

## Nº5. **Midnight Commander.** NASM. **GNU Linux**

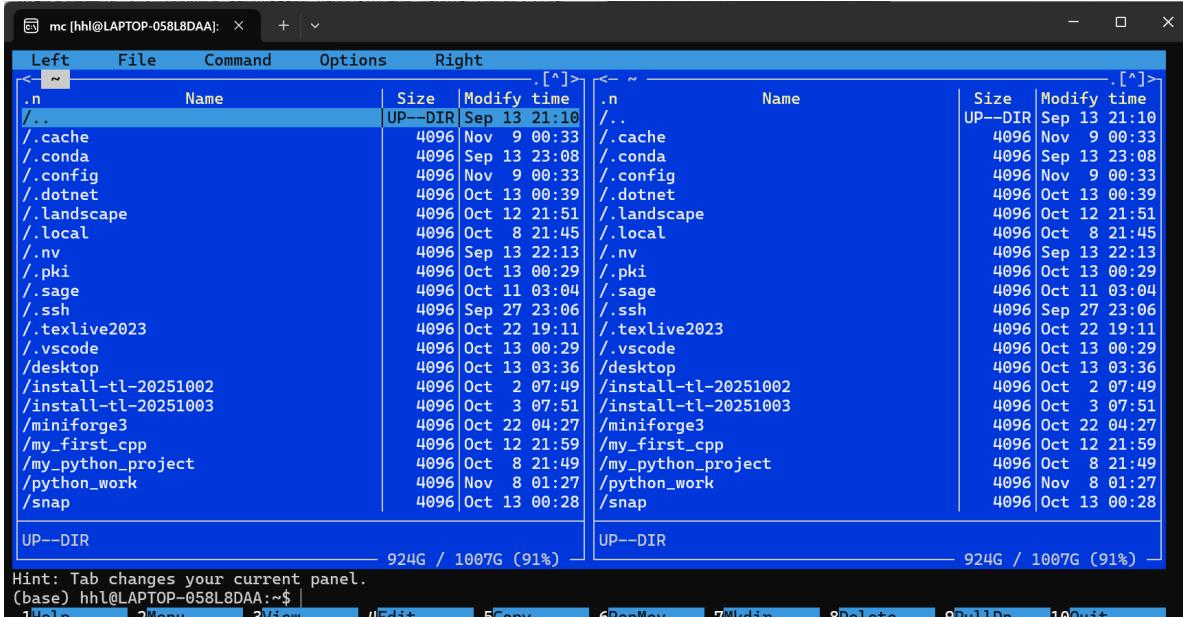
: [ ] : [1132254527]  
: 09 2025

1.

- |   |         | Midnight Commander (mc)           |
|---|---------|-----------------------------------|
|   |         | NASM (.data, .bss, .text)         |
| • | mov int |                                   |
| • | Linux   | - (sys_write, sys_read, sys_exit) |
| • |         | (in_out.asm)                      |

## 2.

### 2.1 1: MC



```

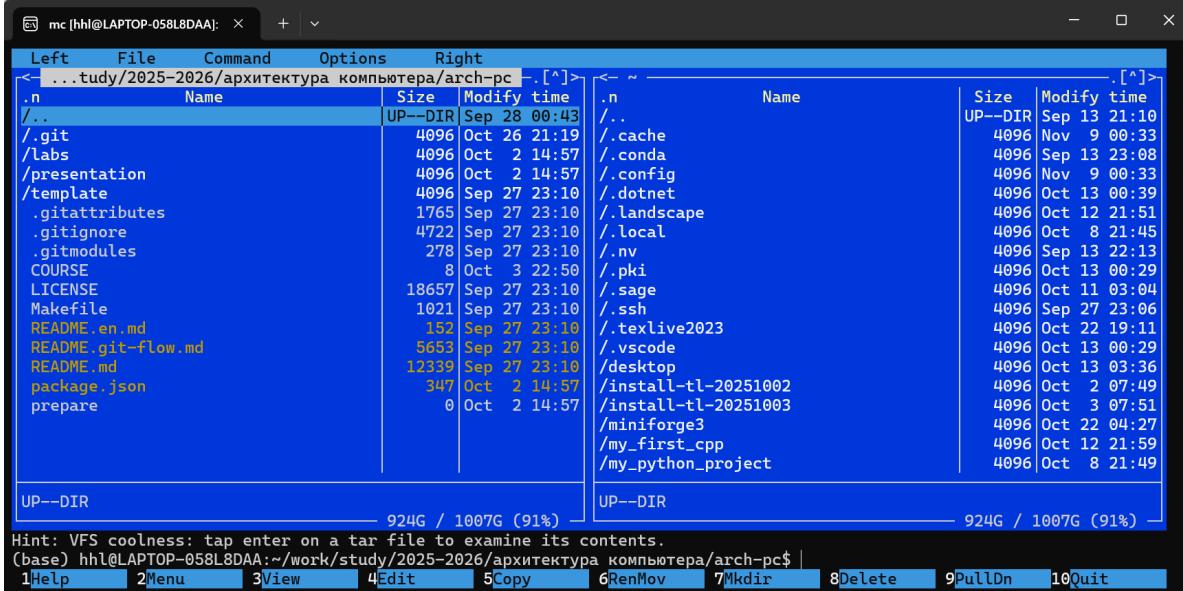
Left      File   Command   Options   Right
<- ~ .n     Name      Size     Modify time .[~]> <- ~ .n     Name      Size     Modify time .[~]>
/..      UP--DIR Sep 13 21:10 /..      UP--DIR Sep 13 21:10
/.cache  4096   Nov 9 00:33 /.cache  4096   Nov 9 00:33
/.conda  4096   Sep 13 23:08 /.conda  4096   Sep 13 23:08
/.config 4096   Nov 9 00:33 /.config  4096   Nov 9 00:33
/.dotnet 4096   Oct 13 00:39 /.dotnet  4096   Oct 13 00:39
/.landscape 4096   Oct 12 21:51 /.landscape 4096   Oct 12 21:51
/.local   4096   Oct 8 21:45 /.local   4096   Oct 8 21:45
/.nv     4096   Sep 13 22:13 /.nv     4096   Sep 13 22:13
/.pki    4096   Oct 13 00:29 /.pki    4096   Oct 13 00:29
/.sage   4096   Oct 11 03:04 /.sage   4096   Oct 11 03:04
/.ssh    4096   Sep 27 23:06 /.ssh    4096   Sep 27 23:06
/.texlive2023 4096   Oct 22 19:11 /.texlive2023 4096   Oct 22 19:11
/.vscode  4096   Oct 13 00:29 /.vscode  4096   Oct 13 00:29
/desktop 4096   Oct 13 03:36 /desktop  4096   Oct 13 03:36
/install-tl-20251002 4096   Oct 2 07:49 /install-tl-20251002 4096   Oct 2 07:49
/install-tl-20251003 4096   Oct 3 07:51 /install-tl-20251003 4096   Oct 3 07:51
/miniforge3 4096   Oct 22 04:27 /miniforge3 4096   Oct 22 04:27
/my_first_cpp 4096   Oct 12 21:59 /my_first_cpp 4096   Oct 12 21:59
/my_python_project 4096   Oct 8 21:49 /my_python_project 4096   Oct 8 21:49
/python_work 4096   Nov 8 01:27 /python_work 4096   Nov 8 01:27
/snap    4096   Oct 13 00:28 /snap    4096   Oct 13 00:28

UP--DIR                                     924G / 1007G (91%)                                     924G / 1007G (91%)

```

Hint: Tab changes your current panel.  
(base) hhl@LAPTOP-058L8DAA:~\$ |

1Help 2Menu 3View 4Edit 5Copy 6RenMov 7Mkdir 8Delete 9PullDn 10Quit

```

Left      File   Command   Options   Right
<- ...study/2025-2026/archитектура_компьютера/arch-pc .[~]> <- ~ .n     Name      Size     Modify time .[~]>
.        UP--DIR Sep 28 00:43 /..      UP--DIR Sep 13 21:10
/.git    4096   Oct 26 21:19 /.cache  4096   Nov 9 00:33
/labs   4096   Oct 2 14:57 /.conda  4096   Sep 13 23:08
/presentation 4096   Oct 2 14:57 /.config  4096   Nov 9 00:33
/template 4096   Sep 27 23:10 /.dotnet  4096   Oct 13 00:39
.gitattributes 1765   Sep 27 23:10 /.landscape 4096   Oct 12 21:51
.gitignore 4722   Sep 27 23:10 /.local   4096   Oct 8 21:45
.gitmodules 278   Sep 27 23:10 /.nv     4096   Sep 13 22:13
COURSE   8     Oct 3 22:50 /.pki    4096   Oct 13 00:29
LICENSE  18657  Sep 27 23:10 /.sage   4096   Oct 11 03:04
Makefile  1021  Sep 27 23:10 /.ssh    4096   Sep 27 23:06
README.en.md 152   Sep 27 23:10 /.texlive2023 4096   Oct 22 19:11
README.git-flow.md 5653  Sep 27 23:10 /.vscode  4096   Oct 13 00:29
README.md 12339  Sep 27 23:10 /desktop  4096   Oct 13 03:36
package.json 347   Oct 2 14:57 /install-tl-20251002 4096   Oct 2 07:49
prepare   0     Oct 2 14:57 /install-tl-20251003 4096   Oct 3 07:51

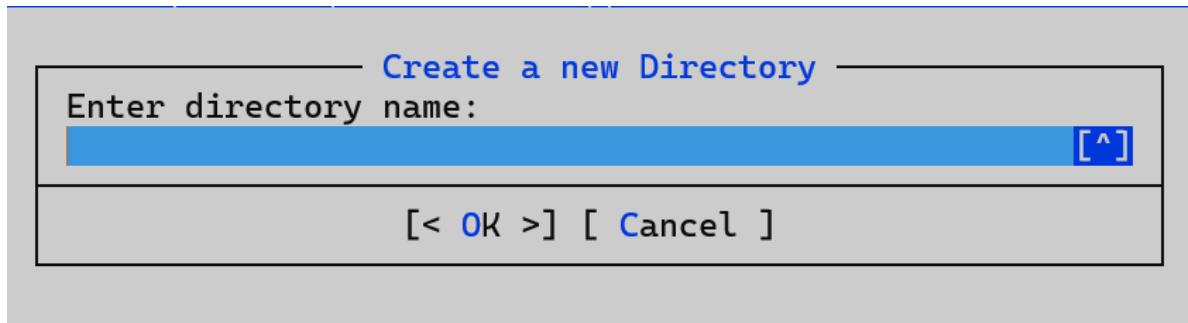
```

Hint: VFS coolness: tap enter on a tar file to examine its contents.  
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/archитектура\_компьютера/arch-pc\$ |

1Help 2Menu 3View 4Edit 5Copy 6RenMov 7Mkdir 8Delete 9PullDn 10Quit

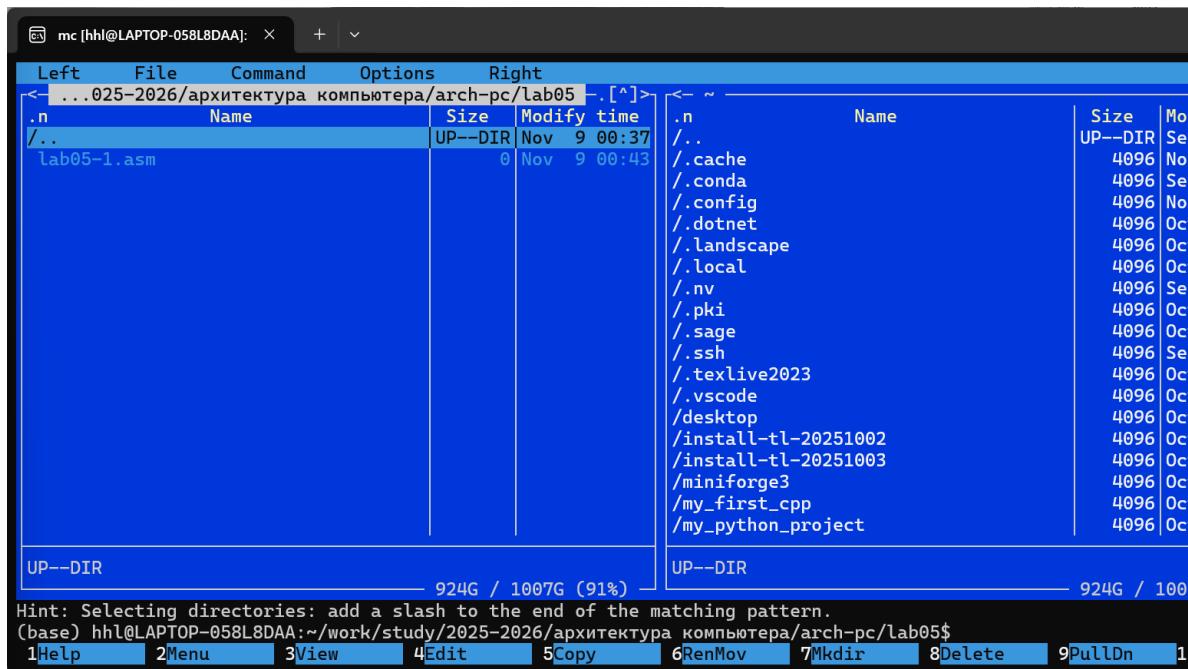
\* : Midnight Commander ~ /work/arch-pc/lab05, ,

## 2.2 2: lab05



\* : F7 lab05,

## 2.3 3: lab05-1.asm



\* : lab5-1.asm lab05.

## 2.4 4:

## lab05-1.asm

```
GNU nano 7.2          /home/hhl/work/study/2025–2026/архитектура компьютера/arch-pc/lab05/lab05-1.asm
SECTION .data
    msg: DB 'Введите строку:',10
    msgLen: EQU $-msg

SECTION .bss
    buf1: RESB 80

SECTION .text
    GLOBAL _start
_start:

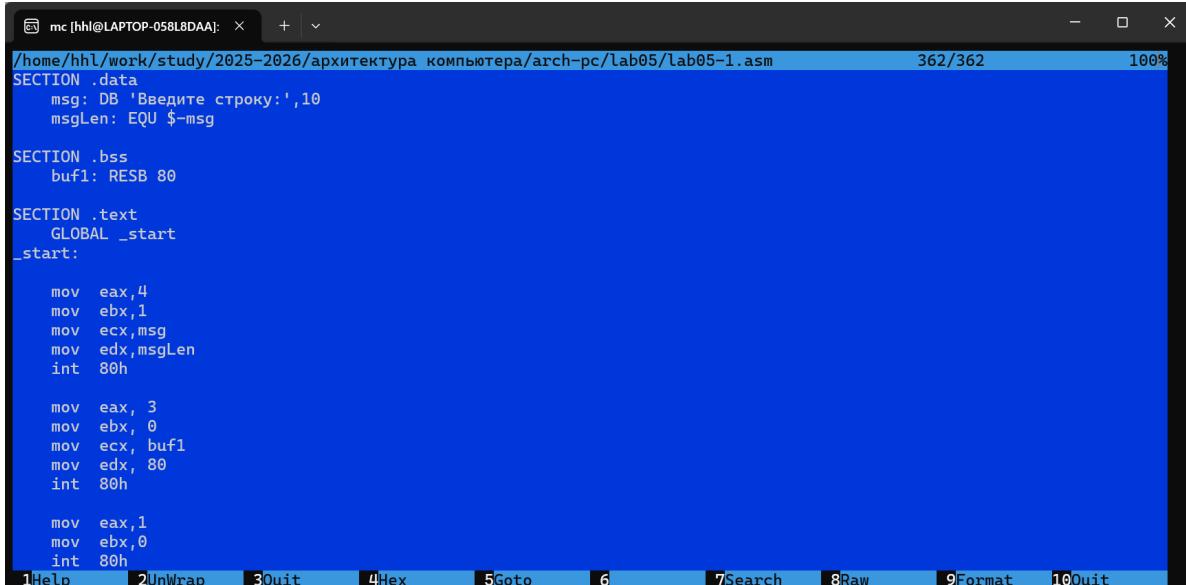
    mov  eax,4
    mov  ebx,1
    mov  ecx,msg
    mov  edx,msgLen
    int  80h

    mov  eax, 3
    mov  ebx, 0
    mov  ecx, buf1
    mov  edx, 80
    int  80h

    mov  eax,1

^G Help      ^O Write Out   ^W Where Is   ^K Cut        ^T Execute   ^C Location   M-U [
^X Exit      ^R Read File   ^\ Replace    ^U Paste     ^J Justify   ^/ Go To Line M-E ]
* : F4 , 5.1,
SECTION.
```

## 2.5 5: lab05-1.asm



The screenshot shows the Mars Cross Assembler (mc) interface. The assembly code for `lab05-1.asm` is displayed in the main window. The code includes sections for .data, .bss, and .text, with instructions like mov, int, and global \_start. The status bar at the bottom shows various menu options: Help, UnWrap, Quit, Hex, Goto, Search, Raw, Format, and Exit.

```
/home/hhl/work/study/2025-2026/архитектура компьютера/arch-pc/lab05/lab05-1.asm
SECTION .data
    msg: DB 'Введите строку:',10
    msgLen: EQU $-msg

SECTION .bss
    buf1: RESB 80

SECTION .text
    GLOBAL _start
_start:

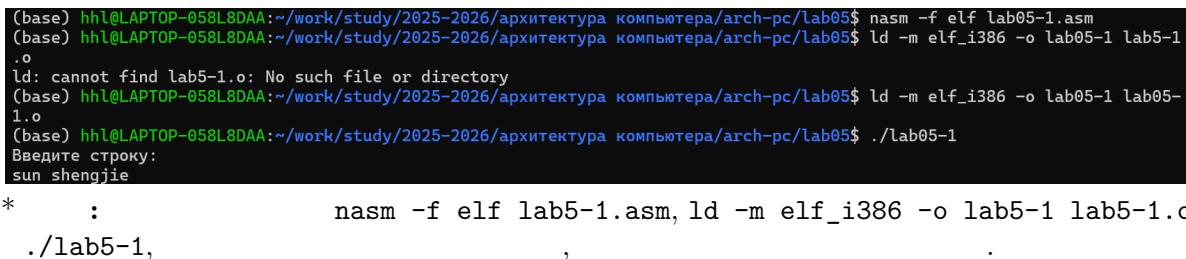
    mov    eax,4
    mov    ebx,1
    mov    ecx,msg
    mov    edx,msgLen
    int    80h

    mov    eax,3
    mov    ebx,0
    mov    ecx, buf1
    mov    edx, 80
    int    80h

    mov    eax,1
    mov    ebx,0
    int    80h
```

\* : F3 ,

## 2.6 6: , lab05-1.asm



The terminal session shows the compilation and execution of `lab05-1.asm`. It starts with the command `nasm -f elf lab05-1.asm`, followed by `ld -m elf_i386 -o lab05-1 lab05-1.o`. An error message indicates that `lab05-1.o` was not found. The user then runs the executable `./lab05-1` and enters the string "Ведите строку: sun shengjie". Finally, the command `nasasm -f elf lab5-1.asm, ld -m elf_i386 -o lab5-1 lab5-1.o` is shown again.

```
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ nasm -f elf lab05-1.asm
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ld -m elf_i386 -o lab05-1 lab05-1.o
ld: cannot find lab05-1.o: No such file or directory
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ./lab05-1
Введите строку:
sun shengjie
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ nasasm -f elf lab5-1.asm, ld -m elf_i386 -o lab5-1 lab5-1.o
./lab5-1,
```

## 2.7 7: in\_out.asm

The screenshot shows the mc (midnight commander) file manager interface. It has two main panes:

- Left Pane:** Shows the directory structure: /work/study/2025-2026/архитектура компьютера/arch-pc/Lab05. It lists several files:
  - .n (UP--DIR)
  - ... (UP--DIR)
  - \*in\_out.asm (3942 bytes, modified Nov 9 00:37)
  - \*lab05-1 (8748 bytes, modified Nov 9 01:21)
  - lab05-1.asm (362 bytes, modified Nov 9 01:15)
  - lab05-1.o (752 bytes, modified Nov 9 01:20)
- Right Pane:** Shows the same directory structure: /work/study/2025-2026/архитектура компьютера/arch-pc/Lab05. It lists the same files, with \*in\_out.asm highlighted.

At the bottom of the interface, there is a status bar with the following information:

Hint: Find File: you can work on the files found using the Panelize button.  
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05\$ [^]  
1Help 2Menu 3View 4Edit 5Copy 6RenMov 7Mkdir 8Delete 9PullDn 10Quit

Below the status bar, there is a command line prompt:  
\* : Tab , in\_out.asm lab05  
F5.

## 2.8 8:

### lab05-2.asm

Left	File	Command	Options	Right			
..025-2026/архитектура_компьютера/arch-pc/lab05				..025-2026/архитектура_компьютера/arch-pc/lab05			
.n	Name	Size	Modify time	.n	Name	Size	Modify time
/..		UP--DIR	Nov 9 00:37	/..		UP--DIR	Nov 9 00:37
*in_out.asm		3942	Nov 9 01:33	*in_out.asm		3942	Nov 9 01:33
*lab05-1		8748	Nov 9 01:21	*lab05-1		8748	Nov 9 01:21
lab05-1.asm		362	Nov 9 01:15	lab05-1.asm		362	Nov 9 01:15
lab05-1.o		752	Nov 9 01:20	lab05-1.o		752	Nov 9 01:20
lab05-2.asm		362	Nov 9 01:15	lab05-2.asm		362	Nov 9 01:15

lab05-2.asm 924G / 1007G (91%)

Hint: Find File: you can work on the files found using the Panelize button.

(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура\_компьютера/arch-pc/lab05\$ [^]

1Help 2Menu 3View 4Edit 5Copy 6RenMov 7Mkdir 8Delete 9PullDn 10Quit

```
GNU nano 7.2      /home/hhl/work/study/2025-2026/архитектура_компьютера/arch-pc/lab05/lab05-2.asm *

SECTION .bss
    buf1: RESB 80

SECTION .text
    GLOBAL _start
_start:
    mov eax, msg
    call sprintLF

    mov ecx, buf1
    mov edx, 80
    call sread

    call quit|
```

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark
 ^X Exit ^R Read File ^N Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-G Copy

\* : F6 lab5-2.asm, %include 'in\_out.asm'  
call

## 2.9 9: lab05-2.asm

```
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ nasm -f elf lab05-2.asm
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ld -m elf_i386 -o lab05-2 lab05-
2.o
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ./lab05-2
Введите строку:
sun shengjie
```

\* : lab5-2.asm,

## 2.10 10: sprintLF sprint

```
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ nasm -f elf lab05-2.asm
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ld -m elf_i386 -o lab05-2 lab05-
2.o
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ./lab05-2
Введите строку:
sun shengjie
```

(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05\$ nasm -f elf lab05-2.asm
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05\$ ld -m elf\_i386 -o lab05-2 lab05-
2.o
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05\$ ./lab05-2
Введите строку: sun shengjie

\* : sprintLF , ; sprint

### 3.

#### 3.1 1 & 2: lab05-1.asm ( )

The image shows two terminal windows side-by-side. Both windows are titled "mc [hh@LAPTOP-058L8DAA]: ~" and display assembly code for a program named "lab05-1-modified.asm".

**Top Terminal Window:**

```
GNU nano 7.2      /home/hhl/work/study/2025-2026/архитектура компьютера/arch-pc/lab05/lab05-1-modified.asm *
SECTION .data
    msg: DB 'Введите строку:',10
    msgLen: EQU $-msg

    echoMsg DB 'Вы ввели: ', 0
    echoLen EQU $-echoMsg

SECTION .bss
    buf1: RESB 80
    inputLen RESD 1

SECTION .text
GLOBAL _start
_start:

    mov eax,4
    mov ebx,1
    mov ecx,msg
    mov edx,msgLen
    int 0x80

    mov eax, 3
    mov ebx, 0
    mov ecx, buf1
```

**Bottom Terminal Window:**

```
GNU nano 7.2      /home/hhl/work/study/2025-2026/архитектура компьютера/arch-pc/lab05/lab05-1-modified.asm *
mov eax, 3
mov ebx, 0
mov ecx, buf1
mov edx, 80
int 0x80

mov [inputLen], eax

mov eax, 4
mov ebx, 1
mov ecx, echoMsg
mov edx, echoLen
int 0x80

mov eax, 4
mov ebx, 1
mov ecx, buf1
mov edx, [inputLen]
int 0x80

mov eax,1
mov ebx,0
int 0x80
```

At the bottom of the bottom window, there is a command-line interface showing the following steps:

```
(base) hh@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ nasm -f elf lab05-1-modified.asm
(base) hh@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ld -m elf_i386 -o lab05-1-modified lab05-1-modified.o
(base) hh@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ./lab05-1-modified
Введите строку:
sun shengjie
Вы ввели: sun shengjie
```

\* : 1, ,

### 3.2 3 & 4: lab05-2.asm ( )

The screenshot displays two terminal windows. The top window shows the assembly code for `lab05-2.asm`. The bottom window shows the execution of the assembled program.

**Top Window (Assembly Code):**

```
GNU nano 7.2 /home/hhl/work/study/2025-2026/архитектура компьютера/arch-pc/lab05/lab05-2-modified.asm *
%include 'in_out.asm'

SECTION .data
    msg: DB 'Введите строку: ', 0
    echoMsg DB 'Вы ввели: ', 0

SECTION .bss
    buf1: RESB 80

SECTION .text
    GLOBAL _start
_start:

    mov eax, msg
    call sprintLF

    mov ecx, buf1
    mov edx, 80
    call sread

    mov eax,echoMsg
    call sprint

    mov eax, buf1
```

**Bottom Window (Execution):**

```
GNU nano 7.2 /home/hhl/work/study/2025-2026/архитектура компьютера/arch-pc/lab05/lab05-2-modified.asm *
echoMsg DB 'Вы ввели: ', 0

SECTION .bss
    buf1: RESB 80

SECTION .text
    GLOBAL _start
_start:

    mov eax, msg
    call sprintLF

    mov ecx, buf1
    mov edx, 80
    call sread

    mov eax,echoMsg
    call sprint

    mov eax, buf1
    call sprintLF

    call quit
```

```
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ nasm -f elf lab05-2-modified.asm
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ld -m elf_i386 -o lab05-2-modified.o lab05-2-modified.o
(base) hhl@LAPTOP-058L8DAA:~/work/study/2025-2026/архитектура компьютера/arch-pc/lab05$ ./lab05-2-modified
Введите строку:
Вы ввели:
```

\* : 2, in\_out.asm ,

4.

1. mc?

Midnight Commander (mc) — , Unix-  
, ( , , ..)

2. bash, ( ) mc?

- : Bash: cp source dest | MC: , F5
- / : Bash: mv old new | MC: , F6
- : Bash: mkdir dirname | MC: F7
- : Bash: rm filename | MC: , F8
- : Bash: cat filename less filename | MC: , F3

3. NASM?

NASM :

- SECTION .data: ( )
- SECTION .bss: ( , )
- SECTION .text: . — \_start:

4. bss data NASM?

- .data ( , , , , )
- .bss , ( , , )

5. db, dw, dd, dq dt NASM?

, .data :

- db (Define Byte): 1
- dw (Define Word): 2
- dd (Define Doubleword): 4
- dq (Define Quadword): 8
- dt (Define Ten Bytes): 10

6. **mov eax, esi?**  
32- (       esi) (       eax).  
eax .

7. **int 80h?**  
Linux int 0x80  
Linux (       ). eax, ebx, ecx, edx  
. , , , ,

5.