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Question 1:

Write a program that takes N, as a variable, the number of rows (where N is odd) and prints out a hollow diamond pattern of the same number of rows on screen.

Answer:

```
 1        ORG 100h
 2
 3        .DATA
 4
 5            ROWS     DW  9
 6            HALF     DW  0
 7            OUTTER   DW  0
 8            INNER    DW  0
 9            COUNT    DW  0
10
11        .CODE
12
13        MAIN PROC
14
15            MOV COUNT, 1
16            MOV AX, ROWS
17            SHR AX, 1
18            MOV OUTTER, AX
19            INC AX
20            MOV HALF, AX
21            MOV INNER, 1
22            MOV AH, 2
23
24      L1:     MOV CX, OUTTER
25              MOV DL, ' '
26
27      H1:     CMP CX, 0
28              JE  OUT1
29              INT 21h
30              DEC CX
31              JMP H1
```

```asm
32
33
34    OUT1:    MOV DL, '*'
35             INT 21h
36
37             MOV DL, 10
38             INT 21h
39             MOV DL, 13
40             INT 21h
41
42             INC COUNT
43             DEC OUTTER
44
45
46    L2:      MOV CX, OUTTER
47             MOV DL, ' '
48
49
50    H2:      CMP CX, 0
51             JE  OUT2
52             INT 21h
53             DEC CX
54             JMP H2
55
56
57    OUT2:    MOV DL, '*'
58             INT 21h
59             MOV CX, INNER
60             MOV DL, ' '
61
62
63    H3:      INT 21h
64             LOOP H3
65             MOV DL, '*'
66             INT 21h
67             MOV DL, 10
68             INT 21h
69             MOV DL, 13
70             INT 21h
71
72             INC COUNT
73             DEC OUTTER
74             ADD INNER, 2
75
76             MOV DX, HALF
77             CMP COUNT, DX
```

```asm
78                JLE L2
79
80                INC OUTTER
81                SUB INNER, 2
82
83
84      L3:       INC OUTTER
85                SUB INNER, 2
86                MOV CX, OUTTER
87                MOV DL, ' '
88
89
90      H4:       CMP CX, 0
91                JE  OUT3
92                INT 21h
93                DEC CX
94                JMP H4
95
96      OUT3:     MOV DL, '*'
97                INT 21h
98                MOV CX, INNER
99                MOV DL, ' '
100
101     H5:       INT 21h
102               LOOP H5
103               MOV DL, '*'
104               INT 21h
105
106               MOV DL, 10
107               INT 21h
108               MOV DL, 13
109               INT 21h
110
111               INC COUNT
112
113               MOV DX, ROWS
114               DEC DX
115               CMP COUNT, DX
116               JLE L3
117
118               INC OUTTER
119               MOV CX, OUTTER
120               MOV DL, ' '
121
122     H6:       INT 21h
123               LOOP H6
```

```asm
                    MOV DL, '*'
                    INT 21h

            RET

        MAIN ENDP
        ORG 100h

            .DATA

                ROWS    DW  9
                HALF    DW  0
                OUTTER  DW  0
                INNER   DW  0
                COUNT   DW  0

            .CODE

        MAIN PROC

                MOV COUNT, 1
                MOV AX, ROWS
                SHR AX, 1
                MOV OUTTER, AX
                INC AX
                MOV HALF, AX
                MOV INNER, 1
                MOV AH, 2

        L1:     MOV CX, OUTTER
                MOV DL, ' '

        H1:     CMP CX, 0
                JE  OUT1
                INT 21h
                DEC CX
                JMP H1


        OUT1:   MOV DL, '*'
                INT 21h

                MOV DL, 10
                INT 21h
                MOV DL, 13
```

```
40              INT 21h
41

42              INC COUNT
43              DEC OUTTER

45
46      L2:     MOV CX, OUTTER
47              MOV DL, ' '
```