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Question 1:

1. Write a program that displays your name horizontally in the middle of the screen using display memory.
a. Write a procedure that on each call shifts your string one row downwards.
b. Change your program so that the string keeps on shifting downwards, and whenever the string exits the lower boundary of the screen, it reappears from the top boundary.

Answer:

```
1     ORG 100h
2
3     .DATA
4
5         STR1    DB  'MAIZ NADEEM'
6         SIZE    DW  10
7
8     .CODE
9
10    MAIN PROC
11
12        MOV AX, 0XB800
13        MOV ES, AX
14        MOV SI, (13-1)*160 + (40-5-1)*2
15
16        MOV CX, SIZE
17        MOV AH, 0X07
18        XOR BX, BX
19
20        NAMEPRINT:  MOV AL, [STR1 + BX]
21                    MOV ES:SI, AX
22                    ADD SI, 2
23                    INC BX
24                    LOOP NAMEPRINT
25
26        PROCCALL:   CALL DOWN
27                    LOOP PROCCALL
28
29    MAIN ENDP
```

```
30      RET
31
32      DOWN PROC
33
34          MOV CX, SIZE
35
36          ERASE:      SUB SI, 2
37                      MOV ES:SI, 0X0720
38                      LOOP ERASE
39
40                      MOV CX, SIZE
41                      MOV BX, 0
42                      ADD SI, 160
43                      CMP SI, 80*25*2
44                      JG  SHIFTTOP
45
46          NAMEPRINT2: MOV AL, [STR1 + BX]
47                      MOV ES:SI, AX
48                      ADD SI, 2
49                      INC BX
50                      LOOP NAMEPRINT2
51      RET
52
53          SHIFTTOP:   MOV SI, (40-5-1)*2
54
55          NAMEPRINT3: MOV AL, [STR1 + BX]
56                      MOV ES:SI, AX
57                      INC BX
58                      ADD SI, 2
59                      LOOP NAMEPRINT3
60
61      DOWN ENDP
62
63      RET
```

Question 2:

2. Write a program that displays your name vertically in the middle of the screen using display memory.

a. Write a procedure that on each call shifts your string one column to the right.

b. Change your program so that the string keeps on shifting right, and whenever the string exits the right boundary of the screen, it reappears from the left boundary

Answer:

```
1     ORG 100h
2
3     .DATA
4
5         STR1    DB  'MAIZ NADEEM'
6         SIZE    DW  10
7
8     .CODE
9
10    MAIN PROC
11
12        MOV AX, 0XB800
13        MOV ES, AX
14        MOV SI, (13-5-1)*160 + (40-1)*2
15
16        MOV CX, SIZE
17        MOV AH, 0X07
18        XOR BX, BX
19
20        NAMEPRINT:  MOV AL, [STR1 + BX]
21                    MOV ES:SI, AX
22                    ADD SI, 80*2
23                    INC BX
24                    LOOP NAMEPRINT
25
26        PROCCALL:   CALL DOWN
27                    LOOP PROCCALL
28
29    MAIN ENDP
30    RET
31
32    DOWN PROC
33
34        MOV CX, SIZE
35
36        ERASE:      SUB SI, 80*2
37                    MOV ES:SI, 0X0720
38                    LOOP ERASE
39
40                    MOV CX, SIZE
41                    MOV BX, 0
42                    ADD SI, 2
43                    CMP SI, 80*25*2
44                    JG  SHIFTLEFT
45
46        NAMEPRINT2: MOV AL, [STR1 + BX]
```

```
                    MOV ES:SI, AX
                    ADD SI, 80*2
                    INC BX
                    LOOP NAMEPRINT2
    RET

        SHIFTLEFT:  MOV SI, (13-5-1)*160

        NAMEPRINT3: MOV AL, [STR1 + BX]
                    MOV ES:SI, AX
                    INC BX
                    ADD SI, 80*2
                    LOOP NAMEPRINT3

    DOWN ENDP

    RET
```