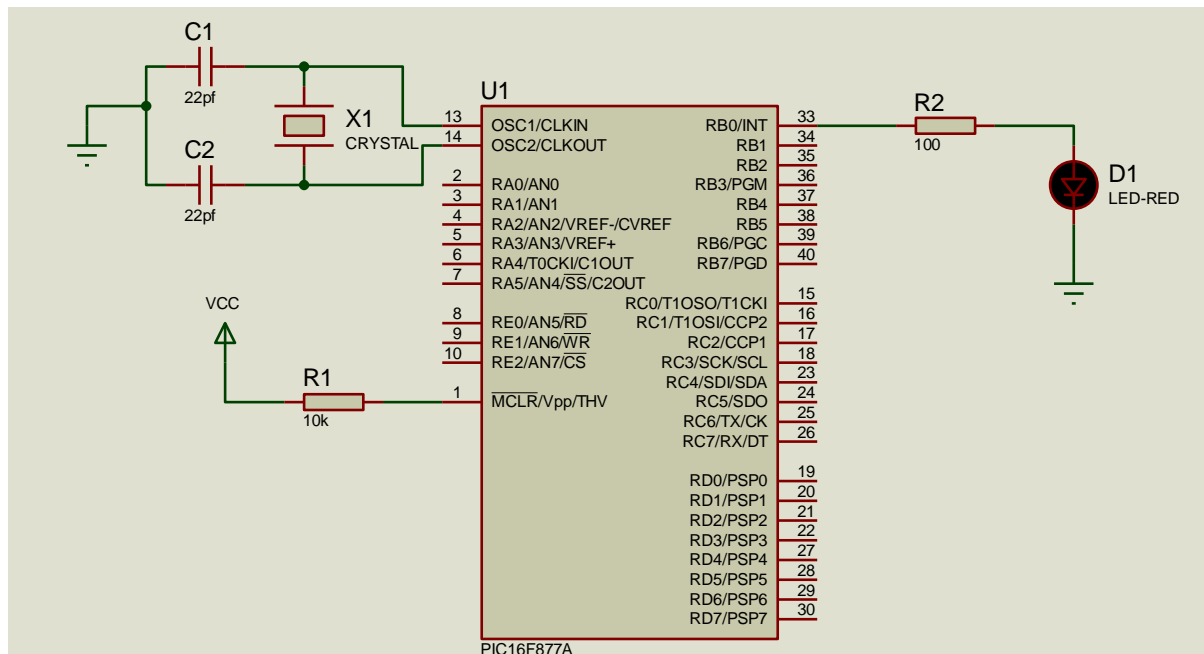


P-7: Simulate a program to glow an LED for 1 to 5 seconds using loop. Also, increase the LED ON Time and decrease the LED OFF Time in every cycle with a total constant Cycle Time of 6 seconds

Circuit:

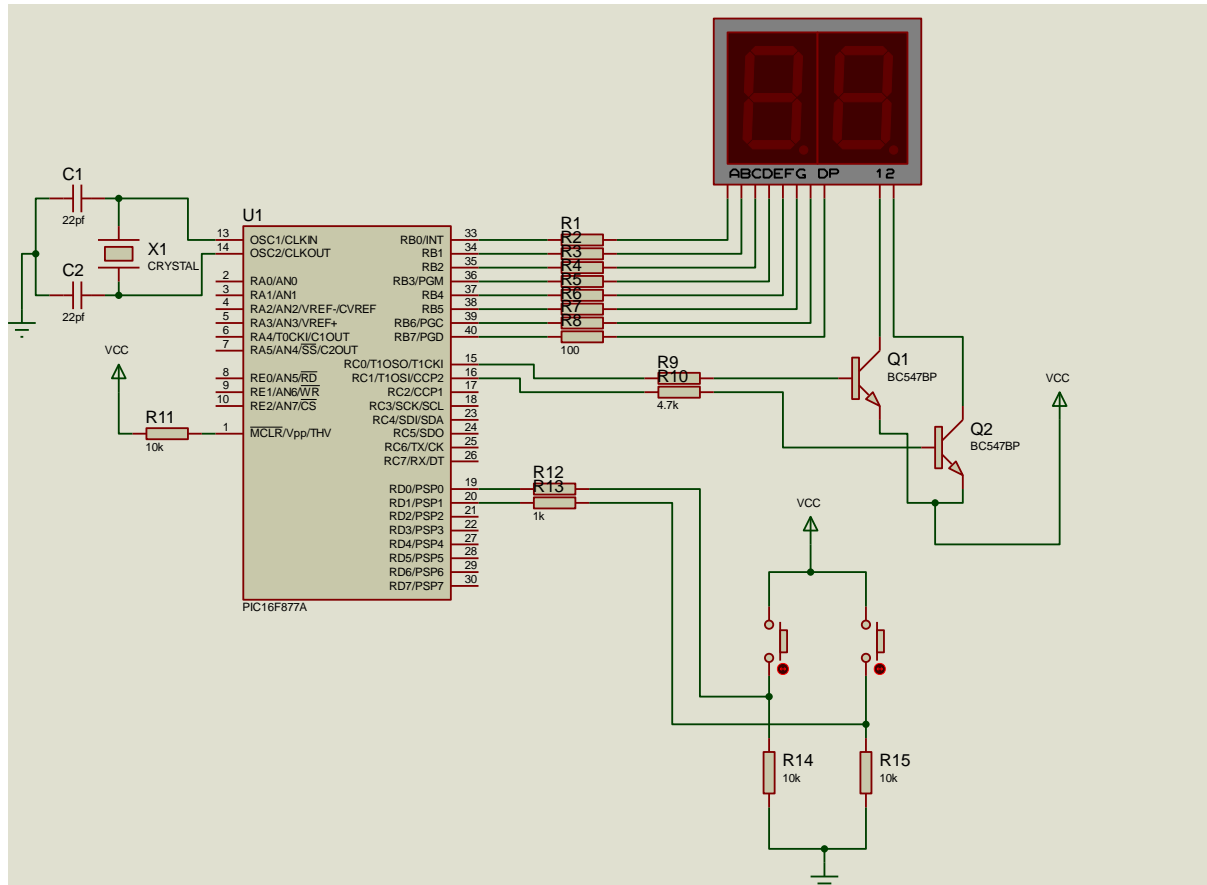


Code:

```
int i,j;
void main(){
    TRISB = 0x00; // Set all pins in Port B as outputs
    PORTB = 0x00; // Initialize all pins to low

    for(i=0; i<5; i++)
    {
        for(j=0;j<=i;j++)
        {
            Portb.f0=1;
            delay_ms(1000); // Fixed on-time of 1 second
        }
        for(j=5;j>i;j--)
        {
            Portb.f0=0;
            delay_ms(1000); // Fixed on-time of 1 second
        }
    }
}
```

Circuit:



```
char arraycc[]={0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x07,0x7F,0x6F};
```

```
void main() {
    int bt_zero = 0;
    int bt_one = 0;

    TRISB = 0x00;
    TRISC = 0x00;
    TRISD = 0xFF;

    PORTB = 0x00;
    PORTC = 0x00;
    PORTD = 0xFF;
    bt_zero = eeprom_read(0x00);
    bt_one = eeprom_read(0x01);

    while(1) {
```

```

// for button zero
if(PORTD.F0 == 1) {
    Delay_ms(100);
    if(PORTD.F0 == 1) {
        bt_zero++;
        if(bt_zero == 10) {
            bt_zero = 0;
        }
    }
}

// for button one
if(PORTD.F1 == 1) {
    Delay_ms(100);
    if(PORTD.F1 == 1) {
        bt_one++;
        if(bt_one == 10) {
            bt_one = 0;
        }
    }
}

eeprom_write(0x00, bt_zero);
eeprom_write(0x01, bt_one);
delay_ms(20);

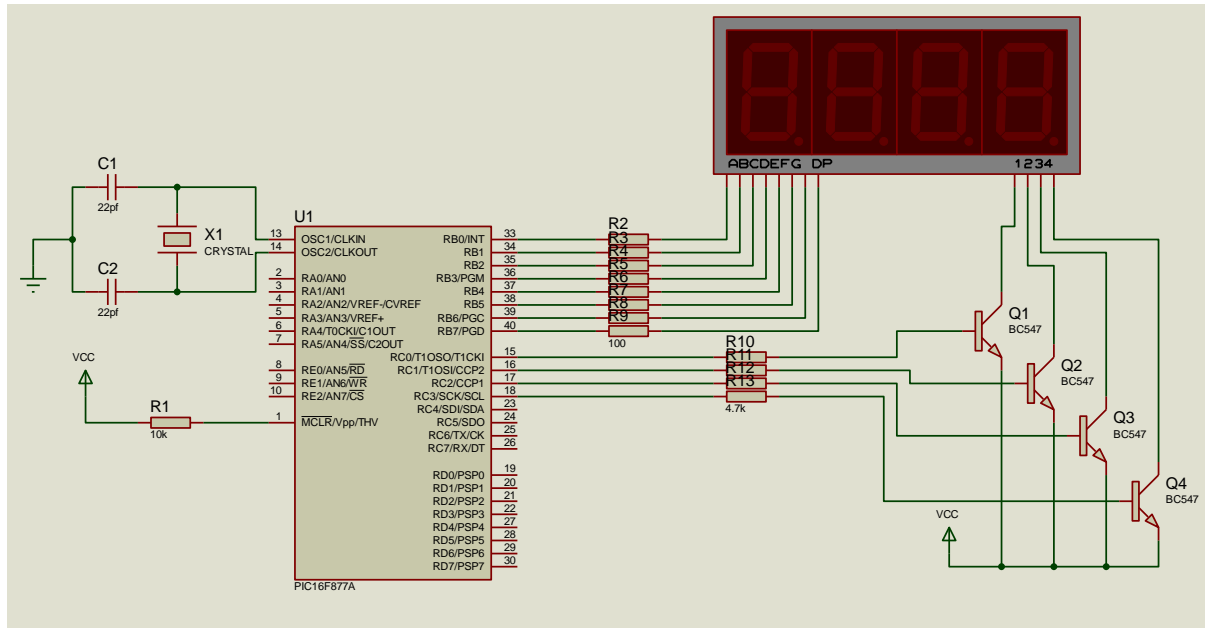
PORTC.F0 = 0;
PORTB = arraycc[bt_zero];
Delay_ms(10);
PORTC.F0 = 1;

PORTC.F1 = 0;
PORTB = arraycc[bt_one];
Delay_ms(10);
PORTC.F1 = 1;
}
}

```

P-1: Display 2123 to 2134 sequentially after a certain time duration using 4 digits seven segment display.

Circuit:



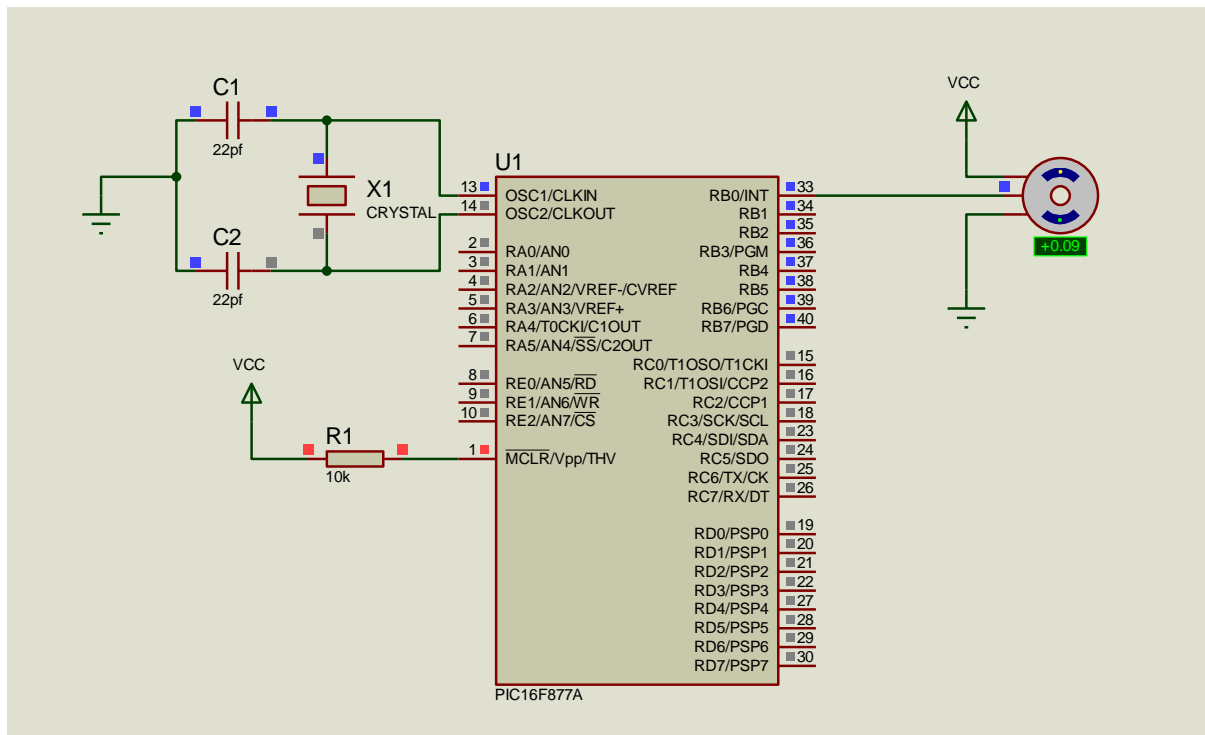
Code:

```
char arraycc[]={0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x07,0x7F,0x6F};
```

```
void main() {
    int d_zero,d_one,d_two,d_three,i,j;
    Trisb=0x00;
    Trisc=0x00;
    portb=0x00;
    portc=0x00;
    d_zero=eeprom_read(0x00);
    d_one=eeprom_read(0x01);
    d_two=eeprom_read(0x02);
    d_three=eeprom_read(0x03);
    while(1)
    {
        for(i=2123;i<=2134;i++) //counting 0-9999
        {
            d_zero=i/1000; // for first digit of display
            d_one=((i/100)%10); // for second digit
            d_two=((i/10)%10); // for third digit
            d_three=i%10;
            for(j=0;j<=10;j++)
            {
                portc.f0=0;
                portb=arraycc[d_zero]; //display
                delay_ms(10);
            }
        }
    }
}
```

```
    portc.f0=1;
    portc.f1=0;
    portb=arraycc[d_one];//display
    delay_ms(10);
    portc.f1=1;
    portc.f2=0;
    portb=arraycc[d_two];//display
    delay_ms(10);
    portc.f2=1;
    portc.f3=0;
    portb=arraycc[d_three];//display
    delay_ms(10);
    portc.f3=1;
  }
  eeprom_write(0x00,d_zero);
  eeprom_write(0x01,d_one);
  eeprom_write(0x02,d_two);
  eeprom_write(0x03,d_three);
  delay_ms(1);
}
}
}
```

P-3: Write a program for controlling a Servo Motor between 0°-180°



Code:

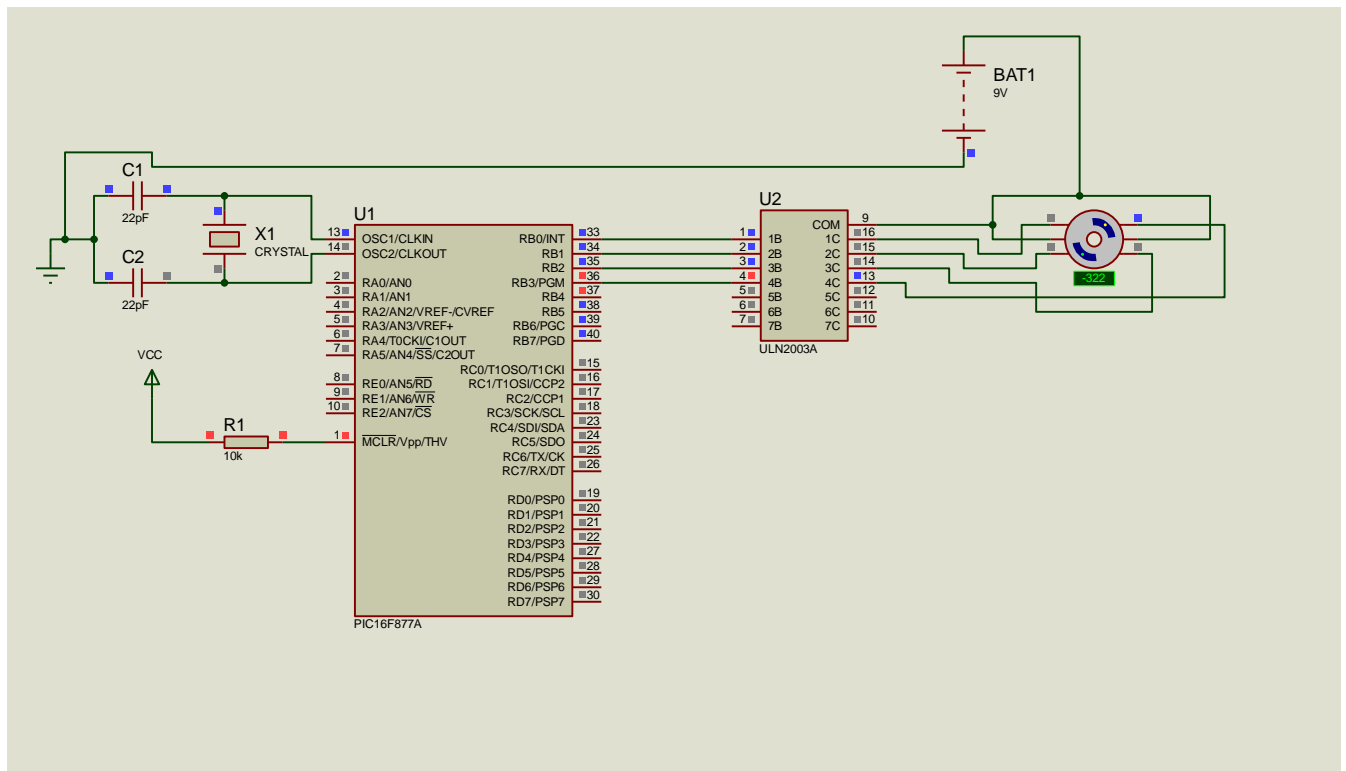
```
void rotateLeft90();
void rotate0();
void rotateRight90();
int i;
void main(){
    Trisb=0x00;
    portb=0x00;
    while(1){
        rotateLeft90();
        delay_ms(2000);
        rotate0();
        delay_ms(2000);
        rotateRight90();
        delay_ms(2000);
    }
}
void rotateLeft90()
{
    for(i=0;i<50;i++)
    {
        portb.f0=1;
        delay_us(800);
        portb.f0=0;
        delay_us(19200);
    }
}

void rotate0()
```

```
{  
  for(i=0;i<50;i++)  
  {  
    portb.f0=1;  
    delay_us(1500);  
    portb.f0=0;  
    delay_us(18500);  
  }  
}
```

```
void rotateRight90()  
{  
  for(i=0;i<50;i++)  
  {  
    portb.f0=1;  
    delay_us(2200);  
    portb.f0=0;  
    delay_us(17800);  
  }  
}
```


P-5: Develop a program to rotate a Stepper Motor at different angles.



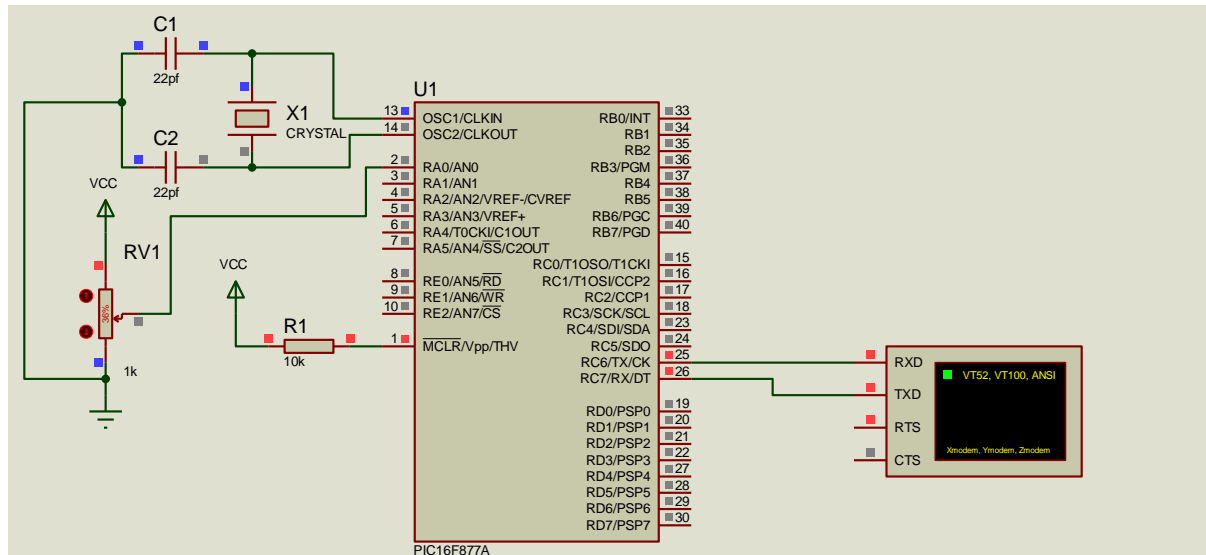
Code:

```
void main() {
    Trisb=0b00000000;//Port b as output;
    portb=0b11111111;

    do{
        Portb=0b00000011;
        delay_ms(500);
        portb=0b00000110;
        delay_ms(500);
        portb=0b00001100;
        delay_ms(500);
        portb=0b00011000;
        delay_ms(500);
    }
    while(1);//loop excuted infinite
}
```

P-6: Write a program to simulate Analog to Digital Conversion using virtual terminal.

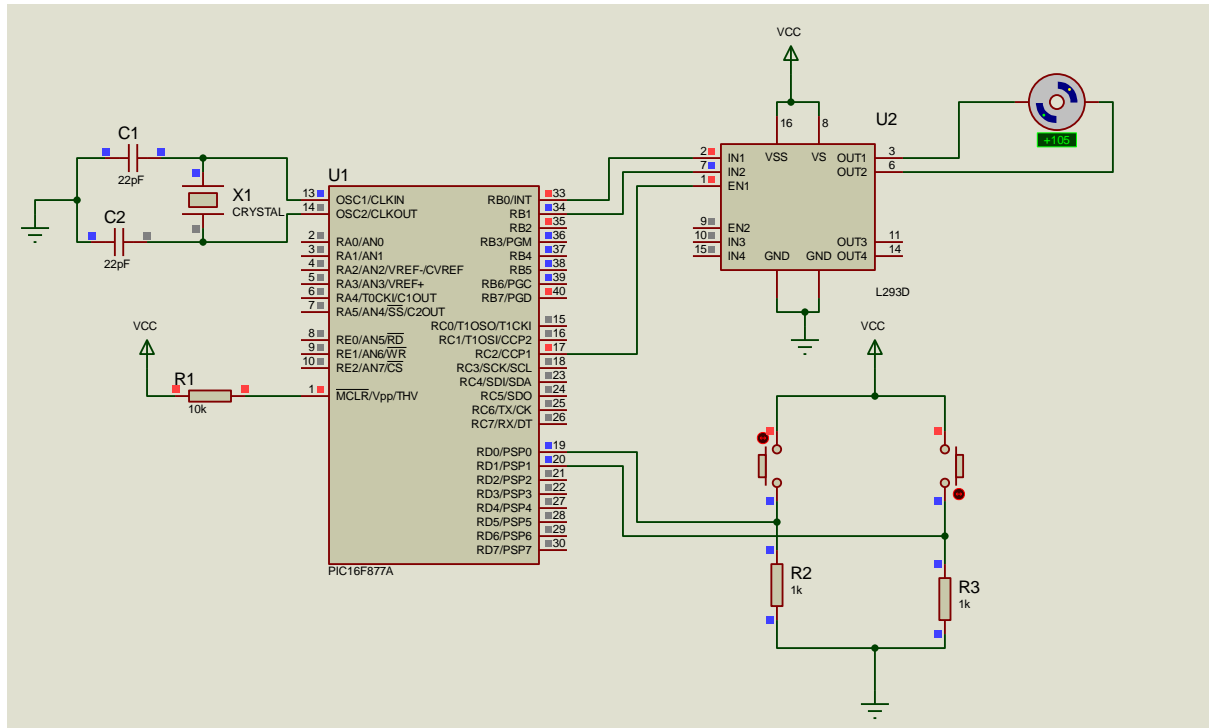
Circuit:



Code:

```
int valAdc;
char x[4];
void main(){
UART1_Init(9600);
ADC_Init();
while(1){
valAdc= ADC_Read(0);
IntToStr(valAdc,x);
UART1_Write_Text("Analog Value= ");
UART1_Write_Text(x);
UART1_Write(13);
strcpy(x," ");
delay_ms(1000);
}
}
```

P11. Write a program to control the speed of a DC motor based on your room temperature and PWM Technique

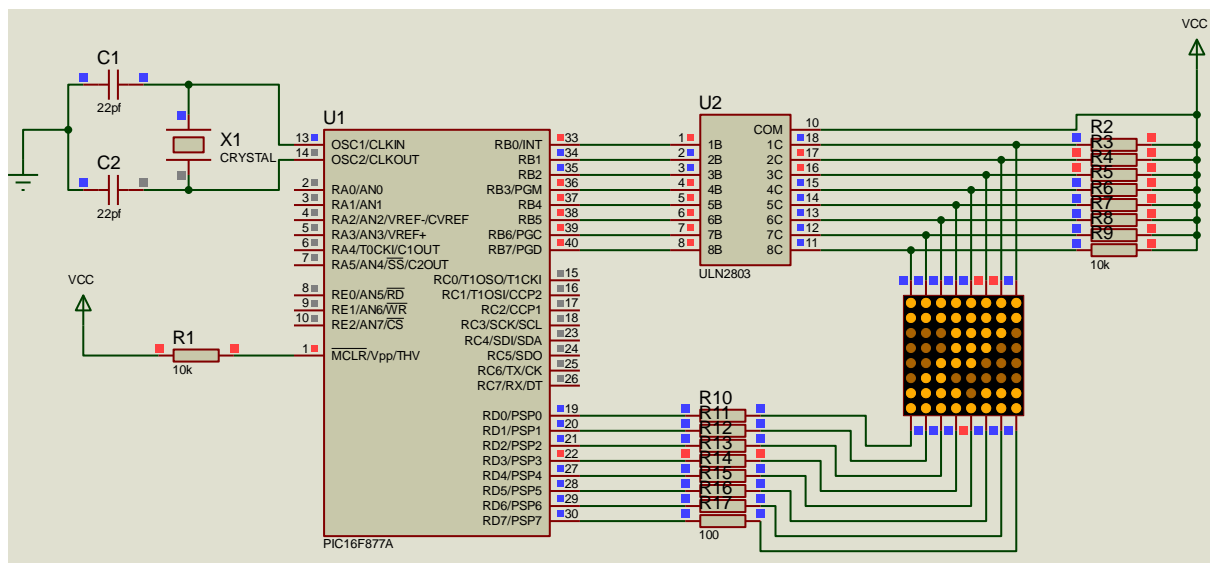


Code:

```
void main() {
    short duty = 0; // initial value for duty
    TRISB = 0x00; // port b as output
    TRISD = 0xff; // port d as input
    Portb.f0 = 0xff;
    portb.f1 = 0x00;
    PWM1_Init(1000);
    PWM1_Start();
    PWM1_Set_Duty(duty);
    while(1)
    {
        if(portd.f0 == 1)
        {
            Delay_ms(100);
            if(portd.f0 == 1)
            {
                duty = duty + 10;
                PWM1_Set_Duty(duty);
            }
        }
    }
}
```

```
    if(portd.f1==1)
    {
        Delay_ms(100);
        if(portd.f1==1)
        {
            duty=duty - 10;
            PWM1_Set_Duty(duty);
        }
    }
    Delay_ms(10);
}
}
```

4: Write a program to display letter "Z" in dot matrix display.



Code:

```
void MSDelay(unsigned char Time)
{
    unsigned char y,z;
    for(y=0;y<Time;y++);
    for(z=0;z<20;z++);
}

void main() {
    PortB=(0xFB);
    MSDelay(10);

    PortD=0x04;
    PortB=(0xCF);
    MSDelay(10);

    PortD=0x02;
    PortB=(0xC7);
    MSDelay(10);

    PortD=0x01;
    PortB=(0xC3);
    MSDelay(10);

    PortD=0x10;
    PortB=(0xF9);
    MSDelay(10);

    PortD=0x08;
```

