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CHENNAI

MICROPROCESSOR AND INTERFACING

Date: 19/02/2021

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Aim:

To find average of 10 numbers stored in an array using 8086 processor by MASM611 assembler.

Tool Used:

Assembler - MASM 611

Algorithm:

In data Segment Define myarray with 10 array elements, SUM and QUO variables

1.Start

2. Move in CX the number of element(10)

3. Move into BX CX's value as a temporary variable to calculate average

4.Clear AX register and set to 0

5. Move into SI the base address of myarr

6. Start Loop

    6.1 Add myarr[SI] into AX register and store into AX

    6.2 Since 16-bit numbers increment SI by 02H

    6.3 Call Loop Again till CX == 0

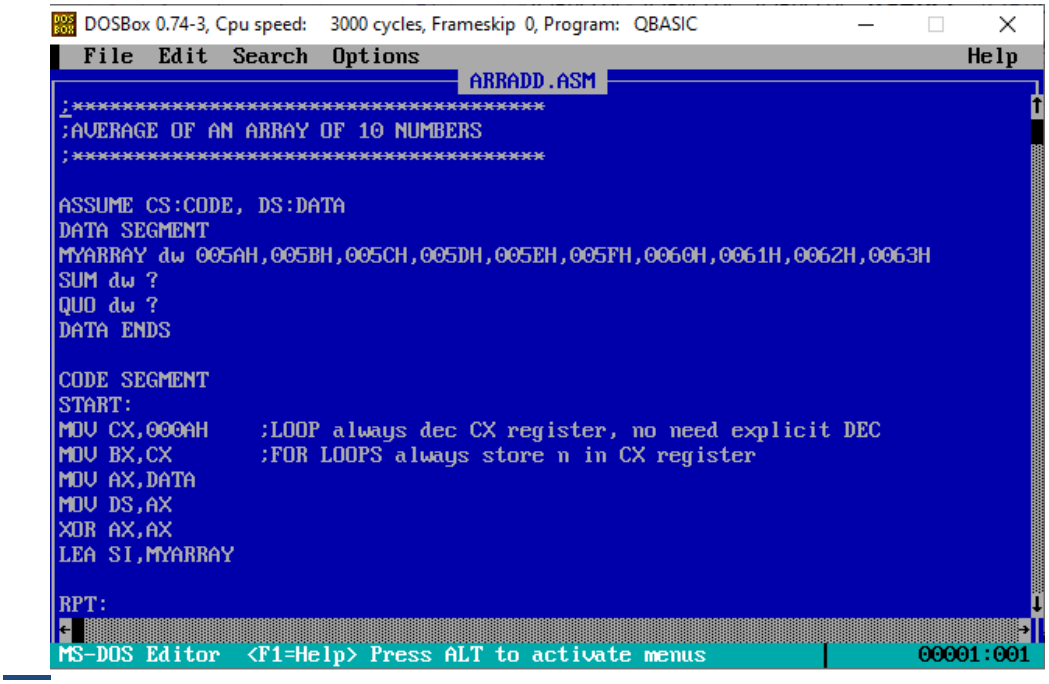
7.Store the sum of array in SUM variable

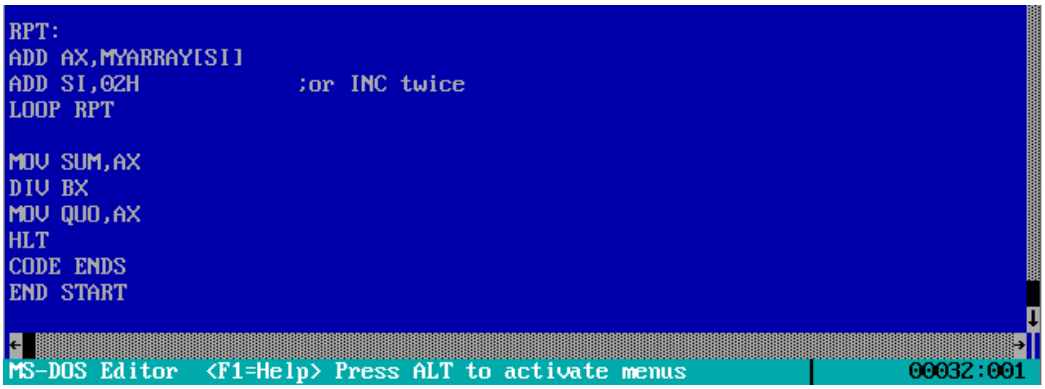
8. Divide AX by BX to find average

9.Store result in QUO

10.HALT

Program:





Sample Input:

Input Array :-

[005AH,005BH,005CH,005DH,005EH,005FH,0060H,0061H,0062H,0063H]

Sample Output:

The sum of the array is : 03B1 H

The Quotient of Average : 005E H

Snapshot of the Output:

```
C:\BIN>debug arradd.exe
-u
0766:0000 B90A00        MOV     CX,000A
0766:0003 8BD9          MOV     BX,CX
0766:0005 B86407        MOV     AX,0764
0766:0008 8ED8          MOV     DS,AX
0766:000A 33C0          XOR     AX,AX
0766:000C 8D360000      LEA     SI,[0000]
0766:0010 03840000      ADD     AX,[SI+0000]
0766:0014 83C602        ADD     SI,+02
0766:0017 E2F7          LOOP    0010
0766:0019 A31400        MOV     [0014],AX
0766:001C F7F3          DIV     BX
0766:001E A31600        MOV     [0016],AX
-u
0766:0021 F4            HLT
0766:0022 741C          JZ      0040
0766:0024 04CE          ADD     AL,CE
```

Register/Memory Contents for I/O

```
-g 0021

AX=005E  BX=000A  CX=0000  DX=0005  SP=0000  BP=0000  SI=0014  DI=0000
DS=0764  ES=0754  SS=0763  CS=0766  IP=0021   NV UP EI PL NZ NA PE NC
0766:0021 F4            HLT
-d 0764:0000 0017
0764:0000  5A 00 5B 00 5C 00 5D 00-5E 00 5F 00 60 00 61 00   Z.[.\.].^._.`.a.
0764:0010  62 00 63 00 B1 03 5E 00                           b.c...^.
-
```

Manual Verification:

Convert Hexadecimal Value to Decimal Value

Result

Decimal value: **945**

Hexadecimal Value: 03b1 = ?

Calculate | Clear

Hexadecimal Calculation—Add, Subtract, Multiply, or Divide

Result

Hex value:
03b1 ÷ 000a = **5E Remainder : 5**

Decimal value:
945 ÷ 10 = **94 Remainder : 5**

Result:

Hence the average of 10 numbers stored in an array has been performed and verified using the MASM611 application in DOSBOX.