



Coal

LAB TASK 6

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Question 1

Code

```
[org 0x0100]

    mov ax, 8      ; Put first number in AX
    mov bx, 12     ; Put second number in BX

    cmp ax, bx     ; Check if both numbers are the same
    je matches      ; Jump if both values match

    mov word [num], 0 ; Values don't match - save 0
    jmp done        ; Skip to the end

matches:
    mov word [num], 1 ; Values match - save 1

done:
    mov ax, 0x4c00
    int 0x21

num: dw 0
```

output

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

AX 0008	SI 0000	CS 19F5	IP 0119	Stack +0 0000	Flags 7295
BX 000C	DI 0000	DS 19F5		+2 20CD	
CX 0020	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CI
DX 0000	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 1 0 1 1 1

S or SI or SYM

CMD >S

0110 E90600	JMP 0119	1 DS:0000 CD 20 FF 9F 00 EA F0 FE
0119 B8004C	MOV AX,4000	DS:0008 AD DE 1B 05 C5 06 00 00
011C CD21	INT 21	DS:0010 18 01 10 01 18 01 92 01
011E 0000	ADD [BX+SI],AL	DS:0018 01 01 01 00 02 FF FF FF
0120 F60000	TEST [BX+SI],00	DS:0020 FF FF FF FF FF FF FF FF
0123 8B46F6	MOV AX,[BP-0A]	DS:0028 FF FF FF FF EB 19 C0 11
0126 D1E0	SHL AX,1	DS:0030 A2 01 14 00 18 00 F5 19
0128 D1E0	SHL AX,1	DS:0038 FF FF FF FF 00 00 00 00
012A C55ED8	LDS BX,[BP-28]	DS:0040 05 00 00 00 00 00 00 00
		DS:0048 00 00 00 00 00 00 00 00

2 DS:0000 CD 20 FF 9F 00 EA F0 FE	A DS:0010 18 01 10 01 18 01 92 01	B DS:0020 FF FF FF FF FF FF FF FF	C DS:0030 A2 01 14 00 18 00 F5 19	D DS:0040 05 00 00 00 00 00 00 00	E DS:0048 00 00 00 00 00 00 00 00	F DS:0050 = f. R≡■ i . . + ..
DS:0008 AD DE 1B 05 C5 06 00 00	DS:0018 01 01 01 00 02 FF FF FF	DS:0028 FF FF FF FF EB 19 C0 11	DS:0038 FF FF FF FF 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00	DS:0050 = f. R≡■ i . . + ..	
DS:0010 01 01 01 00 02 FF FF FF	DS:0020 FF FF FF FF EB 19 C0 11	DS:0030 A2 01 14 00 18 00 F5 19	DS:0040 05 00 00 00 00 00 00 00	DS:0050R.	DS:0052J.	
DS:0020 FF FF FF FF FF FF FF FF	DS:0030 A2 01 14 00 18 00 F5 19	DS:0040 05 00 00 00 00 00 00 00	DS:0050J.	DS:0052	DS:0054	
DS:0030 A2 01 14 00 18 00 F5 19	DS:0040 05 00 00 00 00 00 00 00	DS:0050	DS:0052	DS:0054	DS:0056	

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

Question 2

Code

```
[org 0x0100]

    mov bx, 7      ; Put test value in BX

    test bx, bx   ; Check value by ANDing with itself
    ; Sets zero flag if BX = 0
    ; Sets sign flag based on bit 15

    jz is_zero    ; Jump if value equals zero
    jns is_positive ; Jump if value is non-negative (positive)

    mov word [neg_result], bx ; Store negative value
    jmp complete

is_positive:
    mov word [pos_result], bx ; Store positive value
    jmp complete

is_zero:
    mov word [zero_result], bx ; Store zero value

complete:
    mov ax, 0x4c00
    int 0x21

zero_result: dw 0      ; Memory for zero case
pos_result: dw 0       ; Memory for positive case
neg_result: dw 0       ; Memory for negative case
```

Output

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

AX 0000 SI 0000 CS 19F5 IP 011B	Stack +0 0000 Flags 7200
BX 0007 DI 0000 DS 19F5	+2 20CD
CX 0026 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

S or SI or SYM

CMD >S

0114 E90400 JMP 011B	DS:0000 CD 20 FF 9F 00 EA F0 FE
011B B8004C MOV AX,4C00	DS:0008 AD DE 1B 05 C5 06 00 00
011E CD21 INT 21	DS:0010 18 01 10 01 18 01 92 01
0120 0000 ADD [BX+SI],AL	DS:0018 01 01 01 00 02 FF FF FF
0122 07 POP ES	DS:0020 FF FF FF FF FF FF FF FF
0123 0000 ADD [BX+SI],AL	DS:0028 FF FF FF FF EB 19 C0 11
0125 00D1 ADD CL,DL	DS:0030 A2 01 14 00 18 00 F5 19
0127 E0D1 LOOPNZ 00FA	DS:0038 FF FF FF FF 00 00 00 00
0129 E0C5 LOOPNZ 00F0	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

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	= f.Ω≡■ i ..+...
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF	DS:0018 01 01 01 00 02 FF FF FFff.
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	DS:0028 FF FF FF FF EB 19 C0 11	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	DS:0038 FF FF FF FF 00 00 00 00	6.....J.
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00

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

Question 3

Code

```

org 0x0100

    mov dx, 5      ; Initialize counter with starting value 5

countdown:
    dec dx        ; Reduce counter by 1
    cmp dx, 1      ; Check if counter reached 1
    jnz countdown ; Continue looping if not yet at 1

    mov ax, 0x4c00
    int 0x21

```

Output

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

AX 0000	SI 0000	CS 19F5	IP 0103	Stack +0 0000	Flags 7204		
BX 0000	DI 0000	DS 19F5		+2 20CD			
CX 000F	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF		
DX 0004	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 0 1 0		
S or SI or SYM							
CMD >S							
0108 75F9	JNZ	0103		1 0 1 2 3 4 5 6 7			
0103 4A	DEC	DX		DS:0000 CD 20 FF 9F 00 EA F0 FE			
0104 81FA0100	CMP	DX,0001		DS:0008 AD DE 1B 05 C5 06 00 00			
0108 75F9	JNZ	0103		DS:0010 18 01 10 01 18 01 92 01			
010A B8004C	MOV	AX,4C00		DS:0018 01 01 01 00 02 FF FF FF			
010D CD21	INT	21		DS:0020 FF FF FF FF FF FF FF FF			
010F D089DAEB	ROR	B/[EBDA+BX+DI],1		DS:0028 FF FF FF FF EB 19 C0 11			
0113 0431	ADD	AL,31		DS:0030 A2 01 14 00 18 00 F5 19			
0115 D2	DB	D2		DS:0038 FF FF FF FF 00 00 00 00			
				DS:0040 05 00 00 00 00 00 00 00			
				DS:0048 00 00 00 00 00 00 00 00			
2 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		= f.Ω≡■	↓ . + . .			
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF	ft.			
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11			δ. L.			
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00		6.....J.			
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00				

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