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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:

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| |  |  | | --- | --- | | 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 | | 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 | | 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 | | 124 |  | | 125 | MOV DL, '\*' | | 126 | INT 21h | | 127 |  | | 128 | RET | | 129 |  | | 130 | MAIN ENDP | | 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 | | 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, ' ' | |  |