



American International University- Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)
Spring 22-23

Lab Task -2

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**COMPUTER ORGANIZATION AND
ARCHITECTURE**

Section: B

Course Teacher:

SAEEDA SHARMEEN RAHMAN

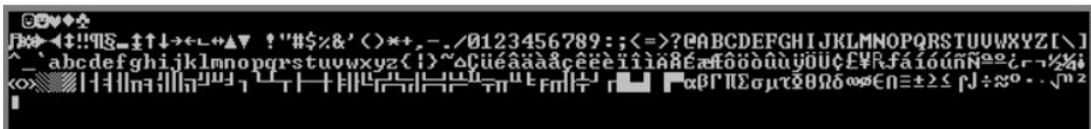
Lab Tasks

Task: 1



- Write an assembly program to print all the ASCII code from 0 to 255. Hints: use jnz and dec instructions

Sample Output



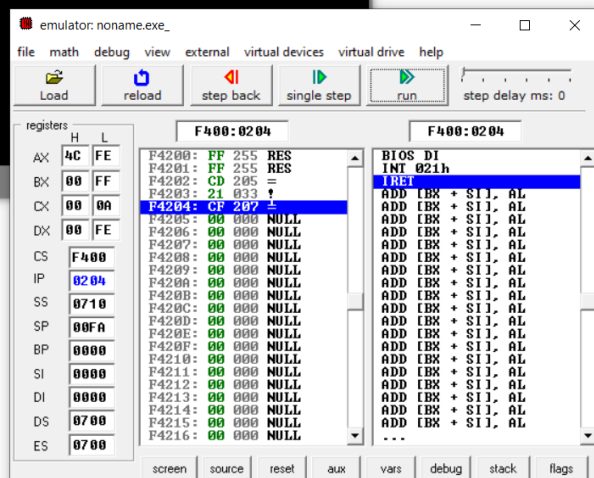
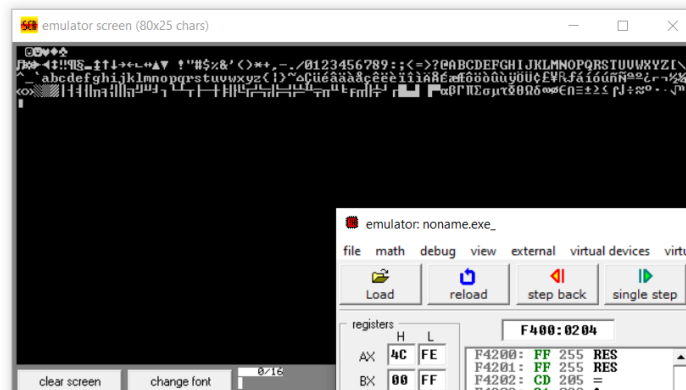
Answer:

emu8086 - assembler and microprocessor emulator 4.08

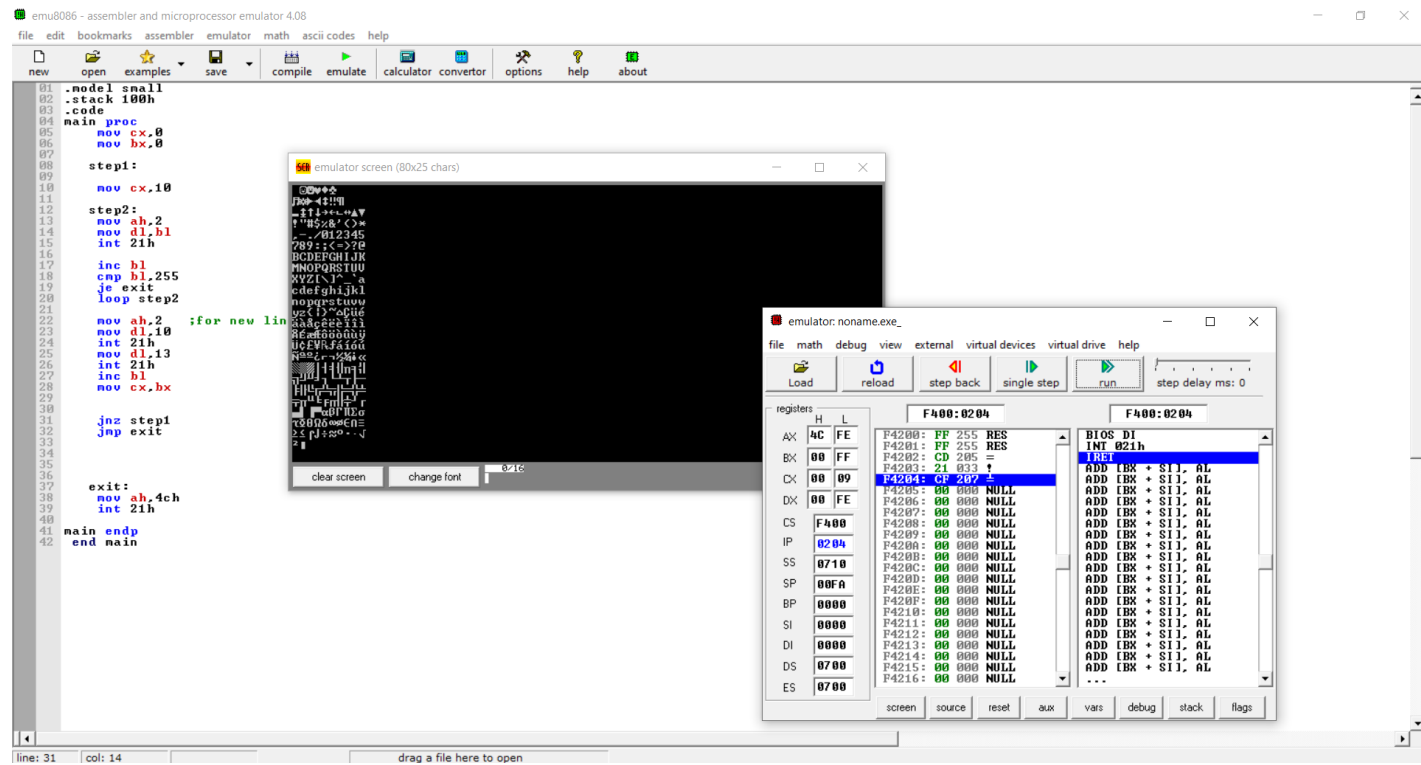
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```
01 .model small
02 .stack 100h
03 .code
04 main proc
05     mov cx,0
06     mov bx,0
07
08     step1:
09
10     mov cx,10
11
12     step2:
13     mov ah,2
14     mov dl,bx
15     int 21h
16
17     inc bx
18     cmp bx,255
19     je exit
20
21     loop step1
22     jnz step2
23
24
25
26
27
28     exit:
29     mov ah,4ch
30     int 21h
31
32 main endp
33 end main
```



If I want to print 10 Characters in each line, then the modified code will be-----



Lab Tasks

Task: 2



Put the sum of the first 50 terms of the arithmetic sequence
1, 5, 9, 13, ... in DX. **Hints:** Employ LOOP instructions to do the following.

first we find how many loops needed:

(last term – first term) / difference

$(148 - 1) / 3 = 49$ loops

So put cx = 49

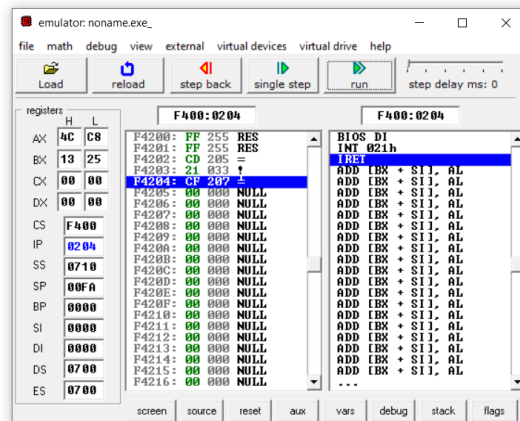
Answer:

emu8086 - assembler and microprocessor emulator 4.08

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```
01 ; Put the sum of the first 50 terms of the arithmetic sequence
02 ; 1, 5, 9, 13, ... in DX.
03
04 .MODEL SMALL
05 .STACK 100H
06 .CODE
07 MAIN PROC
08     MOV CX, 50          ; we need the first 50 terms.
09                         ; so, the number of loop 50
10     MOV AX, 0           ; AX: store the addition result
11     MOV BX, 1           ; BX: numbers to add in AX
12
13     LOOP1:
14         ADD BX, AX       ; add BX to AX
15         ADD AX, 4        ; add 4 to AX as the difference
16                         ; of the sequence is 4
17         LOOP LOOP1
18
19     EXIT:
20         MOV AH, 4CH      ; return control to DOS
21         INT 21H
22     MAIN ENDP
23 END MAIN
```



Lab Tasks

Task: 3



Put the sum $100 + 95 + 90 + \dots + 5$ in AX. **Hints:** Employ LOOP instructions to do the following.

first we find how many loops needed:
(last term – first term) / difference
 $(100 - 5)/5 = 19$ loops
So put cx = 19

Answer:

```
file edit bookmarks assembler emulator math ascii codes help
new open examples save compile emulate calculator convertor options help about

01 ; Put the sum 100 + 95 + 90 + ... + 5 in AX.
02
03 .MODEL SMALL
04 .STACK 100h
05 .CODE
06 MAIN PROC
07     ; total loops = (last term - first term) / difference
08     ; (100 - 5) / 5 = 19 loops
09
10     MOV CX, 19      ; number of loop
11
12     MOV AX, 0       ; AX: store the addition result
13     MOV BX, 100     ; BX: numbers to add in AX
14
15     LOOP1:
16         ADD AX, BX   ; add BX to AX
17         SUB BX, 5    ; sub 5 from BX as the difference
18                     ; of the sequence is 5
19         LOOP LOOP1
20
21     EXIT:
22         MOV AH, 4Ch  ; return control to DOS
23         INT 21h
24     MAIN ENDP
25 END MAIN
```

Lab Tasks

Task: 4



Read a character and display it **50** times on the next line. **Hints:** use **LOOP** instructions and put **cx = 50**

Sample Output

Enter a character: **d**

D
ddddd

Thank you.

Answer:

```
001 ; Read a character and display it 50 times on the next line.
002 ; Hints: use LOOP instructions and put cx = 50
003
004 .MODEL SMALL
005 .STACK 100H
006 .DATA
007     MSG DB 'Enter a character: $'
008     MSG1 DB 'Thank You $'
009     NEW_LINE DB 10, 13, '$'
010
011 .CODE
012 MAIN PROC
013     MOV AX, @DATA ; initialize DS
014     MOV DS, AX
015
016     MOV AH, 9 ; display MSG
017     LEA DX, MSG
018     INT 21H
019
020     MOV AH, 1 ; set single char input function
021     INT 21H
022     MOV BL, AL
023
024     MOV AH, 9 ; display NEW_LINE
025     LEA DX, NEW_LINE
026     INT 21H
027
028     MOV CX, 50 ; initialize CX with 50
029
030     MOV AH, 2 ; set single char output function
031     MOV DL, BL ; put BL in DL to display
032
033     LOOP1: INT 21H ; display
034             LOOP LOOP1 ; start the loop again
035
036
037 EXIT:
038     MOV AH, 9 ; display NEW_LINE
039     LEA DX, NEW_LINE
040     INT 21H
041     MOV AH, 9 ; display MSG1
042     LEA DX, MSG1
043     INT 21H
044     MOV AH, 4CH ; return control to DOS
045     INT 21H
046
047 MAIN ENDP
048 END MAIN
```

Lab Tasks

Task: 5



Write a program to display a "?", read two capital letters, and display them on the next line in alphabetical order. Hints: use `cmp`, `jb`, `xchg`.

Sample Output

Enter character: CB

BC

Thank you.

Answer:

```
01 ; Write a program to display a "?", read two capital letters,  
02 ; and display them on the next line in alphabetical order.  
03 ; Hints: use cmp, jb, xchg  
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