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FACULTY OF INFORMATION TECHNOLOGY

Computer Organization and Assembly Language

Lab 3				
	1. Addressing Modes with variations.			
Topic	2. Declare variables.			
	3. Signed Numbers			

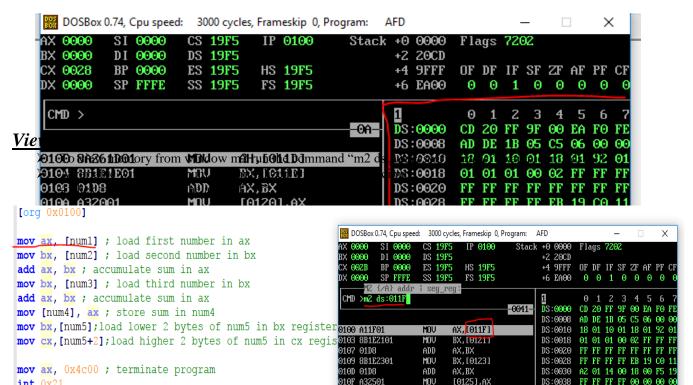
Types of variables

Type		No. of bits	Example declaration:
Byte		8	Num1: db 43
Word=>	2 bytes	16	Num2: dw 0xABFF
double word=> 2 words		32	Num3: dd 0xABCDEF56

Viewing memory in DOSBOX

Areas highlighted in red(memory 1) "m1" and blue (memory 2) "m2" are showing the memory contents. *Note:* Two copies of the same memory is displayed in the given window.

Area highlighted with yellow is showing the ascii values of the contents displayed in the memory m2.



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Add Comment in code:

```
Use; to start comment
[org 0x100]
mov al, [num1]
mov bh, [Num1]
add ax,bx

mov dx, [mynum]; when using dw variables use a 16-bit register.

add cx,dx

mov ax,0x4c00
int 21h

num1: db 01100001b; b is for binary
Num1: db 97; decimal by default, case sensitive names of variables num2: db 0x61; 0x treats it as a hexadecimal number mynum: dw 6100h; h at the end treats it as a hexadecimal number temp: dw 0xABCD; when using characters as a hex values, use 0x
```

or open your code in notepad++ select the code you want to comment/uncomment press ctrl+Q



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Example 1:

[org 0x100]

mov al,9

mov bl,5

add al,bl

mov cl,-10

mov dl,11

add cl,dl

add al,cl

mov ax,0x4c00

int 21h

Example 2:

[org 0x100]

mov ax,75

mov bx,517

add al,bh

mov cl,200

mov dl,56

add cl,dl; why we are getting 0 after addition?

mov ax,0x4c00

int 21h

Example 3:

[org 0x100]

mov ax,75

mov bx,517

add al,bh

mov cl,200

mov dl,56



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add cl,dl; why we are getting 0 after addition?

mov ax,0x4c00 int 21h

Example 4: [org 0x100] mov al,[num1] mov bh,[Num1] add ax,bx

mov cl,[num2] mov dx,[mynum] ;when using dw variables use a 16-bit register.

add cx,dx

mov ax,0x4c00 int 21h

num1: db 01100001b; b is for binary

Num1: db 97; decimal by default, case sensitive names of variables

num2: db 0x61; 0x treats it as a hexadecimal number

mynum: dw 6100h; h at the end treats it as a hexadecimal number temp: dw 0xABCD ; when using characters as a hex values, use 0x

;uncomment the following line and then assemble again



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; temp2: dw EFh ;why dosbox is showing error on this line???

Q1: Write a program to solve the following:

Use any addressing mode to access memory variables:

Let

A = 150

B = 30

C=20

I.Save the sum of these three variables (A+B+C) in ax.

II.Save the result (A-C) in cx.

III.subtract (ah-cl) and save the result in dh.

NOTE: Execute the code in sequence.



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Q2: Write a program to solve the following using the address of variable 'B':

Use direct addressing mode to access memory variables:

Let

A = 150

B = 30

C = 90

I.Save the sum of these three variables (A+B+C) in ax.

II.Save the result (A-C) in cx.

III.subtract (ah-cl) and save the result in dh.

NOTE: Execute the code in sequence.

Hint: for reference see Question 1 (b) of Part 1

Q3: Write a program to solve the following using the address of variable 'Num3':

Use indirect addressing mode to access memory variables:

Let

Num1: db 10 Num2: db 30h

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Num3: db 0x90 Num4: db 0x1A Num5: db 29

I.Save the sum of these five variables (Num1+Num2+Num3+Num4+Num5) in ax.

II.Save the result (Num2-Num5) in cx.

III.Subtract (cl-ah) and save the result in dl.

Q4: Write a program to solve the following equations:

Assume these variables:

a: db 01110111b

b: db 85

c: dw 280

d: db 67h

e: db 0x42

f: db 0xE4

g: dw 0x1A3C

- 1. g=(a+b)-c; save the result back in variable g
- 2. b=c+f; when saving the result if value exceeds the size of variable you can ignore higher byte
- 3. d=e-g; when saving the result if value exceeds the size of variable you can ignore higher byte

4. c = d + b

5. e=a+g

Note: Execute the code in sequence.



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Hint: Observe Q1(g) of Part 1.