



Coal

LAB TASK 3

NAME SAJID ISLAM

ROLLNO 24p-0745 INSTRUCTOR Muhammad Hassan

Question 1

```
[org 0x0100]

mov al, [score]
mov bx, [population]
mov cl, [initial]
mov dl, [numbers]
mov dl, [numbers+1]
mov dl, [numbers+2]
mov dl, [numbers+3]

mov ax, 0x4c00
int 0x21

score: db 100
population: dw 2500h
initial: db 'F'
numbers: db 10,20,30,40
```

A byte variable **score** is initialized to 100 and loaded into AL (8-bit register).

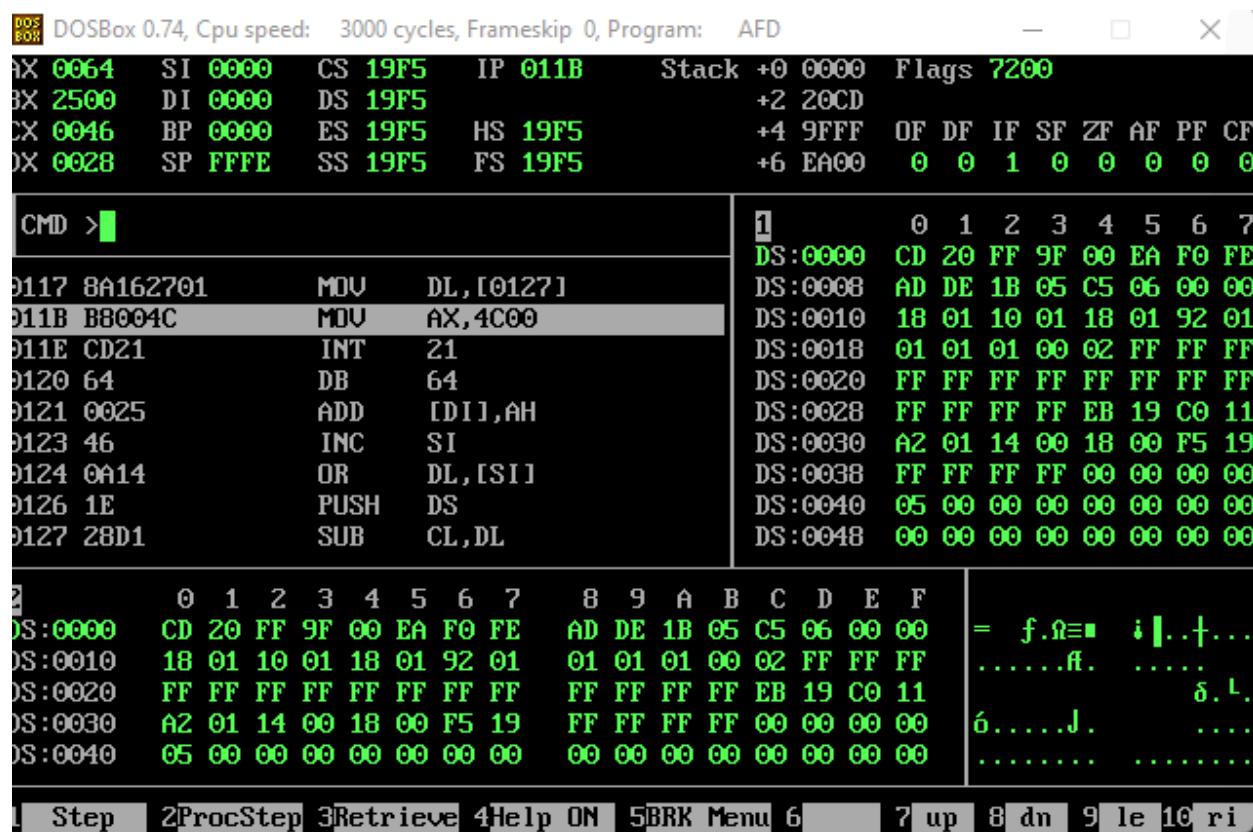
A word variable **population** is set to 2500h (or 9472 decimal) and stored in BX (16-bit register).

A byte variable **initial** is assigned the character 'F' (ASCII 0x46) and moved into CL.

A 4-byte array **numbers** is defined with values 10, 20, 30, 40, each sequentially loaded into DL.

Variable	Type	Size	Value Stored	Memory Rep
Score	Byte	1	100(Decimal)	64h
population	Word	2	2500h(hex)	00h,25h,(little endian)
Initial	Byte	1	'F' (ASCII =70d)	46h
Numbers	Byte	4	10,20,30,40	0Ah, 14h,1EH,28h

ScreenShot of DOS



Question 2

```
ASM Q1.asm X ASM Q2.asm ASM Q3.asm ASM Q4.asm

ASM Q1.asm
1 [org 0x0100]
2
3 mov bl, [score]
4 mov cx, [population]
5 mov dh, [initial]
6 mov [population], ax
7 mov [score], cl
8
9 mov ax, 0x4c00
10 int 0x21
11
12 score: db 100 ; 1 byte (decimal 100)
13 population: dw 02500h ; 2 bytes (hexadecimal 2500h)
14 initial: db 'F' ; 1 byte (ASCII for 'F' = 46h)
15 numbers: db 10 20 30 40 ; 4 bytes (array of 4 elements)
16
```

1→ Copy the value of score into the BL register.

AX 0000	SI 0000	CS 19F5	IP 0104	Stack +0 0000	Flags 7200
BX 0064	DI 0000	DS 19F5		+2 20CD	
CX 0023	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 0000	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 0 0 0

2→ Copy the value of population into the CX register.

CX 2500	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 0000	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 0 0 0

3→ Copy the value of the initial into the DH register

CX 2500	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 4600	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 0 0 0

4 → Copy the value from the AX register into the population variable.

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD
AX 1234  SI 0000  CS 19F5  IP 010F      Stack +0 0000  Flags 7200
BX 0064  DI 0000  DS 19F5
CX 2500  BP 0000  ES 19F5  HS 19F5
DX 4600  SP FFFE  SS 19F5  FS 19F5
+2 20CD
+4 9FFF  OF DF IF SF ZF AF PF CF
+6 EA00  0 0 1 0 0 0 0 0 0 0 0 0
```

5→ Copy the value from the CL register into the score variable.

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD
AX 1234  SI 0000  CS 19F5  IP 0112      Stack +0 0000  Flags 7200
BX 0064  DI 0000  DS 19F5
CX 2500  BP 0000  ES 19F5  HS 19F5
DX 4600  SP FFFE  SS 19F5  FS 19F5
+2 20CD
+4 9FFF  OF DF IF SF ZF AF PF CF
+6 EA00  0 0 1 0 0 0 0 0 0 0 0 0

S or SI or SYM
CMD >S
```

010F	A31C01	MOV	[011C],AX												
0112	880E1B01	MOV	[011B],CL												
0116	B8004C	MOV	AX,4C00												
0119	CD21	INT	21												
011B	64	DB	64												
011C	3412	XOR	AL,12												
011E	46	INC	SI												
011F	0A14	OR	DL,[SI]												
0121	1E	PUSH	DS												

1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
DS:0000	CD	20	FF	9F	00	EA	F0	FE	AD	DE	1B	05	C5	06	00	00
DS:0010	18	01	10	01	18	01	92	01	01	01	01	00	02	FF	FF	FF
DS:0020	FF	EB	19	C0	11											
DS:0030	A2	01	14	00	18	00	F5	19	FF	FF	FF	FF	00	00	00	00
DS:0040	05	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Question 3

```
1 [org 0x0100]
2
3 start:
4     mov al, [num]
5
6     mov ax, 0x4C00
7     int 0x21
8
9 ; --- Data Section ---
10 num: dw 1234h
11
```

We are trying to put the 16 bits data into 8 bits as al hav 8 bits size while dw has 16 bits size so this is a size mis match error

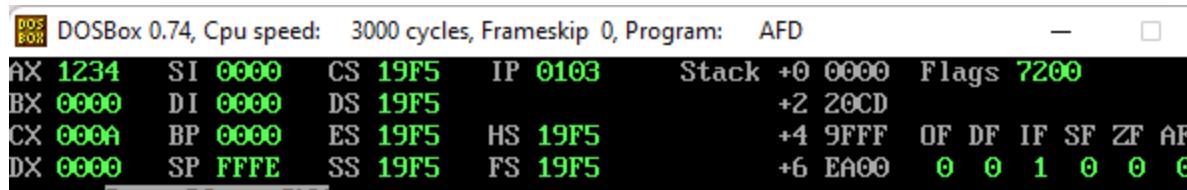
Z80 CPU Registers							
AX 0034	SI 0000	CS 19F5	IP 0103	Stack +0 0000	Flags 7200		
BX 0000	DI 0000	DS 19F5		+2 20CD			
CX 000A	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PE		
DX 0000	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 0 0		

Half of value has copied to register but full value is not there as shown

Corrected code

```
1 [org 0x0100]
2
3 start:
4     mov ax, [num]
5
6
7     mov ax, 0x4C00
8     int 0x21
9
10
11 num: dw 1234h
12
```

It will not give us logical errors because sizes of both are compatible with each other.



DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD

	AX	SI	CS	IP	Stack	Flags
	1234	0000	19F5	0103	+0 0000	7200
	BX	0000	DI	0000	+2 20CD	
	CX	000A	DS	19F5	+4 9FFF	OF DF IF SF ZF AF
	DX	0000	BP	0000	+6 EA00	0 0 1 0 0 0
		SP	FFE	SS 19F5		

The whole value has been copied to register Ax

Question 4

```
1 | mov [var1], 99h ; mov ax, 0099h
2 |
3 | mov ax, [var2]      ; [correct code] mov al, [var2] load single byte into AL
4 | mov bl, var1        ; [correct code] mov bx ,[var1] load the 1 byte into the bl
5 |
6 |
7 | var1 dw 1234h
8 | var2 db 12h
```

In the first line we have added the 8 bits to al while the error was that we were assigning the 1 byte data to 2 byte which was causing mismatch error

In the second line the error was also the mismatch we were assigning the the 16 bits data to 8 bits of register which we have fixed and save the data 16 bits