2){PORTB=0xD;PORTD=go[razr2];}

if(bc547==3){PORTB=0xB;PORTD=go[razr3];}

bc547++;

if(bc547>3) bc547=1;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x07;

DDRC&=~((1<<4)|(1<<5));

PORTC|=(1<<4)|(1<<5);

//PORTB=0x1;

//PORTD=0x3F;

TCCR0 |=(1<<1);TCCR0&=~((1<<0)|(1<<2));

TIMSK |=(1<<0);

TCNT0 = 0;

sei ();

while(1)

{

vse\_numere(r);

if(~PINC&(1<<5))

{

r++;

*\_delay\_ms*(300);

}

if(~PINC&(1<<4))

{

r--;

*\_delay\_ms*(300);

}

/\*

PORTB=0xE;PORTD=go[razr1];//Anod

\_delay\_ms(1000);

PORTB=0xD;PORTD=go[razr2]; //Anod

\_delay\_ms(1000);

PORTB=0xB;PORTD=go[razr3]; //Anod

\_delay\_ms(1000);

\*/

}

}

/\*

\* Neu.c

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

int go [10] = {0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

int z=0;

int main(void)

{DDRD=0xFF;

DDRB=0x0;

PORTB=0x3;

while (1)

{PORTD=go[z];

if (PINB==0x01);

{z++;

if(z>9)z=0;

*\_delay\_ms*(500);

}

if (PINB==0x02);

{z--;

if(z<0)z=9;

*\_delay\_ms*(500);

}

}

}

**If---for Catod**

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

int go [10] = {0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

int z=0;

int main(void)

{DDRD=0xFF;

DDRB=0x0;

PORTB=0x3;

while (1)

/\*{PORTD=go[z];

if (PINB==0x01) //no --;

{z++;

if(z>9)z=0;

\_delay\_ms(500);

}

if (PINB==0x02) //no--;

{z--;

if(z<0)z=9;

\_delay\_ms(500);

}\*/

{for(z=0;z>9;z++); //da--;

{*\_delay\_ms*(500);

PORTD=go[z];

}

for(z=9;z<0;z--); //da--;

{*\_delay\_ms*(500);

PORTD=go[z];

}

}

}

#define *F\_CPU* 1000000 **Buton >> if**

#include <avr/io.h>

#include <util/delay.h>

int go[10] ={0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

int r = 0;

int main(void)

{DDRD=0xFF;

DDRB &=~(1<<0);

PORTB |=(1<<0)|(1<<1);

while(1)

{

if(PINB ==0x1)

{PORTD =go[r];

r++;

*\_delay\_ms*(500);

if(r>9) r=0;}

if(PINB ==0x2)

{PORTD =go[r];

r--;

*\_delay\_ms*(500);

if(r<0) r=9;}

}

}

#define *F\_CPU* 1000000UL //**De la 1 la 9**

#include <avr/io.h>

#include <util/delay.h>

//#define NINA PORTD

//#define MIC 500

int main(void)

{DDRD=0xFF;

while(1)

{

/\*NINA^=(1<<1)|(1<<2);

\_delay\_ms(500);

NINA|=(1<<1);

\_delay\_ms(500);

NINA|=(1<<2);

\_delay\_ms(500);

NINA|=(1<<3);

\_delay\_ms(500);\*/

PORTD=0x79;//0x79;1

*\_delay\_ms*(1000);

PORTD=0x24;//0x24;2

*\_delay\_ms*(2000);

PORTD=0x30;//0x30;3

*\_delay\_ms*(1000);

PORTD=0x19;//0x19;4

*\_delay\_ms*(1000);

PORTD=0x12;//0x12;5

*\_delay\_ms*(1000);

PORTD=0x02;//0x02;6

*\_delay\_ms*(1000);

PORTD=0x78;//0x78;7

*\_delay\_ms*(1000);

PORTD=0x00;//0x00;8

*\_delay\_ms*(1000);

PORTD=0x10;//0x10;9

*\_delay\_ms*(1500);

/\* PORTD=~0b10000110;//0x79;1 Anod ~

\_delay\_ms(1000);

PORTD=~0b11011011;//0x24;2 Anod ~

\_delay\_ms(2000);

PORTD=0x30;//0x30;3

\_delay\_ms(1000);

PORTD=0x19;//0x19;4

\_delay\_ms(1000);

PORTD=0x12;//0x12;5

\_delay\_ms(1000);

PORTD=0x02;//0x02;6

\_delay\_ms(1000);

PORTD=0x78;//0x78;7

\_delay\_ms(1000);

PORTD=0x00;//0x00;8

\_delay\_ms(1000);

PORTD=0x10;//0x10;9

\_delay\_ms(1500);\*/

}

}

#define *F\_CPU* 1000000 **//Buto—(LA MINUS) Anod –(LA PLUS) if---for**

#include <avr/io.h>

#include <util/delay.h>

int go[10] ={0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

int r = 0;

int main(void)

{DDRD=0xFF;

DDRB &=~(1<<0);

PORTB |=(1<<0)|(1<<1);

while(1)

{

if(PINB ==0x1)

{PORTD =~go[r]; //inversia ~

r++;

*\_delay\_ms*(500);

if(r>9) r=0;}

if(PINB ==0x2)

{PORTD =~go[r]; //inversia ~

r--;

*\_delay\_ms*(500);

if(r<0) r=9;

}

}

}

/\*For(b=0;b<9;b++)

{*\_delay\_ms*(500);

PORTD=go[b];

}

For(b=9;b>0;b--)

{*\_delay\_ms*(500);

PORTD=go[b];

}

}

}\*/

**4087 Catod**

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

1 #define NUMERE PORTD

1 #define CIFRE PORTB

unsigned int go[10] ={0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

//int r = 0;

4 unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

2 void vse\_numere (unsigned int rasbivca\_go)

{

3 razr1=rasbivca\_go/1000;

3 razr2=rasbivca\_go%1000/100;

3 razr3=rasbivca\_go%100/10;

3 razr4=rasbivca\_go%10;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

//PORTB=0x1;

//PORTD=0xFF;

while(1)

5 {vse\_numere(4087);

6 PORTB=0x01;PORTD=go[razr1];

*\_delay\_ms*(500);

6 PORTB=0x02;PORTD=go[razr2];

*\_delay\_ms*(500);

6 PORTB=0x04;PORTD=go[razr3];

*\_delay\_ms*(500);

6 PORTB=0x08;PORTD=go[razr4];

*\_delay\_ms*(500);

}

}

**4031 Anod--OK**

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={~0xBF,~0x86,~0xDB,~0xCF,~0xE6,~0xED,~0xFD,~0x87,~0xFF,~0xEF};//Anod

// int r = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

void vse\_numere (unsigned int rasbivca\_go)

{

razr1=rasbivca\_go/1000;

razr2=rasbivca\_go%1000/100;

razr3=rasbivca\_go%100/10;

razr4=rasbivca\_go%10;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

//PORTB=0x1;

//PORTD=0x3F;

while(1)

{

vse\_numere(4031);

PORTB=0xE;PORTD=go[razr1];//Anod

*\_delay\_ms*(1000);

PORTB=0xD;PORTD=go[razr2]; //Anod

*\_delay\_ms*(1000);

PORTB=0xB;PORTD=go[razr3]; //Anod

*\_delay\_ms*(1000);

PORTB=0x7;PORTD=go[razr4]; //Anod

*\_delay\_ms*(1000);

}

}

Adaugam buton timer-- vse\_numere(4087) ficsat

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h> //include taimer control

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

//int r = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

unsigned char bc547 =1;

void vse\_numere (unsigned int rasbivca\_go)

{

razr1=rasbivca\_go/1000;

razr2=rasbivca\_go%1000/100;

razr3=rasbivca\_go%100/10;

razr4=rasbivca\_go%10;

}

ISR(TIMER0\_OVF\_vest) //Include funczia interrupt

{

if(bc547==1){ PORTB=0x01;PORTD=go[razr1];} //introduce variabile (bc547==1)=tranzistor)

if(bc547==2){ PORTB=0x02;PORTD=go[razr2];}

if(bc547==3){ PORTB=0x03;PORTD=go[razr3];}

if(bc547==4){ PORTB=0x04;PORTD=go[razr4];}

bc547++; //incrementazia

if(bc547>4) bc547=1;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

PORTB=0x1;

PORTD=0xFF;

TCCR0|=(1<<1);TCCR0&=~((1<<0)|(1<<2)); //Setap timer T0. Fregvenza/8

TIMSK |=(1<<0);

TCNT0 =0; //in zero

sei() //permeso interrupt global

while(1)

{vse\_numere(4087);

}

}

Adaugam inca **due buton** timer-- vse\_numere(4087) ficsat

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h> //include timer control

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

unsigned int r = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

unsigned char bc547 =1;

void vse\_numere (unsigned int rasbivca\_go)

{

razr1=rasbivca\_go/1000;

razr2=rasbivca\_go%1000/100;

razr3=rasbivca\_go%100/10;

razr4=rasbivca\_go%10;

}

ISR(TIMER0\_OVF\_vest) //Include funczia interrupt

{

If(bc547==1){ PORTB=0x01;PORTD=go[razr1];} //introduce variabile (bc547==1)=tranzistor)

If(bc547==2){ PORTB=0x02;PORTD=go[razr2];}

If(bc547==3){ PORTB=0x03;PORTD=go[razr3];}

If(bc547==4){ PORTB=0x04;PORTD=go[razr4];}

bc547++; //incrementazia

if(bc547>4) bc547=1;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

PORTB=0x1;

PORTD=0xFF;

DDRC&=~((1<<4)|(1<<5));

PORTC|=(1<<4)|(1<<5);

TCCR0|=(1<<1);TCCR0&=~((1<<0)|(1<<2)); //Setap timer T0. Fregvenza/8

TIMSK|=(1<<0);

TCNT0 =0; //in zero

sei() //permeso interrupt global

while(1)

{vse\_numere(z);

If(~PINC&(1<<5))

{

z++;

\_delay\_ms(500);

}

If(~PINC&(1<<4))

{

z--;

\_delay\_ms(500);

}

}

}

**r--- Anod--OK**

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h> //include timer control

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={0xBF,~0x86,~0xDB,~0xCF,~0xE6,~0xED,~0xFD,~0x87,~0xFF,~0xEF};//Anod

unsigned int r = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

unsigned char trnsistor547 =1;

void vse\_numere (unsigned int rasbivca\_go)

{

razr1=rasbivca\_go/1000;

razr2=rasbivca\_go%1000/100;

razr3=rasbivca\_go%100/10;

razr4=rasbivca\_go%10;

}

ISR (TIMER0\_OVF\_vect)

{

if (trnsistor547 ==1){CIFRE=0x01;NUMERE=go[razr1];}

if (trnsistor547 ==2){CIFRE=0x02;NUMERE=go[razr2];}

if (trnsistor547 ==3){CIFRE=0x04;NUMERE=go[razr3];}

if (trnsistor547 ==4){CIFRE=0x08;NUMERE=go[razr4];}

trnsistor547++;

if (trnsistor547>4) trnsistor547=1;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

CIFRE=0x1;

NUMERE=0x3F;

DDRC&=~((1<<4)|(1<<5));

PORTC|=(1<<4)|(1<<5);

{TCCR0|=(1<<1); TCCR0&=~((1<<0) | (1<<2)); //F/8

TIMSK |=(1<<0);

TCNT0 =0;

sei ();

}

while(1)

{

vse\_numere(r);

if(~PINC & (1<<5))

{

r++;

*\_delay\_ms*(500);

}

if(~PINC & (1<<4))

{

r--;

*\_delay\_ms*(500);

}

/\*PORTB=0xE;PORTD=go[razr1];//Anod

\_delay\_ms(1000);

PORTB=0xD;PORTD=go[razr2]; //Anod

\_delay\_ms(1000);

PORTB=0xB;PORTD=go[razr3]; //Anod

\_delay\_ms(1000);

PORTB=0x7;PORTD=go[razr4]; //Anod

\_delay\_ms(1000);\*/

}

}

(4087)>> vse\_numere>> void vse\_numere>>(unsigned int rasbivca\_go)>> rasbivca\_go/1000;>> razr1, PORTB=0x01= CIFRE,>> CHIAMA >> PORTD= NUMERE =**go**[razr1]>>( unsigned int **go** [10)

**PRINCIPALE** #include

#define

unsigned int

void vse\_numere (unsigned int rasbivca\_go)

int main(void)

while(1)

**4087 ANOD 4-0-8-7**

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={~0xBF,~0x86,~0xDB,~0xCF,~0xE6,~0xED,~0xFD,~0x87,~0xFF,~0xEF};//Anod

//int r = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

void vse\_numere (unsigned int rasbivca\_go)

{

razr1=rasbivca\_go/1000;

razr2=rasbivca\_go%1000/100;

razr3=rasbivca\_go%100/10;

razr4=rasbivca\_go%10;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

//PORTB=0x1;

//PORTD=0xFF;

while(1)

{vse\_numere(4087);

PORTB=0xE;PORTD=go[razr1];//Anod

*\_delay\_ms*(1000);

PORTB=0xD;PORTD=go[razr2]; //Anod

*\_delay\_ms*(1000);

PORTB=0xB;PORTD=go[razr3]; //Anod

*\_delay\_ms*(1000);

PORTB=0x7;PORTD=go[razr4]; //Anod

*\_delay\_ms*(1000);

}

}

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h>

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

//int r = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

unsigned char trnsistor547 =1;

void vse\_numere (unsigned int rasbivca\_go)

{

razr1=rasbivca\_go/1000;

razr2=rasbivca\_go%1000/100;

razr3=rasbivca\_go%100/10;

razr4=rasbivca\_go%10;

}

ISR (TIMER0\_OVF\_vect)

{

if (trnsistor547 ==1){PORTB=0x01;PORTD=go[razr1];}

if (trnsistor547 ==2){PORTB=0x02;PORTD=go[razr2];}

if (trnsistor547 ==3){PORTB=0x04;PORTD=go[razr3];}

if (trnsistor547 ==4){PORTB=0x08;PORTD=go[razr4];}

trnsistor547++;

if (trnsistor547>4) trnsistor547=1;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

//PORTB=0x1;

//PORTD=0xFF;

TCCR0|=(1<<1); TCCR0&=~((1<<0) | (1<<2)); //F/8

TIMSK |=(1<<0);

TCNT0 =0;

sei ();

while(1)

{vse\_numere(2507);

/\*PORTB=0x01;PORTD=go[razr1];

\_delay\_ms(500);

PORTB=0x02;PORTD=go[razr2];

\_delay\_ms(500);

PORTB=0x04;PORTD=go[razr3];

\_delay\_ms(500);

PORTB=0x08;PORTD=go[razr4];

\_delay\_ms(500);\*/

}

}

**Adaugam alte 2 butone**

#define *F\_CPU* 1000000UL

#include <avr/io.h>

#include <util/delay.h>

#include <avr/interrupt.h>

#define NUMERE PORTD

#define CIFRE PORTB

unsigned int go[10] ={0xBF,0x86,0xDB,0xCF,0xE6,0xED,0xFD,0x87,0xFF,0xEF};

unsigned int r = 0;

unsigned int razr1=0,razr2=0,razr3=0,razr4=0;

unsigned char trnsistor547 =1;

void vse\_numere (unsigned int rasbivca\_go)

{

razr1=rasbivca\_go/1000;

razr2=rasbivca\_go%1000/100;

razr3=rasbivca\_go%100/10;

razr4=rasbivca\_go%10;

}

ISR (TIMER0\_OVF\_vect)

{

if (trnsistor547 ==1){PORTB=0x01;PORTD=go[razr1];}

if (trnsistor547 ==2){PORTB=0x02;PORTD=go[razr2];}

if (trnsistor547 ==3){PORTB=0x04;PORTD=go[razr3];}

if (trnsistor547 ==4){PORTB=0x08;PORTD=go[razr4];}

trnsistor547++;

if (trnsistor547>4) trnsistor547=1;

}

int main(void)

{ DDRD=0xFF;

DDRB=0x0F;

DDRC&=~((1<<4)|(1<<5));

PORTC|=(1<<4)|(1<<5);

//PORTB=0x1;

//PORTD=0xFF;

TCCR0|=(1<<1); TCCR0&=~((1<<0) | (1<<2)); //F/8

TIMSK |=(1<<0);

TCNT0 =0;

sei ();

while(1)

{vse\_numere(2507);

if (~PINC&(1<<5))

{

r++;

*\_delay\_ms*(500);

}

if (~PINC&(1<<4))

{

r--;

*\_delay\_ms*(500);

}

/\*PORTB=0x01;PORTD=go[razr1];

\_delay\_ms(500);

PORTB=0x02;PORTD=go[razr2];

\_delay\_ms(500);

PORTB=0x04;PORTD=go[razr3];

\_delay\_ms(500);

PORTB=0x08;PORTD=go[razr4];

\_delay\_ms(500);\*/

}

}

**TIMER 0**

\*#define F\_CPU 1000000UL

#include <avr/io.h>

int main(void)

{ DDRD =0xFF;

PORTD=0x0;

TCCR0=0x5;

TCNT0=0;// 255 1000000/1024=976,5625: 1/976,5625=0,0010235../255= 0,261...

while(1)

{

if(TCNT0==128) //255/2=128==0,261/2=0,13..

{

PORTD=0x6;

}

if(TCNT0==255) //255/2=128==0,261/2=0,13..

{

PORTD=0xFF;

}

}

}\*/

#define *F\_CPU* 1000000UL

#include <avr/io.h>

int z=0;

int main(void)

{ DDRD =0xFF; //Timer0

PORTD=0x0;

TCCR0=0x5;

TCNT0=0;// 255 1000000/1024=976,5625: 1/976,5625=0,0010235../255= 0,261...

while(1)

{if(TCNT0==255)

{z++;

TCNT0=0;

}

if(z==10) //10 \*0,261=2,61 sec

{

PORTD=0x6;

}

if(z==20) //255/2=128==0,261/2=0,13..

{

PORTD=0xFF;

}

if(z>20)

{

z=0;

}

}

}