**National University of Computer and Emerging Sciences, Lahore Campus**

**Assignment 1 COAL**

**Deadline: 19th Sep 2022 in class (Assignment on paper)**

**Instructions**

∙ Do **NOT** copy even a single line of code from any other person or book or Internet or any other source.

∙ Late submissions will NOT be accepted, in any case.

**Task-1** Write instructions for following tasks. a- Set value of AX to 18AF

b- Set value of BX to 00FF

c- Add AX and BX and Keep result in BX

d- Swap the contents of AX and BX

e- Move 3487 into DX

f- Subtract BX from DX and keep result in CX

g- Now record value of AX, BX, CX and DX.

Values should be AX=19AE, BX=18AF, CX=1BD8, DX=3487

**Solution**

[org 0x0100]

mov ax, 18AFh

mov bx, 00FFh

;add ax, bx

add bx, ax

mov dx, bx

mov bx, ax

mov ax, dx

mov dx, 3487h

sub dx, bx

mov cx, dx

mov dx, 3487h

mov ax,0x4c00

int 0x21

**Task-2** Write instruction for following

a- Set AX to 2

b- Increase value of AX five times

c- Set CX to 4

d- Increase the value of CX value two times

e- Subtract CX from AX

f- Set BX to 13AF

g- Move the contents of AX to memory location pointed by BX

**Solution**

[org 0x0100]

mov ax, 2h

add ax, 8

mov cx, 4

add cx, 4

sub ax, cx

mov bx, 13AFh

mov [bx],ax

mov ax,

0x4c00

int 0x21

**Task-3** Consider the two segments, named as Segment ‘A’ and Segment ‘B’ in a memory Layout. If segment A begins at address 000C:0000 and ends at address 000C:FFFF, similarly the second segment B begins at address 000E:0000 and ends at address 000E:FFFF.Calculate the common number of locations between these two overlapping segments?

**Task-4** What should be the size of address (in bits) to access a memory of 128 Mega Bytes?

1 mb = 1024 kb

1024 kb = 1024 bytes

1 mb= 1024\*1024

128 mb = 128(1024\*1024)bytes

128 mb = 134217728 bytes

No of bits of address

log 2^n = log(128 × 1024 × 1024)

n log 2 = log(128 × 1024 × 1024)

n = log(128 × 1024 × 1024) / log 2

n = 27 bits

**Task-5** A memory location has physical address 80A32 .In what segment does it have Offset BA32?

Physical address = Segment \* 10h + Offset

Segment \* 10h = Physical address - Offset

Segment = Physical address - Offset / 10h

80A32 - BA32 = 75000

Segment = 75000 / 10

Segment = 7500h

**Task-6** After the execution of the following instructions, what will be the new value of IP? 

Next value of IP will be 000A. As BA0000 is of 3 bytes so by adding 3 in 0007 we get 000A.

**Task-7** For the following instructions, Give the destination contents and the new settings of Carry, Overflow, Sign and Zero Flags. (Suppose that initially all flags are reset)

a) ADD AX, BX where

AX =7132 BX =7000

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AX | Carry | Overflow | Sign | Zero |
| 3734 | 0 | 0 | 0 | 0 |

b) SUB CX, DX where

CX = 8BCD DX =71AB

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CX | Carry | Overflow | Sign | Zero |
| 1A22 | 0 | 1 | 0 | 0 |

c) ADD AX, DX where

AX = 3456 DX =ABCD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AX | Carry | Overflow | Sign | Zero |
| E023 | 0 | 0 | 1 | 0 |

☺ **GOOD LUCK!** ☺

*Remember: Honesty always gives fruit (no matter how frightening is the consequence); and Dishonesty is always harmful (no matter how helping it may seem in a certain situation)!*