***Lab 02***

Execute every part of Question 1 in emu8086 and observe the memory variables and register values.

Q1.

1. Create a simple variable Byte and word type

jmp start:

var1 db 10 ;Create a variable name var1 of BYTE size in memory means 8 bit and store 10 decimal

var2 dw 20 ;Create a variable name var2 of WORD size in memory means 16 bit and store 20 decimal

var3 dw 20h ;var3 of WORD size and store 20H

var4 dw 10 ;var4 of WORD size and store 20H

start:

MOV ah,var1 ;copy var1 into AH

MOV bx,var2 ;copy var2 into BX

add ax,bx ;add BX into AX

MOV var3,ax ;copy AX into var3

MOV cx,var4 ;copy var4 into CX

.exit

1. Copy this code and observe what’s wrong with that and correct it.

jmp start:

var1 db 10

var2 dw 20

var3 dw 20h

var4 dw 10

start:

MOV ax,var1

MOV bx,var2

add ax,bx

MOV var3,ax

MOV cx,var4

.exit

1. Direct addressing of variables by using the address of only one variable

jmp start:

u db 4

v db 5

w db 7

start:

mov bl,[v]

add bl,[v-1]

add bl,[v+1]

1. Indirect accessing of memory of byte size

jmp start:

var1 db 10,

var2 db 55h

var3 db 13

start:

lea bx, var1

mov al,[bx]

mov cl,[bx+1]

mov ch,[bx+2]

sub ch,cl

1. Indirect accessing of Word size

jmp start:

var1 dw 10

var2 dw 20h

var3 dw 13

start:

lea bx, var1

mov ax,[bx]

mov cx,[bx+2]

mov dx,[bx+4]

.exit

1. Reading and writing in memory through indirect memory address.

jmp start:

var1 dw 60

var2 db 5

var3 dw 100

start:

lea bx, var1

mov ax,[bx]

mov cx,[bx+2]

add ax,cx

mov [bx],ax

mov [bx+2],0x0h

mov dx,[bx+3]

add dx,var3

mov [bx+3],dx

.exit

g) Calculate the sum of variables using Indirect addressing mode and store in DX.

jmp start

Var1 db 8

Var2 dw 16

Var3 db 20

Var4 dw 34

Var5 dd 6578h

Var6 db 42h

start:

mov dx,0

lea bx,var1

add dl,[bx] ;8

add dx,[bx+1];16

add dl,[bx+3];20

add dx,[bx+4];34

add dx,[bx+6];6578h

mov cx,0

mov cl,[bx+10];42h

add dx,cx

.exit

Graded Tasks:

1. Write a program that 5 variables of byte size in memory with following values 10, 20,30,40,50.

A=10

B=20

C=30

D=40

E=50

Now solve this expression. Use only two 8-bit registers (AH,AL)

C= (A+B-C) + (E+(A-D)) + (D-E) + (C+B)

1. Write a program to create 5 word type variables of your choice. Use the address of centre variable and do the following:

Let v1,v2,v3,v4,v5

1. The sum of fourth and last variable should be stored in second variable.

V2=(v4+v5);

1. Sum of third and first variable should be subtracted from second variable and store the result in third.

V3=V2-(v3+v1)

1. Write a program to calculate the sum of two 32-bit values using registers (max 16-bit) or variables(32-bit).

Let:

Var1 dd 23456834h

Var2 dd 11112222h

Var3 dd ?

1. Write a program to calculate the sum of these variables using Indirect addressing mode with address of var1 only.

***Hint: lea bx,var1***

Var1 dw 80

Var2 db 0xFF

Var3 dw 0x89AA

Var4 dw 0x66EF

Var5 db 0xFF

Var6 db 0x78