ECE2002 (COA) Digital Assessment 18/11/2021

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Course : Computer Organization & Architecture
Course Code : ECE2002

Question :
Write a program for searching the existence of a certain data in a given data array using 8086. When found, add the searched number to the last 4 digits of your Reg no. Display this result in White color text in the middle row, starting of the column of the output screen at row 20, column 10, page no. 0 using interrupts.

Solution –

Algorithm of 8086 program :-

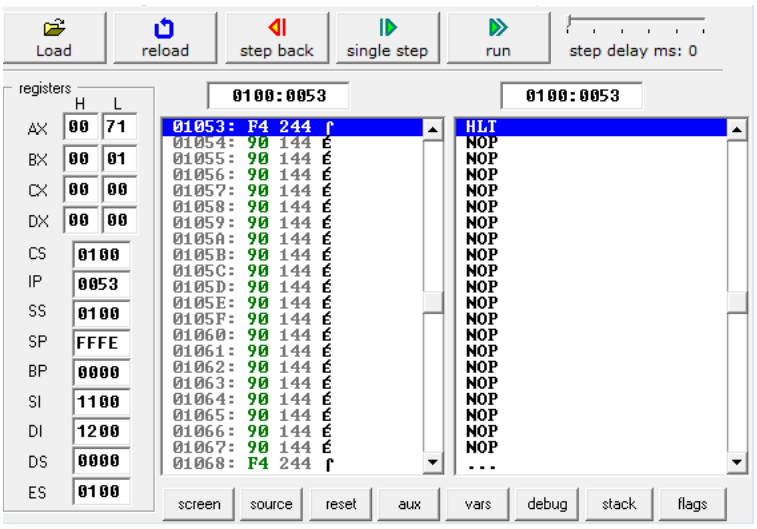
1) Move 2000 in AX and assign it to ES
2) Assign value 600 to DI
3) Move 25 in Al
4) Move the contents of CX to BX
5) Clear the value of directional flag DF
6) Repeat step 7 till ZF is not set
7) Scan byte from [DI] and check its difference with contents of AL
8) Update value of DI
9) Decrease the value of DI by 1
10) Subtract value of BX by CX
11) Decrease value of BX by 1
12) Program halts

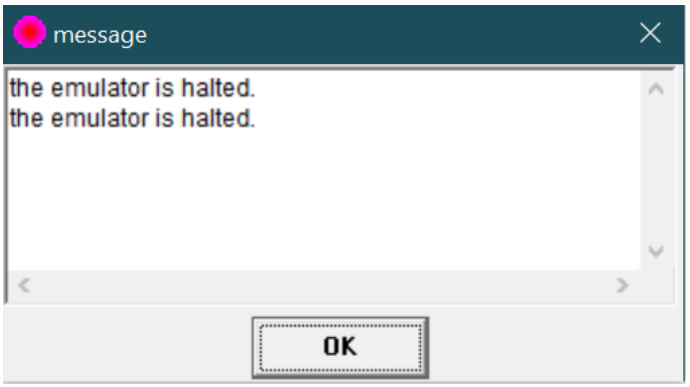
1] 8086 program to put numbers in an array :-

```
; KHAN MOHD OWAIS RAZA 20BCD7138
; ECE2002_Computer Organization & Architecture_Digital Assessment-1
; -------------------------------------------------------------
; 8086 program to put elements in an array
ORG 100H
MOV SI,1200H
MOV CL,10H
NEXT:
MOV [SI],CL
INC SI
INC CL
CMP SI,1200H
JNZ NEXT
MOV SI,1200H
MOV AL,[SI]
INC SI
AGAIN:
ADD AL,[SI]
INC SI
CMP SI,120AH
JNZ NEXT
MOV [120H],AL
RET
```

2] 8086 program to search element in an array :-

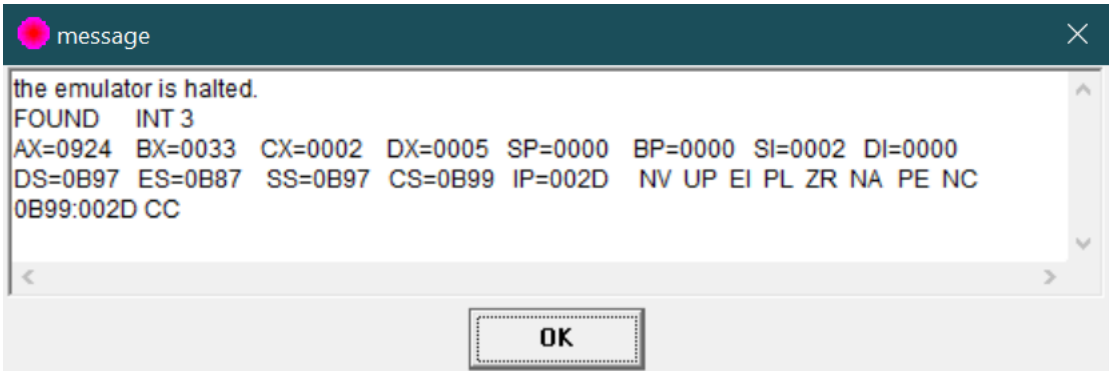
```
; KHAN MOHD OWAIS RAZA 20BCD7138
; ECE2002_Computer Organization & Architecture_Digital Assessment-1
; -------------------------------------------------------------
; 8086 program to search an element in an array
MOV SI,1100H
MOV DI,1200H
MOV DL,[DI]
MOV BL,01H
MOV AL,[SI]
AGAIN:
CMP AL,DL
JZ AVAIL
INC SI
INC BL
MOV AL,[SI]
CMP AL,20H
JNZ AGAIN
NODATA:
MOV CX,0000H
MOV [DI+1],CX
MOV [DI+3],CX
AVAIL:
MOV [DI+1],BH
MOV [DI+2],BL
MOV [DI+3],SI
DATA SEGMENT
A DB 09H
B DB 02H
C DW ?
DATA ENDS
CODE SEGMENT
ASSUME CS:CODE,DS:DATA
START:
MOV AX,DATA
MOV DS,AX
MOV AL,A
MOV BL,B
ADD AL,BL
MOV C,AX
INT 8
OVER:
HLT
```

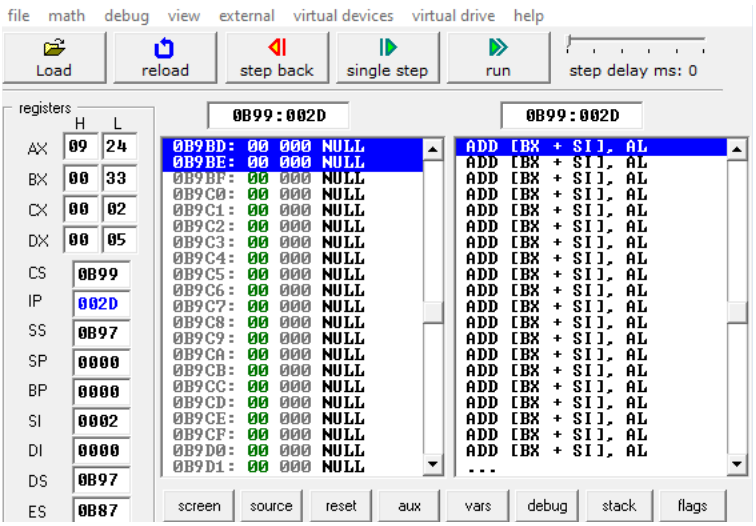




8086 program to search element in array (second method) :-

```
; KHAN MOHD OWAIS RAZA 20BCD7138
; ECE2002 Computer Organization & Architecture Digital Assessment-1
; -------------------------------------------------------------------
; 8086 program to search an element in an array
org 100h
DATA SEGMENT
STRING1 DB 11H,22H,33H,44H,55H
MSG1 DB "FOUND$"
MSG2 DB "NOT FOUND$"
SE DB 33H
DATA ENDS

PRINT MACRO MSG
MOV AH, 09H
LEA DX, MSG
INT 21H
INT 3
ENDM

CODE SEGMENT
ASSUME CS:CODE, DS:DATA
START:
MOV AX, DATA
MOV DS, AX
MOV AL, SE
LEA SI, STRING1
MOV CX, 04H

UP:
MOV BL,[SI]
CMP AL, BL
JZ FO
INC SI
DEC CX
JNZ UP
PRINT MSG2
JMP END1

FO:
PRINT MSG1

END1:
INT 3
CODE ENDS
END START
ret
```





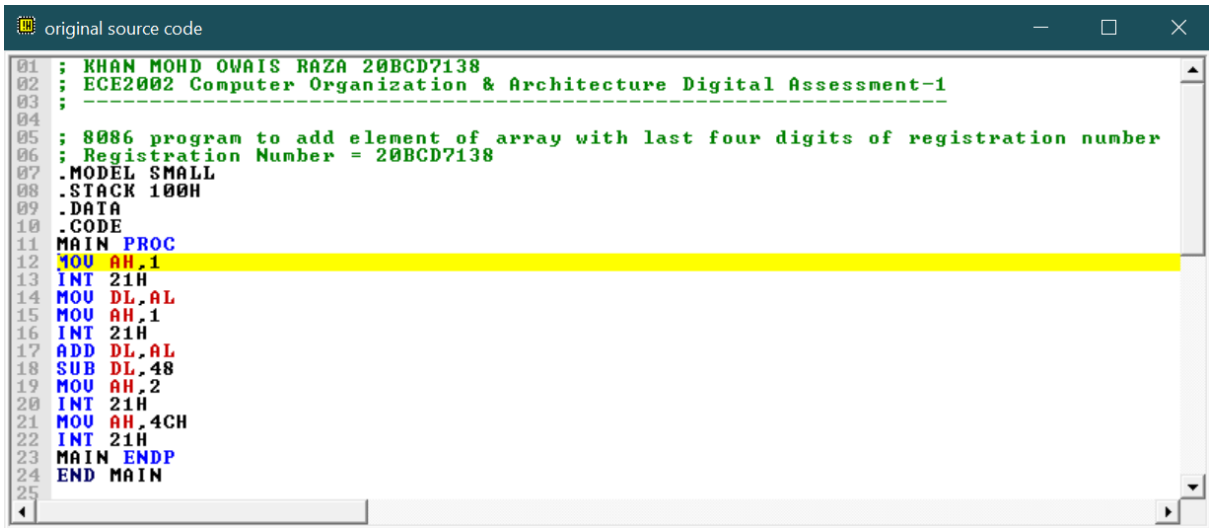
3] 8086 program to add the number to last four digits of registration number :-

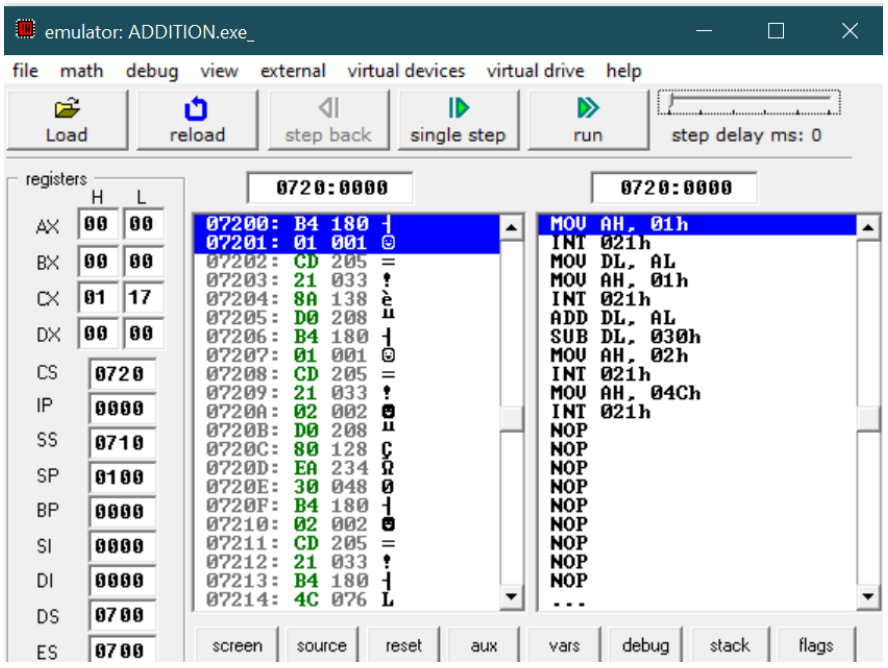
Registration number = 20BCD7138

Thus, last four digits are = 7, 1, 3, 8

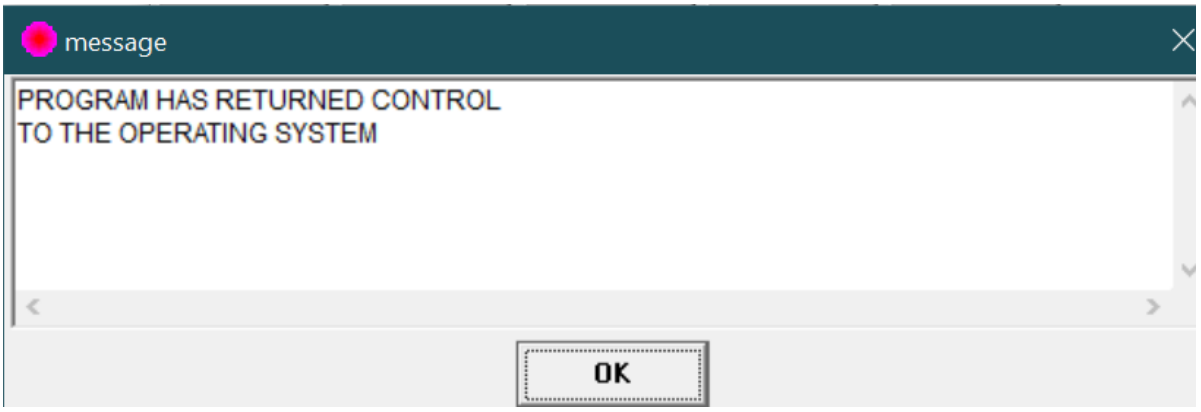
8086 code to perform addition -

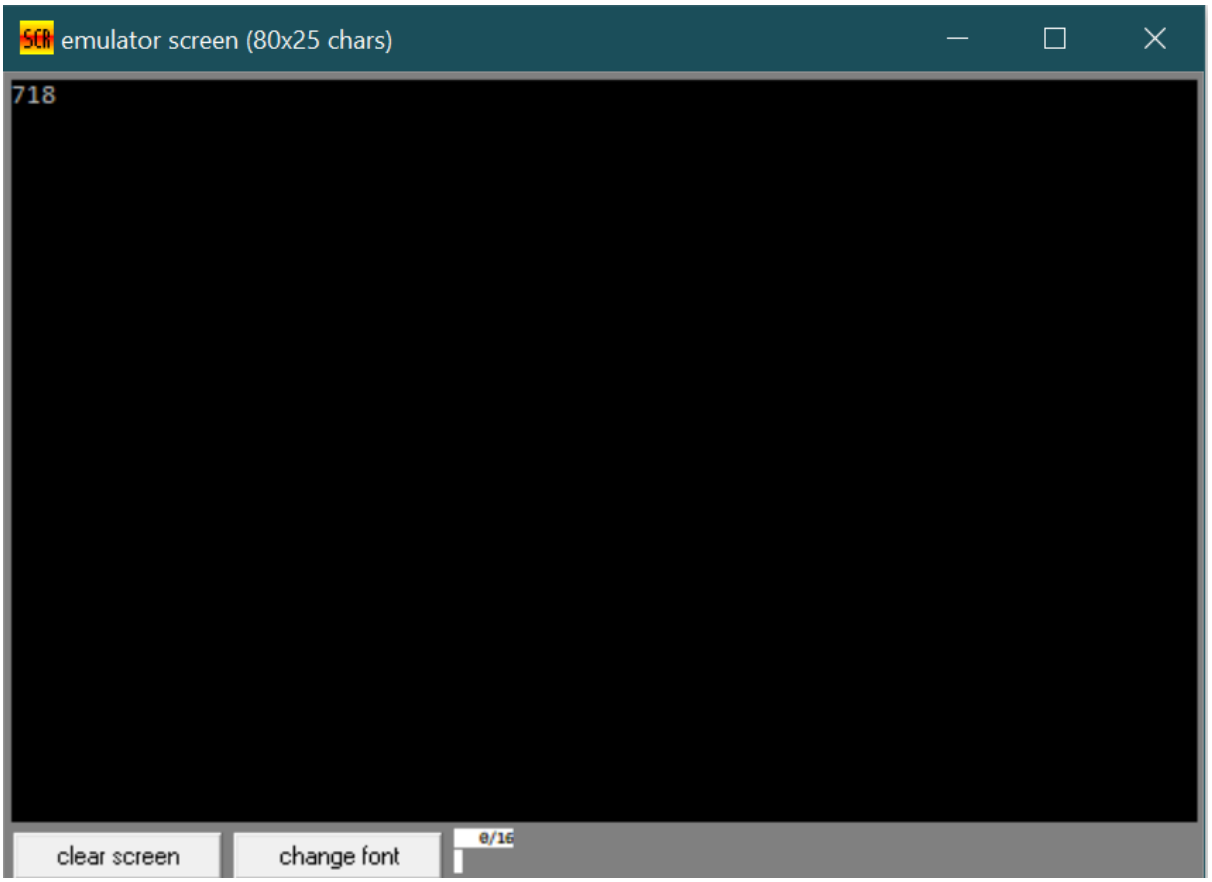
```
; KHAN MOHD OWAIS RAZA 20BCD7138
; ECE2002 Computer Organization & Architecture Digital Assessment-1
; ---------------------------------------------------------------

; 8086 program to add element of array with last four digits of registration number
; Registration Number = 20BCD7138
.MODEL SMALL
.STACK 100H
.DATA
.CODE
MAIN PROC
    MOV AH,1
    INT 21H
    MOV DL,AL
    MOV AH,1
    INT 21H
    ADD DL,AL
    SUB DL,48
    MOV AH,2
    INT 21H
    MOV AH,4CH
    INT 21H
    MAIN ENDP
END MAIN
```



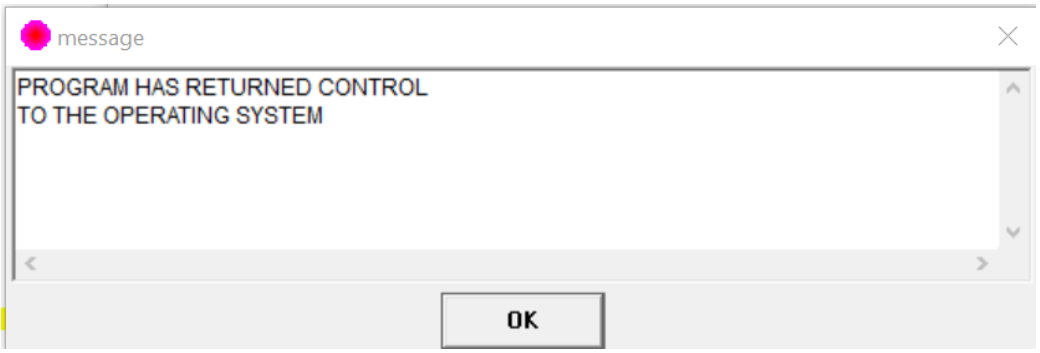


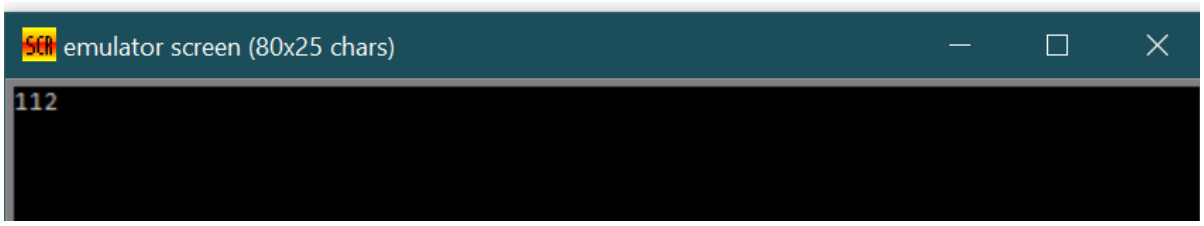
1) When we take first digit 7,
Inputs = 7, 1 & Output = 8



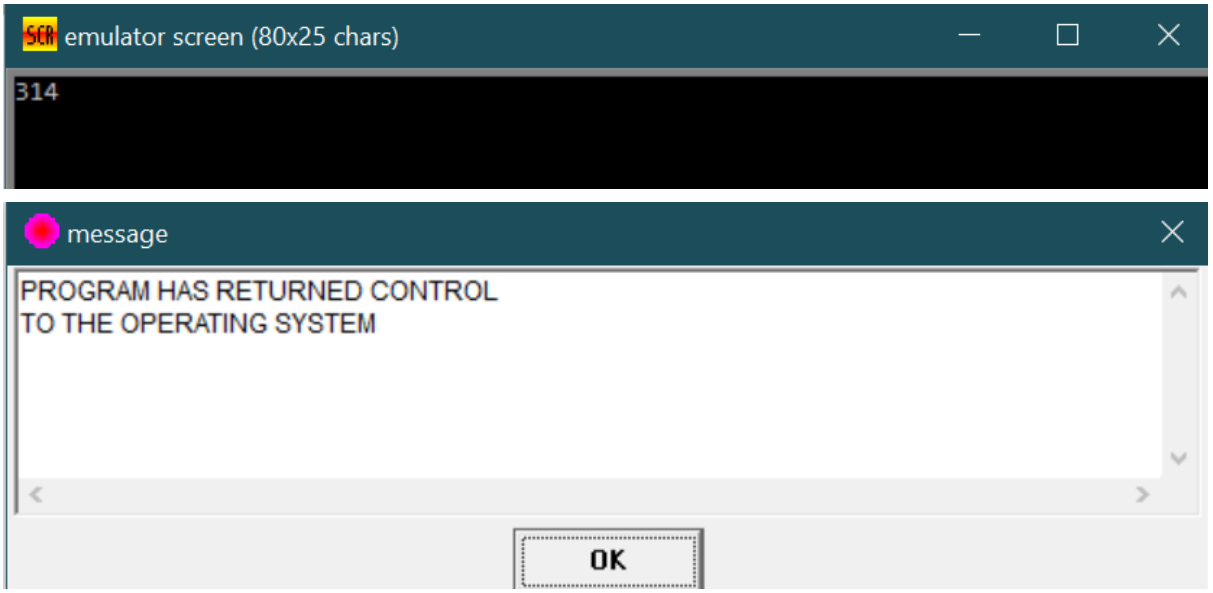


2) When we take second digit 1,
Inputs = 1, 1 & Output = 9





3) When we take third digit 3,
Inputs = 3, 1 & Output = 4



4) When we take fourth digit 8,
Inputs = 8, 1 & Output = 9