EXPERIMENT I

Fall - 2022/2023

MKT3811 – Microprocessors and Programming

Lab 1 Report

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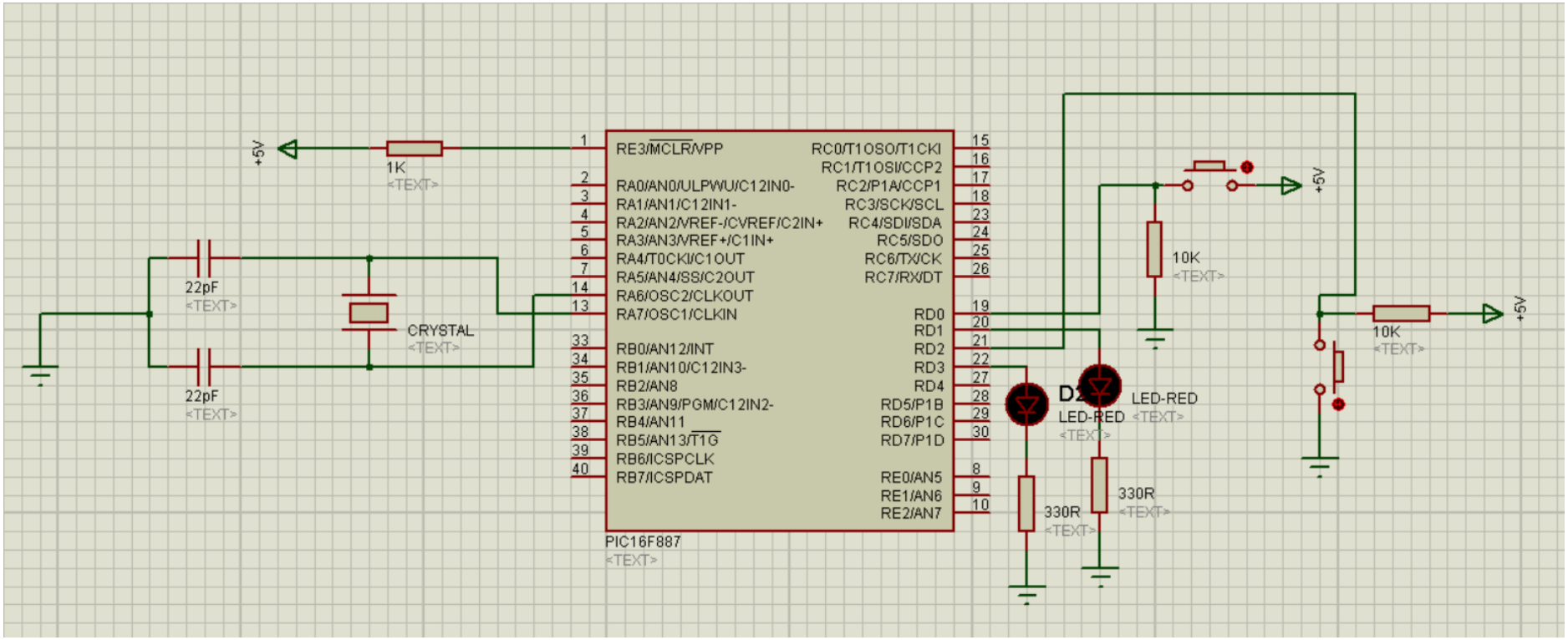
Descriptions:

The purpose of this experiment is to define the input and output pins in assembly language and accordingly, to perform the LED on – off application with the button. In the experiment, when the buttons connected to the D0 and D2 pins are pressed, the LED connected to the D1 and D3 pins should turn on, otherwise it should turn off. Note that the buttons are connected in different configurations.

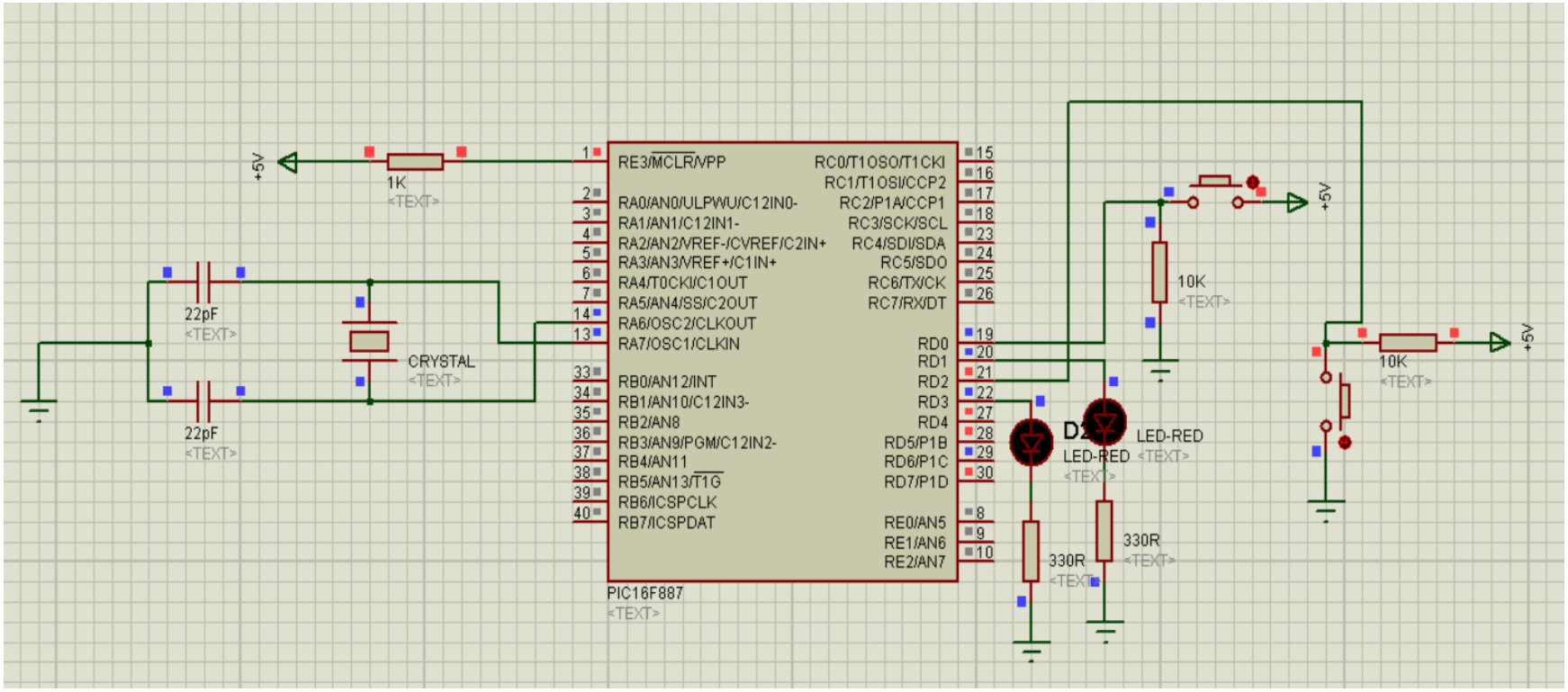


Proteus Schematic Design

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 used 2 buttons. One pull-up and one pull-down command will be undertaken. At the same time, I connected 2 LEDs with 330-ohm protective resistors to my RD1 and RD3 terminals.

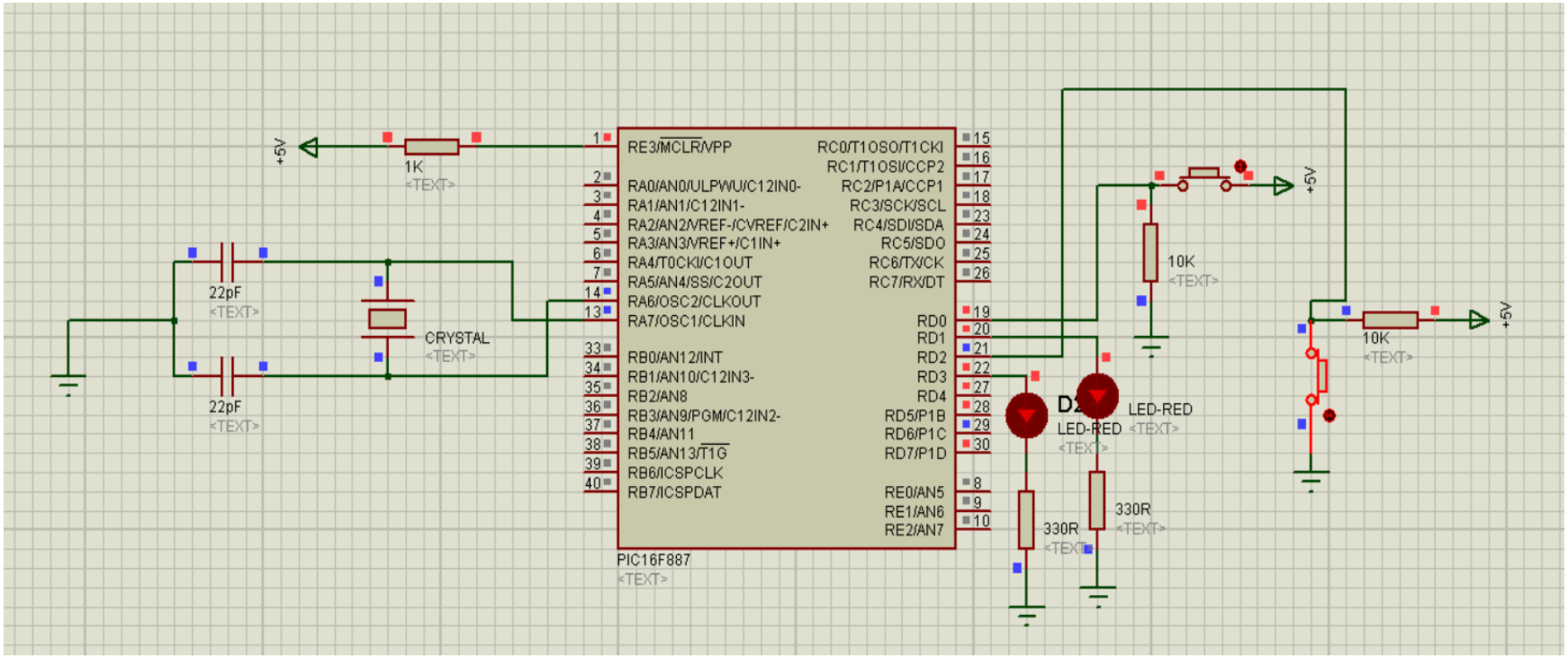
```
    LIST    P=16F887
;I introduced the controller model.
    #INCLUDE    <p16f887.inc>
;I introduced the MCU library.
    ORG    0x00
;Reset.
    BSF        STATUS,5
;I switched to BANK 1.
    MOVLW   0x05
;I'm moving it to the accumulator to input RD0 and RD2.
    MOVWF   TRISD
;Now I threw in TRISD.
    BCF        STATUS,5
;I switched to BANK 0.

MAIN
    BCF        PORTD,1
    BCF        PORTD,3

BUTTON_CONTROL_ON
    BTFSS   PORTD,0
;Pull-Down button --> I used the BTFSS command.
;If the button connected to RD0 is 0, the code goes back to the beginning
and continues to check.
    GOTO    BUTTON_CONTROL_ON
;If the button connected to RD0 is 1 (+5V), the code continues instead
of going back to the beginning.
```

```
     BTFSC   PORTD,2
;Pull-Up button --> I used the BTFSC command.
;If the button connected to RD2 is 1, the code continues to control by going back to the beginning.
     GOTO    BUTTON_CONTROL_ON
;If the button connected to RD2 is 0 (ground), the code continues instead of returning to the beginning.
     BSF       PORTD,1
     BSF       PORTD,3
;The led in RD1 and RD3 is lit.
     END
```



Proteus Simulation Part 1

After inputting RD0 and RD2, we see that 2 LEDs do not light up when the buttons I connected are not pressed.



Proteus Simulation Part 2

In the next stage of the simulation, we see that both LEDs light up when the buttons connected to RD0 and RD2 are pressed at the same time.