```
#include <pic.h>


__CONFIG( FOSC_HS & WDTE_OFF & PWRTE_OFF & CP_OFF & BOREN_ON &
LVP_OFF & CPD_OFF & WRT_OFF & DEBUG_OFF);



#define rs RD2

#define en RD3


#define R1 RB0

#define R2 RB1

#define R3 RB2

#define R4 RB3

#define C1 RB4

#define C2 RB5

#define C3 RB6

#define C4 RB7


void lcd_init();

void cmd(unsigned char a);

void dat(unsigned char b);

void show(unsigned char *s);

void lcd_delay();
```

```
unsigned char key();
void keyinit();

unsigned char keypad[4][4]={{'7','8','9','/'},{'4','5','6','*'},{'1','2','3','-'},{'C','0','=','+'}};
unsigned char rowloc,colloc;

void main()
{
    unsigned int i;
    TRISD=0;
    lcd_init();
    keyinit();
    unsigned char b;
    cmd(0x80);
    show("  Enter the Key ");
    while(1)
    {
        cmd(0xc7);
        b=key();
        dat(b);
```

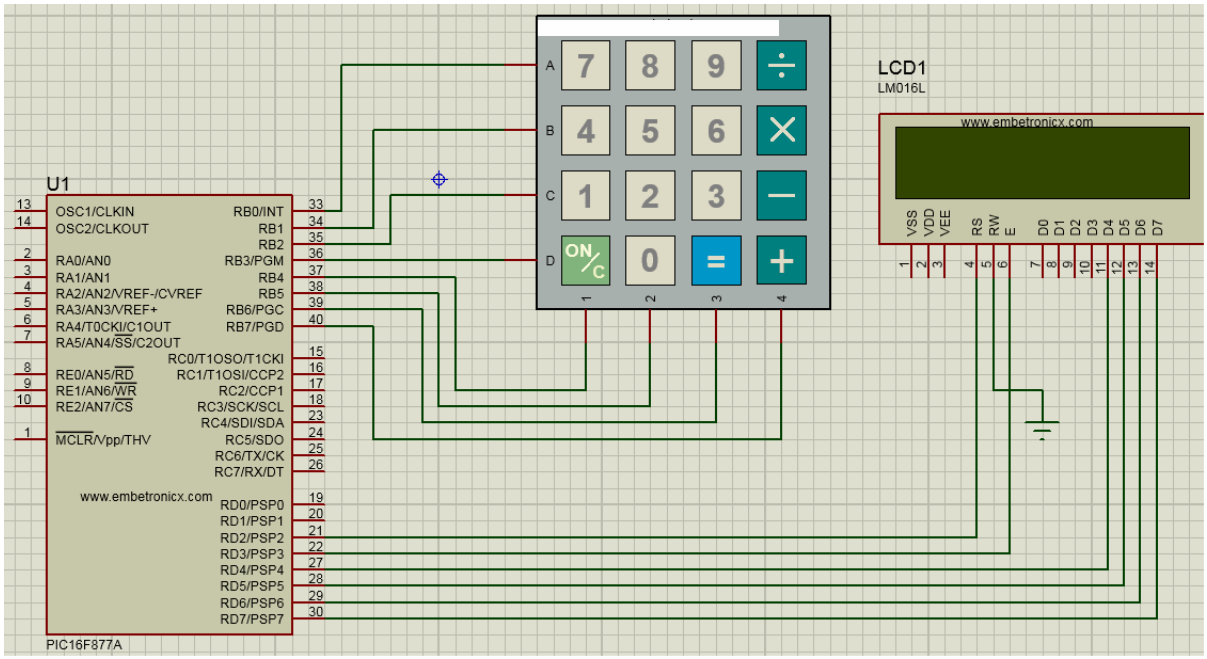
```
    }
}

void lcd_init()
{
    cmd(0x02);
    cmd(0x28);
    cmd(0x0e);
    cmd(0x06);
    cmd(0x80);
}

void cmd(unsigned char a)
{
    rs=0;
    PORTD&=0x0F;
    PORTD|=(a&0xf0);
    en=1;
    lcd_delay();
    en=0;
    lcd_delay();
    PORTD&=0x0f;
```

```
    PORTD|=(a<<4&0xf0);
    en=1;
    lcd_delay();
    en=0;
    lcd_delay();
}

void dat(unsigned char b)
{
    rs=1;
    PORTD&=0x0F;
    PORTD|=(b&0xf0);
    en=1;
    lcd_delay();
    en=0;
    lcd_delay();
    PORTD&=0x0f;
    PORTD|=(b<<4&0xf0);
    en=1;
    lcd_delay();
    en=0;
    lcd_delay();
```

```
}

void show(unsigned char *s)
{
    while(*s) {
        dat(*s++);
    }
}

void lcd_delay()
{
    unsigned int lcd_delay;
    for(lcd_delay=0;lcd_delay<=1000;lcd_delay++);
}

void keyinit()
{
    TRISB=0XF0;
    OPTION_REG&=0X7F;          //ENABLE PULL UP
}

unsigned char key()
```

```
{
    PORTB=0X00;
    while(C1&&C2&&C3&&C4);
    while(!C1||!C2||!C3||!C4) {
        R1=0;
        R2=R3=R4=1;
        if(!C1||!C2||!C3||!C4) {
            rowloc=0;
            break;
        }
        R2=0;R1=1;
        if(!C1||!C2||!C3||!C4) {
            rowloc=1;
            break;
        }
        R3=0;R2=1;
        if(!C1||!C2||!C3||!C4) {
            rowloc=2;
            break;
        }
        R4=0; R3=1;
        if(!C1||!C2||!C3||!C4){
```

```
            rowloc=3;
            break;
        }
    }
    if(C1==0&&C2!=0&&C3!=0&&C4!=0)
            colloc=0;
    else if(C1!=0&&C2==0&&C3!=0&&C4!=0)
            colloc=1;
    else if(C1!=0&&C2!=0&&C3==0&&C4!=0)
            colloc=2;
    else if(C1!=0&&C2!=0&&C3!=0&&C4==0)
            colloc=3;
    while(C1==0||C2==0||C3==0||C4==0);
    return (keypad[rowloc][colloc]);
}
```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OSC1/CLKIN
OSC2/CLKOUT
RA0/AN0
RA1/AN1
RA2/AN2/VREF-/CVREF
RA3/AN3/VREF+
RA4/T0CKI/C1OUT
RA5/AN4/SS/C2OUT
RE0/AN5/RD
RE1/AN6/WR
RE2/AN7/CS
MCLR/Vpp/THV
RB0/INT
RB1
RB2
RB3/PGM
RB4
RB5
RB6/PGC
RB7/PGD
RC0/T1OSO/T1CKI
RC1/T1OSI/CCP2
RC2/CCP1
RC3/SCK/SCL
RC4/SDI/SDA
RC5/SDO
RC6/TX/CK
RC7/RX/DT
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