COAL-LAB02

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I22-1609

Introduction

This report is written as an explanation of code/steps done in COAL-LAB#2. There were a total of 9 tasks described in the manual to code and then make a document with the right explanation of the code to ensure that the students did the tasks themselves and got the understanding of the code.

The nine tasks were:

1. Write an assembly language program to print Hello World using mov ah,02 service routine.
2. Write an Assembly program to Input Characters from the user and display it.
3. Take a number and print the next number
4. Take a number and print the previous number
5. Write an Assembly program to Input a Lower Case letter from the user and display its upper case. (Subtract 32 in ASCII)
6. Write an Assembly program to Input an Upper-case letter from the user and display it's lower case. (ADD 32 from ASCII)
7. Write an Assembly program to input a letter from the user and display the next Character.
8. Write an assembly language program to ADD two values.
9. Write an assembly language program to subtract two values.

Common Code

First of all in every code we use the following commands to tell the CPU exactly how much memory and stack we will be using and other types of commands that we use in asm files.

.model small: This tells the CPU how much memory our data and code directives will use.

The small directive tells that our data and code directive will use a total of 64kb of memory.

.data: We use this directive to store the data or variables that we are going to use in our code.

.code: After this directive we code our program and functions that will do our calculations.

main proc: This tells the assembler that our main code starts from here.

mov ah,2: This command is used to insert/move 2 in the ***ah*** register. 2 is used to print the value.

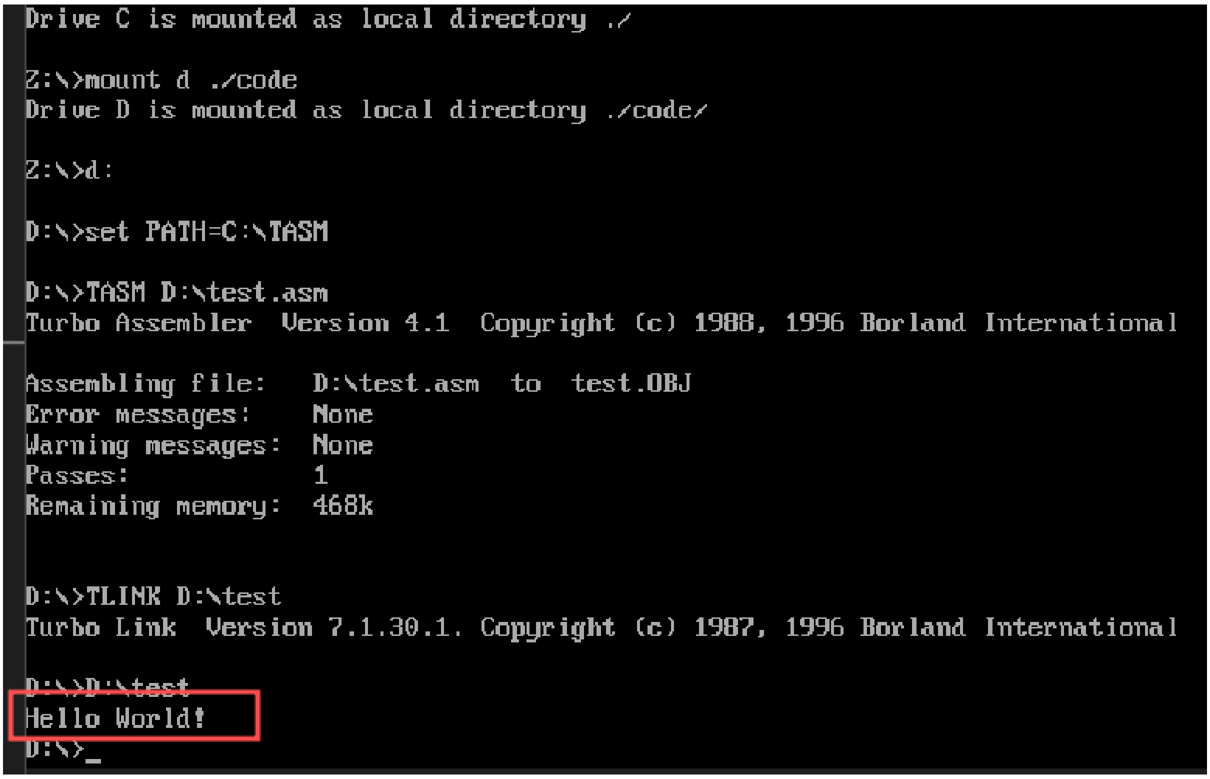
Int 21h: This is an interrupt that interrupts the CPU to call whatever command is in ah register.

So, when the CPU is interrupted and mov ah,2 is called, it prints the value in ***dl*** register on the screen.

mov ah, 4ch: This is used to move ***4ch*** into the ah register which is a command when int 21h is called the main program is terminated.

Task#1

The assembly code file of task#1 is provided in the same zip file as this document.

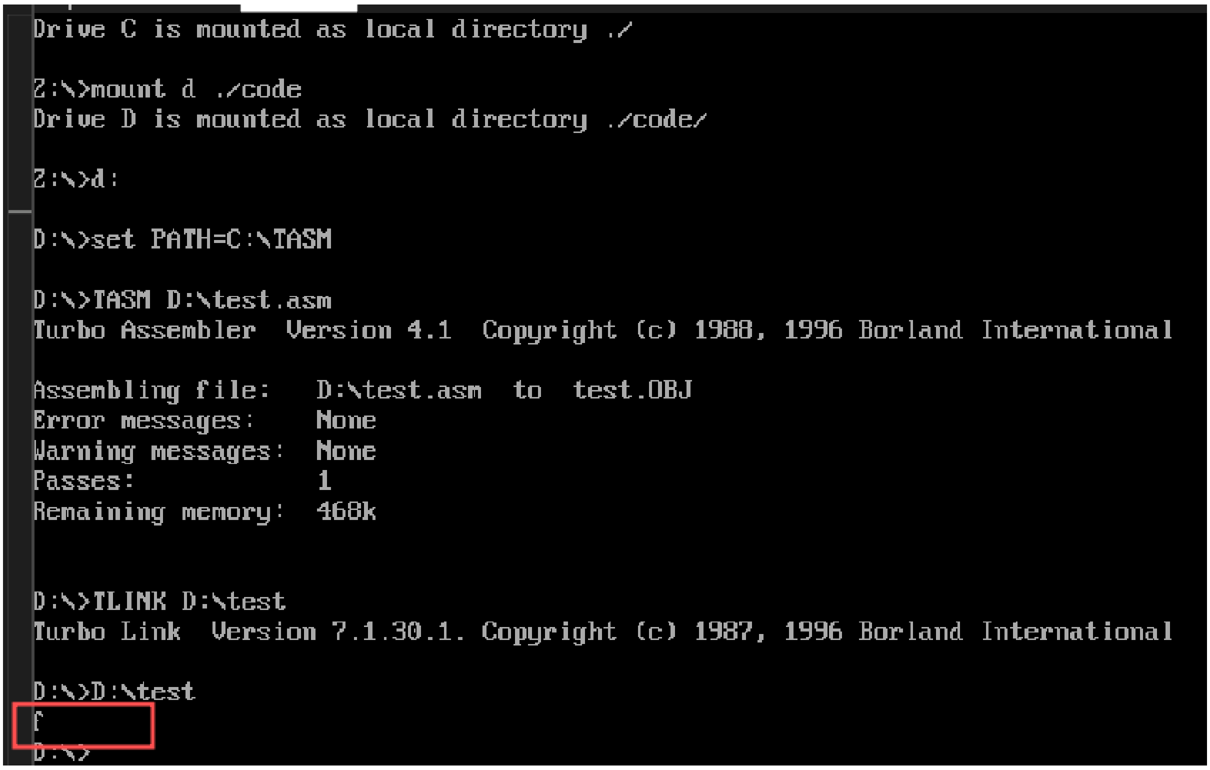


```
Drive C is mounted as local directory ./

Z:\>mount d ./code
Drive D is mounted as local directory ./code/

Z:\>d:

D:\>set PATH=C:\TASM

D:\>TASM D:\test.asm
Turbo Assembler  Version 4.1  Copyright (c) 1988, 1996 Borland International

Assembling file:   D:\test.asm  to  test.OBJ
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  468k


D:\>TLINK D:\test
Turbo Link  Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

D:\>D:\test
Hello World!
D:\>_
```

The Two commands that I used to print the whole “Hello World!” string are:

1. mov dl, ‘Desired Character’
2. mov ah,2
3. int 21h

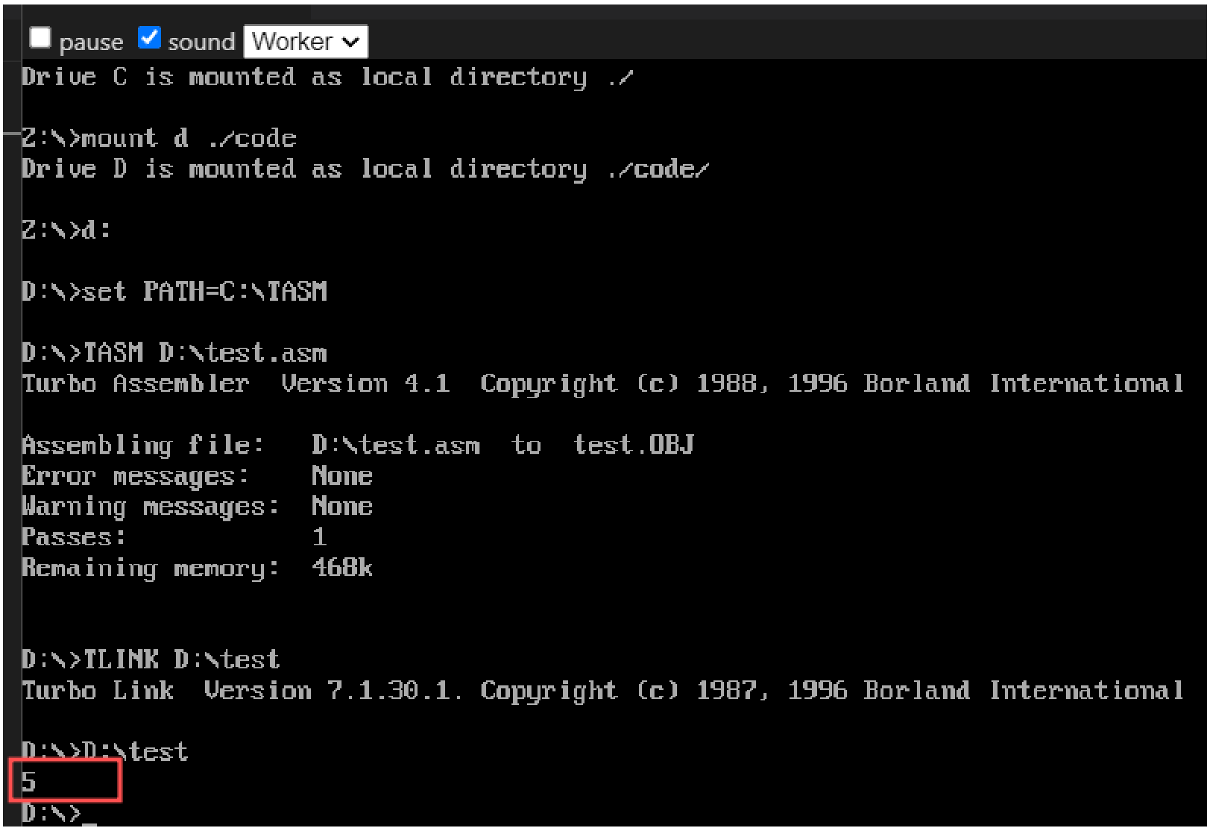
Task#2



```
Drive C is mounted as local directory ./

Z:\>mount d ./code
Drive D is mounted as local directory ./code/

Z:\>d:

D:\>set PATH=C:\TASM

D:\>TASM D:\test.asm
Turbo Assembler  Version 4.1  Copyright (c) 1988, 1996 Borland International

Assembling file:   D:\test.asm  to  test.OBJ
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  468k


D:\>TLINK D:\test
Turbo Link  Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

D:\>D:\test
f
D:\>
```

In this task, we use mov ah,01 to print the character at the same time we take as input.

Task#3 & 4

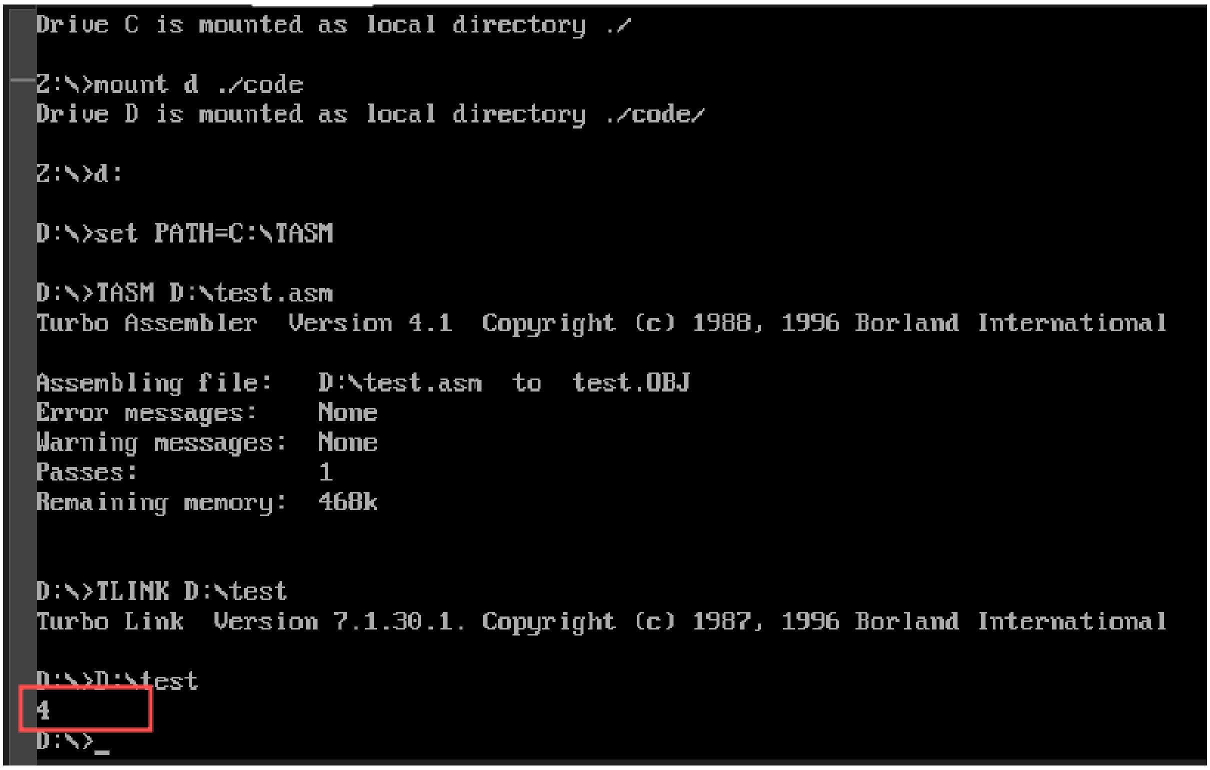


☐ pause ☑ sound Worker

```
Drive C is mounted as local directory ./

Z:\>mount d ./code
Drive D is mounted as local directory ./code/

Z:\>d:

D:\>set PATH=C:\TASM

D:\>TASM D:\test.asm
Turbo Assembler  Version 4.1  Copyright (c) 1988, 1996 Borland International

Assembling file:   D:\test.asm  to  test.OBJ
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  468k


D:\>TLINK D:\test
Turbo Link  Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

D:\>D:\test
5
D:\>_
```

This is the screenshot of task#3 where after running the command mov dl, al which copies the value of al to dl register we run the command inc dl which increments the value in dl and then prints it.

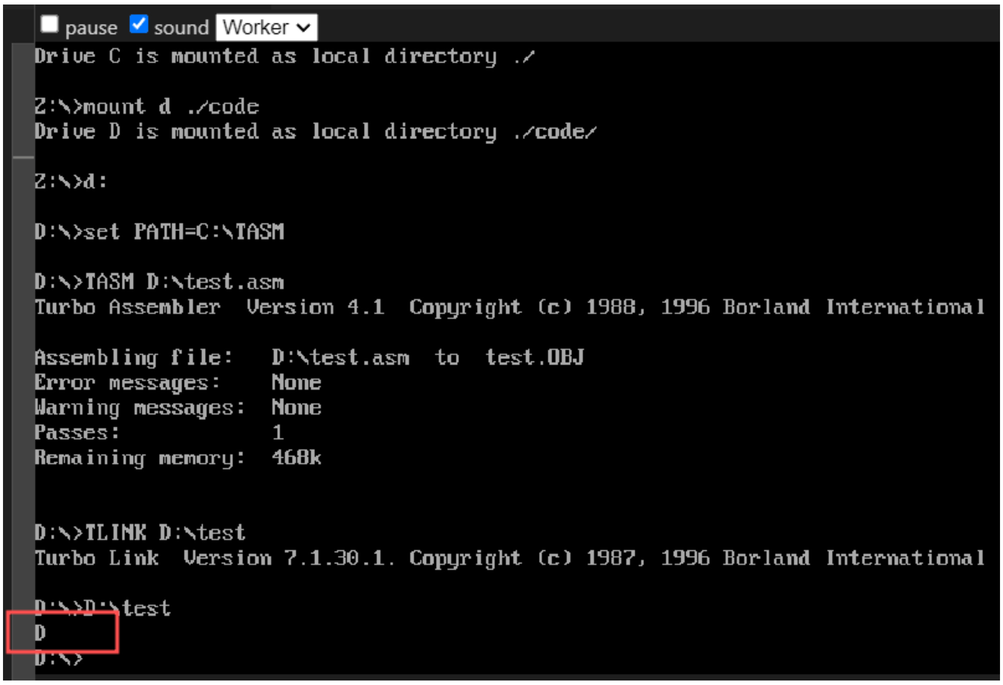
In Task#4 we just replaced **inc dl** with **dec dl** to decrements the value in dl.



```
Drive C is mounted as local directory ./

Z:\>mount d ./code
Drive D is mounted as local directory ./code/

Z:\>d:

D:\>set PATH=C:\TASM

D:\>TASM D:\test.asm
Turbo Assembler  Version 4.1  Copyright (c) 1988, 1996 Borland International

Assembling file:   D:\test.asm  to  test.OBJ
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  468k


D:\>TLINK D:\test
Turbo Link  Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

D:\>D:\test
4
D:\>_
```

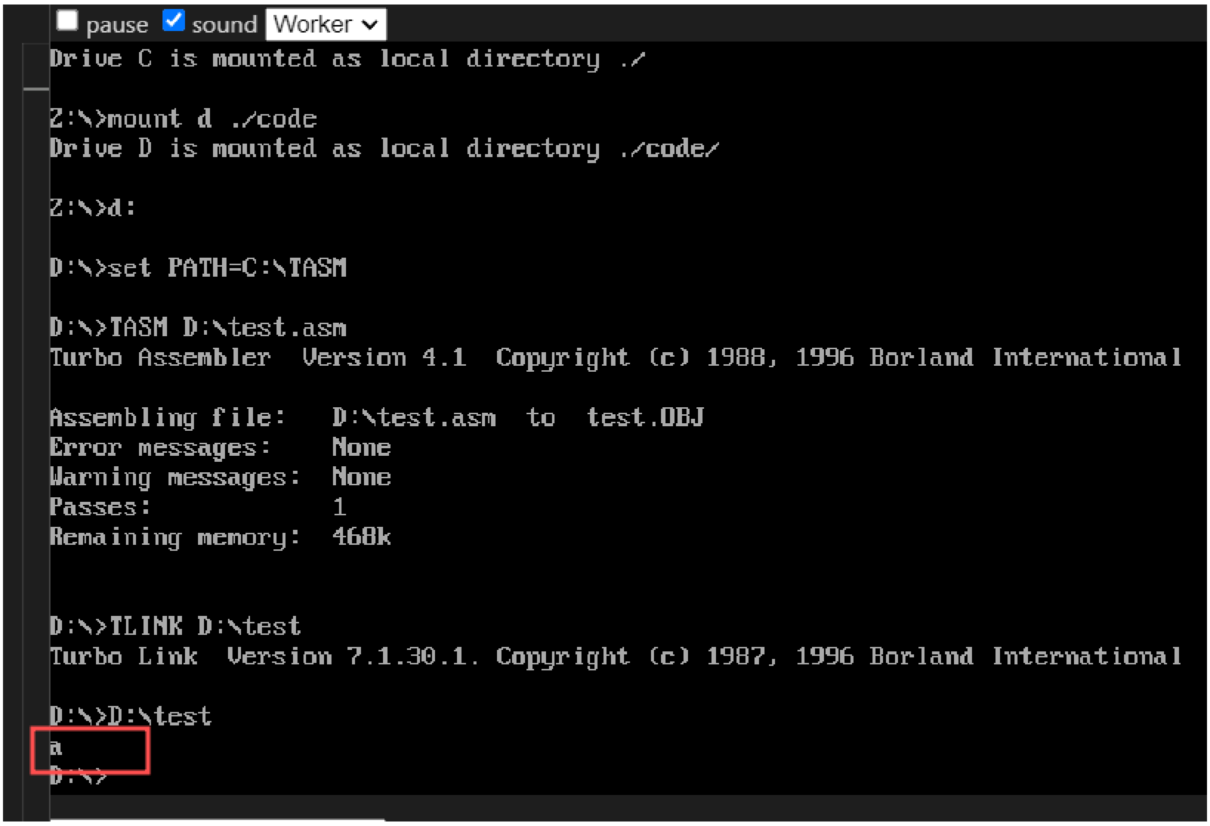
Task#5 & 6

In this code, after copying the value from al to dl we use the command ***sub dl,32*** which subtracts 32 from ASCII from the value in dl.



```
Drive C is mounted as local directory ./

Z:\>mount d ./code
Drive D is mounted as local directory ./code/

Z:\>d:

D:\>set PATH=C:\TASM

D:\>TASM D:\test.asm
Turbo Assembler  Version 4.1  Copyright (c) 1988, 1996 Borland International

Assembling file:   D:\test.asm  to  test.OBJ
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  468k


D:\>TLINK D:\test
Turbo Link  Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

D:\>D:\test
D
D:\>
```

In task#6 we just replaced ***sub dl,32*** command with ***add dl,32*** to print lower case of the character.

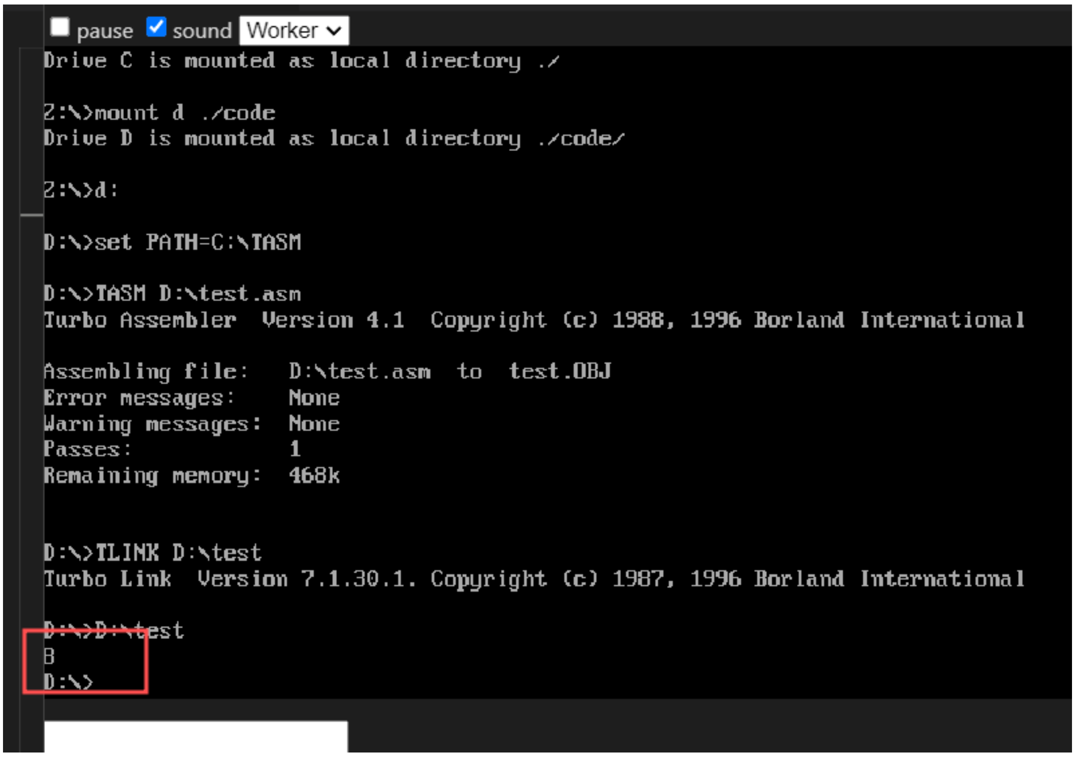


☐ pause ☑ sound Worker

```
Drive C is mounted as local directory ./

Z:\>mount d ./code
Drive D is mounted as local directory ./code/

Z:\>d:

D:\>set PATH=C:\TASM

D:\>TASM D:\test.asm
Turbo Assembler  Version 4.1  Copyright (c) 1988, 1996 Borland International

Assembling file:   D:\test.asm  to  test.OBJ
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  468k


D:\>TLINK D:\test
Turbo Link  Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

D:\>D:\test
a
D:\>
```

Tasl#7

This Task is the same as above but we just ***add dl,1*** instead of ***add dl,32*** to show the next character.

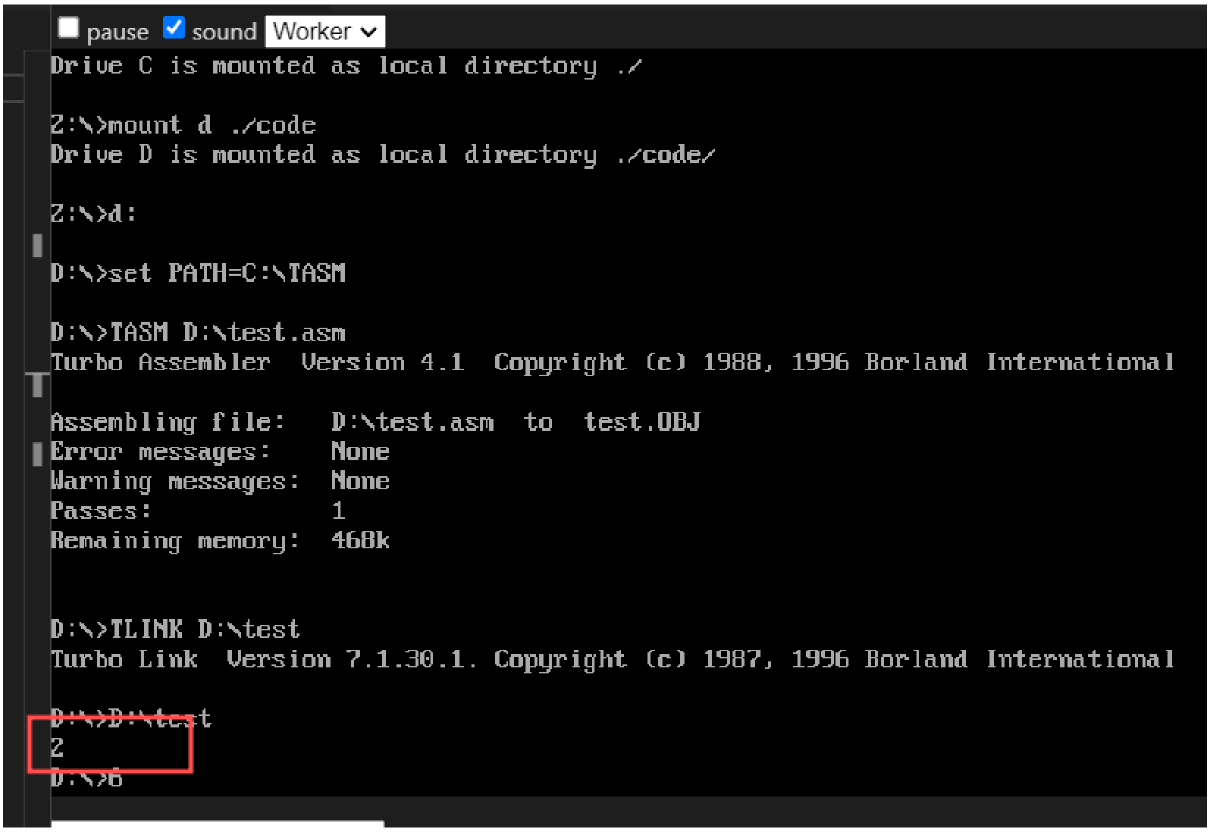


☐ pause ☑ sound Worker

```
Drive C is mounted as local directory ./

Z:\>mount d ./code
Drive D is mounted as local directory ./code/

Z:\>d:

D:\>set PATH=C:\TASM

D:\>TASM D:\test.asm
Turbo Assembler  Version 4.1  Copyright (c) 1988, 1996 Borland International

Assembling file:   D:\test.asm  to  test.OBJ
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  468k


D:\>TLINK D:\test
Turbo Link  Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

D:\>D:\test
B
D:\>
```

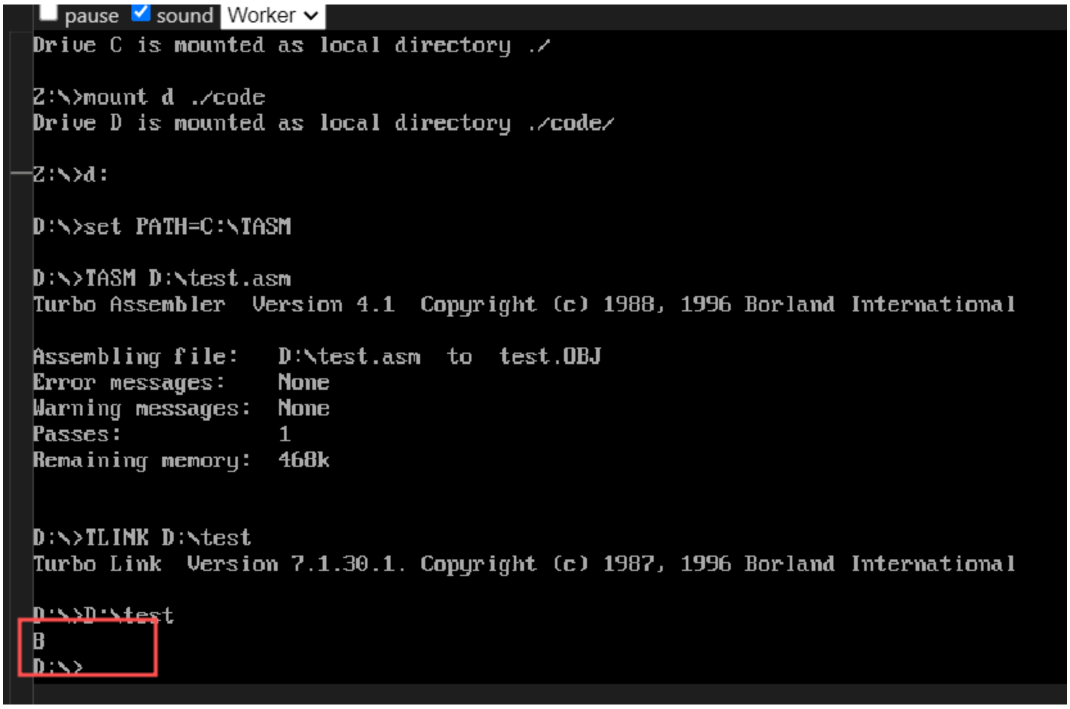
Task# 8&9

In Task#8 we take input from users and after running the command mov dl, al we run sub dl,4 to subtract 4 from the input given by the user. In the given screenshot the user inputs 6 which gives 2 after subtracting from 4.



```
Drive C is mounted as local directory ./

Z:\>mount d ./code
Drive D is mounted as local directory ./code/

Z:\>d:

D:\>set PATH=C:\TASM

D:\>TASM D:\test.asm
Turbo Assembler  Version 4.1  Copyright (c) 1988, 1996 Borland International

Assembling file:   D:\test.asm  to  test.OBJ
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  468k


D:\>TLINK D:\test
Turbo Link  Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

D:\>D:\test
2
D:\>6
```

In task#9 we just replaced the sub dl,4 commands with add dl,4 command which adds 4 to the input given by the user. In this screenshot the user inputs 4 which is added to the 4 in the code.



```
Drive C is mounted as local directory ./

Z:\>mount d ./code
Drive D is mounted as local directory ./code/

Z:\>d:

D:\>set PATH=C:\TASM

D:\>TASM D:\test.asm
Turbo Assembler  Version 4.1  Copyright (c) 1988, 1996 Borland International

Assembling file:   D:\test.asm  to  test.OBJ
Error messages:    None
Warning messages:  None
Passes:            1
Remaining memory:  468k


D:\>TLINK D:\test
Turbo Link  Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

D:\>D:\test
B
D:\>
```