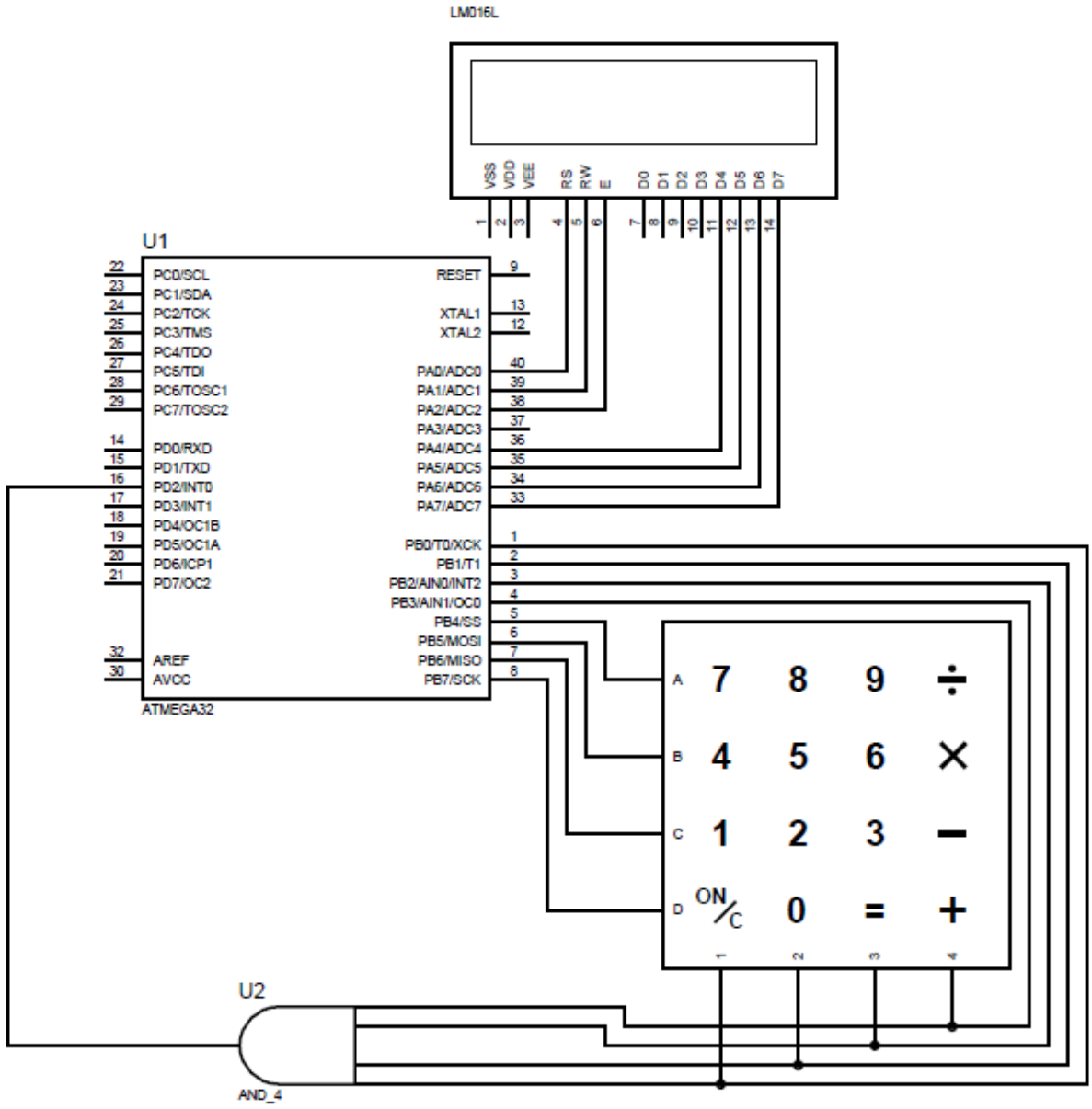
تمرین صفحه ۷۳:



```
#include <mega32.h>
#include <delay.h>
// Alphanumeric LCD functions
#include <alcd.h>

// Declare your global variables here
unsigned char i;
// External Interrupt 0 service routine
interrupt [EXT_INT0] void ext_int0_isr(void)
{PORTB=0xFF;
// Place your code here
lcd_gotoxy(0,1);
//---ROW1---//
PORTB.4=0;
delay_ms(3);
if(PINB.0==0){;lcd_putchar('7');while(PINB.0==0);}
if(PINB.1==0){lcd_putchar('8');while(PINB.1==0);}
if(PINB.2==0){lcd_putchar('9');while(PINB.2==0);}
if(PINB.3==0){lcd_putchar('/');while(PINB.3==0);}
PORTB.4=1;

//---ROW2---//
PORTB.5=0;
delay_ms(3);
if(PINB.0==0){lcd_putchar(0xF1);while(PINB.0==0);}
if(PINB.1==0){lcd_putchar('5');while(PINB.1==0);}
if(PINB.2==0){lcd_putchar('6');while(PINB.2==0);}
if(PINB.3==0){lcd_putchar('*');while(PINB.3==0);}
```

```
PORTB.5=1;

//---ROW3---//
PORTB.6=0;
delay_ms(3);
if(PINB.0==0){lcd_putchar('1');while(PINB.0==0);}
if(PINB.1==0){lcd_putchar('2');while(PINB.1==0);}
if(PINB.2==0){lcd_putchar('3');while(PINB.2==0);}
if(PINB.3==0){lcd_putchar('-');while(PINB.3==0);}
PORTB.6=1;

//---ROW4---//
PORTB.7=0;
delay_ms(3);
if(PINB.0==0){lcd_clear();while(PINB.0==0);}
if(PINB.1==0){lcd_putchar('0');while(PINB.1==0);}
if(PINB.2==0){lcd_putchar('=');while(PINB.2==0);}
if(PINB.3==0){lcd_putchar('+');while(PINB.3==0);}
PORTB.7=1;
PORTB=0x0F;
}

void main(void)
{
DDRB=0xF0;
PORTB=0x0F;
// External Interrupt(s) initialization
// INT0: On
```

```
// INT0 Mode: Falling Edge
// INT1: Off
// INT2: Off
GICR|=(0<<INT1) | (1<<INT0) | (0<<INT2);
MCUCR=(0<<ISC11) | (0<<ISC10) | (1<<ISC01) | (0<<ISC00);
MCUCSR=(0<<ISC2);
GIFR=(0<<INTF1) | (1<<INTF0) | (0<<INTF2);

// Alphanumeric LCD initialization
// Connections are specified in the
// Project|Configure|C Compiler|Libraries|Alphanumeric LCD menu:
// RS - PORTA Bit 0
// RD - PORTA Bit 1
// EN - PORTA Bit 2
// D4 - PORTA Bit 4
// D5 - PORTA Bit 5
// D6 - PORTA Bit 6
// D7 - PORTA Bit 7
// Characters/line: 16
lcd_init(16);

// Global enable interrupts
#asm("sei")

while (1)
    {
    // Place your code here
    for (i=0;i<13;i++)
```

```
    {lcd_clear();
    lcd_gotoxy(i,0);
    lcd_putsf("test");
    delay_ms(200);
    }
    }
}
```