“Київський фаховий коледж зв’язку”
Циклова комісія Комп’ютерної інженерії

ЗВІТ ПО ВИКОНАННЮ ЛАБОРАТОРНОЇ РОБОТИ №2

з дисципліни: «Операційні системи»

Тема: «Знайомство з інтерфейсом та можливостями ОС Linux»

Виконала студентка
групи РПЗ-13б
Дімітрова С.П.
Перевірив викладач
Сушанова В.С.

Київ 2024

Робота студентки групи РПЗ-13б Дімітрової Софії

Мета роботи:

1. Знайомство з інтерфейсами ОС Linux.
2. Отримання практичних навиків роботи в середовищах ОС Linux та мобільної ОС – їх графічною оболонкою, входом і виходом з системи, ознайомлення зі структурою робочого столу, вивчення основних дій та налаштувань при роботі в системі

Матеріальне забезпечення занять:

1. ЕОМ типу IBM PC.
2. ОС сімейства Windows (Windows 7).
3. Віртуальна машина – Virtual Box (Oracle).
4. Операційна система GNU/Linux – CentOS.
5. Сайт мережевої академії Cisco netacad.com та його онлайн курси по Linux

Завдання для попередньої підготовки.

1. Прочитайте короткі теоретичні відомості до лабораторної роботи та зробіть невеликий словник базових англійських термінів з питань призначення команд та їх параметрів.

Термін англійською	Термін українською
Command	Команда
Parameter	Параметр
Flag	Прапорець
Option	Опція
Argument	Аргумент
Command-line	Рядок команд
Shell	Оболонка

2. Дайте визначення наступним поняттям:

- CLI-режим:

The command line interface (CLI) is a simple text input system for entering anything from single-word commands to complicated scripts.

- Термінал на основі графічного інтерфейсу користувача:

A GUI terminal is a program within the GUI environment that emulates a terminal window. GUI terminals can be accessed through the menu system.

- Віртуальний термінал:

A virtual terminal is a text-based interface within a graphical user interface (GUI) or another program that enables users to access a computer or server. Virtual terminals essentially replicate the functionality of hardware terminals without the need for physical devices.

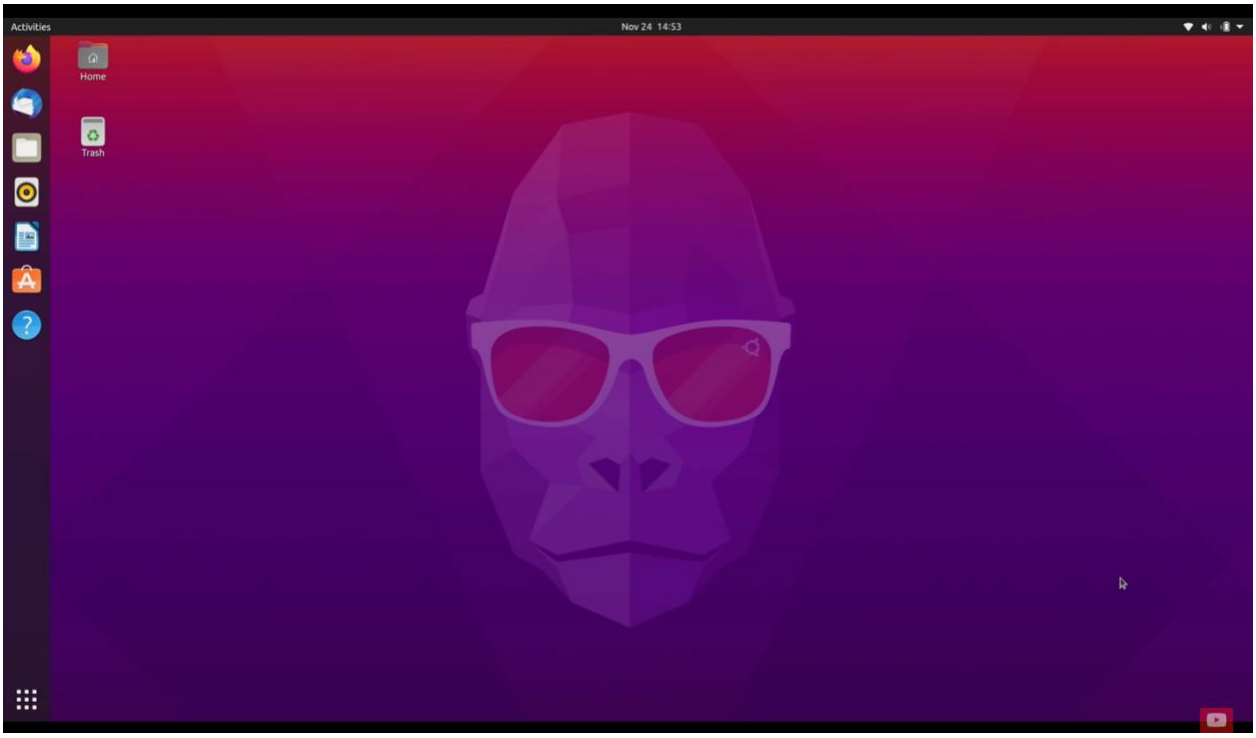
Хід роботи.

1. Робота в графічному режимі в ОС сімейства Linux (робота з інтернет-джерелами):

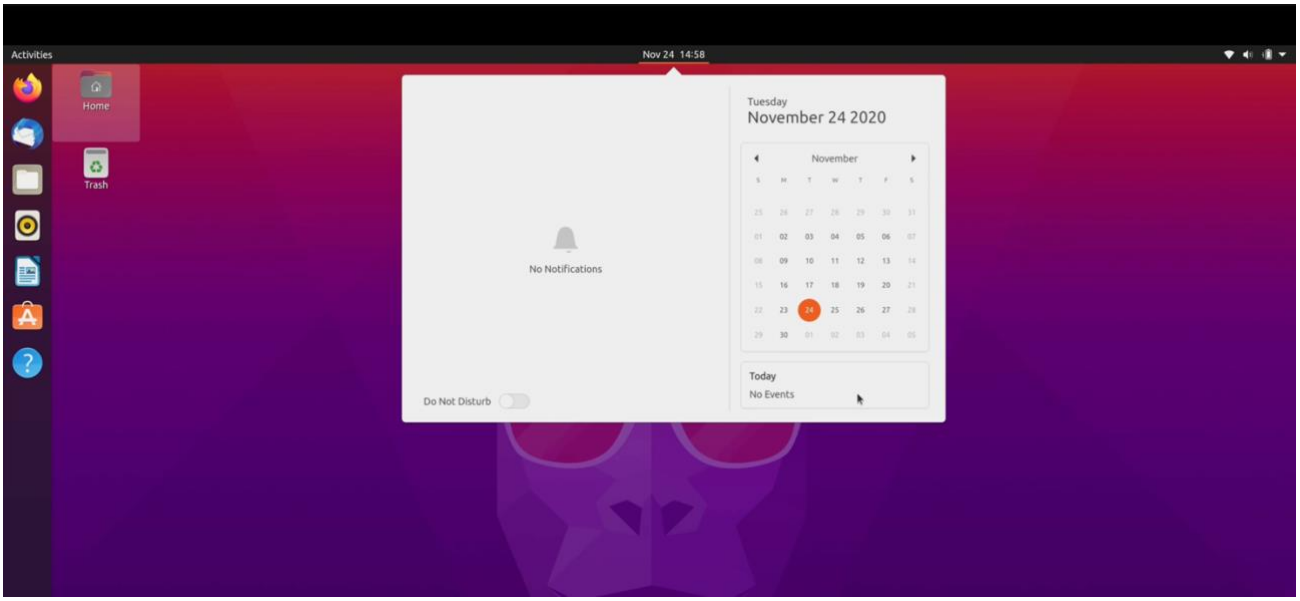
   1.1. Оберіть графічну оболонку для ОС сімейства Linux, яку ви хочете розглянути. Розгляньте структуру робочого простору користувача, та опишіть основні його компоненти (***показано основні компоненти оболонки Gnome):

   Consider the graphical shell of one of the most popular Linux distributions, namely Ubuntu. Ubuntu's standard graphical shell is GNOME.

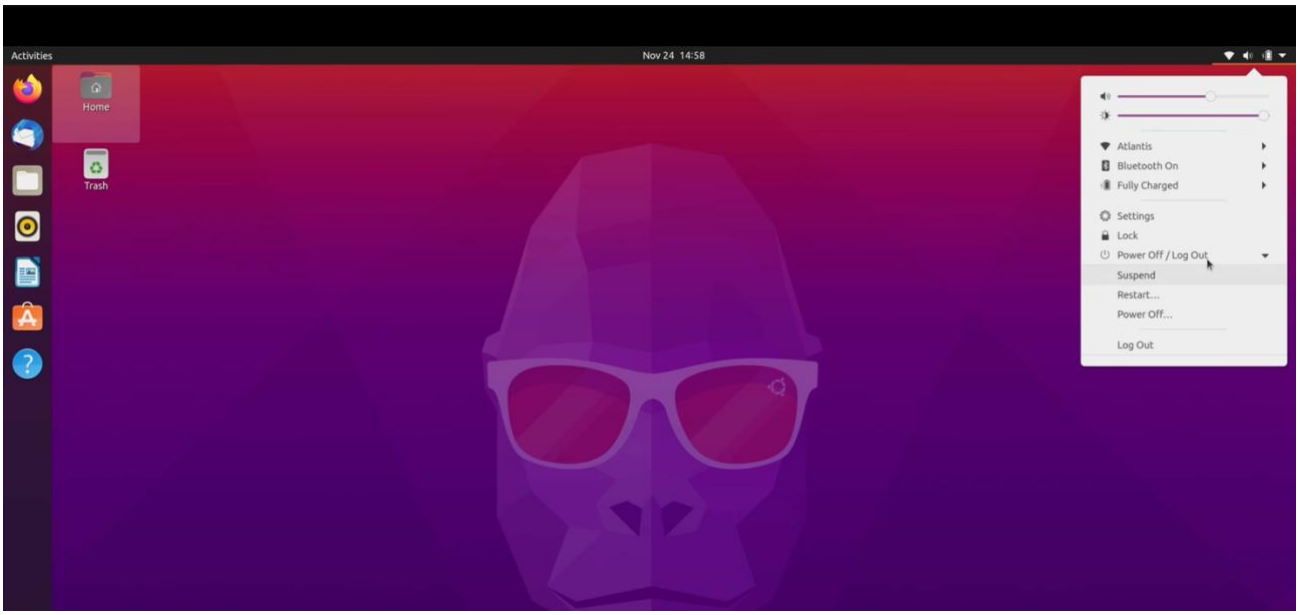
   - *Desktop:* This is the main area where the user can place windows, icons, and other elements. On the left edge is “The Dash” – a bar with a number of icons. By default, this option lists popular applications (such as Firefox, mail, music, files, and so on.). Users can add their favorites to it (or remove the defaults). This is a quick way to launch applications.



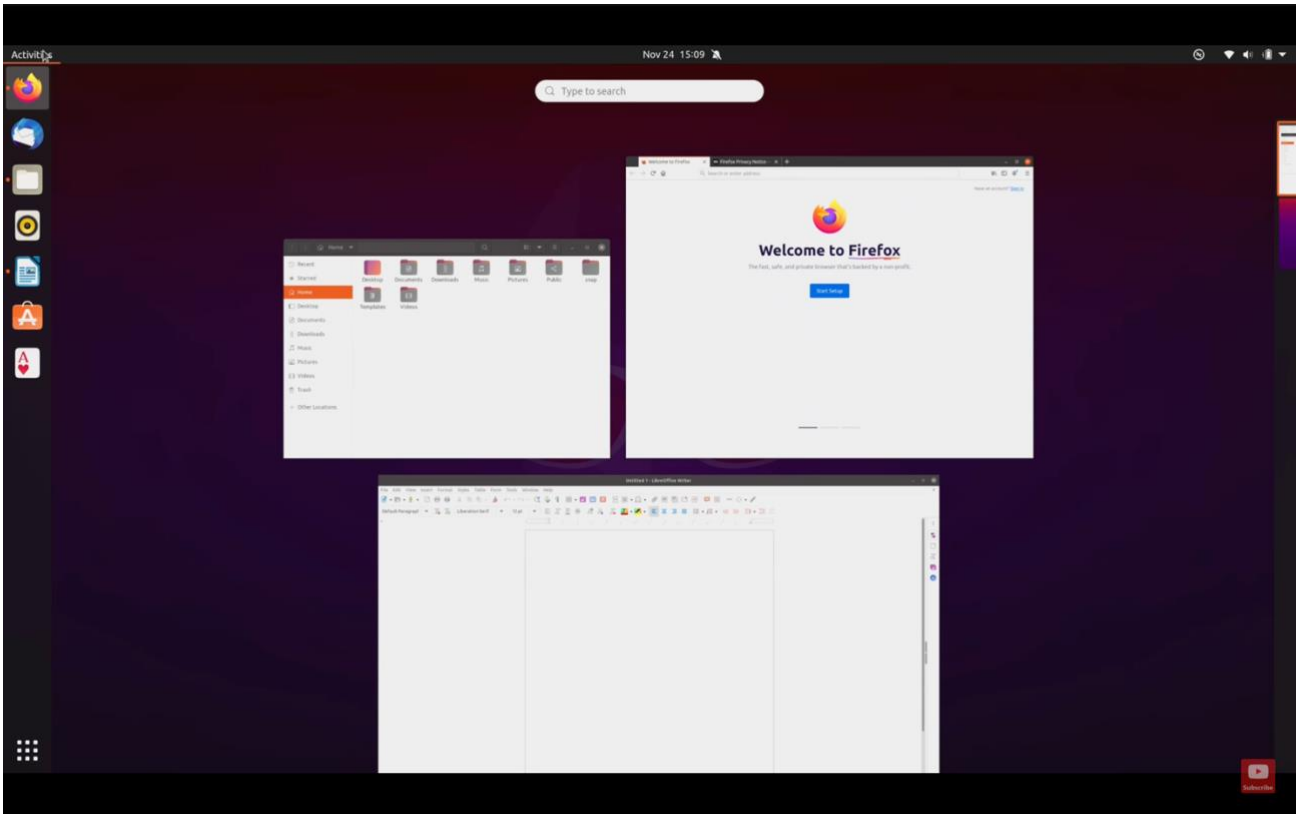
- *Calendar & Notifications:* Date, Time, Calendar and app notifications appear in the top-middle of the screen, and can be reviewed in the drop-down menu.



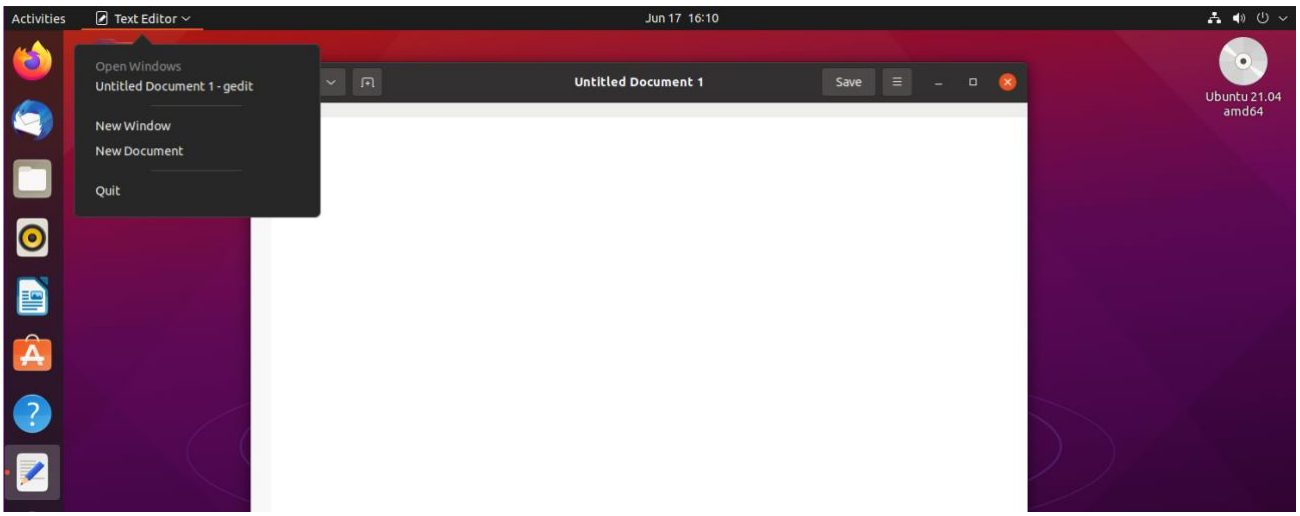
- *System Menu:* On the top, right is the system menu drop-down which has useful system related utilities. Go here to: Configure the wired ethernet connection; Connect to a Wi-Fi access point; Connect to a Bluetooth device; Check battery status; Launch the Settings dialog; Lock or shut down the device.



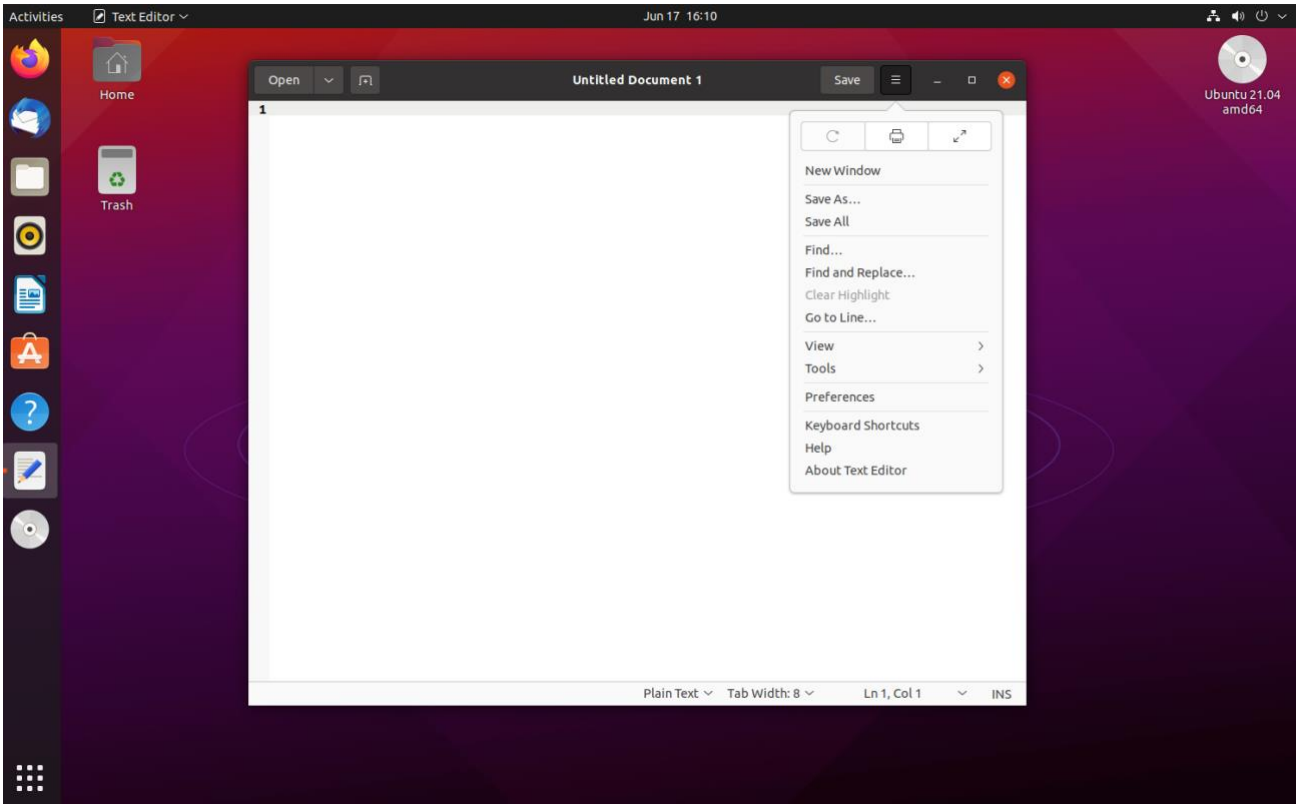
- *Activities:* The activities overview is an important feature of GNOME. This is used to access applications, any minimized applications, search, and access virtual desktops. To get the activities overview: Click Activities in the top, left.



- *Application Top Bar Menu:* You can control certain applications actions from the menu in the top bar. This menu will change from app to app, and won't be visible until the app is running.

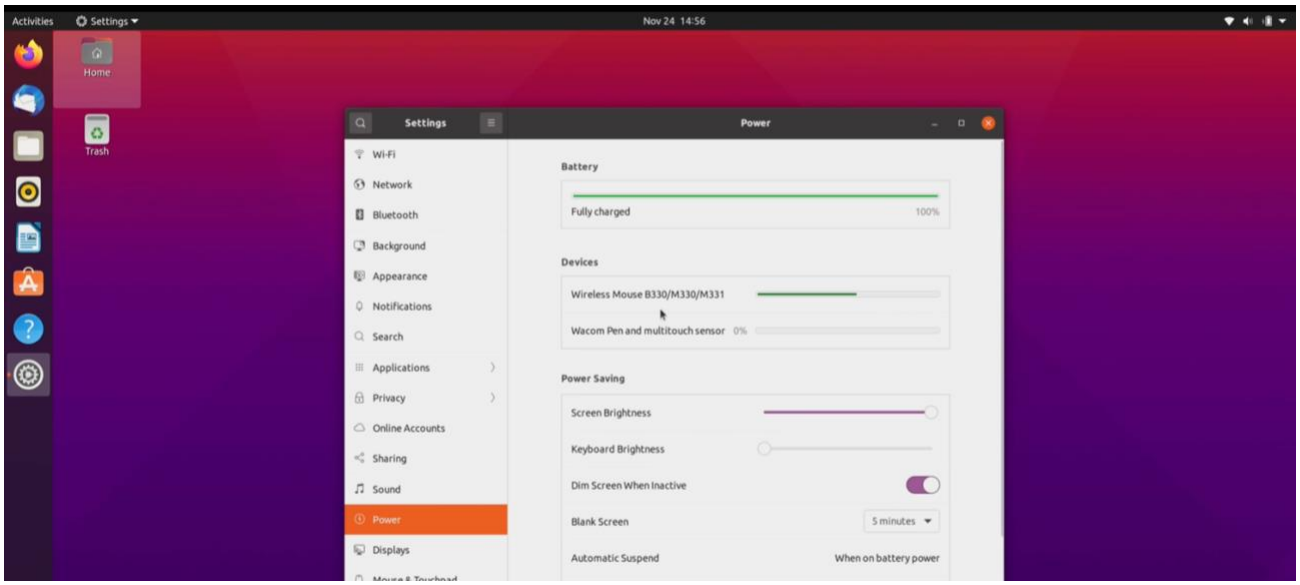


- *Application Window Menu:* Many applications also have in-window menus for adjusting settings, switching to full-screen, etc.



1.2. Запуск програм. Дослідіть можливості запуску додатків різними способами (описати спосіб і по-можливості показати скріншоти):

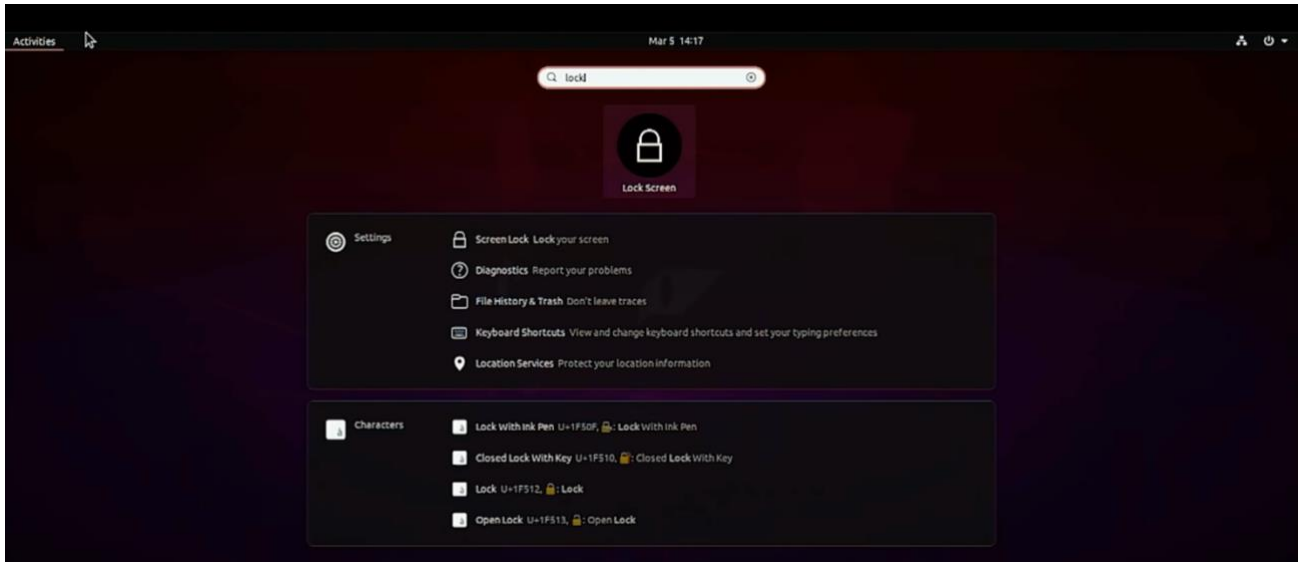
- *Запуск програм через панель швидкого запуску:*



- *Запуск програм через пошук в меню:* In Ubuntu, you can find and open any application installed on your system using the Show Applications button.

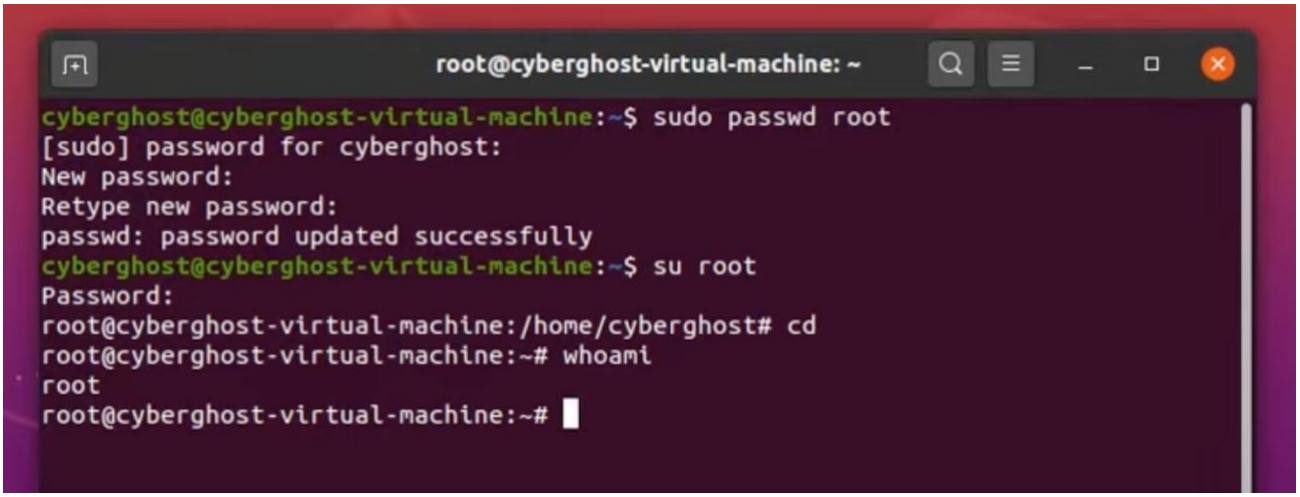
- Запуск програм через глобальне меню:

Activities – Search: The same Activities icon reveals a Search textbox. Keywords entered here will search through associated applications that can be launched.

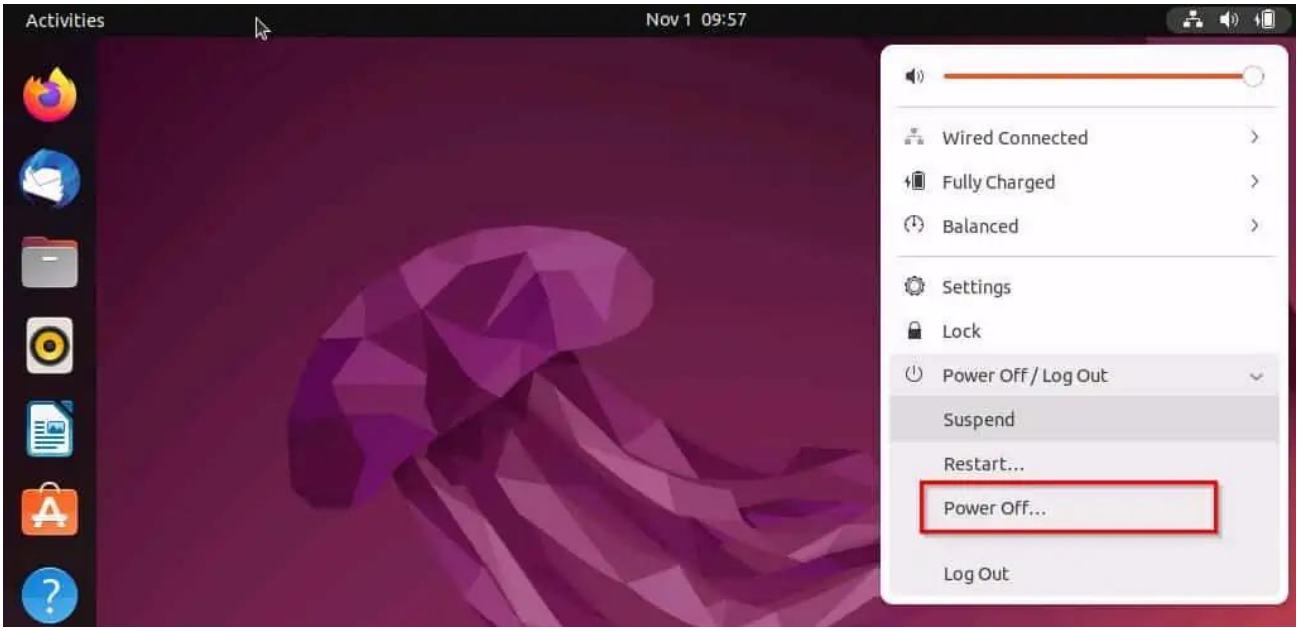


1.3. Вихід з системи та завершення роботи в Linux. Як виконати в графічному інтерфейсі наступні дії (наведіть скріни):

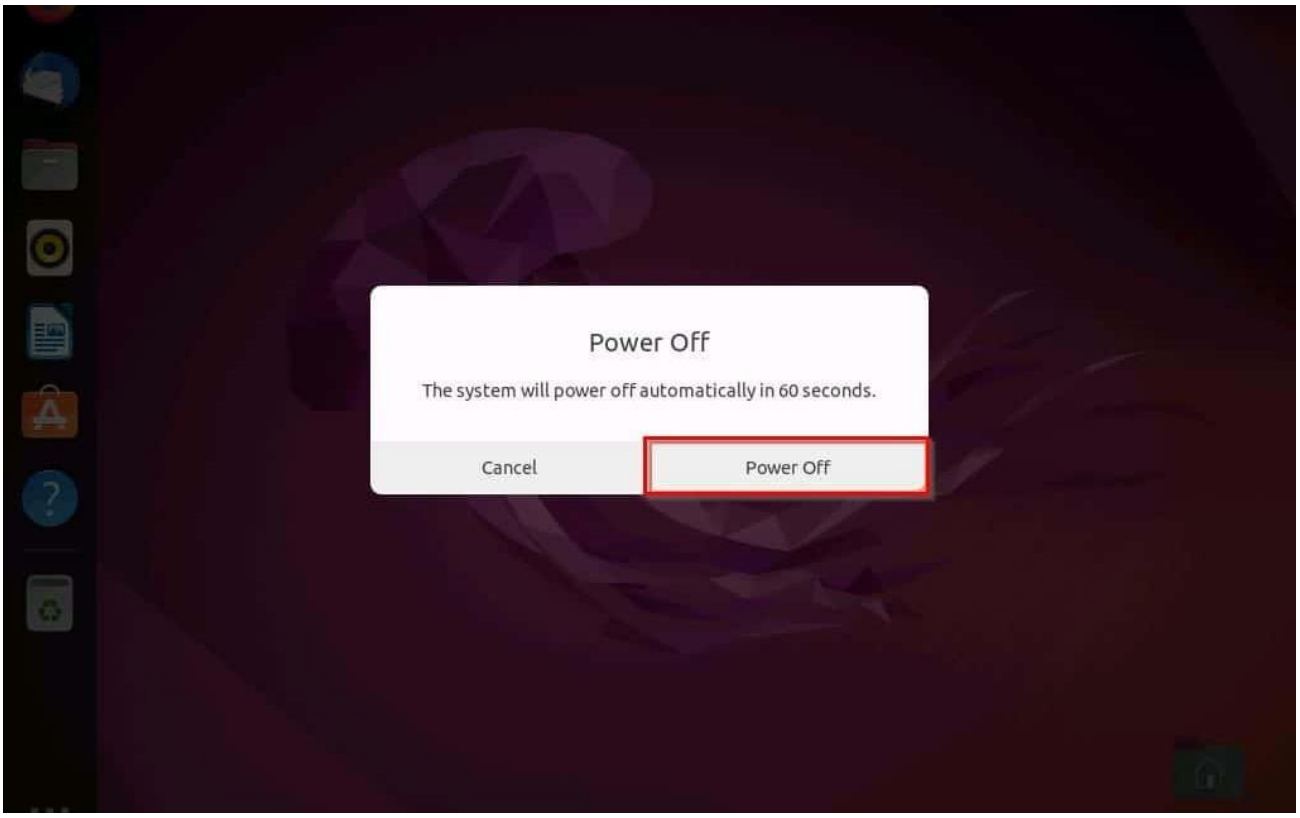
- *Зміна користувача на root :* You want to log in as root. But the root account is disabled by default. The first step is to enable it. Change the root account password that will eventually enable the root account for you: sudo passwd root.

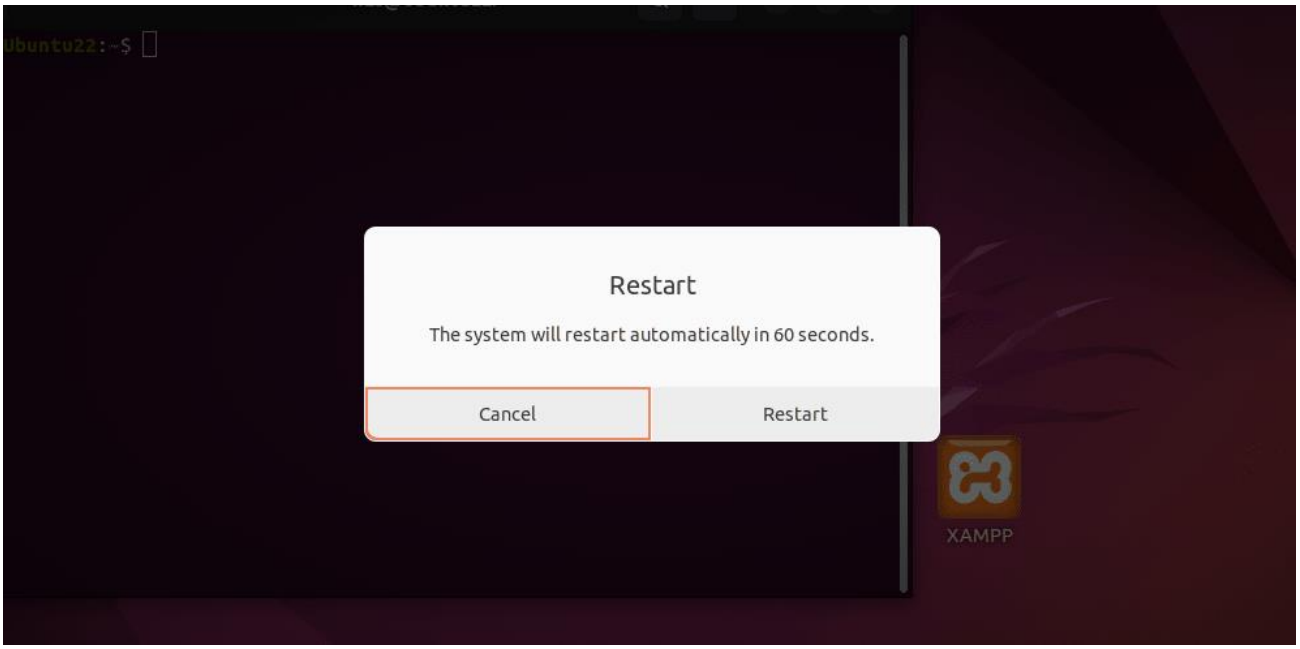


- *Перезавантаження системи та вимкнення системи:* Click on the top-right corner of the screen to open the system menu. Select the power icon, and then choose either “Power Off” or “Restart”.

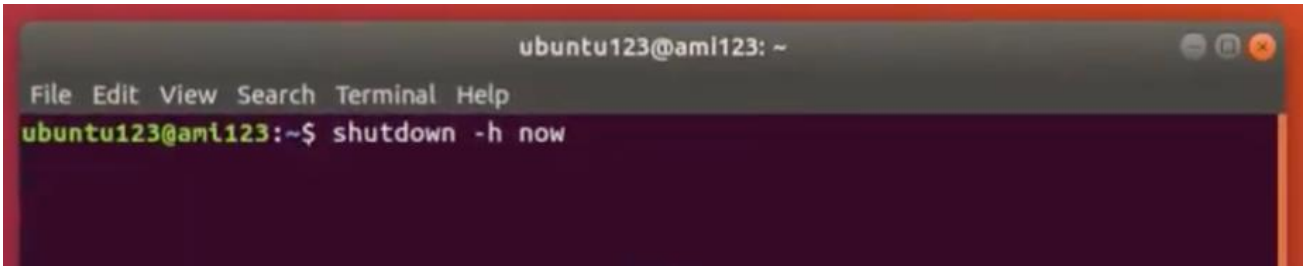


As soon as you press the option “Power Off” or “Restart”, you will see a pop-up window where you are asked to confirm the shutdown or window to confirm to restart.

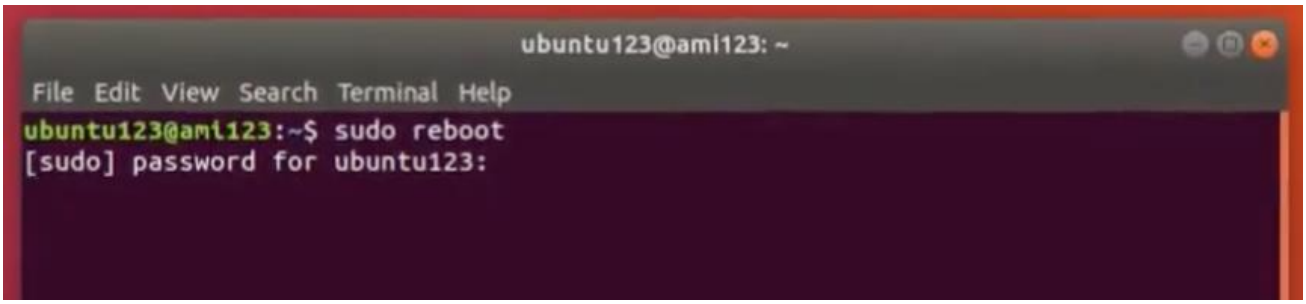




You can also perform these actions using the terminal. To shut down the system, enter the following command: sudo shutdown -h now.



If you want to restart Ubuntu, you can use this command: sudo reboot.



2. Робота в середовищі мобільної ОС.

2.1. Опишіть головне меню вашої мобільної ОС, який графічний інтерфейс вона використовує?

The iOS home screen, rendered by SpringBoard, displays application icons and a dock at the bottom where users can pin their most frequently used apps. iOS home screens are typically made up of app icons and widgets; app icons launch the associated app, whereas widgets display live, auto-updating content, such as a weather forecast, the user's email inbox, or a news ticker directly on the home screen. Users can organize applications into folders by simply dragging and dropping the icon of one application onto another.

iOS uses a graphical user interface (GUI) with direct manipulation. This means that users interact with the device directly through the touch screen using multi-touch gestures such as swipe, tap, tap, swipe, swipe, and return.

2.2. Опишіть меню налаштувань компонентів мобільного телефону.

The iPhone settings menu includes the following components:

- *Apple ID:* Allows users to view Apple ID information, change their Apple ID password, and manage their Apple subscriptions.
- *Wi-Fi:* Allows users to connect to Wi-Fi networks, configure Wi-Fi settings, and change the Wi-Fi password.
- *Bluetooth:* Allows users to connect to Bluetooth devices, configure Bluetooth settings, and pair devices
- *Cellular:* Allows users to manage cellular data, set up an APN, and select a SIM card (for dual-SIM iPhones).
- *VPN:* Set up and connect to a VPN server.
- *General:* Includes various settings such as software updates, Siri settings, privacy, accessibility, and more.
- *Display & Brightness*: Adjusts the display brightness, auto-lock, and more.
- *Face ID & Passcode:* Settings for Face ID (or Touch ID, depending on your iPhone model) and passcode.
- *Battery:* View battery usage and turn on power saving mode.
- *Privacy:* Manage application permissions to access data.

2.3. Використання комбінацій клавіш для виконання спеціальних дій.

- Hold Power + Vol + + + Vol - - hard reboot the smartphone in case of a freeze;
- Power + Vol + - screenshot;
- Press and hold Power + Vol - - smartphone shutdown menu, SOS mode and access to medical records;
- Double press Power - open Apple Pay (wallet);
- Single press Power - turn the screen on/off;
- Press and hold the Power button - launch Siri.

2.4. Вхід у систему та завершення роботи пристрою. Особливості налаштувань живлення батареї.

1. Turn on iPhone: Press and hold the side button until the Apple logo appears.
2. Sign in: Use Face ID or Touch ID to unlock your device. If you don't have these features installed, use a passcode.
3. Turn off iPhone: Press and hold Power + Vol - or Vol + until the power slider appears. Drag the slider to turn off iPhone.

Features of iPhone battery power settings:

- *Optimized charging:* To help slow down battery aging, iPhone learns your daily charging routine and can pause charging above 80% until you need it.

- *Low Power Mode:* Temporarily minimizes background activity, such as ongoing downloads and mail delivery, until iPhone is fully charged.
- *Battery Health:* This feature shows the status of your iPhone's battery, including its maximum capacity and when it needs to be serviced.
- *Battery usage:* This feature shows how much battery power each app is using. You can also tap on an app to see more detailed information about its battery usage, such as how much time it was in the foreground and background.

Відповіді на контрольні запитання:

1. Наведіть приклади серверних додатків Linux для сервера баз даних, серверів розсилки повідомлень та файлообмінників.

   - *Database Servers:* MariaDB, Firebird, PostgreSQL, MySQL.
   - Email Servers: Sendmail, Postfix, Dovecot, Cyrus IMAP, Exim.
   - *File Sharing:* Netatalk, NFS, Samba, FTP.

2. Порівняйте оболонки Bourne, C, Bourne Again (Bash), the tcsh, Korn shell (Ksh) та zsh.
   - *Bourne shell:* Due to its speed and compactness, this shell is the best option for writing shell scripts. Its disadvantages include the lack of functions for using the shell interactively, as well as the lack of built-in processing of arithmetic and logical expressions.
   - *csh (C shell*): A command shell created to improve the standard Unix shell (sh). It has built-in features for interactive use, such as aliases and command history. It supports programming-friendly features such as built-in support for arithmetic expressions and C-like scripting syntax.
   - *Bourne Again (bash):* An improved and expanded version of the sh shell, which is one of the most popular modern command shells for *nix systems. Compatible with sh. Combines useful features of ksh and csh shells. Supports navigation with arrows, so you can view command history and perform editing directly on the command line.
   - *tcsh (TENEX C Shell):* Positioned as an improved version of the csh shell. It is fully compatible with csh. It was in this shell that the function of auto-completion of commands and paths first appeared. Convenient for interactive work. Supports vi or emacs-style command line editor. It is the standard shell in FreeBSD.
   - *Korn shell (ksh):* It is an extension of sh. It is backwards compatible with sh. It has interactive functionality like csh. Supports programming-friendly features, such as: built-in support for arithmetic expressions/functions, C-like scripting syntax, and string manipulation. It is faster than csh. It can run scripts written for sh.

- *zsh (Z Shell):* Positioned as a free modern sh-compatible command shell. Among standard shells, it is most similar to ksh, but includes many improvements. Built-in support for programmatic autocomplete of commands, file names, and more. Support for spelling and syntax checking. Separate command history for simultaneous work with several running shells.

3. Для чого потрібен менеджер пакетів. Які менеджери пакетів ви знаєте у Linux?

A package manager takes care of keeping track of which files belong to which package and even downloading updates from repositories, typically a remote server sharing out the appropriate updates for a distribution. Some of the most well-known package managers are: Yum and RPM - on Red Hat and similar systems; Dpkg - in Debian and similar systems; Pacman - in Arch Linux; Portage and Paludis in Gentoo; openSUSE: zypper.

4. Які засоби безпеки використовуються в Linux?

Disabling root access: Good practice, minimizes risk of unauthorized access. Using sudo/su with proper configuration: Allows privilege elevation securely. Never use root for regular tasks: Avoids potential damage from mistakes. Firewall: Controls incoming/outgoing traffic, blocks unwanted connections. SSH: Securely connects to remote systems, encrypts communication. Two-factor authentication (2FA): Adds extra layer of security for administrative accounts. VPNs: Encrypt data transmission for additional security. Regular updates: Crucial for patching vulnerabilities and fixing security issues. Specialized distributions: Options like Kali Linux cater to security professionals.

5. Чому використання віртуалізації зараз стало таким актуальним?

- *Running multiple operating systems on a single physical server:* This core benefit enables efficient resource utilization, reducing hardware needs and associated costs.
- *Increased efficiency:* By consolidating servers, virtualization minimizes power consumption and simplifies management.
- *Rapid provisioning and scalability:* Software-based guests are easier to create,destroy, and scale compared to physical machines, fostering agile workflows.

6. Як ви розумієте поняття контейнеризації?

I understand containerization as a technology for packaging software applications and their dependencies into standardized units called containers. These containers are

isolated from each other and the underlying host operating system, allowing for efficient resource utilization, portability, and scalability.

7. Які переваги/недоліки використання програмного забезпечення з відкритим кодом?

   Advantages:
   - Cost-effective: Free to use and modify, saving on licenses and subscriptions.
   - Security: Transparent code leads to faster vulnerability patching.
   - Flexibility: Customizable to your specific needs.
   - Community: Active user base for support and updates.
   - High reliability: because it is tested by many developers, testers, and users.

   Disadvantages:
   - Support: Finding official support may be challenging.
   - Security risks: Vulnerabilities might be exploited faster due to transparency.
   - Not always user-friendly

8. ***Скільки активних віртуальних консолей (терміналів) може бути у процесі роботи Linux по замовчуванню. Як їх викликати та між ними перемикатися? Наведіть приклади?

Linux provides six virtual consoles for interactive use. You can switch between Virtual Consoles by pressing the "ALT" and a function key, such as "ALT+F1", "ALT+F2" and so on. If it doesn't work for you, try Ctrl + Alt + F1 instead. On Linux most of the time the default console is the one you can switch by pressing "ALT+F1", and you can use up to six local Virtual Console ("ALT+F1" … "ALT+F6"). When you switch virtual consoles, they're labeled with the TTY number, going from one to seven, such as "tty1" for the first virtual console.
Switching does not terminate the active login session. Each virtual console is independent and separate.

9. ***Яка віртуальна консоль (термінал) виконує функцію графічної оболонки?

A seventh virtual console is associated with the graphical user interface. To access the GUI from any virtual console press the keyboard combination Ctrl+Alt+F7.

10. ***Чи можлива реєстрація в системі Linux декілька разів під одним і тим же системним ім’ям? Які переваги це може надати?

In most cases, this is not recommended or even possible. Usernames in Linux are supposed to be unique identifiers, and having two users with the same name can lead

to confusion and potential security risks.
However, a single user can open several sessions. This is done using different terminal sessions, either on a physical machine or remotely via SSH (Secure Shell). This allows for multitasking, task isolation, convenience.

Висновки:
While completing the assignments, I got acquainted with the Ubuntu graphical interface and working in the iOS environment. I studied the structure of the user's workspace, methods of launching programs and logging out of the system in Ubuntu. Explored the main menu and iOS settings. In addition, I expanded my knowledge of Linux server applications and various command line shells.