Izvještaj laboratorijske vježbe 7

Praktikum automatike

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Postavka zadatka:

Na razvojnom sistemu je potrebno u programskom jeziku C realizirati digitalni voltmetar. Mjereni napon dovesti na analogni ulaz AN0, a mjereni napon iz opsega 0-5 V sa rezolucijom od 0,1 V prikazivati na displeju realiziranom pomoćcu dva sedmosegmentna displeja (sa zajedničckom anodom). Sedmosegmentne displeje spojiti na PORTD, a multipleksiranje prikaza na svaku od cifara realizirati korišstenjem tranzistora.
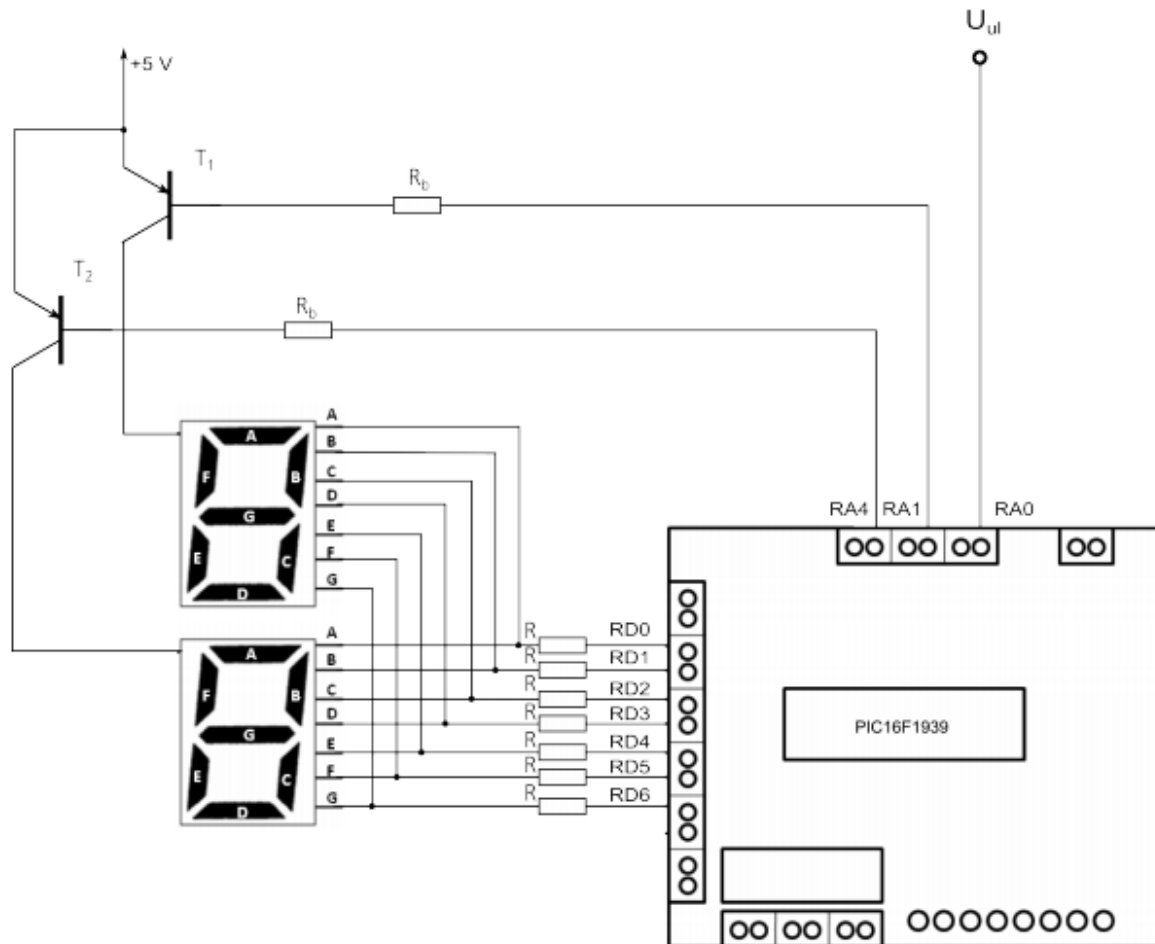
Slika 1: Šema spajanja dvije sedmosegmentne cifre sa razvojnim sistemom

Kod:

```c
#include <xc.h>

#pragma config
FOSC=HS,WDTE=OFF,PWRTE=OFF,MCLRE=ON,CP=OFF,CPD=OFF,BOREN=OFF,CLKOUTEN=OFF
#pragma config
IESO=OFF,FCMEN=OFF,WRT=OFF,VCAPEN=OFF,PLLEN=OFF,STVREN=OFF,LVP=OFF

#define _XTAL_FREQ 8000000
#define setbit(var,bit) ((var)|= (1<<(bit)))
#define clrbit(var,bit) ((var &=~(1<<bit)))
char brojevi[]={0xc0,0xf9,0xa4,0xb0,0x99,0x92,0x82,0xf8,0x80,0x90};


void analog_initialization(){
    ADCON1bits.ADFM=0;
    ADCON1bits.ADCS2=1;
    ADCON1bits.ADCS1=1;
    ADCON1bits.ADCS0=1;

    ADCON1bits.ADNREF=0;
    ADCON1bits.ADPREF1=0;
    ADCON1bits.ADPREF0=0;
    ADCON0bits.ADON=1;

    ADCON0bits.CHS0=0;
    ADCON0bits.CHS1=0;
    ADCON0bits.CHS2=0;
    ADCON0bits.CHS3=0;
    ADCON0bits.CHS4=0;

    CHS0=0;
    CHS1=0;
    CHS2=0;
    CHS3=0;
    CHS4=0;
}

void port_initialization(){
    ANSELA=0x01;
    TRISA=0x01;
    ANSELD=0x00;
    TRISB = 0x00;
    TRISD=0x00;
```

```c
        LATD=1;
}

int voltage_one(){
    double voltage;
    char voltage_binary=ADRESH;
    voltage=voltage_binary * 5.0 /255;
    return (int)((voltage-(int)voltage)*10);
}

int voltage_ten(){
    double voltage;
    char voltage_binary=ADRESH;
    voltage=voltage_binary * 5.0 /255;
    return (int)voltage;
}

void show_digit(int jed_ili_deset){
    if(jed_ili_deset==1){
        LATAbits.LATA1=0;
        LATAbits.LATA4=1;
        LATD=brojevi[voltage_ten()];
    } else {
        LATAbits.LATA4=0;
        LATAbits.LATA1=1;
        LATD=brojevi[voltage_one()];
    }
}

void main(void) {
    port_initialization();
    analog_initialization();
    int multiplekser=0;
    while(1){
        ADGO = 1;
        while(ADGO);
        LATB = ADRESH;

        __delay_ms(10);
        show_digit(0);
        __delay_ms(10);
        show_digit(1);
    }
    return;
}
```