

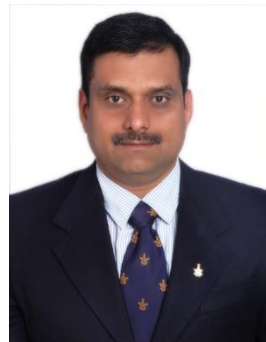


Microprocessors and Interfaces: 2021-22

Lab 5

ALP for Average of N Numbers and Fibonacci Series

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ALPs to be completed

5.1 FIND THE AVERAGE OF N NUMBERS.

5.2 FIND THE FIBONACCI SERIES.

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5.1 Average of N numbers

Objective: To find average of N numbers stored.

Formula:

$$\text{Average} = \frac{\sum_{i=1}^N i}{N}$$

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Pseudocode

```
org 100h
MOV AX,0000H
MOV SI,xxxxH
MOV CX,xxH
MOV DX,xxH

loop: ADD AL,[SI]
      INC SI
      INC DX
      CMP CX,DX
      JNZ loop
      DIV CL
      MOV [xxxxH],AX
      HLT
      ret
```

- Values in decimal:
03, 04, 05, 08
- Result in decimal: 05
- SI register location: 1100H
- Result location: 1200H

Change here to complete the code.

Note: SI register content is the offset relative to DS. Make sure to load the data in appropriate locations prior to execution of the code.

Review Questions

1. What if the accumulator is not initialized to zero ?
2. Does it have any effect on output result if the accumulator is not initialized to zero?
3. Repeat the problem with five numbers of 16-bit data of your choice. What are changes you had made in your code?

5.2 Fibonacci series

Each number is the sum of the two preceding ones, starting from 0 and 1 as depicted below.

Fibonacci series

0, 1, 1, 2, 3, 5, 8, 13, 21.....

Pseudocode

```
org 100h

MOV AX, xxH
MOV SI, yyyyH
MOV [zz], AL
INC zz
ADD AL, 01H
MOV [SI], AL
MOV CX, [600H]
SUB CX, wwwwH
L1: MOV AL, [zz-1]
ADD AL, [SI]
INC zz
MOV [zz], AL
LOOP L1
HLT
```

- ❑ Assume SI location to be 500h.
- ❑ Initialize the AX register to free it from garbage value.

Change here to complete the code.

Review Questions

1. Why is sub instruction used ?
2. What is the replaced number instead of “pp” and why is it so?
3. Which addressing mode is used in this programming?
4. What is the role of LOOP instruction in this ALP?

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- Thankyou

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