

“Київський фаховий коледж зв’язку”

Циклова комісія Комп’ютерної інженерії

WORK-CASE №4

з дисципліни: «Операційні системи»

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Завдання:

1. В ході роботи досить часто виникає необхідність встановлювати нові програми та додатки. Для цього необхідно в терміналі вміти працювати з менеджерами пакетів:

- Дайте розгорнуте визначення таким поняттям як «пакет» та «репозиторій».

In Linux *a package* is a compressed software archive file that contains all the files that comes with a software application delivers any kind of functionality, this can be any kind of command line utility, GUI application or a software library. A package may consist of a binary executable, configuration file and other software dependencies. Packages are designed to make software distribution and installation easier and more efficient. They provide a standardized way to bundle all the required components of a program into a single file, which can then be easily installed or removed from a system.

A repository is a central location where software packages are stored and managed. It provides a way to organize and distribute packages for different software applications, making it easier for users to find and install the software they need. Repositories hold essential information regarding the available packages, such as the package name, version, dependencies, and other metadata the system needs. Based on this information, the package manager determines which packages to install, which dependencies to resolve, and which packages are required to update.

- Надайте короткий огляд існуючих менеджерів пакетів у Linux. Охарактеризуйте їх основні можливості.

APT (Advanced Package Tool):

- Distributions: Ubuntu, Debian, and Kali Linux
- Commands: apt, apt-get, apt-cache
- Underlying package management tool: dpkg
- Package file format: .deb

Downloads, installs, removes, updates packages from Debian/Ubuntu/Kali repositories. Automatically resolves package dependencies. Provides a user-friendly interface for managing packages.

YUM (Yellowdog Updater Modified):

- Distributions: RHEL/CentOS 7, Fedora 21, and earlier versions of both distributions
- Command: yum
- Underlying package management tool: RPM (RPM Package Manager)

- Package file format: .rpm

Install, uninstall, update packages on RPM-based systems. Can automatically resolve package dependencies. It has a simple command line interface for managing packages.

DNF (Dandified YUM):

- Distributions: RHEL/CentOS 8, Fedora 22, and later versions of both distributions
- Commands: dnf, yum
- Underlying package management tool: RPM (RPM Package Manager)
- Package file format: .rpm

As the successor to YUM, DNF has several enhancements including increased performance, faster dependency resolution, and more complete documentation for its API.

Pacman:

- Distributions: Arch-based, including Arch and Manjaro
- Command: pacman
- Package file format: .tar.xz (and other compressed tar formats)

Manages packages on systems based on Arch Linux. It has a simple interface. Supports fast installation, updating and uninstallation of packages. Pacman is unique in that it comes with a system to build packages, not just manage them. This system is called the ABS (Arch Build System).

Zypper:

- Distributions: openSUSE
- Command: zypper
- Underlying package management tool: ZYpp (also called libzypp)
- Package file format: .rpm

It has extensive package and repository management capabilities. Provides fast installation, updating, and uninstallation of packages.

Portage:

- Distributions: Gentoo
- Command: emerge
- Package file format: ebuild shell script or .tbz2 (compressed tar archive)

Uses ebuild scripts to build and manage packages. Provides more flexibility and control over installed packages because they are usually compiled from source.

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2. Визначте який менеджер пакетів використовує ваш дистрибутив Linux. Опишіть основні команди для роботи з ним:

Ubuntu uses APT (Advanced Package Tool) as its package manager. Basic Commands for Working with APT:

- Пошук, скачування та установка необхідних пакетів, яких у Вашій системі немає (зі сховища по замовчуванню, з нового репозиторію тощо).
- Search for Packages: `apt search <package name>`
This command allows you to search for packages by their names or keywords.

```
sofipxs@ubuntu: ~  
sofipxs@ubuntu:~$ apt search neofetch  
Sorting... Done  
Full Text Search... Done  
neofetch/jammy 7.1.0-3 all  
  Shows Linux System Information with Distribution Logo  
sofipxs@ubuntu:~$
```

- Install Packages:

To install a package from the repositories, as well as all of the necessary dependencies, you can use the apt command with the install argument.

`sudo apt install <package name>`

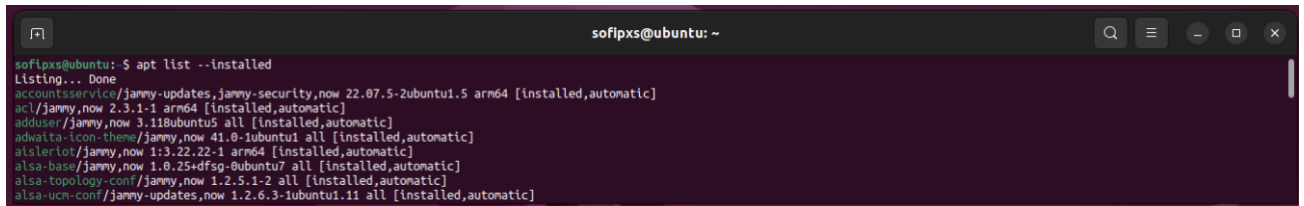
```
sofipxs@ubuntu:~$ sudo apt install neofetch  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following additional packages will be installed:  
  caca-utils chafa gsfonts imagemagick imagemagick-6-common imagemagick-6.q16 jp2a libchafa0 libde265-0 libfftw3-double3 libheif1  
  libid3tag0 libilmbase25 liblmlib2 libjxr-tools libjxr0 liblqr-1-0 libmagickcore-6.q16-6 libmagickwand-6.q16-6-extra  
  libmagickwand-6.q16-6 libnetpbm10 libopenexr25 libsixel-bin libsixel1 netpbm toilet toilet-fonts w3m w3m-img  
sofipxs@ubuntu:~$
```

```
sofipxs@ubuntu:~$ neofetch  
./+oossssoo+/+..  
:ssssssssssssssssss+!  
-ssssssssssssssssssyyssss+..  
..ssssssssssssssssss:dmNNy:ssso..  
/ssssssssss:hdNNNNyNPPH:ssssss/  
+ssssssss:hm:PPPPPPHdddy:ssssss/  
/ssssssss:hNNNN:hyyyhNNNH:ssssss/  
..ssssssss:dmNNH:ssssssssshNNHdd:ssssss..  
+ssssshhhyNNNNy:ssssssssss:yNNNy:ssssss+..  
ssyNNNNyNNH:ssssssssssssshNNH:ssssssso  
ssyNNNNyNNH:ssssssssssssshNNH:ssssssso  
+ssssshhhyNNNNy:ssssssssss:yNNNy:ssssss+..  
..ssssssss:dmNNH:ssssssssshNNHdd:ssssss..  
/ssssssss:hNNNN:hyyyhNNNH:ssssssss/  
+ssssssss:dm:PPPPPPHdddy:ssssss+..  
/ssssssssss:hdNNNNyNPPH:ssssss/  
..ssssssssssssssssss:dmNNy:ssso..  
-ssssssssssssssssssyy:ssss+..  
:ssssssssssssssssss+!  
./+oossssoo+/+..  
sofipxs@ubuntu  
-----  
OS: Ubuntu 22.04.4 LTS aarch64  
Host: QEMU Virtual Machine virt-7.2  
Kernel: 5.15.0-101-generic  
Uptime: 52 mins  
Packages: 1869 (dpkg), 13 (snap)  
Shell: bash 5.1.16  
Resolution: 2294x1342  
DE: GNOME 42.9  
WM: Mutter  
WM Theme: Adwaita  
Theme: Yaru-dark [GTK2/3]  
Icons: Yaru [GTK2/3]  
Terminal: gnome-terminal  
CPU: (6)  
GPU: 00:02.0 Red Hat, Inc. Virtio GPU  
Memory: 1064MiB / 3911MiB
```

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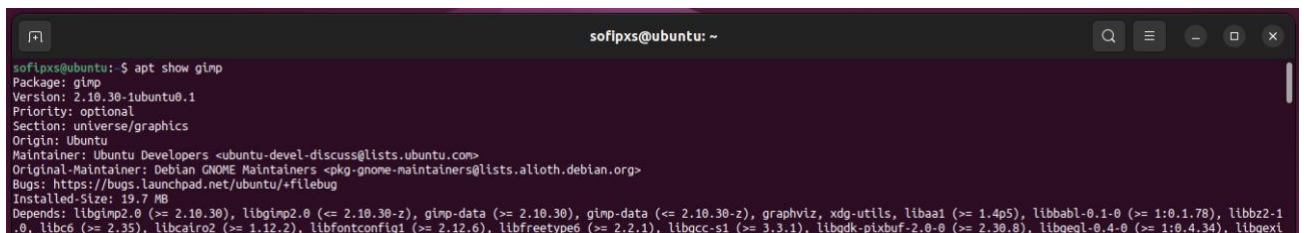
- Перегляд інформації про встановлені та доступні пакети.

The `apt list` command displays a list of all available packages. However, this command can display a large amount of information, so it is better to use it with a filter, for example: `apt list --installed`. This command lists all installed packages



```
sofipxs@ubuntu: ~  
sofipxs@ubuntu:~$ apt list --installed  
Listing... Done  
accounts-service/jammy-updates,jammy-security,now 22.07.5-2ubuntu1.5 arm64 [installed,automatic]  
acl/jammy,now 2.3.1-1 arm64 [installed,automatic]  
adduser/jammy,now 3.118ubuntu5 all [installed,automatic]  
adwaita-icon-theme/jammy,now 4:18-1ubuntu1 all [installed,automatic]  
astirator/jammy,now 1:3.22.22-1 arm64 [installed,automatic]  
alsa-base/jammy,now 1.0.25+dfsg-0ubuntu7 all [installed,automatic]  
alsa-topology-conf/jammy,now 1.2.5.1-2 all [installed,automatic]  
alsa-ucm-conf/jammy-updates,now 1.2.6.3-1ubuntu1.11 all [installed,automatic]
```

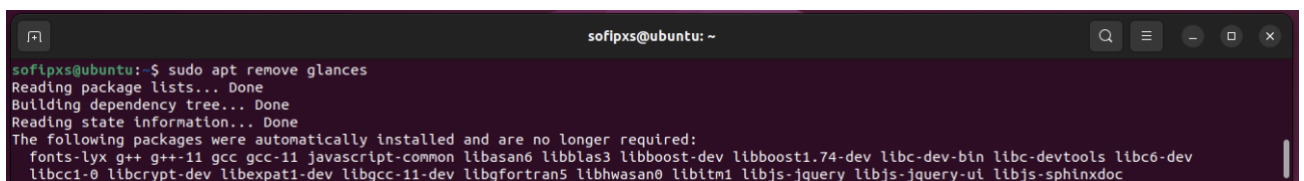
To view detailed information about a particular package, use the `apt show` command. For example, to view information about the `gimp` package, run the following command: `apt show gimp`



```
sofipxs@ubuntu:~$ apt show gimp  
Package: gimp  
Version: 2.10.30-1ubuntu0.1  
Priority: optional  
Section: universe/graphics  
Origin: Ubuntu  
Maintainer: Ubuntu Developers <ubuntu-devel-discuss@lists.ubuntu.com>  
Original-Maintainer: Debian GNOME Maintainers <pkg-gnome-maintainers@lists.alioth.debian.org>  
Bugs: https://bugs.launchpad.net/ubuntu/+filebug  
Installed-Size: 19.7 MB  
Depends: libgimp2.0 (>= 2.10.30), libgimp2.0 (<= 2.10.30-z), gimp-data (>= 2.10.30), gimp-data (<= 2.10.30-z), graphviz, xdg-utils, libaa1 (>= 1.4p5), libbabl-0.1-0 (>= 1:0.1.78), libbz2-1.0, libc6 (>= 2.35), libcairo2 (>= 1.12.2), libfontconfig1 (>= 2.12.6), libfreetype6 (>= 2.2.1), libgcc-s1 (>= 3.3.1), libgdk-pixbuf-2.0-0 (>= 2.30.8), libgegl-0.4-0 (>= 1:0.4.34), libgexl
```

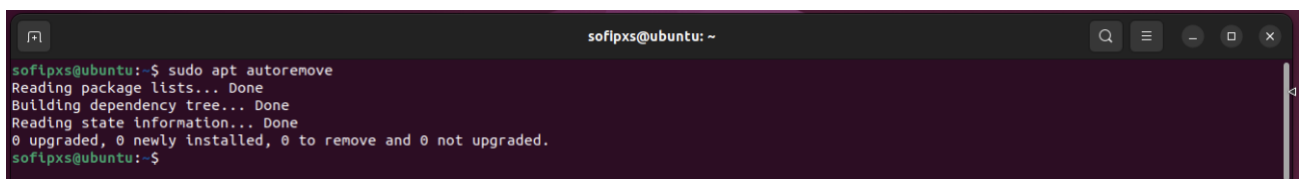
- Видалення непотрібних або застарілих пакетів.

The `apt remove` command is used to uninstall or remove a specific package from our system. `sudo apt remove <package name>`



```
sofipxs@ubuntu:~$ sudo apt remove glances  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following packages were automatically installed and are no longer required:  
 fonts-lyx g++ g++-11 gcc gcc-11 javascript-common libasan6 libblas3 libboost-dev libboost1.74-dev libc-dev-bin libc-devtools libc6-dev  
 libcc1-0 libcrypt-dev libexpat1-dev libgcc-11-dev libgfortran5 libhwasan0 libitm1 libjs-jquery libjs-jquery-ui libjs-sphinxdoc
```

The `apt autoremove` command is used to remove packages that were automatically installed as dependencies but are no longer needed by any other package on your system.



```
sofipxs@ubuntu:~$ sudo apt autoremove  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
sofipxs@ubuntu:~$
```

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- Оновлення менеджера пакетів.

The apt update command will help you to download a list of packages from different repositories included on your system and updates them when there are new versions of packages and their dependencies.

```
sofipxs@ubuntu: ~  
sofipxs@ubuntu:~$ sudo apt update  
[sudo] password for sofipxs:  
Hit:1 http://ports.ubuntu.com/ubuntu-ports jammy InRelease  
Get:2 http://ports.ubuntu.com/ubuntu-ports jammy-updates InRelease [119 kB]  
Hit:3 http://ports.ubuntu.com/ubuntu-ports jammy-backports InRelease  
Get:4 http://ports.ubuntu.com/ubuntu-ports jammy-security InRelease [110 kB]  
Get:5 http://ports.ubuntu.com/ubuntu-ports jammy-updates/main arm64 Packages [1,298 kB]  
Get:6 http://ports.ubuntu.com/ubuntu-ports jammy-updates/universe arm64 Packages [999 kB]  
Get:7 http://ports.ubuntu.com/ubuntu-ports jammy-updates/universe Translation-en [240 kB]  
Get:8 http://ports.ubuntu.com/ubuntu-ports jammy-security/main arm64 Packages [1,090 kB]  
Get:9 http://ports.ubuntu.com/ubuntu-ports jammy-security/main Translation-en [229 kB]  
Fetched 4,085 kB in 3s (1,373 kB/s)  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
All packages are up to date.  
sofipxs@ubuntu:~$
```

This command will update the package manager and any other installed packages for which updates are available : *sudo apt upgrade*.

```
sofipxs@ubuntu: ~  
sofipxs@ubuntu:~$ sudo apt upgrade  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
Calculating upgrade... Done  
The following packages were automatically installed and are no longer required:  
 fonts-lyx g++ g++-11 gcc gcc-11 javascript-common libasan6 libblas3 libboost-dev libboost1.74-dev libc-dev-bin libc-devtools libc6-dev
```

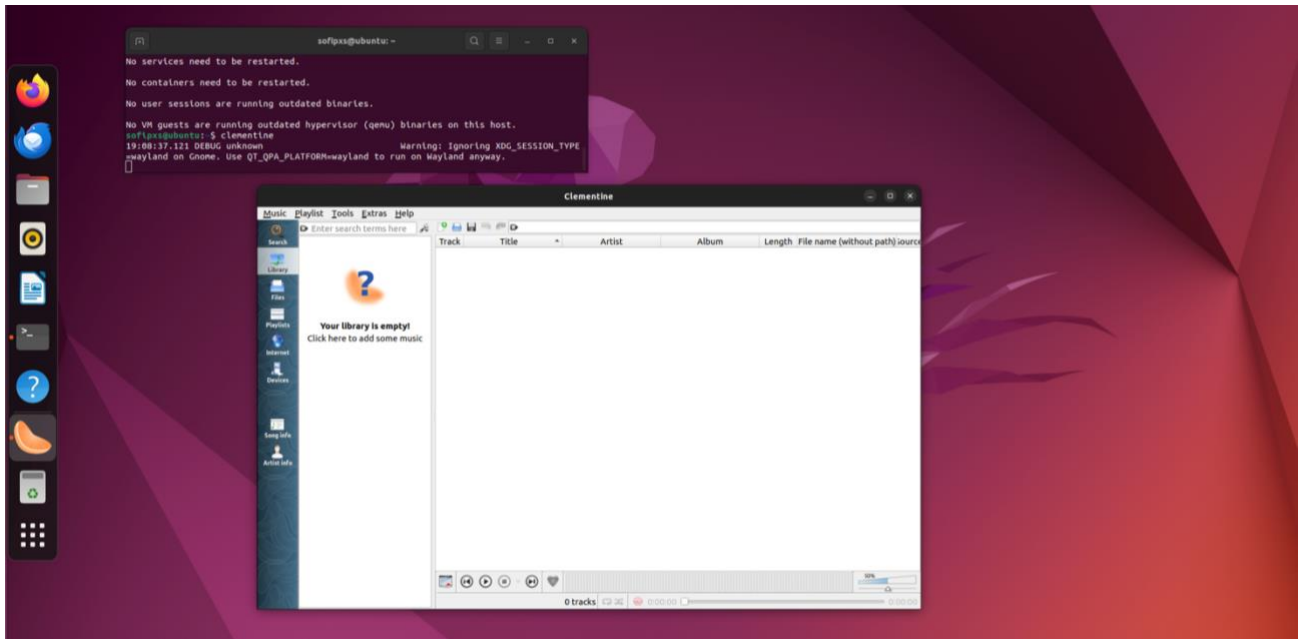
3. Встановіть у терміналі через менеджер пакетів на свою систему:

- Новий відео- чи аудіоплеєр.

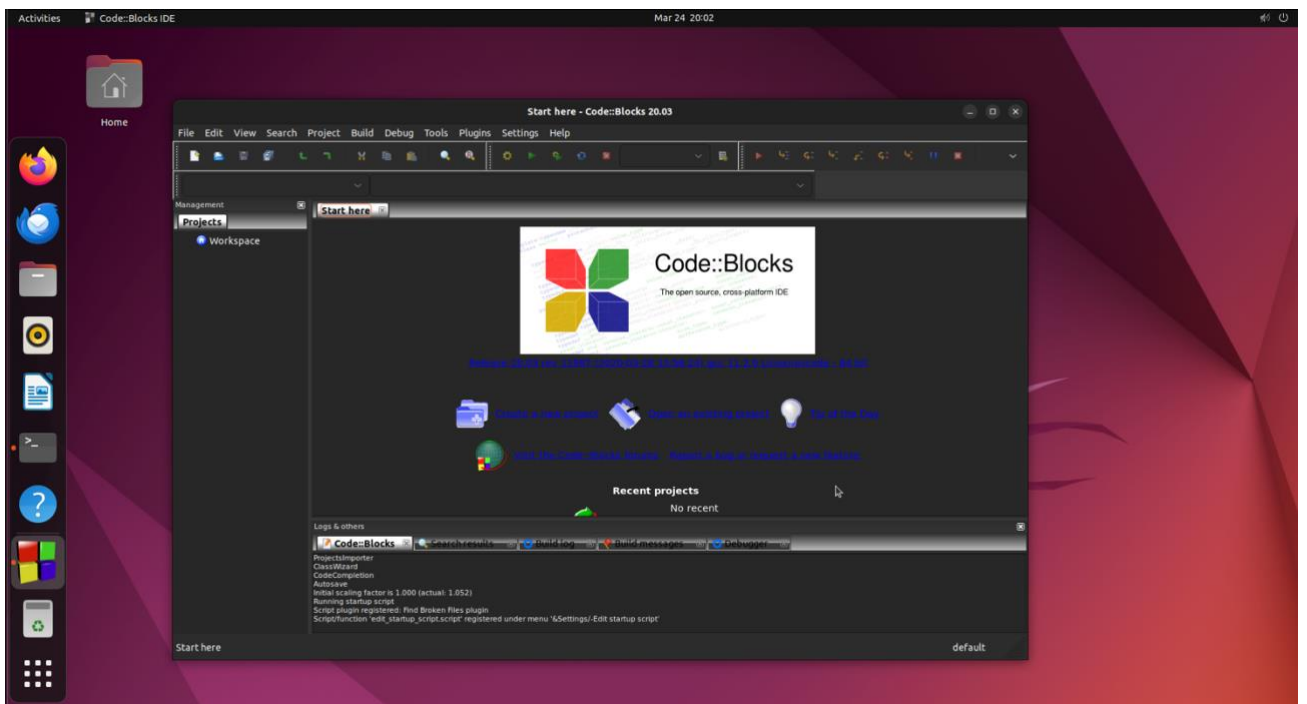
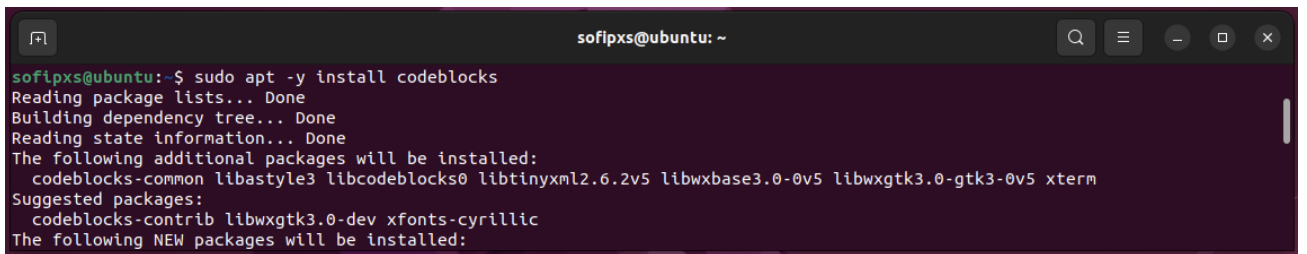
Installation of Clementine Music Player on Ubuntu: *sudo apt install clementine*

```
sofipxs@ubuntu: ~  
sofipxs@ubuntu:~$ sudo apt install clementine  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following packages were automatically installed and are no longer required:  
 fonts-lyx g++ g++-11 gcc gcc-11 javascript-common libasan6 libblas3 libboost-dev libboost1.74-dev libc-dev-bin libc-devtools libc6-dev  
 libbcb1-0 libccrypt-dev libexpat1-dev libgcc-11-dev libgfortran5 libhwasan0 libitm1 libjs-jquery libjs-jquery-ui libjs-sphinxdoc  
 libjs-underscore liblapack3 liblbfgsb0 liblsan0 libnsl-dev libopenblas-dev libopenblas-pthread-dev libopenblas0 libopenblas0-pthread  
 libpython3-dev libpython3.10-dev libqhull-r8.0 libstdc++-11-dev libtirpc-dev libtsan0 libubsan1 libxsimd-dev linux-libc-dev manpages-dev  
 python-matplotlib-data python3-appdirs python3-beniget python3-bottle python3-brotli python3-bs4 python3-cycler python3-decorator  
 python3-defusedxml python3-dev python3-docker python3-fonttools python3-fs python3-gast python3-html5lib python3-influxdb python3-kiwisolver
```

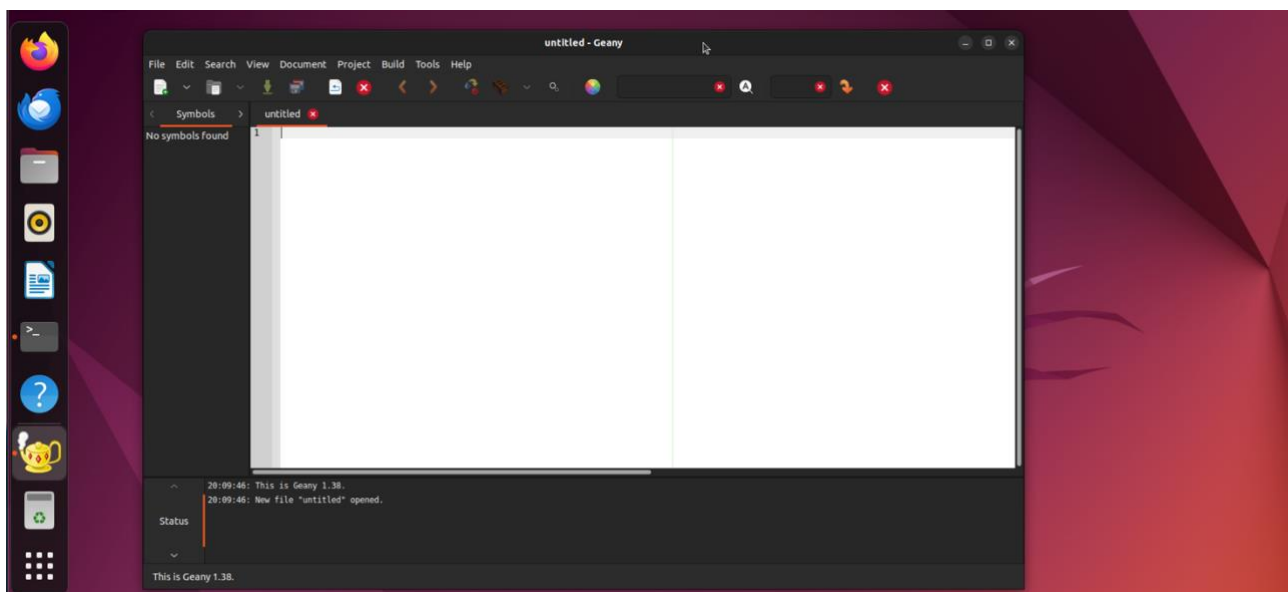
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- Середовище для мови програмування, що ви вивчаєте.



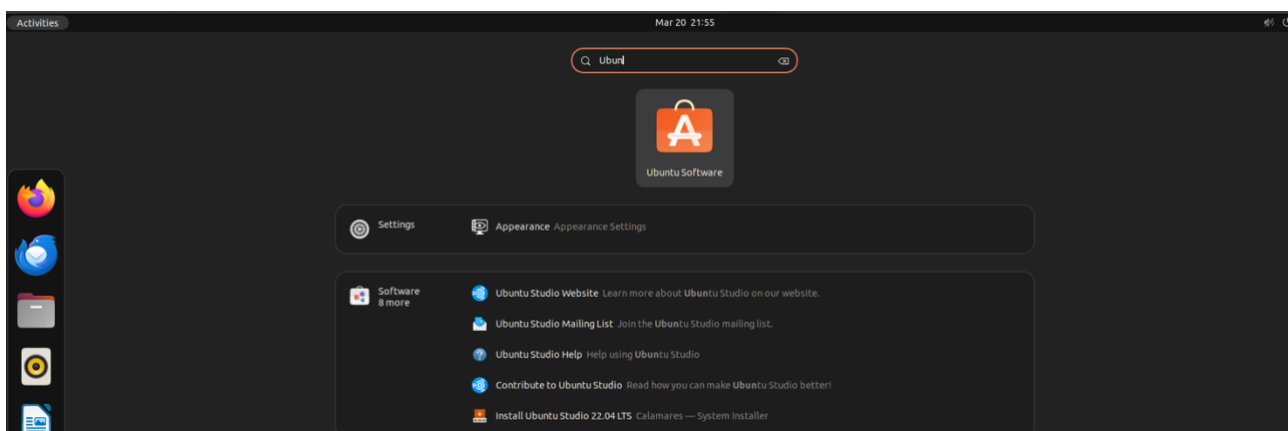
```
sofipxs@ubuntu: ~  
sofipxs@ubuntu:~$ sudo apt install geany  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following additional packages will be installed:  
  geany-common  
Suggested packages:  
  libvte9 doc-base  
The following NEW packages will be installed:
```



4. Яким чином можна встановити нові програми через магазини додатків та менеджери пакетів у графічному середовищі. Наведіть свої приклади.

Ubuntu Software.

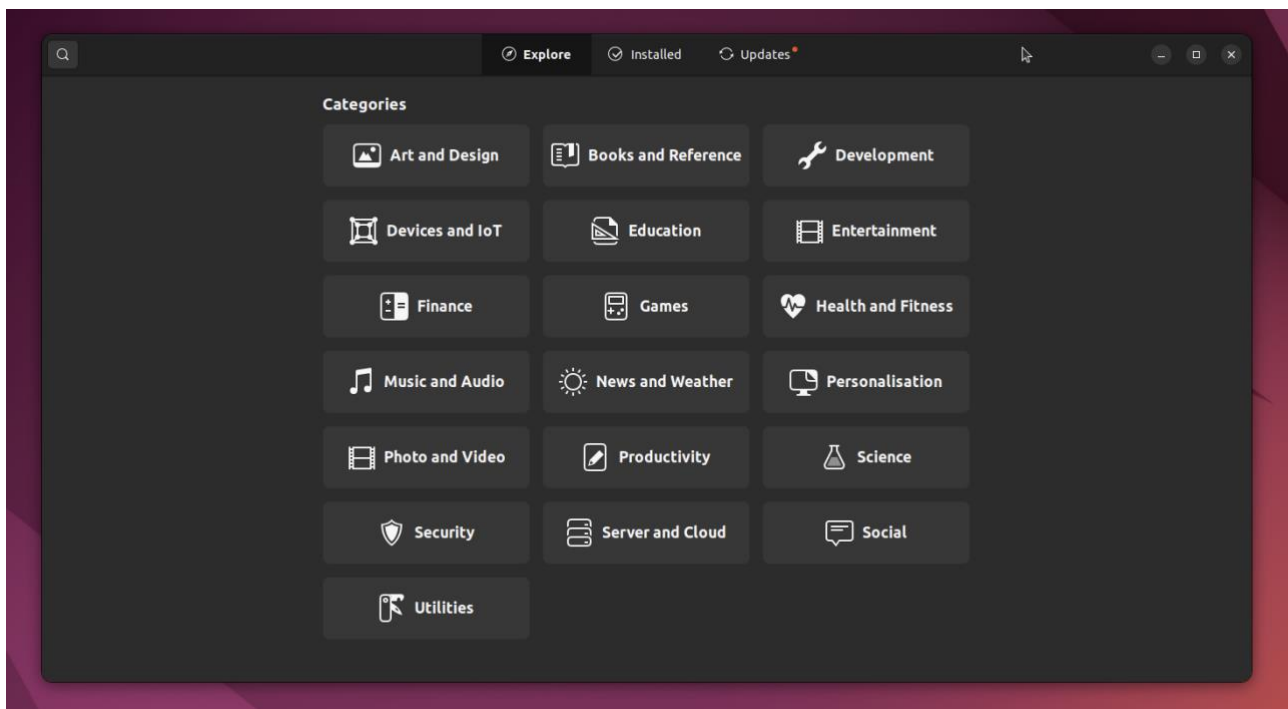
One way to view, install, and uninstall applications in Ubuntu is to use Ubuntu Software.



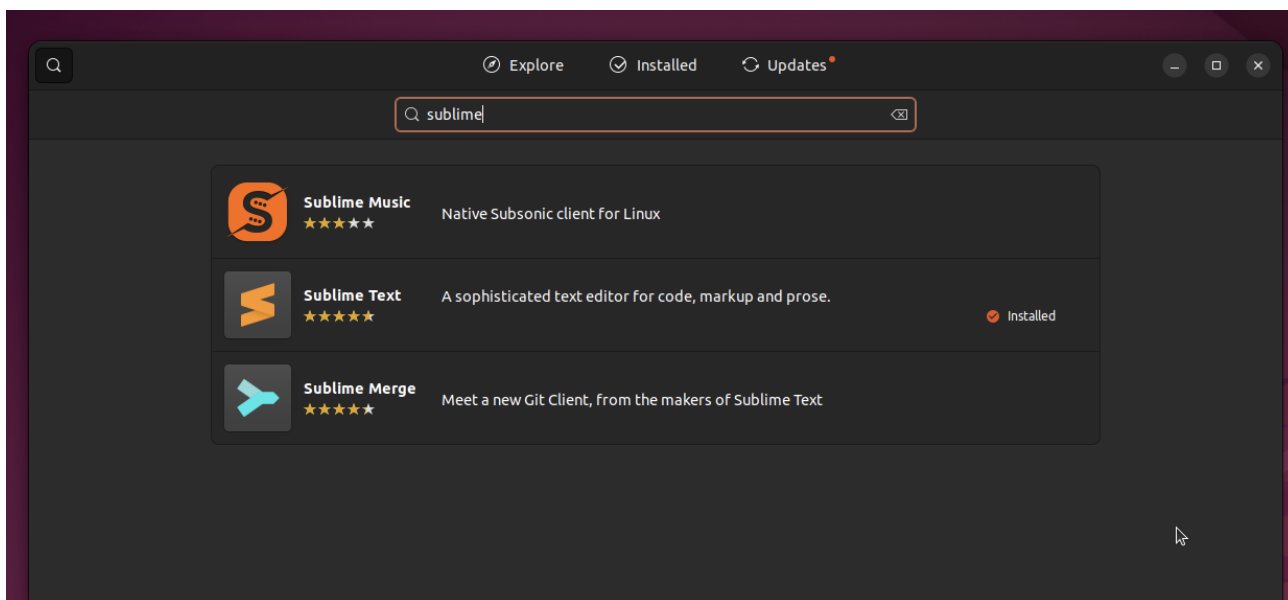
To install an application, you need to select the category in which it may be located, find its name, and select it for installation. Or you can search for an application by name or part of the name. In addition, in Ubuntu Software, you can view the installed, updated

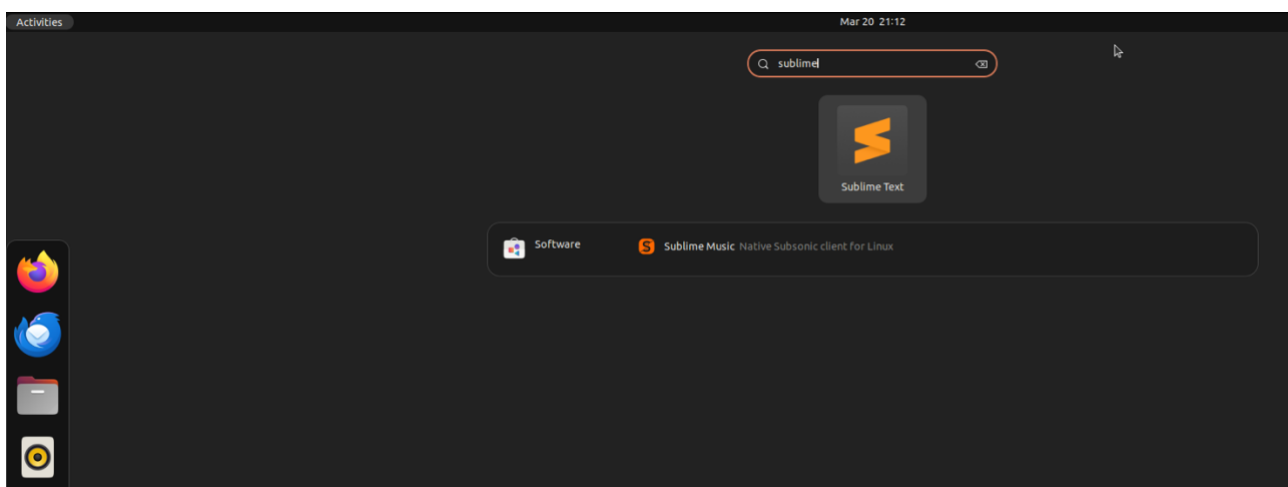
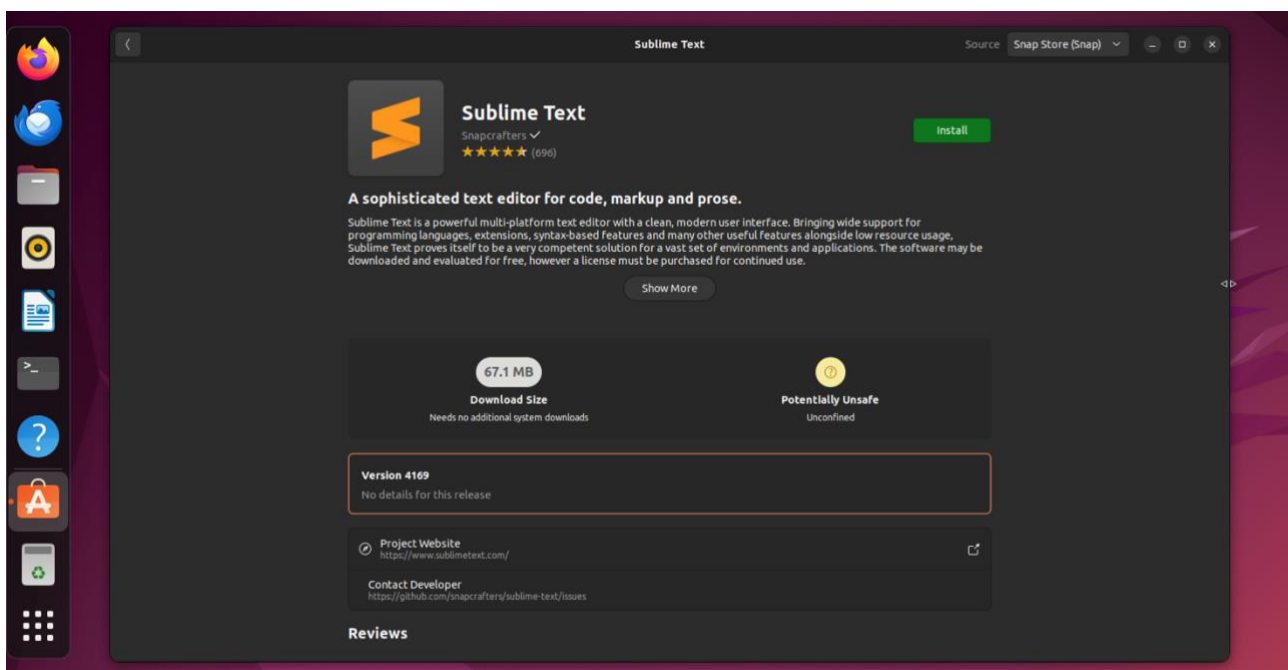
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applications on your system and, if necessary, uninstall an application from your system.



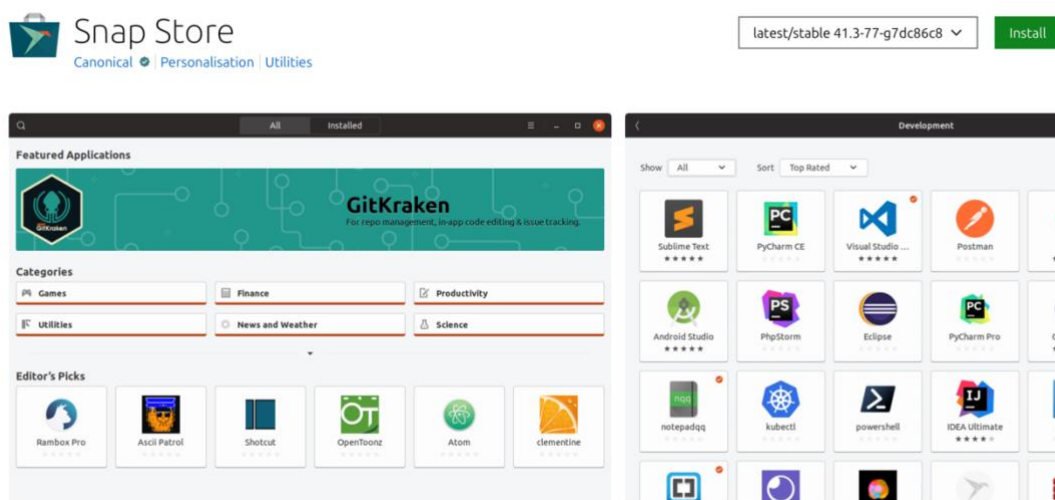
Search for the application you want to install. Click the "Install" button. Enter password if prompted.





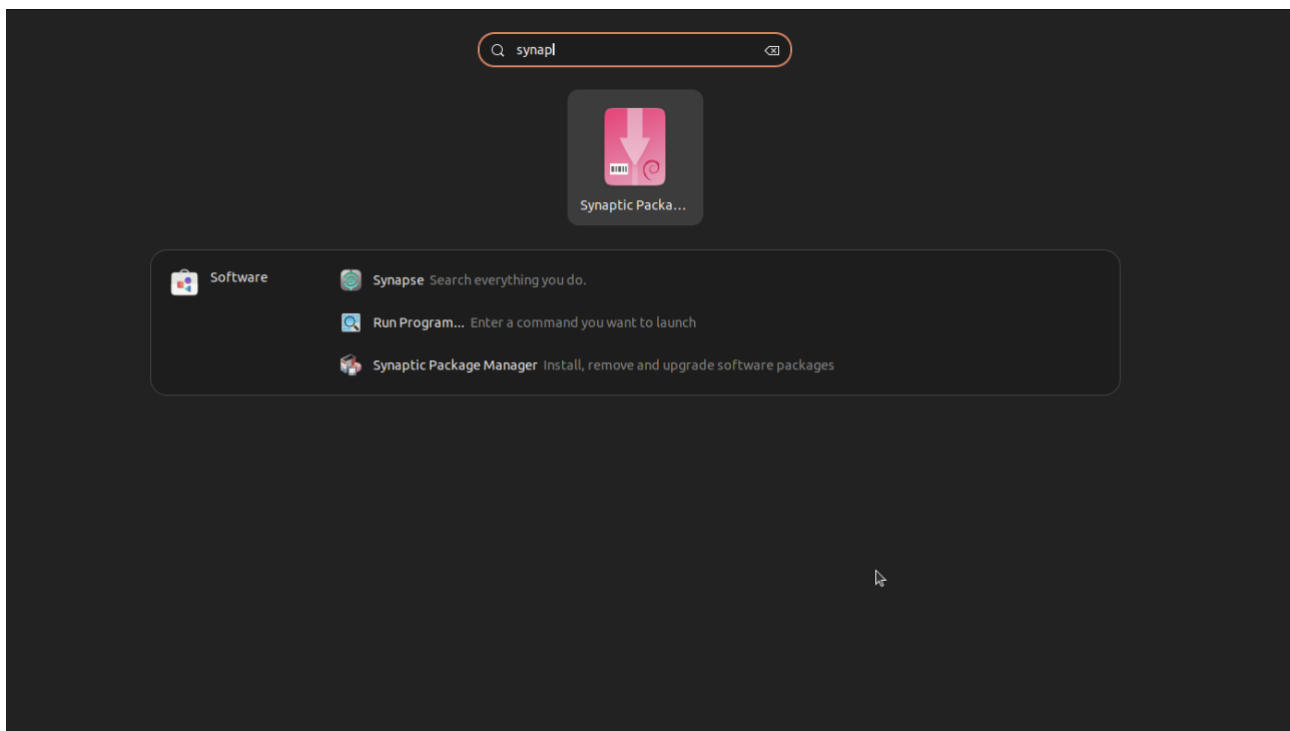
Snap Store

Ubuntu also has the Snap Store, which contains applications built as Snap packages. The search interface of the Snap Store is very similar to other app stores. Find the app you want and click the Install button. Enter your administrator password, if required, and wait for the installation process to complete.

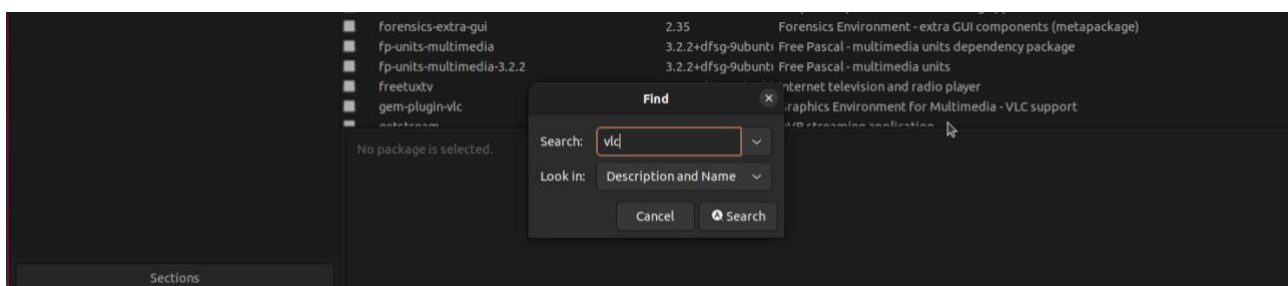
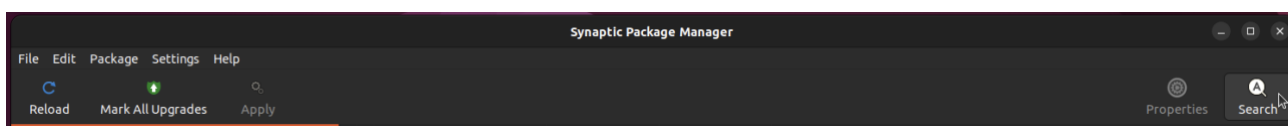
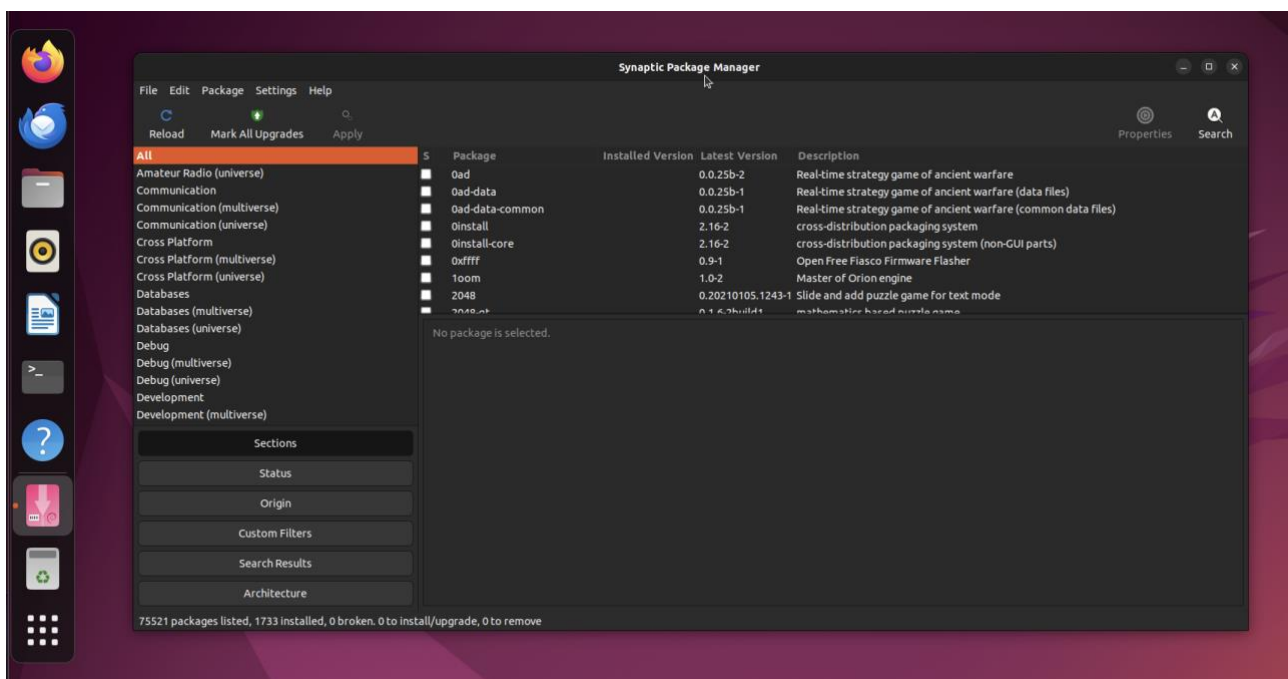


Synaptic Package Manager.

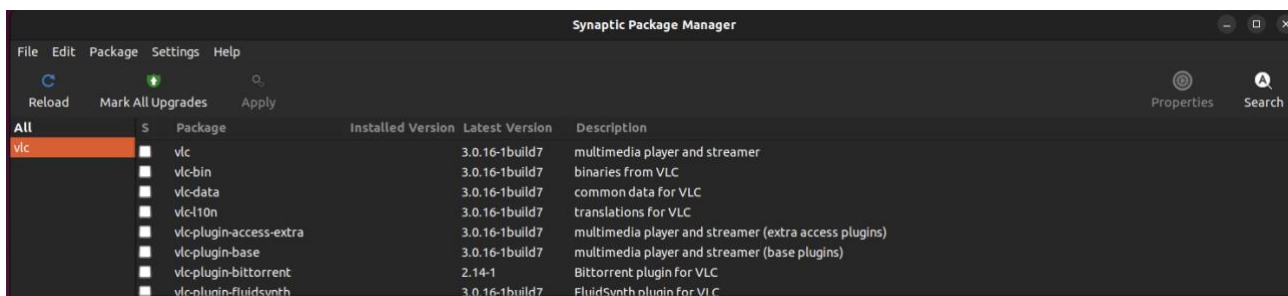
Synaptic is a package manager that allows you to manage packages in Ubuntu. It combines all the features of the apt package management system with the convenience of a graphical interface. Synaptic is an add-on to apt. With Synaptic, you can install, uninstall, configure and update packages on your system, view lists of available and installed packages, manage repositories and upgrade your system to a new version.



After starting Synaptic, enter your administrator password. In Synaptic, you can search for packages using the search function in the upper right corner of the window.

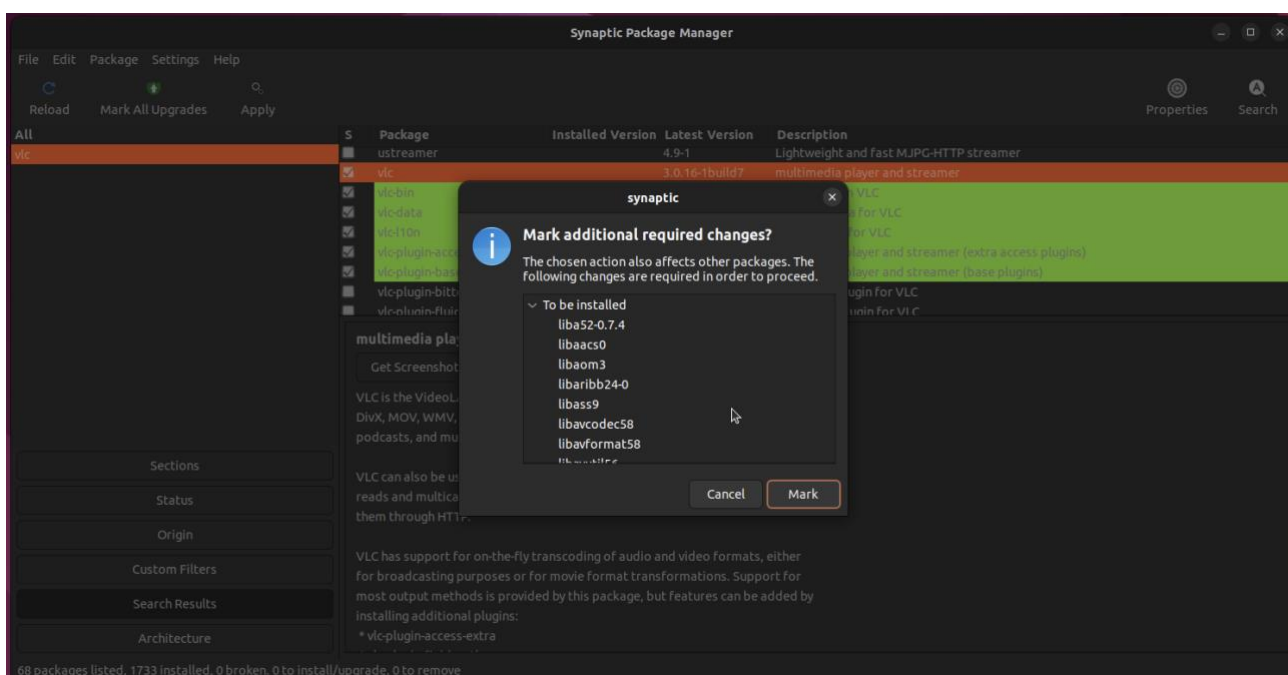
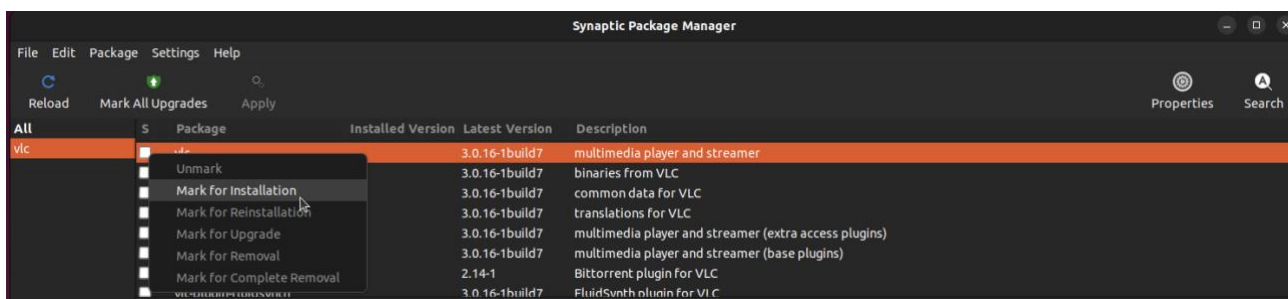


As a result, a list of related packages will be found.

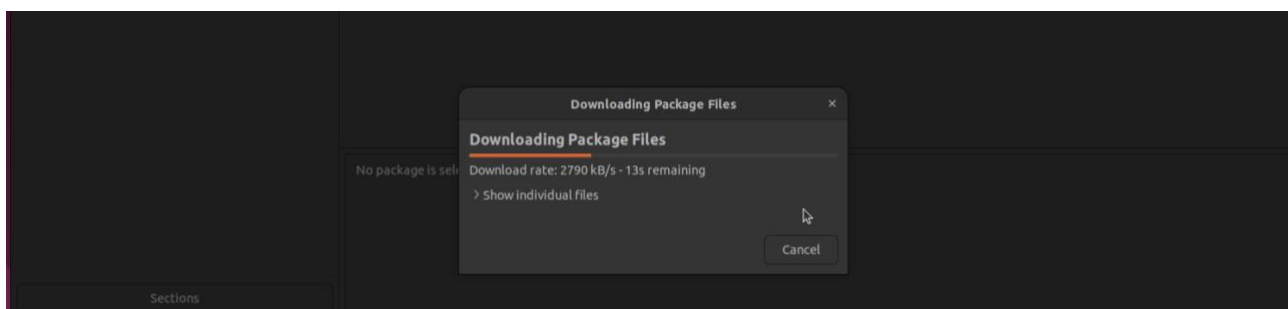
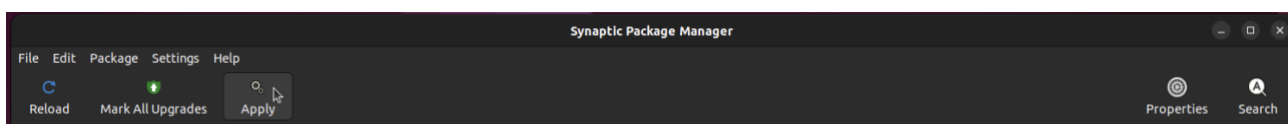


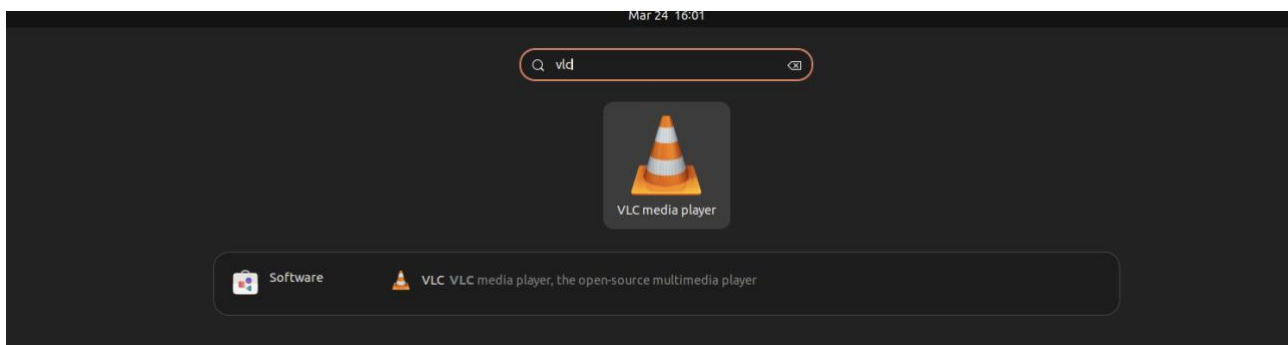
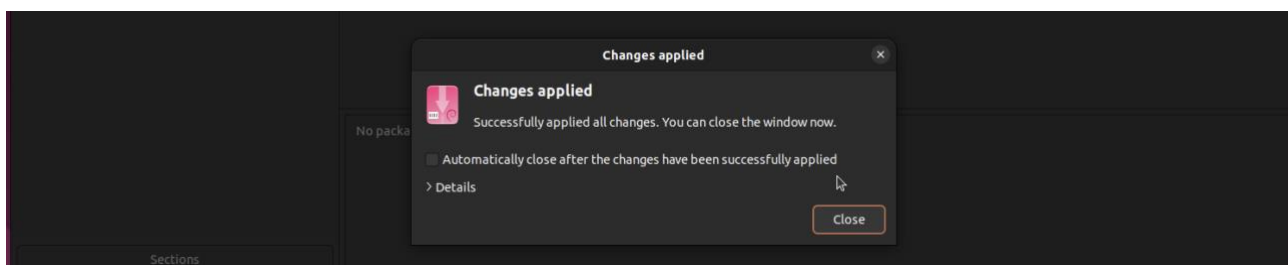
Once the package we need is found, select it and click "Mark for installation":
Right-click on the desired package (in this case, vlc) and select "Mark for installation" from the context menu that appears. If the package requires other packages to be installed, a dialog box appears with the changes that will be made

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When all the necessary packages are selected, click "Apply" in the top menu to start the installation process. Wait for the installation process to complete and close Synaptic.





Висновки:

У ході виконання ворк-кейсу мною було досліджено менеджери пакетів у Linux, а саме їх використання для встановлення нових програм і додатків у терміналі. Більш детально теоретично досліджено питання визначення понять "пакет" і "репозиторій", а також огляд існуючих менеджерів пакетів у Linux та їх основних можливостей. Отримано практичні навички роботи з командами менеджера пакетів для пошуку, встановлення, видалення та оновлення пакетів.