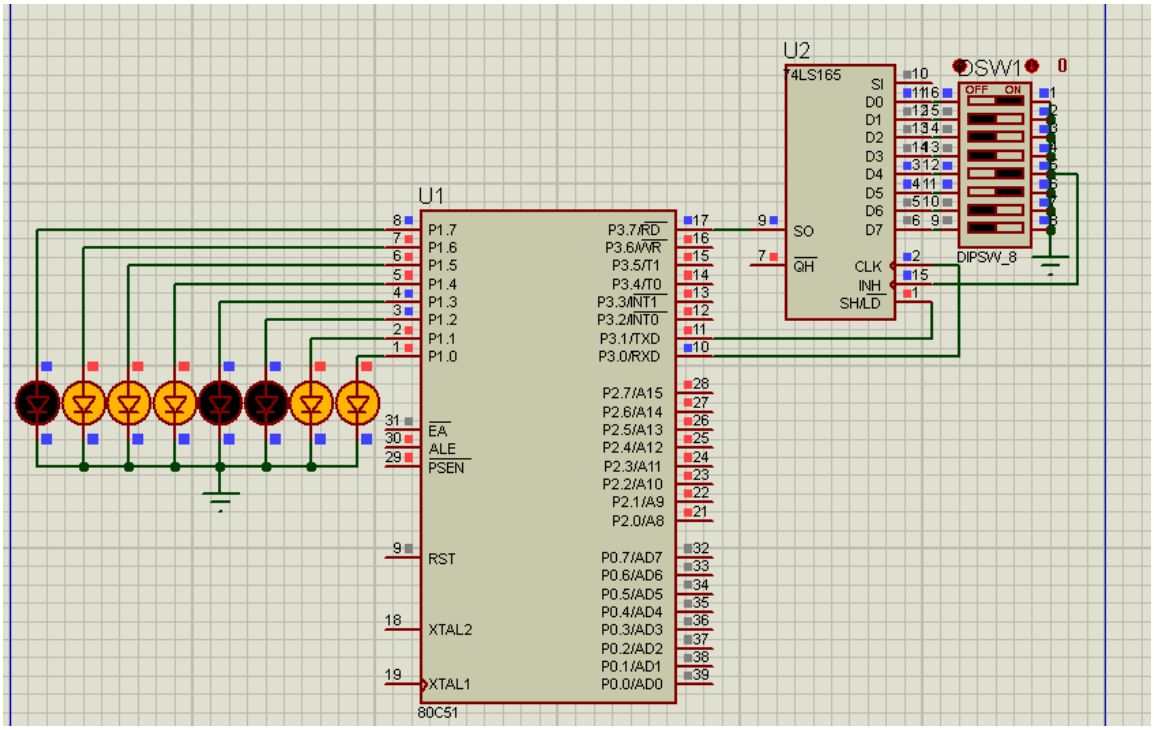
Problem 13

In this project, we read the value from 8-dip switches and display them on 8-LEDs.

The dip-switches are connected to 74165 → parallel in serial out shift register.

To read from this shift register, we execute the following

1. Clear SH/LD pin to zero to store the status of the dip-switches into the internal register of the 74165.
2. Set SH/LD pin to one to enable shifting the data out from the 74165 shift register
3. To read the next bit, we must send a clock pulse
4. To read all bits, we repeat step three 8 times



Section 1 initialization

```
;===============================================
CLK EQU P3.0
DAT EQU P3.7
LOAD EQU P3.1
;===============================================
```

We define the pins connected to the 74165 shift register

CLK → CLK

DAT← SO

LOAD → SH/LD

Section 2 Main code

```
40  LOOP:
41     CALL READ_INPUT
42     MOV P1,A
43     JMP LOOP
```

Simply we call the function that reads from the 74165 register and send the value to P1 to display it on the LEDs

Function READ_INPUT

```
45  READ_INPUT:
46     MOV R7,#8
47     CLR LOAD
48     SETB LOAD
49  ALL_BITS:
50     MOV C,DAT
51     RRC A
52     SETB CLK
53     CLR CLK
54     DJNZ R7,ALL_BITS
55  RET
```

We, follow the previous steps

1- Load switch status into register (47)
2- Set 74165 in shift register mode (48)
3- Move the first bit to carry (50)
4- Shift this bit into "A" using RRC ((51))
5- Send a clock pulse to read next bit (52,53)
6- Repeat 8 times (54)