

“Київський фаховий коледж зв’язку”

Циклова комісія Комп’ютерної інженерії

## **WORK-CASE №6**

з дисципліни: «Операційні системи»

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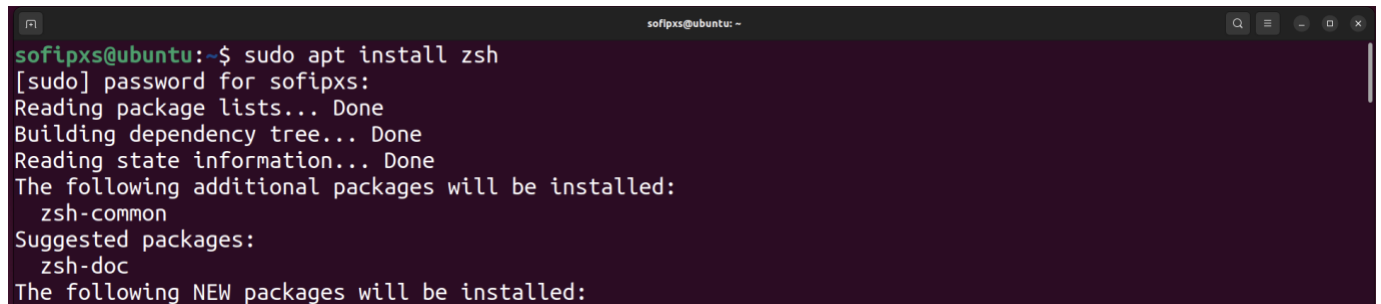
### Завдання:

1. В робочому просторі операційної системи необхідно встановити декілька командних інтерпретаторів (окрім `bash` ще 2 на ваш вибір):

- Якими командами це можна зробити;

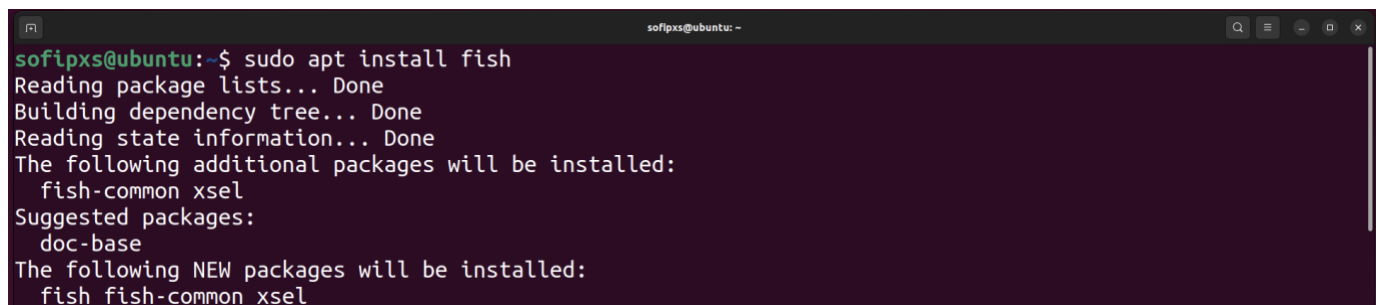
To install additional shells other than `bash`, we can use the package manager of our operating system. For example, for Ubuntu, this can be the `apt-get install` command or `apt install`, for CentOS - `yum install`, and so on.

- To install `zsh`: `sudo apt install zsh`



```
sofipxs@ubuntu:~$ sudo apt install zsh
[sudo] password for sofipxs:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  zsh-common
Suggested packages:
  zsh-doc
The following NEW packages will be installed:
```

- To install `fish`: `sudo apt install fish`



```
sofipxs@ubuntu:~$ sudo apt install fish
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  fish-common xsel
Suggested packages:
  doc-base
The following NEW packages will be installed:
  fish fish-common xsel
```

- Опишіть коротко можливості кожного з них.

**Z shell (zsh):** is a UNIX command interpreter (shell) usable as an interactive login shell and as a shell script command processor. Of the standard shells, `zsh` most closely resembles `ksh` but includes many enhancements. `Zsh` has command-line editing, built-in spelling correction, programmable command completion, shell functions (with autoloading), a history mechanism, and a host of other features. Other additional features provided by `zsh` are: Auto Completions are case insensitive much faster than `bash`. All sorts of bells and whistles made possible by a community-driven framework like `oh-my-zsh`. Support multi-line editing. Recursive file globbing. Highly compatible with `ksh`. `Zsh` has a huge collection of better themes. Simple configuration style. Output redirection to multiple destinations.

**Friendly Interactive Shell (fish):** is a Unix shell released in the mid-2000s with a focus on usability. The feature-rich shell does not require additional configuration, which makes it user-friendly from the start. The default executable path is `/usr/bin/fish`. The user prompt

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is `user@hostname location>`, while the root prompt is `root@hostname location#`. Fish avoids using cryptic characters, providing a clearer and friendlier syntax. Features in the shell include: Advanced suggestions/tab completion based on the current directory history. Helpful syntax highlighting and descriptive error messages. Web-based configuration. Command history with search options.

A terminal window titled 'fish /home/sofipxs' showing the installation of the fish shell. The user runs 'fish', which displays a welcome message and instructions. Then, the user runs 'echo \$FISH\_VERSION', which outputs '3.3.1'.

```
sofipxs@ubuntu:~$ fish
Welcome to fish, the friendly interactive shell
Type help for instructions on how to use fish
sofipxs@ubuntu ~> echo $FISH_VERSION
3.3.1
sofipxs@ubuntu ~>
```

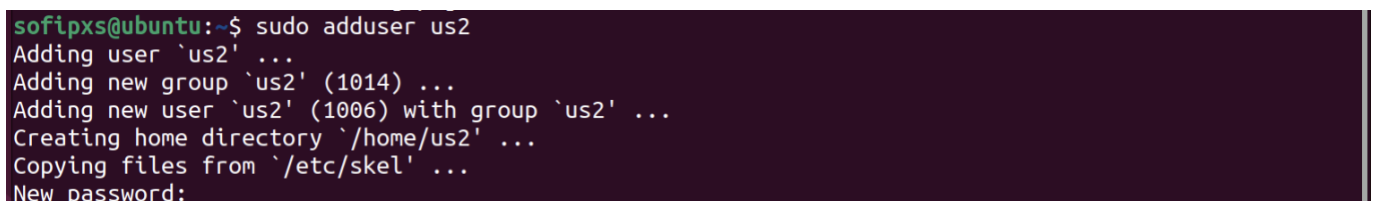
2. Необхідно створити 10 нових користувачів в вашій системі та розподілити їх по групам: Technical support (технічна підтримка, системні адміністратори); Developers (розробники, технічні спеціалісти свого профілю); Financiers (бухгалтерія, економісти тощо); Founders (керівництво); Guests (гості).

The `addgroup` command is used to create a new group. Simply specify a group name as a parameter:

A terminal window titled 'sofipxs@ubuntu: ~' showing the execution of the 'addgroup' command five times to create new system groups. Each command is preceded by 'sudo'. The groups created are 'technical\_support' (GID 1005), 'developers' (GID 1006), 'financiers' (GID 1007), 'founders' (GID 1011), and 'guests' (GID 1012).

```
sofipxs@ubuntu:~$ sudo addgroup technical_support
Adding group `technical_support' (GID 1005) ...
Done.
sofipxs@ubuntu:~$ sudo addgroup developers
Adding group `developers' (GID 1006) ...
Done.
sofipxs@ubuntu:~$ sudo addgroup financiers
Adding group `financiers' (GID 1007) ...
Done.
sofipxs@ubuntu:~$ sudo addgroup founders
Adding group `founders' (GID 1011) ...
Done.
sofipxs@ubuntu:~$ sudo addgroup guests
Adding group `guests' (GID 1012) ...
Done.
sofipxs@ubuntu:~$
```

`adduser` is a high-level interactive Linux command-line utility. Unlike `useradd`, the `adduser` command is a Perl script that essentially performs the same function as `useradd`, but in addition sets the password for the new user (the command is `sudo passwd username`) and creates the `~/home` directory.

A terminal window showing the execution of the 'adduser' command to create a new user named 'us2'. The command is preceded by 'sudo'. The output shows the creation of a new group 'us2' (GID 1014), a new user 'us2' (UID 1006) with group 'us2', the creation of the home directory '/home/us2', and the copying of files from '/etc/skel'. The prompt 'New password:' is visible at the end.

```
sofipxs@ubuntu:~$ sudo adduser us2
Adding user `us2' ...
Adding new group `us2' (1014) ...
Adding new user `us2' (1006) with group `us2' ...
Creating home directory `/home/us2' ...
Copying files from `/etc/skel' ...
New password:
```

```
sofipxs@ubuntu:~$ sudo adduser us3
Adding user `us3' ...
Adding new group `us3' (1015) ...
Adding new user `us3' (1007) with group `us3' ...
Creating home directory `/home/us3' ...
```

```
sofipxs@ubuntu:~$ sudo adduser us4
Adding user `us4' ...
Adding new group `us4' (1016) ...
Adding new user `us4' (1008) with group `us4' ...
Creating home directory `/home/us4' ...
```

```
sofipxs@ubuntu:~$ sudo adduser us5
Adding user `us5' ...
Adding new group `us5' (1017) ...
Adding new user `us5' (1009) with group `us5' ...
Creating home directory `/home/us5' ...
```

And so on up to 10 users.

To assign users to groups, use the following command: *sudo usermod -aG <group> <username>* :

```
sofipxs@ubuntu:~$ sudo usermod -aG technical_support us1 && sudo usermod -aG technical_support us2
sofipxs@ubuntu:~$ sudo usermod -aG developers us3 && sudo usermod -aG developers us4
sofipxs@ubuntu:~$ sudo usermod -aG developers us5
sofipxs@ubuntu:~$ sudo usermod -aG financiers us6 && sudo usermod -aG financiers us7
sofipxs@ubuntu:~$ sudo usermod -aG founders us8
sofipxs@ubuntu:~$ sudo usermod -aG guests us9 && sudo usermod -aG guests us10
sofipxs@ubuntu:~$ getent group
```

```
technical_support:x:1005:us1,us2
developers:x:1006:us3,us4,us5
financiers:x:1007:us6,us7
founders:x:1011:us8
guests:x:1012:us9,us10
us1:x:1013:
us2:x:1014:
us3:x:1015:
us4:x:1016:
us5:x:1017:
us6:x:1018:
us7:x:1019:
us8:x:1020:
us9:x:1021:
us10:x:1022:
sofipxs@ubuntu:~$
```

3. Для кожного з користувачів визначити його командний інтерпретатор за замовчуванням:

- Technical support – bash;
- Developers – командний інтерпретатор 1 (завдання 1);

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- Financiers – заборонити доступ до командних інтерпретаторів;
- Founders – командний інтерпретатор 2 (завдання 1);
- Guests – заборонити доступ до командних інтерпретаторів.

```
sofipxs@ubuntu: ~  
sofipxs@ubuntu:~$ sudo usermod -s /bin/bash us1  
usermod: no changes  
sofipxs@ubuntu:~$ sudo usermod -s /bin/bash us2  
usermod: no changes  
sofipxs@ubuntu:~$ sudo usermod -s /usr/bin/zsh us3  
sofipxs@ubuntu:~$ sudo usermod -s /usr/bin/zsh us4  
sofipxs@ubuntu:~$ sudo usermod -s /usr/bin/zsh us5  
sofipxs@ubuntu:~$ sudo usermod -s /usr/sbin/nologin us6  
sofipxs@ubuntu:~$ sudo usermod -s /usr/sbin/nologin us7  
sofipxs@ubuntu:~$ sudo usermod -s /usr/bin/fish us8  
sofipxs@ubuntu:~$ sudo usermod -s /usr/sbin/nologin us9  
sofipxs@ubuntu:~$ sudo usermod -s /usr/sbin/nologin us10  
sofipxs@ubuntu:~$
```

```
sofipxs@ubuntu:~$ cat /etc/passwd  
us1:x:1005:1013:,,,:/home/us1:/bin/bash  
us2:x:1006:1014:,,,:/home/us2:/bin/bash  
us3:x:1007:1015:,,,:/home/us3:/usr/bin/zsh  
us4:x:1008:1016:,,,:/home/us4:/usr/bin/zsh  
us5:x:1009:1017:,,,:/home/us5:/usr/bin/zsh  
us6:x:1010:1018:,,,:/home/us6:/usr/sbin/nologin  
us7:x:1011:1019:,,,:/home/us7:/usr/sbin/nologin  
us8:x:1012:1020:,,,:/home/us8:/usr/bin/fish  
us9:x:1013:1021:,,,:/home/us9:/usr/sbin/nologin  
us10:x:1014:1022:,,,:/home/us10:/usr/sbin/nologin  
sofipxs@ubuntu:~$
```

4. Продемонструвати приклади роботи кожної групи користувачів у своєму командному інтерпретаторі – наприклад збір відомостей про систему, визначення базової конфігурації, системної дати, поточних каталогів тощо.

User with bash:

```
sofipxs@ubuntu:~$ su us1  
Password:  
us1@ubuntu: /home/sofipxs$ cd  
us1@ubuntu:~$ uname -a  
Linux ubuntu 5.15.0-102-generic #112-Ubuntu SMP Tue Mar 5 16:49:56 UTC 2024 aarch64 aarch64 aarch64  
GNU/Linux  
us1@ubuntu:~$ pwd  
/home/us1  
us1@ubuntu:~$ date  
Mon Apr 29 03:41:53 AM UTC 2024  
us1@ubuntu:~$ lsb_release -a  
No LSB modules are available.  
Distributor ID: Ubuntu  
Description:    Ubuntu 22.04.4 LTS  
Release:        22.04  
Codename:       jammy  
us1@ubuntu:~$
```

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```
us1@ubuntu:~$ ls -l
total 0
us1@ubuntu:~$ ls -la
.  ..  .bash_logout  .bashrc  .profile
us1@ubuntu:~$
```

User with zsh:

```
sofipxs@ubuntu:~$ su us3
Password:
ubuntu%
ubuntu% uname -a
Linux ubuntu 5.15.0-102-generic #112-Ubuntu SMP Tue Mar 5 16:49:56 UTC 2024 aarch64 aarch64 aarch64
GNU/Linux
ubuntu% echo Hello
Hello
ubuntu%
```

A users who does not have access to command line interpreters:

```
sofipxs@ubuntu:~$ su us6
Password:
This account is currently not available.
sofipxs@ubuntu:~$
```

```
sofipxs@ubuntu:~$ su us9
Password:
This account is currently not available.
sofipxs@ubuntu:~$
```

```
sofipxs@ubuntu:~$ su us10
Password:
This account is currently not available.
sofipxs@ubuntu:~$
```

```
sofipxs@ubuntu:~$ su us7
Password:
This account is currently not available.
```

User with fish:

```
sofipxs@ubuntu:~$ su us8
Password:
Unable to open the current working directory: Permission denied
Welcome to fish, the friendly interactive shell
Type help for instructions on how to use fish
us8@ubuntu /h/sofipxs> uname -a
Linux ubuntu 5.15.0-102-generic #112-Ubuntu SMP Tue Mar 5 16:49:56 UTC 2024 aarch64 aarch64 aarch64
GNU/Linux
us8@ubuntu /h/sofipxs> date
Mon Apr 29 04:12:03 AM UTC 2024
us8@ubuntu /h/sofipxs> pwd
/home/sofipxs
us8@ubuntu /h/sofipxs> cd
```



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```
us8@ubuntu ~-> ls -a
. . . .bash_logout .bashrc .config .local .profile
us8@ubuntu ~-> ls -l
total 0
us8@ubuntu ~-> ls -ld
drwxr-x--- 4 us8 us8 4096 Apr 29 04:10 .
us8@ubuntu ~->
```

```
sofipxs@ubuntu: ~
. . . .bash_logout .bashrc .config .local .profile
top - 04:18:57 up 4:38, 1 user, load average: 0.04, 0.03, 0.00
Tasks: 235 total, 2 running, 233 sleeping, 0 stopped, 0 zombie
%Cpu(s): 1.9 us, 1.2 sy, 0.0 ni, 96.9 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 3911.0 total, 1537.6 free, 914.8 used, 1458.6 buff/cache
MiB Swap: 3911.0 total, 3911.0 free, 0.0 used. 2699.5 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1583	sofipxs	20	0	5034372	310000	150560	S	7.7	7.7	8:05.68	gnome-shell
2580	sofipxs	20	0	562908	60228	38804	R	3.8	1.5	1:48.34	gnome-terminal-
7323	us8	20	0	10056	3548	2812	R	3.8	0.1	0:00.03	top
1	root	20	0	167312	11476	7388	S	0.0	0.3	0:03.08	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.04	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp

```
us8@ubuntu ~-> exit
sofipxs@ubuntu:~$
```

### Висновки:

In the course of the task, we investigated the process of installing several command line interpreters in the Ubuntu operating system workspace, in particular, zsh and fish. This was done using the apt package manager. Further, 10 new users were created and distributed to five different groups according to the specified roles. A command prompt was defined for each group.