

## EXPERIMENT III



Fall - 2022/2023

MKT3811 - Microprocessors and Programming

Lab 3 Report

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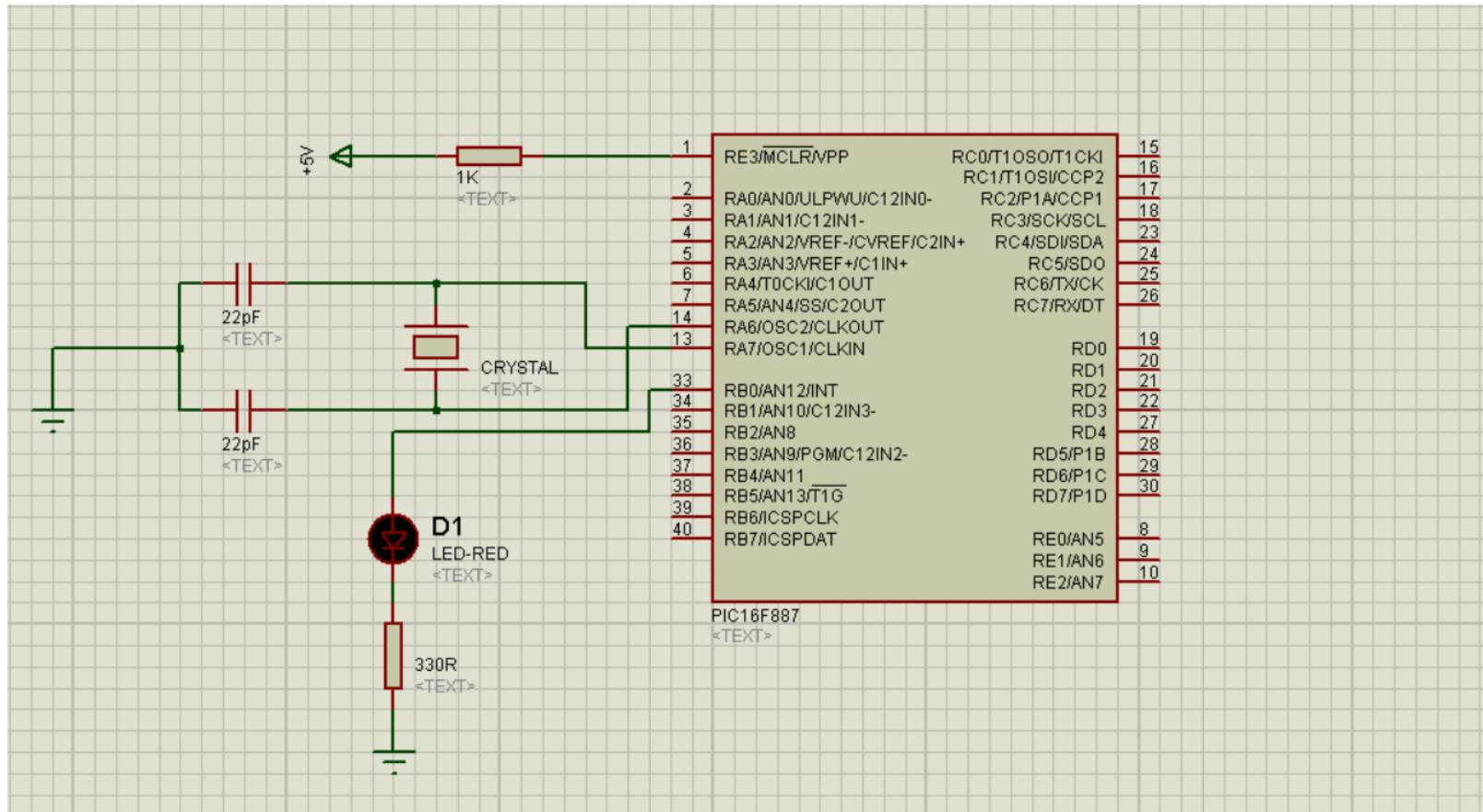
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## **Descriptions:**

The purpose of the experiment is to demonstrate the use of the interrupt and timer with assembly instructions. In the experiment, using the TMR0 interrupt, the LED connected to the B0 pin is requested to blink at 1-second intervals.



### Proteus Schematic Design

As you can see, I used PIC16F887 microcontroller. I supplied +5V power to the Vpp terminal. Since I want to use an external oscillator, I connected my oscillator to the 13th and 14th inputs via capacitors. I connected 1 led-red to my RB0 terminal.

```

LIST    P=16F887

;I introduced the controller model.
    #INCLUDE    <p16f887.inc>
;I introduced the MCU library.
    __config    _CONFIG1,b'1110000011100001'
    __config    _CONFIG2,b'1111100011111111'
    TEMP    EQU    H'20'
;For using interrupt many times
    ORG        0x00
;Reset.
    GOTO    MAIN

    ORG        0x04
    GOTO    TMR0_INT

MAIN
    BSF        PORTB,0
    BANKSEL ANSEL
    CLRF    ANSEL
    CLRF    ANSELH
;Tüm giriş ve çıkışlar dijital olarak atadım.
    BCF        STATUS,6
    BSF        STATUS,5
;RP0 ve RP1 bitlerini 01 yaparak Bank 1'e geçtim.
    MOVLW    b'11010111'
;Timer0 prescaler -- 0x87 -- 255
    MOVWF    OPTION_REG
    MOVLW    b'10100000'

```

```
;GIE ve TMR0IE aktif
;GIE: Tüm kesmeleri yetkilendirme bayrağını logic 1 yaptım.
;TMR0IE: TMR0 sayıcı kesmesini yetkilendirme bayrağını logic 1 yaptım.
```

```
MOVWF INTCON
```

```
CLRF TRISB
```

```
;Port B'nin tüm pinleri output olarak atadım.
```

```
BCF STATUS,5
```

```
;RP0 ve RP1 bitlerini 00 yaparak Bank 0'a geçtim.
```

```
CLRF PORTB
```

```
;Port B'nin çıkışları 0 oldu.
```

```
LOOP
```

```
GOTO LOOP
```

```
;Sonsuz döngü
```

```
TMR0_INT
```

```
BCF INTCON,2
```

```
;TMR0 overflow interrupt flag biti 0 oldu.
```

```
DECFSZ TEMP,F
```

```
RETFIE
```

```
;Kesme komutuna döndü.
```

```
MOVLW 0x10
```

```
;Geçici sayaç ile 16 kere döndürerek interrupt'ın 1 saniyede 1 olmasını sağladım.
```

```
MOVWF TEMP
```

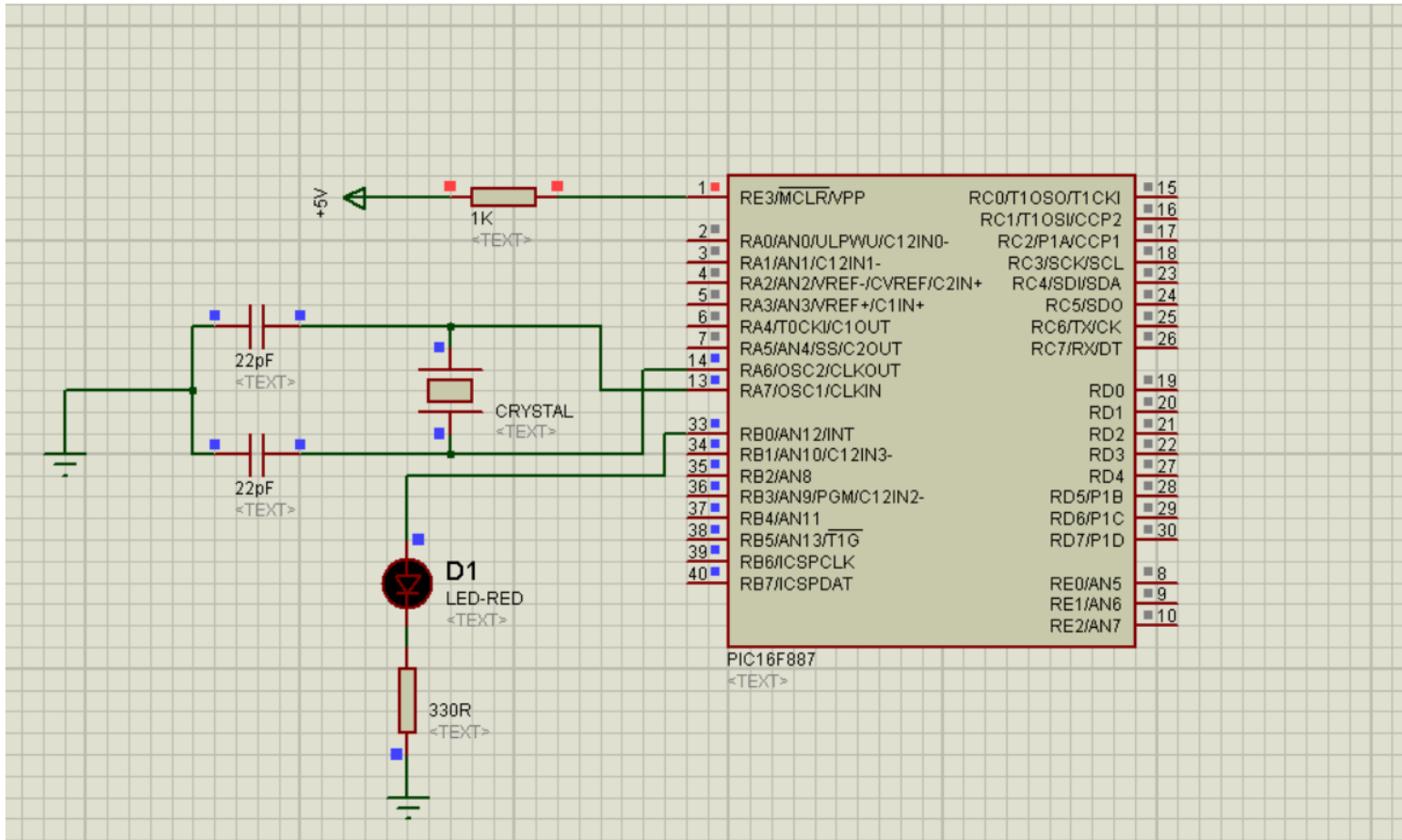
```
MOVLW H'01'
```

```
XORWF PORTB,F
```

```
;Led toggle oldu.
```

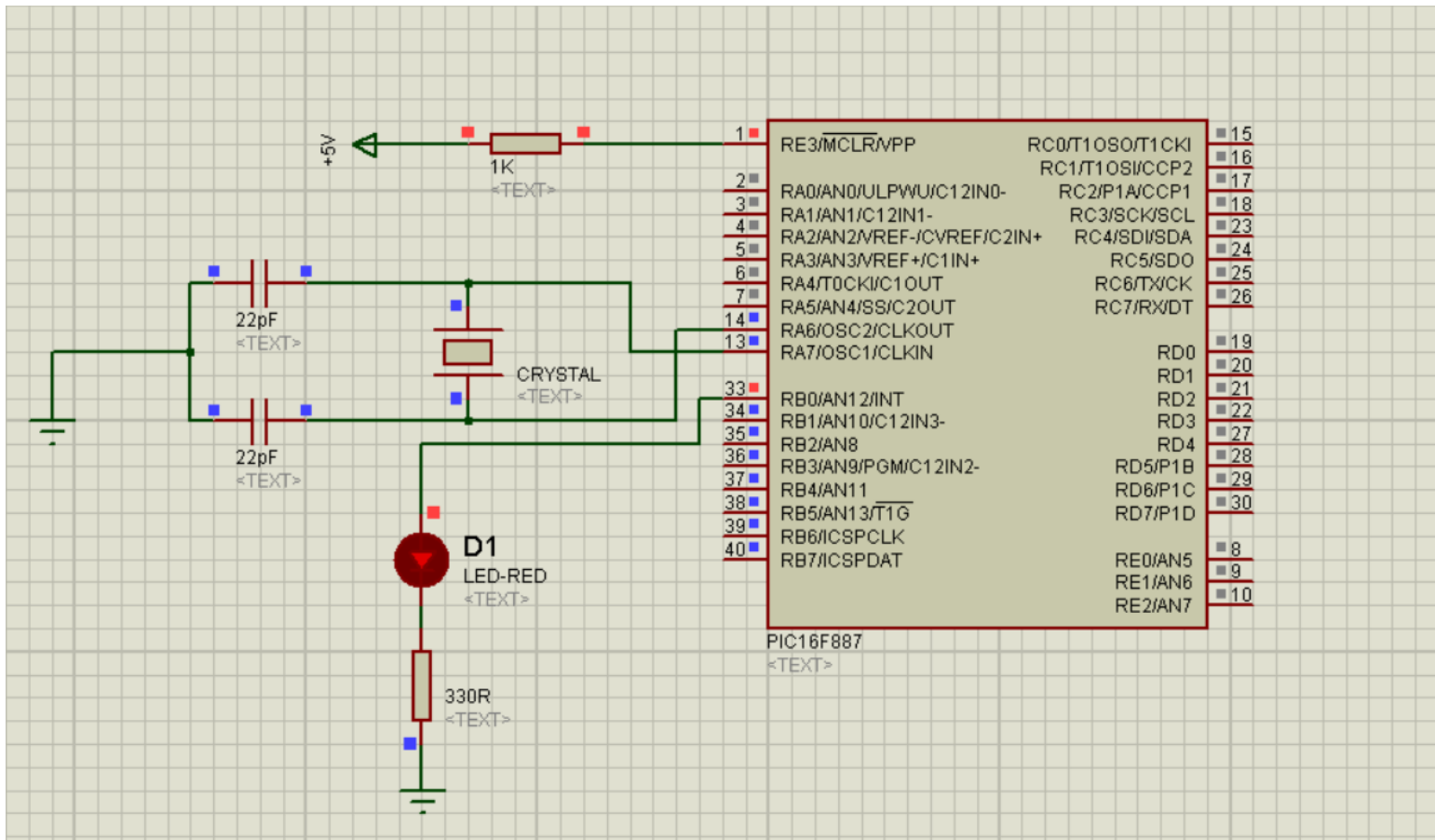
```
    CLRF    TMR0
;Timer0 temizlendi.
    RETFIE
;Kesme komutuna döndü.

    END
```



### Proteus Simulation Part 1

*We see that the led starts lighting and 1 second after it stops. The blinking continues.*



### Proteus Simulation Part 2

*We see that the led starts lighting and 1 second after it stops. The blinking continues.*



