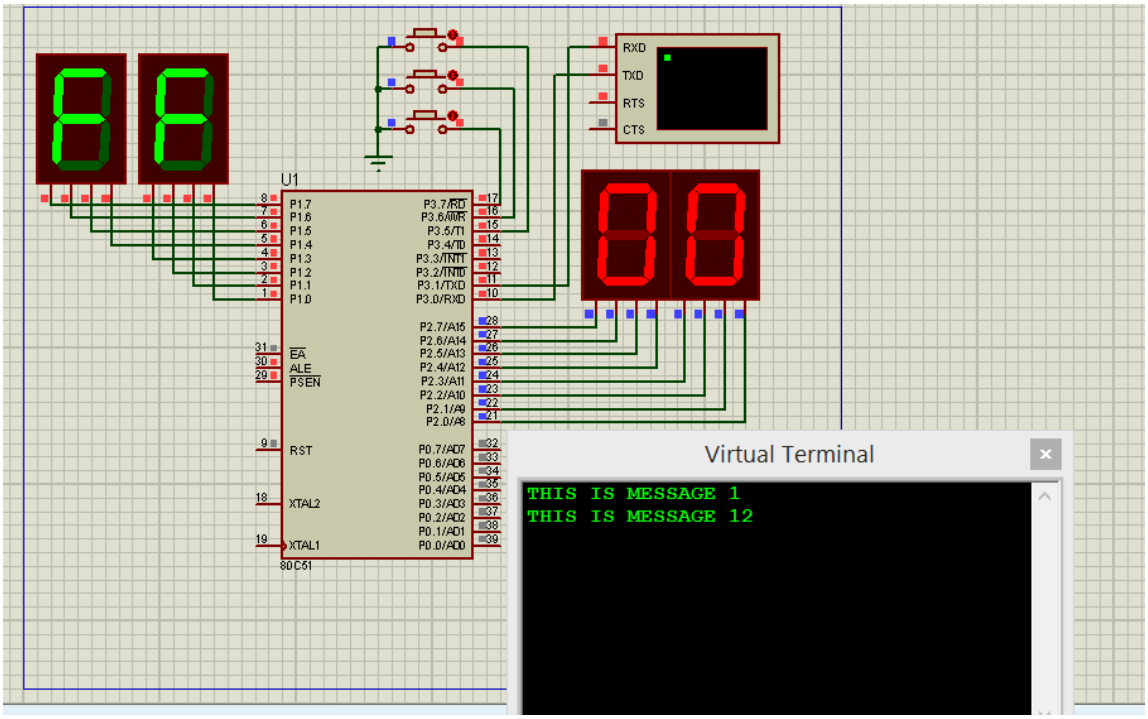
Problem 22



It is another version of P22, where message format include its length as shown below

Message format

```
100  MSG1: DB 19,"THIS IS MESSAGE 1",10,13
101  MSG2: DB 20,"THIS IS MESSAGE 12",10,13
102  MSG3: DB 21,"THIS IS MESSAGE 123",10,13
```

Here is the definition of the messages with each message start by its length.

Now the differences are
1- the display starts by the message length and decrement with each character sent.

2- subroutine SEND_MSG, will read first the message length and then repeats a loop with the number of characters as shown below

```
40  SEND_MSG:
41     CLR A
42     MOVC A,@A + DPTR
43     MOV R4,A
44     MOV B,#10
45     DIV AB
46     SWAP A
47     ADD A,B
48     MOV COUNT,A
49     MOV P2,COUNT
50  ALL_CHAR:
51     INC DPTR
52     CLR A
53     MOVC A,@A + DPTR
54     CALL SEND_CHAR
55     CALL DEC_BCD
56     MOV R5,#2
57     CALL DELAY_100MS
58     MOV P2,COUNT
59     DJNZ R4,ALL_CHAR
60     RET
```

41-43, we read first byte → message length and put it in R4 (loop counter) Since we display decimal number, we convert the length into BCD number by dividing it by 10 → remainder in B(first digit) and A will contain the 2nd digit.

We swap A (46) to make 2nd digits at higher nibble then we add the 1st digit to it (47), save it into count.

Then we go into a for loop with R5 as its counter, where we read a character (51-53) then send it (54), decrement the count in BCD (55); pause for 200ms to catch the display (56-57);