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Circuit diagram:

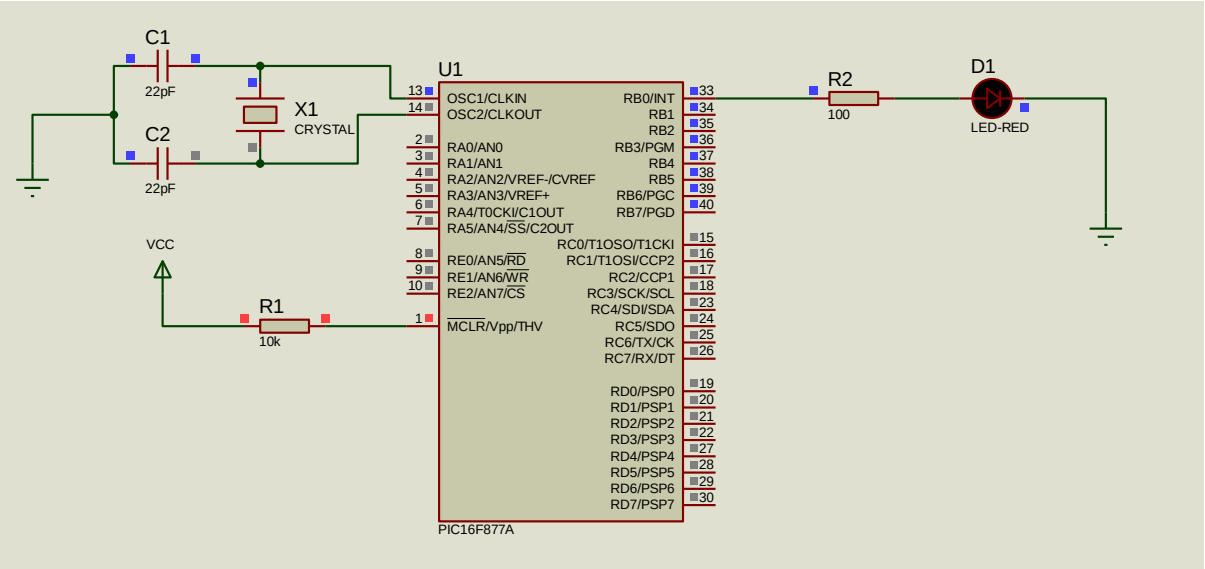


Figure 01: Circuit diagram for led blinking using for lop

Code:

```
//Using for lop
void main() {
  int i;
  Trisb=0x00;
  portb=0x00;

   for (i=0;i<50;i++)
  {
      portb.f0=0xff;
      delay_ms(2000);
      portb.f0=0;
      delay_ms(1000);
  }
}
```

Circuit diagram:

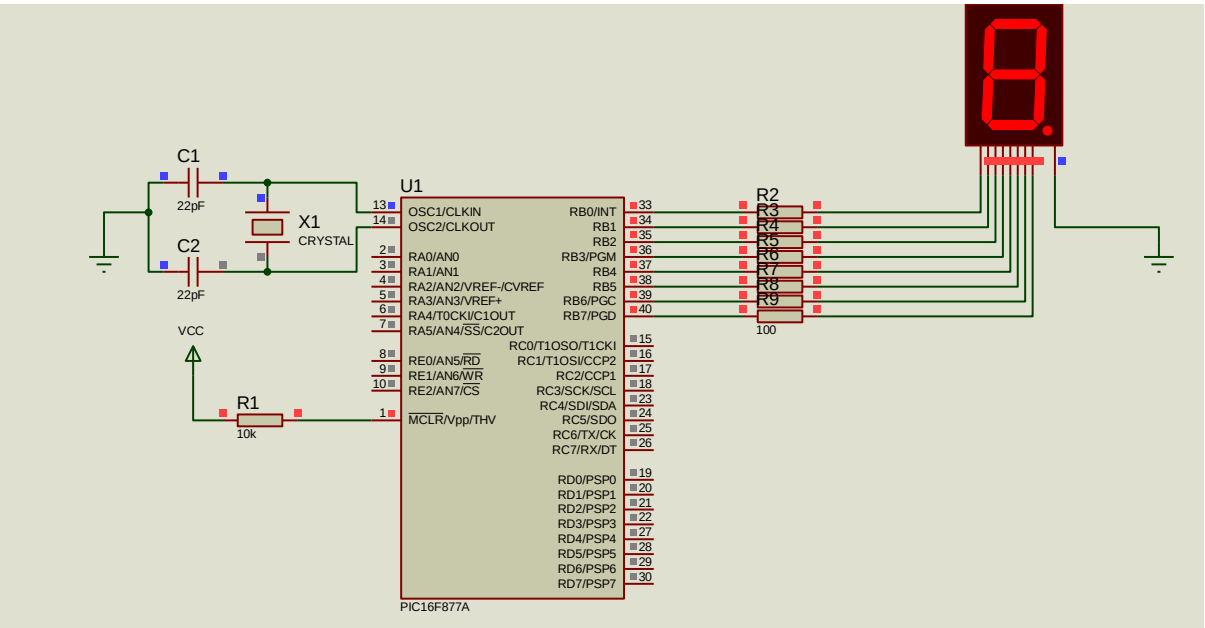


Figure 01: Circuit diagram for counting 0-9 using 7 segment common cathod display

Code:

```
//Counting 0-9
char arraycc[]={0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x07,0x7F,0x6F};

  void  main()
  {
   int i=0;
   trisb=0x00;
   portb=0x00;
   for(i=0;i<10;i++)
   {
     portb=arraycc[i];
     delay_ms(500);
   }
  }
```

Circuit diagram:

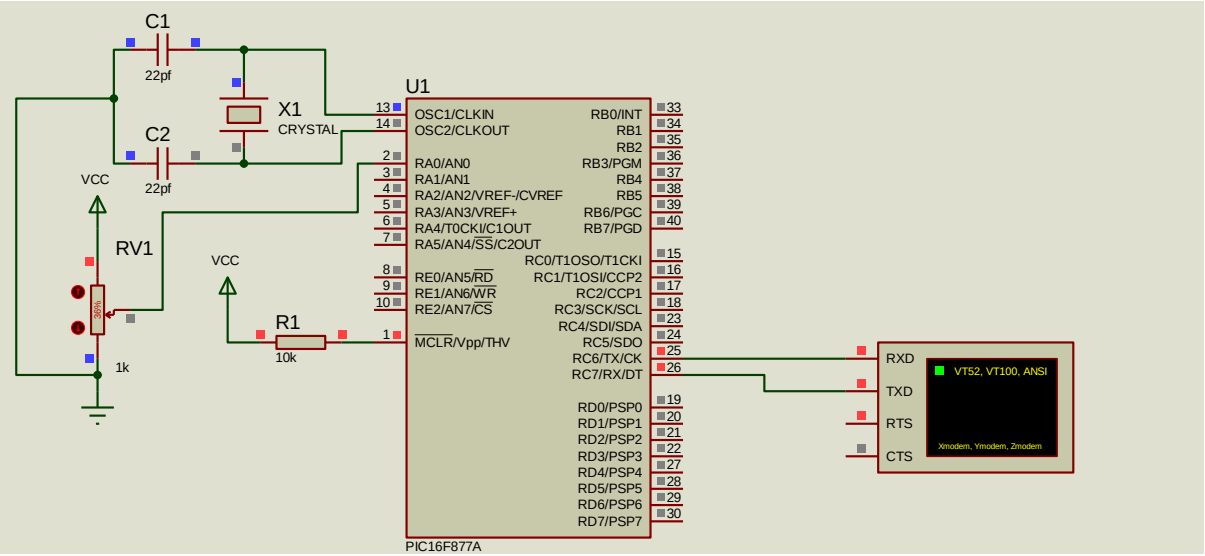


Figure 01: Circuit diagram to display Analog to Digital (ADC) value using virtual terminal

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);
}
}
```

Circuit diagram:

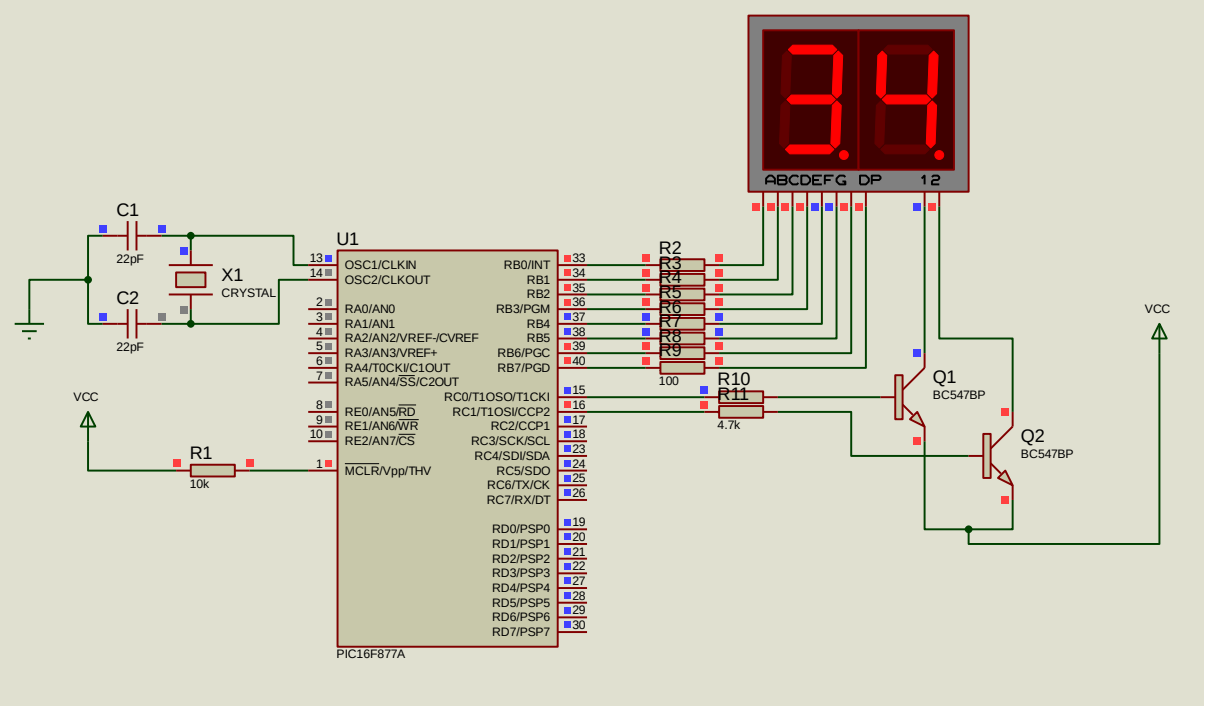


Figure 01: Circuit diagram to cout 0-99 using common cathode 2 digits 7 segment display

Code:

```
char arraCC[] = { 0xBF, 0x86, 0xDB, 0xCF, 0xE6, 0xED, 0xFD, 0x87, 0xFF, 0xEF };

void main()
{
  int mod = 0, res = 0, i = 0, k = 0;

  // Set port directions for controlling the display
  TRISB = 0x00;
  TRISC = 0x00;
  TRISD = 0x00;

  // Initialize port values
  portb = 0x00;
  portc = 0x00;
  portd = 0x00;

  while(1)
  {
```

```
    // Loop through numbers from 0 to 99
    for(i = 0; i <= 99; i++)
    {
      res  = i / 10;  // Calculate tens digit
      mod = i % 10;   // Calculate units digit

      // Display each digit for a brief delay
      for(k = 0; k < 10; k++)
      {
        portc.f0 = 0x00;          // Activate power for left digit
        portb = arraCC[res];     // Set segment data for tens digit
        delay_ms(10);            // Delay

        portc.f0 = 0xff;          // Deactivate power for left digit

        portc.f1 = 0x00;          // Activate power for right digit
        portb = arraCC[mod];     // Set segment data for units digit
        delay_ms(10);            // Delay

        portc.f1 = 0xff;          // Deactivate power for right digit
      }
    }
  }
}
```

Circuit Diagram:

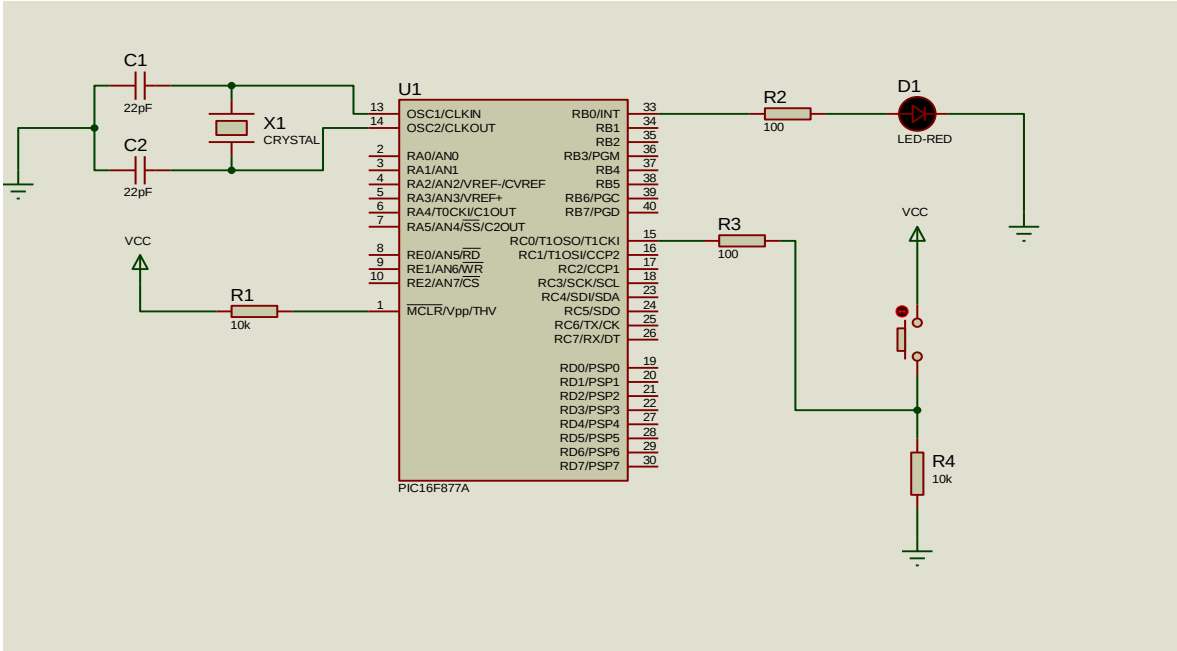


Figure 01: Circuit diagram for blinking led using push button

Code:

```
void main() {
  int i, bt_zero = 0;
  Trisb = 0x00;
  trisc = 0x01;  // Set port C bit 0 as input
  portb = 0x00;
  portc = 0x00;
  while (1) {
    if (portc.f0 == 1) {
      delay_ms(150);
      if (portc.f0 == 1) {
        bt_zero++;
        if (bt_zero == 10) {
          bt_zero = 0;
        }}}
    if (portc.f0 == 1) {
      for (i = 0; i < 50; i++) {
        portb.f0 = 1;
        delay_ms(1000);
        portb.f0 = 0;
        delay_ms(1000);  // LED on for 1 second, off for 1 second
      }}}}
```

Circuit Diagram:

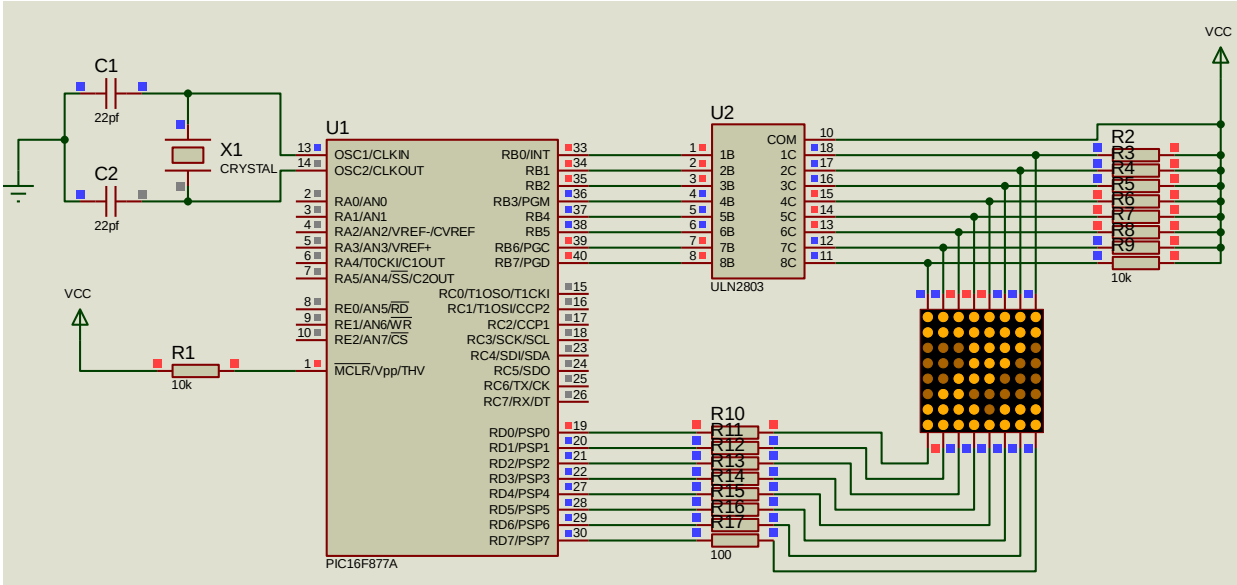


Figure 01: Circuit diagram for dot matrix display to visualize character

Code:

```
void MSDelay(unsigned char Time)
 {
  unsigned char y,z;
  for(y=0;y<Time;y++);
  for(z=0;z<20;z++);
 }
void main() {
  Trisb=0x00;
  Trisd=0x00;
  while(1){
   PortD=0x80;
   PortB=(0xC3);
   MSDelay(10);

   PortD=0x40;
   PortB=(0xE3);
   MSDelay(10);

   PortD=0x20;
   PortB=(0xF3);
   MSDelay(10);

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

   PortD=0x08;
   PortB=(0xFB);
   MSDelay(10);

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

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

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

  }

}
```

Circuit Diagram:

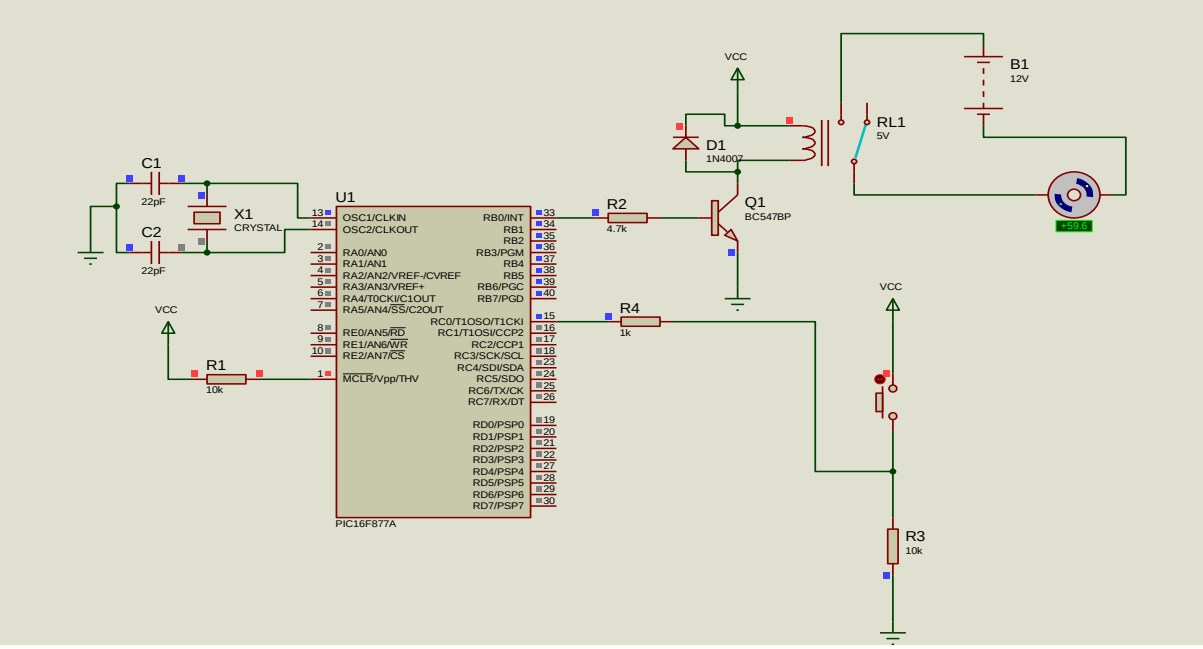


Figure 01: Circuit diagram for relay control using push button

Code:

```
void main() {
   int bt=0;
   Trisb=0x00; //as output
   Trisc=0xff; // as input
   portb=0x00;
   while(1)
    {
     //button
     if(portc.f0==1)
     {
      delay_ms(150);
      if(portc.f0==1)
       {
        bt++;

        if(bt==10)
        {
          bt=0;
        }
       }
     }
    if(portc.f0==1)
    {
         portb.f0=1;//turn on relay
        delay_ms(10000);  // relay on for 10
second
        portb.f0=0;//turn off relay
        delay_ms(10000);  // off for 10 second
       }
      }
}
```

Circuit Diagram:

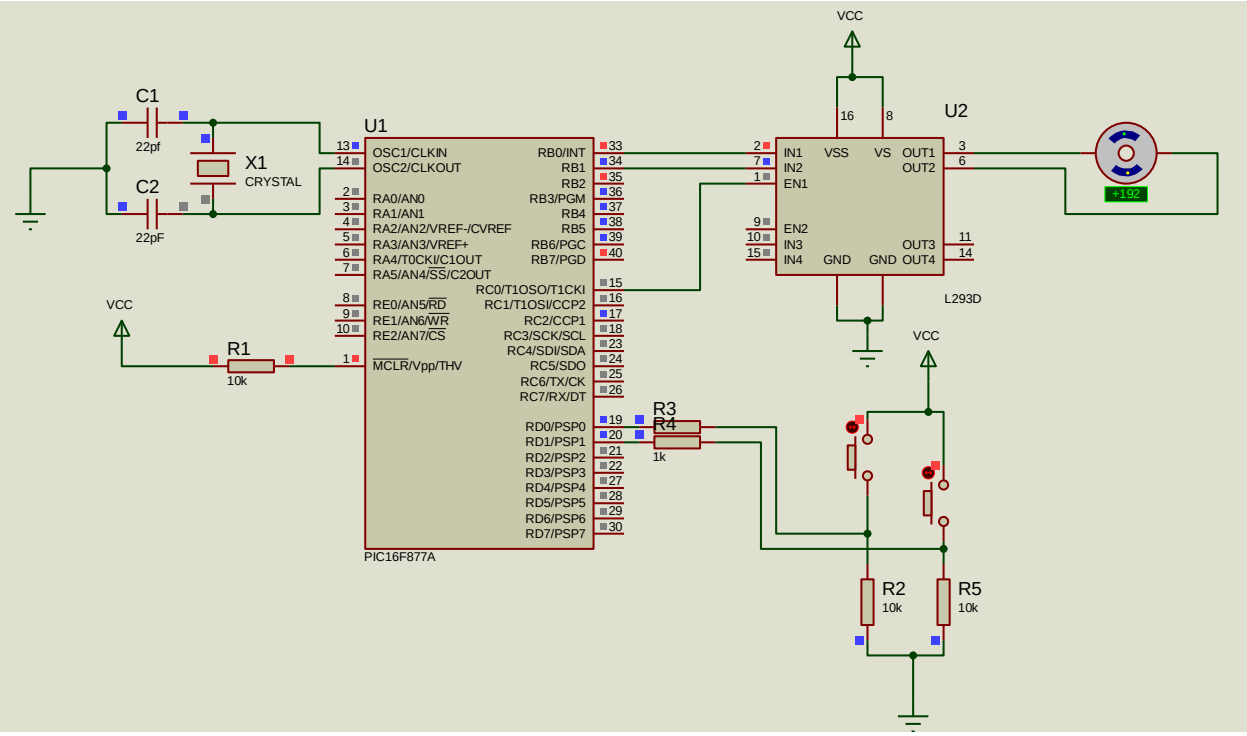


Figure 01: Circuit diagram for Speed control of DC motor using push button and PWM

Code:

```
void main() {
      short duty=0; // initial value for duty for motor
      TrisB=0x00;// as output
      TrisD=0xff; // as input
      portB.f0=0xffl; //initialize the port
      portB.f1=0x00;

      PWM1_Init(1000);
      PWM1_Start();
      PWM1_Set_Duty(duty);// set current duty for pwm

      while(1)
      {
       if(portd.f0==1 && duty<250)
       {
         Delay_ms(100);
          if(portd.f0 && duty<250)
          {
```

```
        duty=duty+10;
        PWM1_Set_Duty(duty);
       }
     }

     if(portd.f1==1 && duty>0)
     {
      Delay_ms(100);
       if(portd.f0 && duty>0)
       {
        duty=duty-10;
        PWM1_Set_Duty(duty);
       }
     }

     delay_ms(10);
    }

}
```

Circuit Diagram:

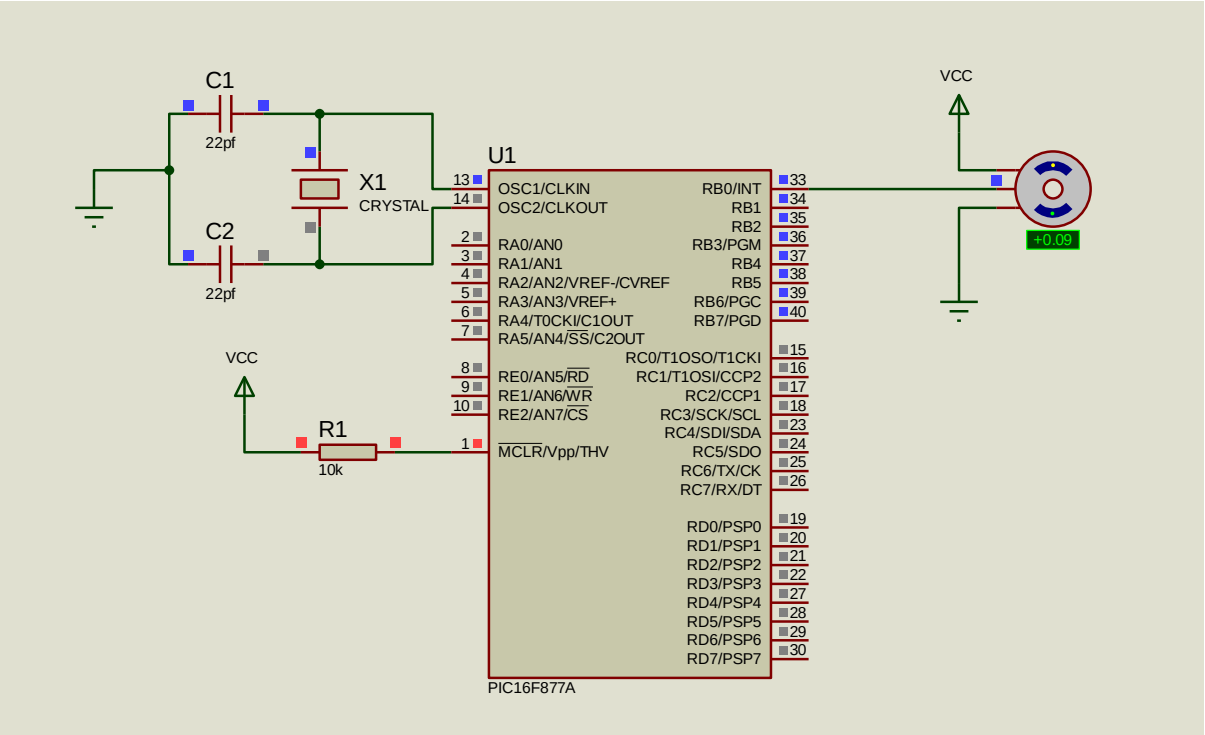


Figure 01: Circuit diagram for controlling servo motor (0-180)

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);
  }
}
```

Circuit Diagram:

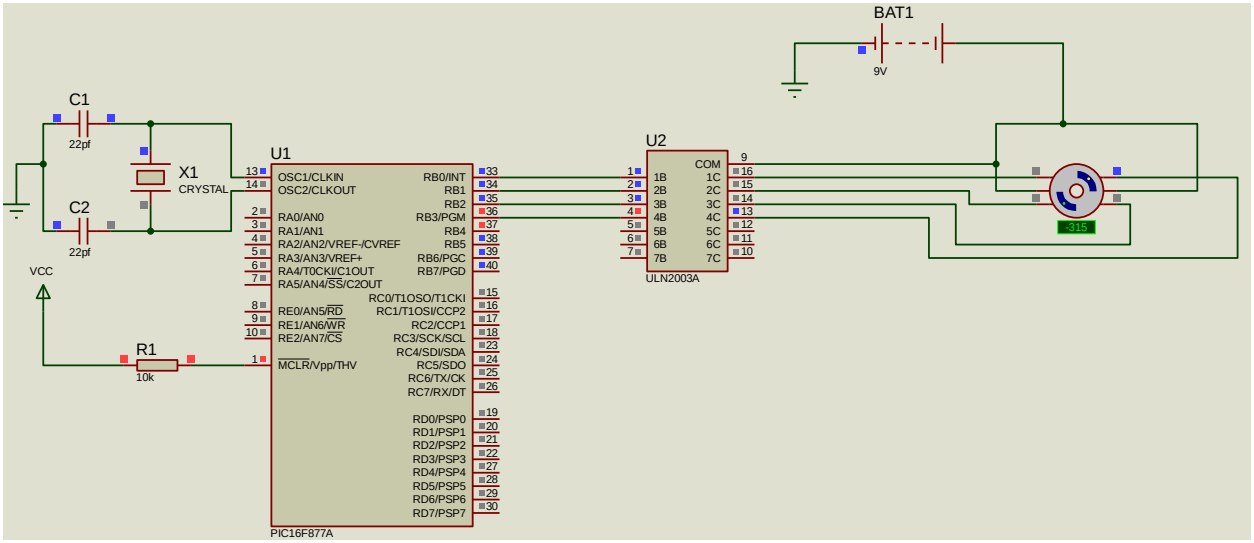


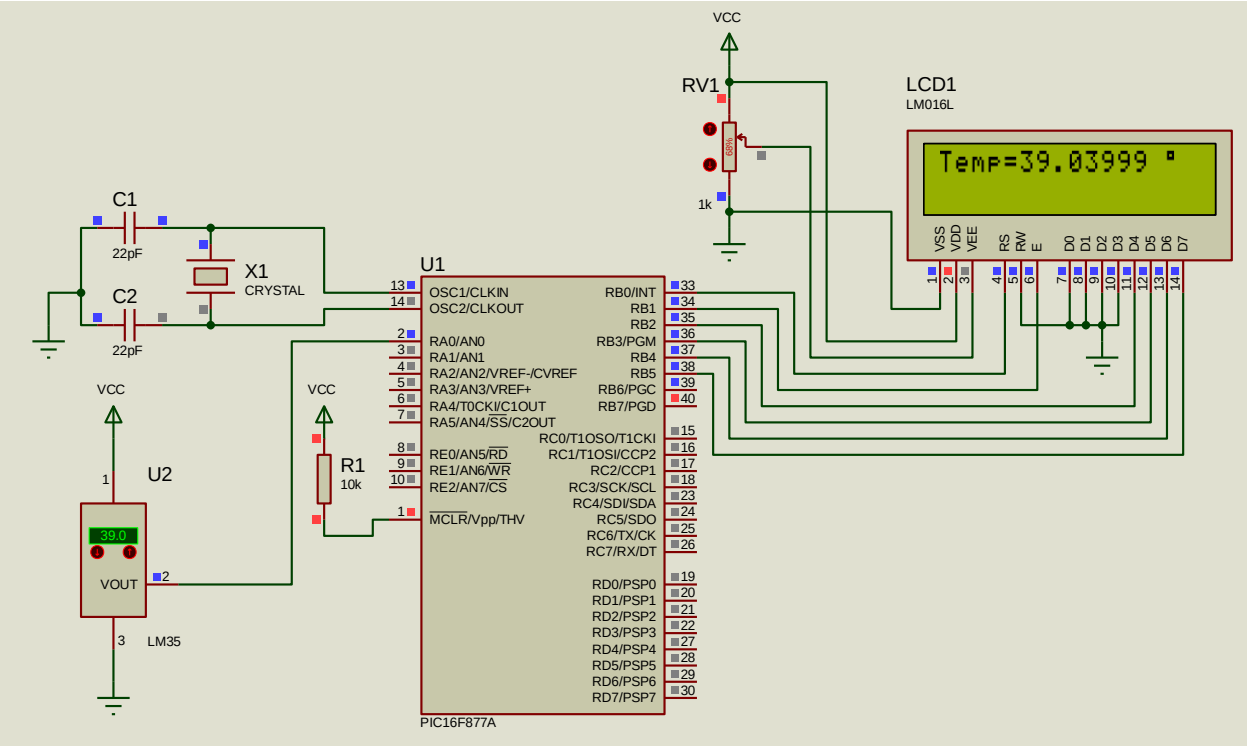
Figure 01: Circuit diagram for stepper motor control using pic microcontroller

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
}
```

Circuit Diagram:



Code:

```
//LCD Module Connection
// Lcd pinout settings
sbit LCD_RS at RB0_bit;
sbit LCD_EN at RB1_bit;
sbit LCD_D4 at RB2_bit;
sbit LCD_D5 at RB3_bit;
sbit LCD_D6 at RB4_bit;
sbit LCD_D7 at RB5_bit;

// Pin direction
sbit LCD_RS_Direction at TRISB0_bit;
sbit LCD_EN_Direction at TRISB1_bit;
sbit LCD_D4_Direction at TRISB2_bit;
sbit LCD_D5_Direction at TRISB3_bit;
sbit LCD_D6_Direction at TRISB4_bit;
sbit LCD_D7_Direction at TRISB5_bit;
//LCD Module Connection

char display[16]="";
void main() {
    unsigned int result;
```

```
    float volt,temp;
    trisb=0x00;
    trisa=0xff;
    adcon1=0x80;
    lcd_init();
    lcd_cmd(_lcd_clear);
    lcd_cmd(_LCD_CURSOR_OFF);
    while(1)
    {
          result=adc_Read(0);
          volt=result*4.88;
          temp=volt/10;
          lcd_out(1,1,"Temp=");
          FloatToStr(temp,display);
          lcd_out(1,6,display);
          lcd_chr(1,15,223);
          lcd_chr(1,16,"C");
    }
}
```