

The screenshot shows the 8086 Emulator software. The left pane contains the following assembly code:

```

01 org 0100h
02 .CODE
03 MAIN PROC
04     MOV AH,2
05     MOV CX,256
06     MOV DL,0
07 PRINT_LOOP:
08     INT 21H
09     INC DL
10     DEC CX
11     JNZ PRINT_LOOP
12
13     MOV AH,4CH
14     INT 21H
15 MAIN ENDP
16 END MAIN
17
18 RET

```

The right pane, titled "emulator screen (80x25 chars)", shows the output of the program. The word "HELLO" is displayed in a large, stylized font, with each letter composed of multiple rows of characters. The background of the screen is black, and the text is white.

[illegible]

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[illegible]

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```

01 org 0100h
02 .DATA
03 X DW "ZERO$"
04 Y DW "NOT ZERO$"
05 .CODE
06 MAIN PROC
07     MOV AX, 5
08     MOV BX, 0
09
10     CMP AX, BX
11     JZ ZERO
12     LEA DX, Y
13     JMP PRINT
14 ZERO:
15     LEA DX, X
16 PRINT:
17     MOV AH, 9
18     INT 21H
19 EXIT:
20     MOV AH, 4CH
21     INT 21H
22 MAIN ENDP
23 END MAIN
24
25 RET

```

emulator screen (80):

NOT ZERO

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```
001 org 100h
002
003 .DATA
004 a DW ?
005 b DW ?
006 c DW 1d
007 va DW "Enter a Character:$"
008 er DW "Enter wrong character!!$"
009
010 .CODE
011 MAIN PROC
012     MOV AX, @DATA
013     MOV DX, AX
014
015     MOV CX, 5
016
017     MOV AH, 9
018     MOV DX, OFFSET va
019     INT 21H
020
021     MOV AH, 1
022     INT 21h
023     MOV AH, 0
024     MOV a, AX
025     MOV b, AX
026
027     MOV CX, 5
028
029     MOV AH, 2
030     MOV DL, 0DH
031     INT 21h
032     MOV DL, 0AH
033     INT 21h
034
035
036
037     CMP a, 'a'
038     JL itsUpper
039     CMP a, 'z'
```

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```
040     JG Eror
041     SUB a, 32
042     SUB b, 32
043     JMP Display1stLine
044
045 itsUpper:
046
047     CMP a, 'A'
048     JL Eror
049     CMP a, 'Z'
050     JG Eror
051     ADD a, 32
052     ADD b, 32
053     JMP Display1stLine_lower
054
055 move_Z:
056     MOV a, 'A'
057     MOV c, 0d
058     JMP Display1stLine
059 Display1stLine:
060     MOV DX, a
061     ADD DX, c
062
063     CMP DX, 'Z'
064     JG move_Z
065
066     MOV AH, 2
067     INT 21H
068
069     INC c
070     DEC CX
071     JNZ Display1stLine
072
073     MOV CX, 5
074     MOV c, 1d
075
076     MOV AH, 2
077     MOV DL, 0DH
078     INT 21h
```

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```
079 MOV DL, 0AH
080 INT 21h
081 JMP Display2ndLine
082 move_A:
083 MOV b, 'Z'
084 MOV c, 0d
085 JMP Display2ndLine
086 Display2ndLine:
087 MOV DX, b
088 SUB DX, c
089
090 CMP DX, 'A'
091 JL move_A
092
093 MOV AH, 2
094 INT 21H
095
096 INC c
097 DEC CX
098 JNZ Display2ndLine
099 JMP endprogram
100
101
102 move_zz:
103 MOV a, 'a'
104 MOV c, 0d
105 JMP Display1stLine_lower
106 Display1stLine_lower:
107 MOV DX, a
108 ADD DX, c
109
110 CMP DX, 'z'
111 JG move_zz
112
113 MOV AH, 2
114 INT 21H
115
116 INC c
117 DEC CX
```

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```
118 JNZ Display1stLine_lower
119
120 MOV CX, 5
121 MOV c, 1d
122
123 MOV AH, 2
124 MOV DL, 0DH
125 INT 21h
126 MOV DL, 0AH
127 INT 21h
128 JMP Display2ndLine_lower
129 move_aa:
130 MOV b, 'z'
131 MOV c, 0d
132 JMP Display2ndLine_lower
133 Display2ndLine_lower:
134 MOV DX, b
135 SUB DX, c
136
137 CMP DX, 'a'
138 JL move_aa
139
140 MOV AH, 2
141 INT 21H
142
143 INC c
144 DEC CX
145 JNZ Display2ndLine_lower
146 JMP endprogram
147 Error:
148 MOV AH, 9
149 MOV DX, OFFSET er
150 INT 21H
151 endprogram:
152 MOV AX, 4C00h
153 INT 21h
154
155 MAIN ENDP
156 END MAIN
```

line: 59 col: 87

emulator screen (80x25 chars)

```
Enter a Character:c
DEFGH
BAZYX
```

emulator screen (80x25 chars)

```
Enter a Character:Z
abcde
yxwvu
```