Heaven's light is our guide

Rajshahi University of Engineering And Technology

Dept. of Computer Science & Engineering

Details

Course No : CSE 3110

Course Title : Microprocessors and Assembly Language

Date of Submission : 10-08-2022

Submitted To	Submitted By
Sadia Zaman Mishu **Assistant Professor** **RUET,CSE**	**Nazmul Haque** **Roll : 1803109** **Section : B** **Department : CSE**

Lab-4

Problem Statement :

Write a program that starts with an initially undefined byte array of maximum size 100 , and lets the user insert string into the array in such a way that the array is always sorted in decreasing order. The program should print a question mark, let the user enter a string ,and display the array with the new string inserted. Input ends when the user hits the ESC key.

Discussion:

In this problem I need to take a array which can contain duplicate letters. Then SI point to the initial address of the array or the value of SI is 0 as register index addressing mode. At first print question mark then take user input until user press ESC button. If user press enter button then print newly decreasing sorted string and ask user to take another string and so on. In insertion sort If the character at index si is greater than the character in AL then control jump to the swap state. The termination point of a string is define by character '$' whose ascii value is 24H .

1.

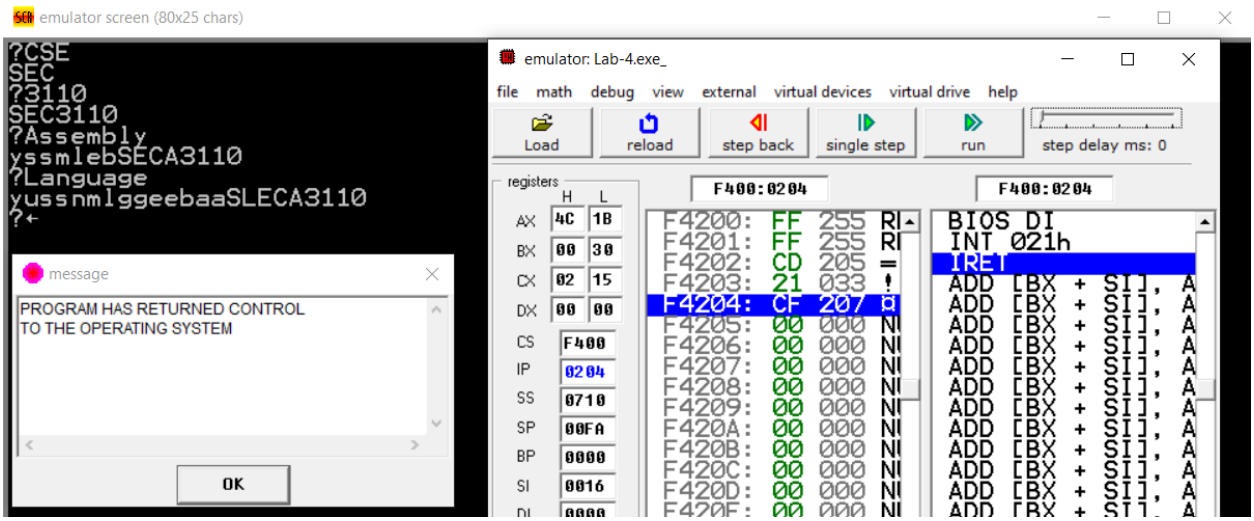
Code:

```
INCLUDE 'EMU8086.INC'
.MODEL SMALL
.STACK 100H
.DATA

STR DB 100 DUP("$")

.CODE

MAIN PROC

MOV AX,@DATA
      MOV DS,AX

      PRINT "?"
      FOR:
      MOV AH,1
      INT 21H

      ;if esc key is pressed then stop taking input
      CMP AL,1BH
      JE END_FOR
      INSERTION_SORT:
      CMP [SI],AL
      JL SWAP
      CMP [SI],24H
      JE MOV1
      INC SI
      JMP INSERTION_SORT

      MOV1:
      MOV [SI],AL
      JMP FOR

      SWAP:
      MOV BL,[SI]
      MOV [SI],AL
      MOV AL,BL
      INC SI
      CMP [SI],24H
      JE MOV1
      JMP SWAP


      PRINT:
```

```
18.       ;if the new line is
      entered then print the whole
      sorted string
19.       CMP AL,0DH
20.       JE PRINT


21.       XOR SI,SI
```

```
41.       PRINTN

42.       ;print the desired output
43.       MOV AH,09H
44.       LEA DX,STR
45.       INT 21H


46.       PRINTN
47.       PRINT "?"
48.       JMP FOR


49.       END_FOR:
50.       MOV AH,4CH
51.       INT 21H

52.       MAIN ENDP
53. END MAIN
```

Input & Output:



Conclusion: This program gives write output according to the given input. Knowledge of Loop,jmp , cmp ,,array and stack is needed to solve this problem. We need to must follow the size of destination and source of a parameter of an operation.