

Idea Solution of First assignment of CS 401BY

MASOOM FAIRY

Question No. 1:

Calculate physical address of your AFD window contains CS and IP register (segment offset pairs).

Explain each and every step for calculating the physical address.

Calculation: 4 marks

Explanation: 3 marks

Conclusion: 3 marks

(Calculation)

(Explanation)

(Conclusion)

Solution:

; a program to add three numbers using registers
[org 0x0100]

```
mov ax, 5      ; load first number in ax
mov bx, 10     ; load second number in bx
add ax, bx     ; accumulate sum in ax
mov bx, 15     ; load third number in bx
add ax, bx     ; accumulate sum in ax

mov ax, 0x4c00 ; terminate program
int 0x21
```

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```

cmd - afd test.com

AX 0000 SI 0000 CS 1DE8 IP 0100 Stack +0 0000 Flags 3202
BX 0000 DI 0000 DS 1DE8 +2 20CD
CX 0012 BP 0000 ES 1DE8 HS 1DE8 +4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 1DE8 FS 1DE8 +6 9A00 0 0 1 0 0 0 0 0

CMD >

0100 B80500 MOV AX,0005
0103 B80A00 MOV BX,000A
0106 01D8 ADD AX,BX
0108 B80F00 MOV BX,000F
010B 01D8 ADD AX,BX
010D B8004C MOV AX,4C00
0110 CD21 INT 21
0112 F4 HLT

DS:0000 CD 20 FF 9F 00 9A F0 FE 1D F0 1B 05 86 0A 4B 01
DS:0008 23 04 56 01 23 04 53 05 01 01 01 00 02 FF FF FF
DS:0010 01 01 01 00 02 FF FF FF FF FF FF FF FF FF FF
DS:0018 01 01 01 00 02 FF FF FF FF FF FF FF FF FF FF
DS:0020 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
DS:0028 FF FF FF FF AC 1D C0 11 63 05 14 00 18 00 E8 1D
DS:0030 63 05 14 00 18 00 E8 1D FF FF FF FF 00 00 00 00
DS:0038 FF FF FF FF 00 00 00 00 00 00 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00 00 00 00 00 00 00
DS:0048 00 00 00 00 00 00 00 00 00 00 00 00 00 00

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#.U.#.S. .... %..L.
c.....ö.....
.....

1 Step 2ProcStep 3Retrieve 4Help ON 5BRK Menu 6 7 up 8 dn 9 le 10 ri
    
```

CS: 1DE8

IP: 0100

Segment Address: 1DE80

Offset Address: 00100

Physical Address: 1DF80

NOTE: These calculations are not complete. All students do it by practice.

Question No. 2:

Write a program to add these 8 numbers (15, 20, 25, 30, 35, 40, 45, and 50) with using conditional jump. Explain each instruction of program in your own words.

Solution:

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; a program to add eight numbers
[org 0x0100]

mov bx, 0
mov ax, 0

l1:

add ax, [num1+bx]
add bx, 2
cmp bx, 16
jne l1

mov [total], ax

mov ax, 0x4c00
int 0x21

num1: dw 15, 20, 25, 30, 35, 40, 45, 50
total: dw 0

```
cmd - afd que.com
AX 0000 SI 0000 CS 1DE8 IP 0100 Stack +0 0000 Flags 3202
BX 0000 DI 0000 DS 1DE8 +2 20CD
CX 002E BP 0000 ES 1DE8 HS 1DE8 +4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 1DE8 FS 1DE8 +6 9A00 0 0 1 0 0 0 0 0

CMD >
0100 BB0000 MOV BX,0000
0103 B80000 MOV AX,0000
0106 03871C01 ADD AX,[011C+BX]
010A 81C30200 ADD BX,0002
010E 81FB1000 CMP BX,0010
0112 75F2 JNZ 0106
0114 A32C01 MOV [012C],AX
0117 B8004C MOV AX,4C00
DS:0000 CD 20 FF 9F 00 9A F0 FE 1D F0 1B 05 86 0A 4B 01
DS:0008 23 04 56 01 23 04 53 05 01 01 01 00 02 FF FF FF
DS:0010 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
DS:0018 FF FF FF FF AC 1D C0 11 63 05 14 00 18 00 E8 1D
DS:0020 FF FF FF FF 00 00 00 00 FF FF FF FF 00 00 00 00
DS:0028 05 00 00 00 00 00 00 00 00 00 00 00 00 00
DS:0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00
DS:0038 00 00 00 00 00 00 00 00 00 00 00 00 00 00
DS:0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00
DS:0048

DS:0000 0 1 2 3 4 5 6 7 8 9 A B C D E F = f.ü=  .≡..â.K.
DS:0010 CD 20 FF 9F 00 9A F0 FE 1D F0 1B 05 86 0A 4B 01 #.U.#.S. ....
DS:0020 23 04 56 01 23 04 53 05 01 01 01 00 02 FF FF FF %..L.
DS:0030 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF c.....
DS:0040 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF .....

1 Step 2ProcStep 3Retrieve 4Help ON 5BRK Menu 6 7 up 8 dn 9 le 10 ri
```