



DEPARTMENT OF SOFTWARE ENGINEERING

LAB#5

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Task 1: Discover missing command & install Java using apt suggestion

```
khadija@ubuntu:~$ java
Command 'java' not found, but can be installed with:
sudo apt install default-jre          # version 2:1.17-75, or
sudo apt install openjdk-17-jre-headless # version 17.0.16+8~us1-0ubuntu1~24.04.1
sudo apt install openjdk-21-jre-headless # version 21.0.8+9~us1-0ubuntu1~24.04.1
sudo apt install openjdk-11-jre-headless # version 11.0.28+6-1ubuntu1~24.04.1
sudo apt install openjdk-25-jre-headless # version 25+36-1~24.04.2
sudo apt install openjdk-8-jre-headless  # version 8u462-ga~us1-0ubuntu2~24.04.2
sudo apt install openjdk-19-jre-headless # version 19.0.2+7-4
sudo apt install openjdk-20-jre-headless # version 20.0.2+9-1
sudo apt install openjdk-22-jre-headless # version 22~22ea-1
khadija@ubuntu:~$
```

```
Adding debian:TWCA_Root_Certification_Authority.pem
Adding debian:UCA_Extended_Validation_Root.pem
Adding debian:UCA_Global_G2_Root.pem
Adding debian:USERTrust_ECC_Certification_Authority.pem
Adding debian:USERTrust_RSA_Certification_Authority.pem
Adding debian:vTrus_ECC_Root_CA.pem
Adding debian:vTrus_Root_CA.pem
Adding debian:XRamp_Global_CA_Root.pem
done.
Setting up openjdk-21-jre:amd64 (21.0.8+9~us1-0ubuntu1~24.04.1) ...
Setting up default-jre-headless (2:1.21-75+exp1) ...
Setting up default-jre (2:1.21-75+exp1) ...
Processing triggers for libgdk-pixbuf-2.0-0:amd64 (2.42.10+dfsg-3ubuntu3.2) ...
Scanning processes...
Scanning linux images...
```

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.

```
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ java --version
openjdk 21.0.8 2025-07-15
OpenJDK Runtime Environment (build 21.0.8+9-Ubuntu-0ubuntu124.04.1)
OpenJDK 64-Bit Server VM (build 21.0.8+9-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
khadija@ubuntu:~$
```

```

khadija@ubuntu:~$ sudo apt remove default-jre -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer req
adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-common at-s
default-jre-headless fontconfig fonts-dejavu-extra gsettings-desktop-sc
libasound2-data libasound2t64 libatk-bridge2.0-0t64 libatk-wrapper-java
libavahi-common-data libavahi-common3 libcairo-gobject2 libcairo2 libco
libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin libgdk-pixbuf2.0-common libgif
libgtk-3-bin libgtk-3-common libharfbuzz0b libice6 liblcms2-2 libllvm20
libpixmap-1-0 librsvg2-2 librsvg2-common libsm6 libthai-data libthai0 l
libx11-xcb1 libxaw7 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-ra
libxcomposite1 libxcursor1 libxdamage1 libxfixes3 libxft2 libxi6 libxin
libxv1 libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers ope
x11-utils
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  default-jre
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 6,144 B disk space will be freed.
(Reading database ... 139901 files and directories currently installed.)
Removing default-jre (2:1.21-75+exp1) ...
khadija@ubuntu:~$ _

```

```

khadija@ubuntu:~$ java
-bash: /usr/bin/java: No such file or directory
khadija@ubuntu:~$

```

```

khadija@ubuntu:~$ hash -r
khadija@ubuntu:~$ java
Command 'java' not found, but can be installed with:
sudo apt install default-jre # version 2:1.17-75, or
sudo apt install openjdk-17-jre-headless # version 17.0.16+8~us1-0ubuntu1~24.04.1
sudo apt install openjdk-21-jre-headless # version 21.0.8+9~us1-0ubuntu1~24.04.1
sudo apt install openjdk-11-jre-headless # version 11.0.28+6-1ubuntu1~24.04.1
sudo apt install openjdk-25-jre-headless # version 25+36-1~24.04.2
sudo apt install openjdk-8-jre-headless # version 8u462-ga~us1-0ubuntu2~24.04.2
sudo apt install openjdk-19-jre-headless # version 19.0.2+7-4
sudo apt install openjdk-20-jre-headless # version 20.0.2+9-1
sudo apt install openjdk-22-jre-headless # version 22~22ea-1
khadija@ubuntu:~$ _

```

Task 2: Install & remove Java using apt-get (explicitly)

```

khadija@ubuntu:~$ sudo apt-get update
Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Get:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.5 kB]
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [9,008 B]
Get:6 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:8 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1,573 kB]
Get:10 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [208 B]
Get:11 http://archive.ubuntu.com/ubuntu noble-updates/main Translation-en [297 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [175 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [15.4 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [2,226 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [505 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:17 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [1,498 kB]
Get:18 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [377 kB]
Get:19 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [31.4 kB]
Get:20 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:21 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7,144 B]
Get:22 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [212 B]
Get:23 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [11.0 kB]
Get:24 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Fetched 7,180 kB in 7s (1,092 kB/s)
Reading package lists... Done
khadija@ubuntu:~$ sudo apt-get install default-jre -y

```

```

khadija@ubuntu:~$ java --version
openjdk 21.0.8 2025-07-15
OpenJDK Runtime Environment (build 21.0.8+9-Ubuntu-0ubuntu124.04.1)
OpenJDK 64-Bit Server VM (build 21.0.8+9-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
khadija@ubuntu:~$

```

```

khadija@ubuntu:~$ sudo apt-get remove default-jre -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-common at-spi2-core ca-certificates-j
  default-jre-headless fontconfig fonts-dejavu-extra gsettings-desktop-schemas gtk-update-icon-cach
  libasound2-data libasound2t64 libatk-bridge2.0-0t64 libatk-wrapper-java libatk-wrapper-java-jni l
  libavahi-common-data libavahi-common3 libcairo-gobject2 libcairo2 libcolord2 libcups2t64 libdatr
  libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin libgdk-pixbuf2.0-common libgif7 libgl1 libgl1-mesa-dri l
  libgtk-3-bin libgtk-3-common libharfbuzz0b libice6 liblcms2-2 libllvm20 libpango-1.0-0 libpangoc
  libpixmap-1-0 librsvg2-2 librsvg2-common libsm6 libthai-data libthai0 libvulkan1 libwayland-clien
  libx11-xcb1 libxaw7 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb
  libxcomposite1 libxcursor1 libxdamage1 libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6
  libxv1 libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers openjdk-21-jre openjdk-21-jre
  x11-utils
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  default-jre
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 6,144 B disk space will be freed.
(Reading database ... 139901 files and directories currently installed.)
Removing default-jre (2:1.21-75+exp1) ...
khadija@ubuntu:~$ sudo apt autoremove

```

```

khadija@ubuntu:~$ hash -r
khadija@ubuntu:~$ java
Command 'java' not found, but can be installed with:
sudo apt install default-jre # version 2:1.17-75, or
sudo apt install openjdk-17-jre-headless # version 17.0.16+8~us1-0ubuntu1~24.04.1
sudo apt install openjdk-21-jre-headless # version 21.0.8+9~us1-0ubuntu1~24.04.1
sudo apt install openjdk-11-jre-headless # version 11.0.28+6-1ubuntu1~24.04.1
sudo apt install openjdk-25-jre-headless # version 25+36-1~24.04.2
sudo apt install openjdk-8-jre-headless # version 8u462-ga~us1-0ubuntu2~24.04.2
sudo apt install openjdk-19-jre-headless # version 19.0.2+7-4
sudo apt install openjdk-20-jre-headless # version 20.0.2+9-1
sudo apt install openjdk-22-jre-headless # version 22~22ea-1
khadija@ubuntu:~$

```

Task 3: apt update vs apt upgrade - run & explain

```
khadija@ubuntu:~$ sudo apt update
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
khadija@ubuntu:~$
```

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

```
GNU nano 7.2 /home/khadija/apt_update_vs_upgrade.md
apt update checks for new versions and packages (refreshes the package index) while apt upgrade installs those new versions and packages._
```

Task 4: Install Visual Studio Code via snap on CLI and verify (DO NOT remove Code)

```

khadija@ubuntu: ~
Microsoft Windows [Version 10.0.19045.6456]
(c) Microsoft Corporation. All rights reserved.

C:\Users\DSP_Lab_S6>ssh khadija@192.168.154.141
khadija@192.168.154.141's password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-87-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Mon Nov  3 09:40:07 AM UTC 2025

System load:  0.02               Processes:            220
Usage of /:   35.9% of 19.51GB   Users logged in:     1
Memory usage: 8%                IPv4 address for ens33: 192.168.154.141
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Mon Nov  3 09:40:08 2025 from 192.168.154.1
khadija@ubuntu:~$

```

```

khadija@ubuntu:~$ sudo snap install --classic code
[sudo] password for khadija:
2025-11-03T09:42:07Z INFO Waiting for automatic snapd restart...
code 7d842fb8 from Visual Studio Code (vscode) installed
khadija@ubuntu:~$

```

```

khadija@ubuntu:~$ snap list code
Name Version Rev Tracking Publisher Notes
code 7d842fb8 211 latest/stable vscode classic
khadija@ubuntu:~$

```

```

khadija@ubuntu:~$ code --version
1.105.1
7d842fb85a0275a4a8e4d7e040d2625abbbf7f084
x64
khadija@ubuntu:~$

```

```

khadija@ubuntu:~$ ls -l /snap/bin | grep code
lrwxrwxrwx 1 root root 13 Nov  3 09:43 code -> /usr/bin/snap
lrwxrwxrwx 1 root root 13 Nov  3 09:43 code.url-handler -> /usr/bin/snap
khadija@ubuntu:~$

```

Task 5: Install XFCE GUI + XRDP - minimal desktop and remote access (GUI) and launch VS Code


```
khadija@ubuntu:~$ sudo apt update && sudo apt upgrade -y
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo apt install xfce4 xfce4-goodies -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  7zip accountsservice accountsservice-ubuntu-schemas acl activity-log-manager adwaita-icon-theme alsa-topology-conf
  alsa-ucm-conf apg aspell aspell-en at-spi2-common at-spi2-core avahi-daemon avahi-utils bamfdaemon bluez bluez-obexd
  bubblewrap bzip2 cheese-common colord colord-data cpp cpp-13 cpp-13-x86-64-linux-gnu cpp-x86-64-linux-gnu
  cracklib-runtime cups cups-browsed cups-client cups-common cups-core-drivers cups-daemon cups-filters
  cups-filters-core-drivers cups-ipp-utils cups-pk-helper cups-ppdc cups-server-common dconf-cli
  dconf-gsettings-backend dconf-service desktop-base desktop-file-utils dictionaries-common dns-root-data dnsmasq-base
  docbook-xml elementary-xfce-icon-theme emacsen-common enchant-2 evolution-data-server evolution-data-server-common
  exo-utils fontconfig fonts-droid-fallback fonts-noto-mono fonts-quicksand fonts-ubuntu fonts-urw-base35 gcc-13-base
  gcr gcr4 geocode-glib-common ghostscript gir1.2-atk-1.0 gir1.2-dbusmenu-glib-0.4 gir1.2-freedesktop
  gir1.2-gdkpixbuf-2.0 gir1.2-gtk-3.0 gir1.2-handy-1 gir1.2-harfbuzz-0.0 gir1.2-ibus-1.0 gir1.2-notify-0.7
  gir1.2-pango-1.0 gir1.2-polkit-1.0 gir1.2-secret-1 gkbd-capplet glib-networking glib-networking-common
  glib-networking-services gnome-bluetooth gnome-bluetooth-3-common gnome-bluetooth-sendto gnome-control-center-faces
  gnome-desktop3-data gnome-keyring gnome-keyring-pkcs11 gnome-menus gnome-power-manager gnome-screensaver
  gnome-session-bin gnome-session-common gnome-settings-daemon-common gnome-startup-applications gnome-terminal
  gnome-terminal-data greybird-gtk-theme gsettings-desktop-schemas gsettings-ubuntu-schemas gstreamer1.0-clutter-3.0
  gstreamer1.0-gl gstreamer1.0-plugins-base gstreamer1.0-plugins-good gstreamer1.0-x gtk-update-icon-cache
  gtk2-engines-murrine gvfs gvfs-backends gvfs-common gvfs-daemons gvfs-libs hicolor-icon-theme humanity-icon-theme
  hunspell-en-us i965-va-driver ibus ibus-data ibus-gtk ibus-gtk3 ibus-gtk4 im-config indicator-aplet
  indicator-application indicator-appmenu indicator-bluetooth indicator-common indicator-datetime indicator-keyboard
  indicator-messages indicator-power indicator-printers indicator-session indicator-sound intel-media-va-driver
  ipp-usb jayatana libaa1 libabsl20220623t64 libaccounts-glib0 libaccounts-service0 libadwaita-1-0 libasound2-data
  libasound2-plugins libasound2t64 libaspell15 libasynccs0 libatk-bridge2.0-0t64 libatk1.0-0t64 libatkmm-1.6-1v5
  libatomic1 libatspi2.0-0t64 libauthen-sasl-perl libavahi-client3 libavahi-common-data libavahi-common3
  libavahi-core7 libavahi-glib1 libavc1394-0 libavcodec60 libavutil58 libayatana-appindicator3-1 libayatana-ido3-0.4-0
```

```
aspell-autobuildhash: processing: en [en_GB-variant_1].
aspell-autobuildhash: processing: en [en_US-w_accents-only].
aspell-autobuildhash: processing: en [en_US-wo_accents-only].
Processing triggers for libgdk-pixbuf-2.0-0:amd64 (2.42.10+dfsg-3ubuntu3.2) ...
Processing triggers for sgml-base (1.31) ...
Processing triggers for libc-bin (2.39-0ubuntu8.6) ...
Processing triggers for dbus (1.14.10-4ubuntu4.1) ...
Processing triggers for ufw (0.36.2-6) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
khadija@ubuntu:~$
```

```

khadija@ubuntu:~$ sudo apt install xrdp -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libfuse2t64 libpipewire-0.3-modules-xrdp pipewire-module-xrdp xorgxrdp
Suggested packages:
  pipewire-bin guacamole
The following NEW packages will be installed:
  libfuse2t64 libpipewire-0.3-modules-xrdp pipewire-module-xrdp xorgxrdp xrdp
0 upgraded, 5 newly installed, 0 to remove and 0 not upgraded.
Need to get 715 kB of archives.
After this operation, 3,895 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/universe amd64 libfuse2t64 amd64 2.9.9-8.1build1 [89.9 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble/universe amd64 xrdp amd64 0.9.24-4 [536 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble/universe amd64 libpipewire-0.3-modules-xrdp amd64 0.2-2 [20.6 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble/universe amd64 pipewire-module-xrdp all 0.2-2 [3,800 B]
Get:5 http://archive.ubuntu.com/ubuntu noble/universe amd64 xorgxrdp amd64 1:0.9.19-1 [65.3 kB]
Fetched 715 kB in 3s (238 kB/s)
Selecting previously unselected package libfuse2t64:amd64.
(Reading database ... 175651 files and directories currently installed.)
Preparing to unpack .../libfuse2t64_2.9.9-8.1build1_amd64.deb ...
Unpacking libfuse2t64:amd64 (2.9.9-8.1build1) ...
Selecting previously unselected package xrdp.
Preparing to unpack .../xrdp_0.9.24-4_amd64.deb ...
Unpacking xrdp (0.9.24-4) ...
Selecting previously unselected package libpipewire-0.3-modules-xrdp:amd64.
Preparing to unpack .../libpipewire-0.3-modules-xrdp_0.2-2_amd64.deb ...
Unpacking libpipewire-0.3-modules-xrdp:amd64 (0.2-2) ...
Selecting previously unselected package pipewire-module-xrdp.
Preparing to unpack .../pipewire-module-xrdp_0.2-2_all.deb ...
Unpacking pipewire-module-xrdp (0.2-2) ...
Selecting previously unselected package xorgxrdp.
Preparing to unpack .../xorgxrdp_1%3a0.9.19-1_amd64.deb ...
Unpacking xorgxrdp (1:0.9.19-1) ...
Setting up libpipewire-0.3-modules-xrdp:amd64 (0.2-2) ...
Setting up xorgxrdp (1:0.9.19-1) ...
Setting up libfuse2t64:amd64 (2.9.9-8.1build1) ...
Setting up xrdp (0.9.24-4) ...

Generating 2048 bit rsa key...

ssl_gen_key_xrdp1 ok

saving to /etc/xrdp/rsakeys.ini

Created symlink /etc/systemd/system/multi-user.target.wants/xrdp-sesman.service → /usr/lib/systemd/system/xrdp-sesman.service.
Created symlink /etc/systemd/system/multi-user.target.wants/xrdp.service → /usr/lib/systemd/system/xrdp.service.
Setting up pipewire-module-xrdp (0.2-2) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.6) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

```

```

khadija@ubuntu:~$ sudo systemctl enable --now xrdp
Synchronizing state of xrdp.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable xrdp
khadija@ubuntu:~$

```

```

khadija@ubuntu:~$ sudo systemctl status xrdp
● xrdp.service - xrdp daemon
   Loaded: loaded (/usr/lib/systemd/system/xrdp.service; enabled; preset: enabled)
   Active: active (running) since Mon 2025-11-03 09:59:30 UTC; 4min 26s ago
     Docs: man:xrdp(8)
           man:xrdp.ini(5)
   Main PID: 18599 (xrdp)
    Tasks: 1 (limit: 4545)
   Memory: 872.0K (peak: 1.5M)
      CPU: 12ms
   CGroup: /system.slice/xrdp.service
           └─18599 /usr/sbin/xrdp

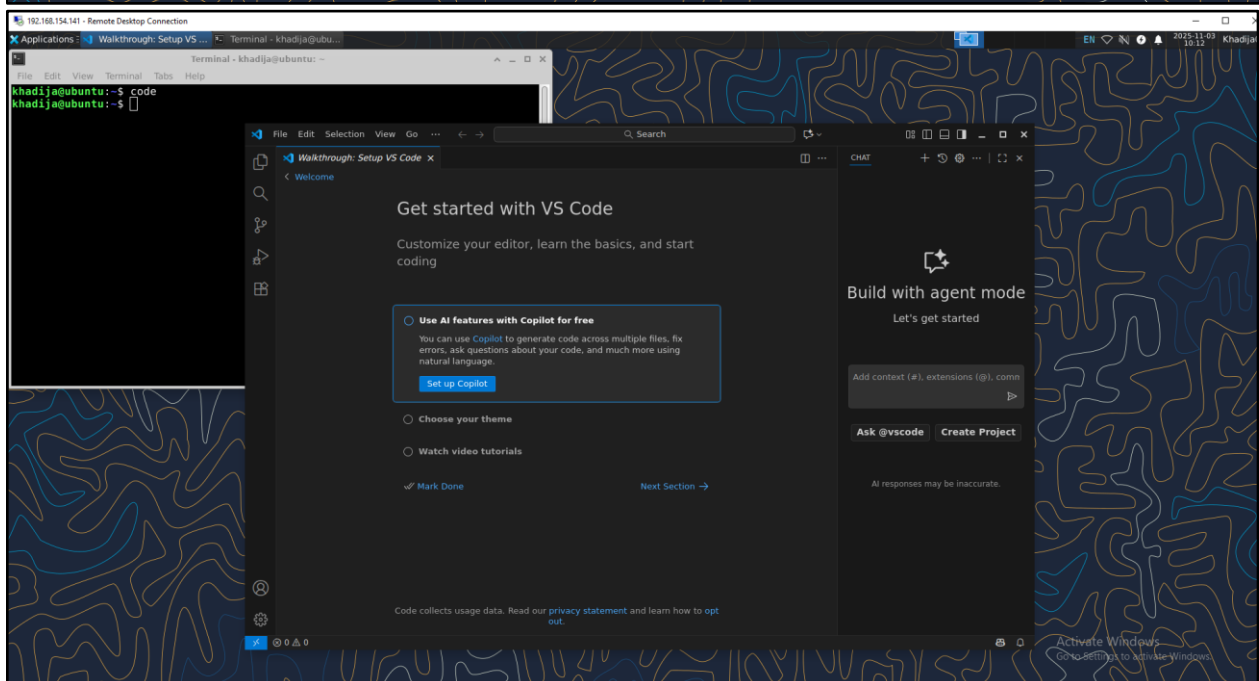
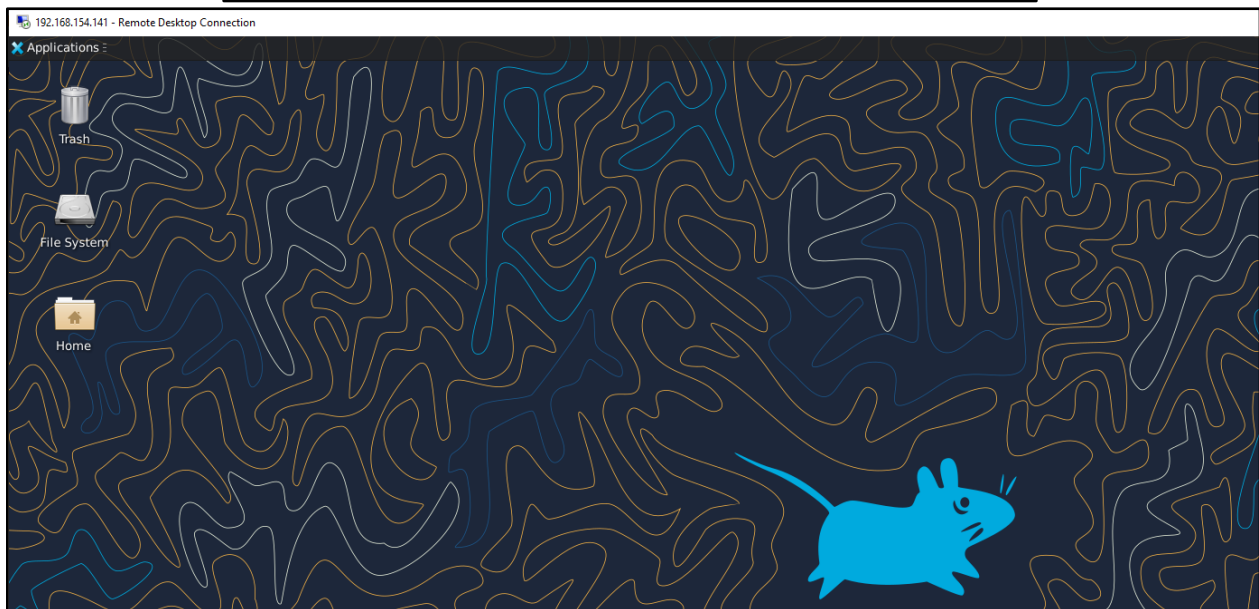
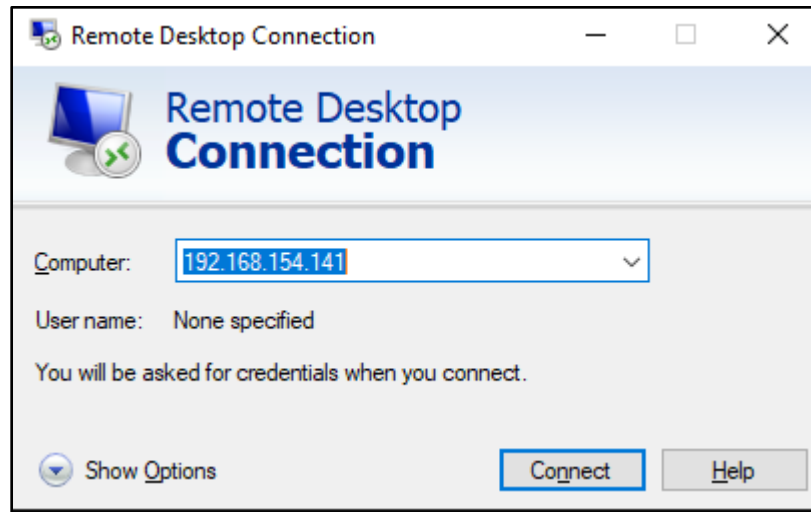
Nov 03 09:59:29 ubuntu systemd[1]: Starting xrdp.service - xrdp daemon...
Nov 03 09:59:29 ubuntu xrdp[18597]: [INFO ] address [0.0.0.0] port [3389] mode 1
Nov 03 09:59:29 ubuntu xrdp[18597]: [INFO ] listening to port 3389 on 0.0.0.0
Nov 03 09:59:29 ubuntu xrdp[18597]: [INFO ] xrdp_listen_pp done
Nov 03 09:59:29 ubuntu systemd[1]: xrdp.service: Can't open PID file /run/xrdp/xrdp.pid (yet?) after start: No such file or directory
Nov 03 09:59:30 ubuntu systemd[1]: Started xrdp.service - xrdp daemon.
Nov 03 09:59:31 ubuntu xrdp[18599]: [INFO ] starting xrdp with pid 18599
Nov 03 09:59:31 ubuntu xrdp[18599]: [INFO ] address [0.0.0.0] port [3389] mode 1
Nov 03 09:59:31 ubuntu xrdp[18599]: [INFO ] listening to port 3389 on 0.0.0.0
Nov 03 09:59:31 ubuntu xrdp[18599]: [INFO ] xrdp_listen_pp done
khadija@ubuntu:~$

```

```

khadija@ubuntu:~$ echo xfce4-session > ~/.xsession
khadija@ubuntu:~$

```

Task 6: Install lightdm-gtk-greeter and GUI verification - start GUI, open VS Code, take snapshot, then end (GUI)

```
khadija@ubuntu:~$ sudo apt install lightdm lightdm-gtk-greeter -y
[sudo] password for khadija:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
lightdm is already the newest version (1.30.0-0ubuntu14).
lightdm set to manually installed.
The following additional packages will be installed:
  gnome-accessibility-themes gnome-themes-extra gnome-themes-extra-data gtk2-engines-pixbuf
The following NEW packages will be installed:
  gnome-accessibility-themes gnome-themes-extra gnome-themes-extra-data gtk2-engines-pixbuf lightdm-gtk-greeter
0 upgraded, 5 newly installed, 0 to remove and 0 not upgraded.
Need to get 2,495 kB of archives.
After this operation, 7,003 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 gnome-accessibility-themes all 3.28-2ubuntu5 [2,296 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble/main amd64 gnome-themes-extra-data all 3.28-2ubuntu5 [69.4 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gtk2-engines-pixbuf amd64 2.24.33-4ubuntu1.1 [20.6 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble/main amd64 gnome-themes-extra amd64 3.28-2ubuntu5 [15.2 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble/universe amd64 lightdm-gtk-greeter amd64 2.0.9-0ubuntu3 [94.3 kB]
Fetched 2,495 kB in 3s (767 kB/s)
Selecting previously unselected package gnome-accessibility-themes.
(Reading database ... 175804 files and directories currently installed.)
Preparing to unpack .../gnome-accessibility-themes_3.28-2ubuntu5_all.deb ...
Unpacking gnome-accessibility-themes (3.28-2ubuntu5) ...
Selecting previously unselected package gnome-themes-extra-data.
Preparing to unpack .../gnome-themes-extra-data_3.28-2ubuntu5_all.deb ...
Unpacking gnome-themes-extra-data (3.28-2ubuntu5) ...
Selecting previously unselected package gtk2-engines-pixbuf:amd64.
Preparing to unpack .../gtk2-engines-pixbuf_2.24.33-4ubuntu1.1_amd64.deb ...
Unpacking gtk2-engines-pixbuf:amd64 (2.24.33-4ubuntu1.1) ...
Selecting previously unselected package gnome-themes-extra:amd64.
Preparing to unpack .../gnome-themes-extra_3.28-2ubuntu5_amd64.deb ...
Unpacking gnome-themes-extra:amd64 (3.28-2ubuntu5) ...
Selecting previously unselected package lightdm-gtk-greeter.
Preparing to unpack .../lightdm-gtk-greeter_2.0.9-0ubuntu3_amd64.deb ...
Unpacking lightdm-gtk-greeter (2.0.9-0ubuntu3) ...
Setting up gnome-themes-extra-data (3.28-2ubuntu5) ...
Setting up gnome-accessibility-themes (3.28-2ubuntu5) ...
Setting up gtk2-engines-pixbuf:amd64 (2.24.33-4ubuntu1.1) ...
Setting up lightdm-gtk-greeter (2.0.9-0ubuntu3) ...
update-alternatives: using /usr/share/xgreeters/lightdm-gtk-greeter.desktop to provide /usr/share/xgreeters/lightdm-greeter.desktop (lightdm-greeter) in auto mode
Setting up gnome-themes-extra:amd64 (3.28-2ubuntu5) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo mkdir -p /etc/lightdm/lightdm.conf.d
khadija@ubuntu:~$ echo -e "[Seat:*]\ngreeter-session=lightdm-gtk-greeter\nuser-session=xfce\nautologin-user=timeout=0" | sudo tee /etc/lightdm/lightdm.conf.d/99-xfce.conf
[Seat:*]
greeter-session=lightdm-gtk-greeter
user-session=xfce
autologin-user=timeout=0
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo rm -f /var/lib/lightdm/.Xauthority
khadija@ubuntu:~$ sudo rm -f ~/.Xauthority
khadija@ubuntu:~$ sudo rm -rf ~/.cache/sessions
khadija@ubuntu:~$ sudo chown -R $USER:$USER /home/$USER
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo systemctl restart lightdm
khadija@ubuntu:~$
```

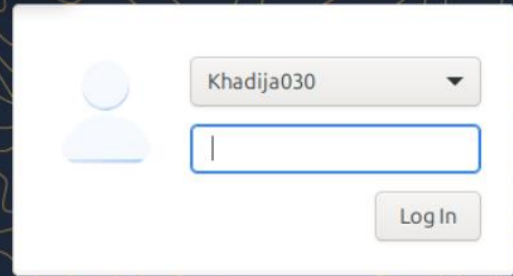
```
khadija@ubuntu:~$ sudo systemctl enable lightdm
Synchronizing state of lightdm.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable lightdm
The unit files have no installation config (WantedBy=, RequiredBy=, UpheldBy=,
Also=, or Alias= settings in the [Install] section, and DefaultInstance= for
template units). This means they are not meant to be enabled or disabled using systemctl.
```

Possible reasons for having these kinds of units are:

- A unit may be statically enabled by being symlinked from another unit's .wants/, .requires/, or .upholds/ directory.
- A unit's purpose may be to act as a helper for some other unit which has a requirement dependency on it.
- A unit may be started when needed via activation (socket, path, timer, D-Bus, udev, scripted systemctl call, ...).
- In case of template units, the unit is meant to be enabled with some instance name specified.

```
khadija@ubuntu:~$ sudo systemctl set-default graphical.target
Created symlink /etc/systemd/system/default.target → /usr/lib/systemd/system/graphical.target.
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo reboot
Broadcast message from root@ubuntu on pts/2 (Mon 2025-11-03 10:29:43 UTC):
The system will reboot now!
khadija@ubuntu:~$ client_loop: send disconnect: Connection reset
C:\Users\DSP_Lab_S6>
```

A login dialog box with a dark blue background featuring a wavy pattern. It contains a user selection dropdown menu with 'Khadija030' selected, a password input field, and a 'Log In' button.

```
khadija@ubuntu:~$ sudo systemctl set-default multi-user.target
[sudo] password for khadija:
Removed "/etc/systemd/system/default.target".
Created symlink /etc/systemd/system/default.target → /usr/lib/systemd/system/multi-user.target.
khadija@ubuntu:~$ sudo systemctl disable lightdm
Synchronizing state of lightdm.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install disable lightdm
Removed "/etc/systemd/system/display-manager.service".
khadija@ubuntu:~$
```

Home x Ubuntu 64-bit x

```
Ubuntu 24.04.3 LTS ubuntu tty1

ubuntu login: khadija
Password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-87-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Mon Nov  3 10:35:45 AM UTC 2025

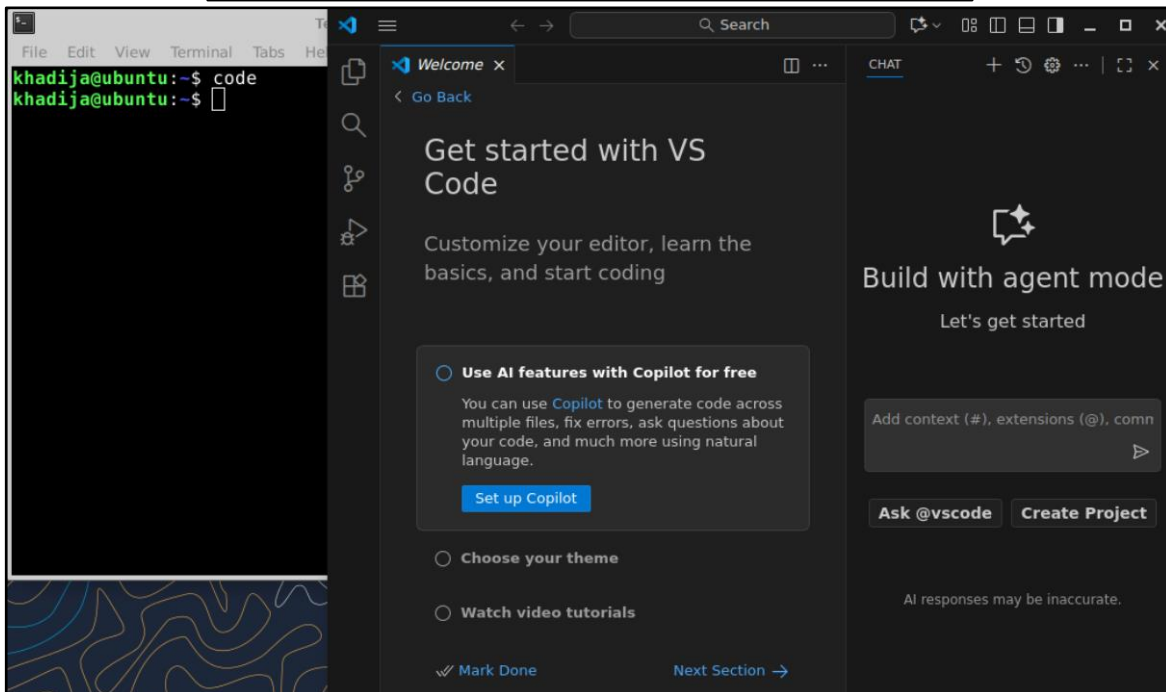
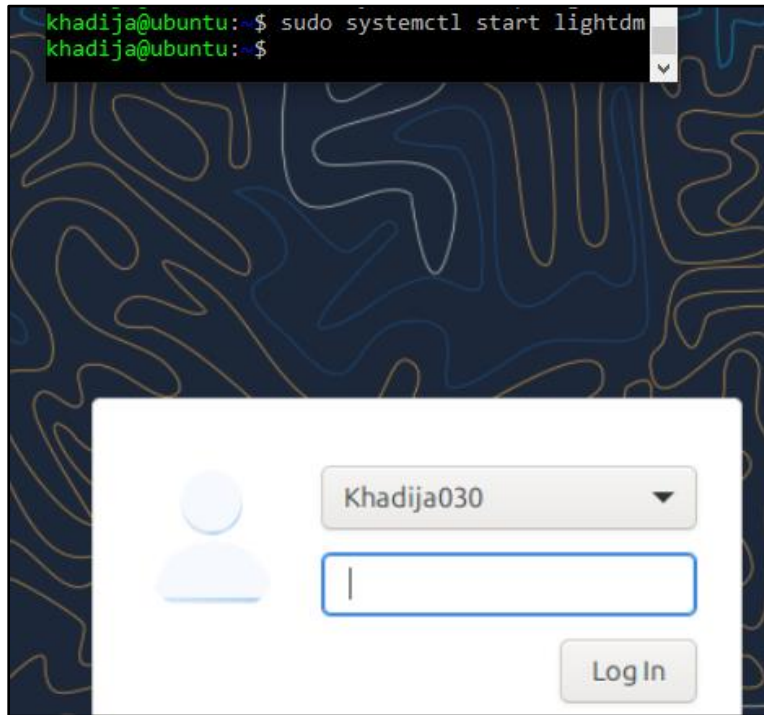
System load:  1.63           Processes:            252
Usage of /:   45.2% of 19.51GB Users logged in:       0
Memory usage: 8%           IPv4 address for ens33: 192.168.154.141
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

6 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

khadija@ubuntu:~$
```



Task 7 - Install Google Chrome by adding its apt source & key (Chrome)

```
khadija@ubuntu:~$ sudo systemctl start lightdmkhadija@ubuntu:~$ sudo apt install google-chrome-stable -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package google-chrome-stable
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ ls -la /etc/apt
total 48
drwxr-xr-x  9 root root  4096 Oct 17 13:47 .
drwxr-xr-x 142 root root 12288 Nov  3 10:11 ..
drwxr-xr-x  2 root root  4096 Oct 31 04:56 apt.conf.d
drwxr-xr-x  2 root root  4096 Mar 31 2024 auth.conf.d
drwxr-xr-x  2 root root  4096 Mar 31 2024 keyrings
drwxr-xr-x  2 root root  4096 Aug  5 17:14 preferences.d
drwxr-xr-x  2 root root  4096 Aug  5 17:14 preferences.d.save
-rw-r--r--  1 root root    70 Oct 17 14:13 sources.list
drwxr-xr-x  2 root root  4096 Oct 17 14:13 sources.list.d
drwxr-xr-x  2 root root  4096 Aug  5 17:01 trusted.gpg.d
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ cat /etc/apt/sources.list
# Ubuntu sources have moved to /etc/apt/sources.list.d/ubuntu.sources
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ cat /etc/apt/sources.list.d/ubuntu.sources
Types: deb
URIs: http://archive.ubuntu.com/ubuntu/
Suites: noble noble-updates noble-backports
Components: main restricted universe multiverse
Signed-By: /usr/share/keyrings/ubuntu-archive-keyring.gpg

Types: deb
URIs: http://security.ubuntu.com/ubuntu/
Suites: noble-security
Components: main restricted universe multiverse
Signed-By: /usr/share/keyrings/ubuntu-archive-keyring.gpg
khadija@ubuntu:~$
```


khadija@ubuntu: ~

GNU nano 7.2

/etc/apt/sources.list.d/ubuntu.sources

```
Types: deb
URIs: http://archive.ubuntu.com/ubuntu/
Suites: noble noble-updates noble-backports
Components: main restricted universe multiverse
Signed-By: /usr/share/keyrings/ubuntu-archive-keyring.gpg
```

```
Types: deb
URIs: http://security.ubuntu.com/ubuntu/
Suites: noble-security
Components: main restricted universe multiverse
Signed-By: /usr/share/keyrings/ubuntu-archive-keyring.gpg
```

```
Types: deb
URIs: http://dl.google.com/linux/chrome/deb/
Suites: stable
Components: main
Architectures: amd64
Signed-By: /etc/apt/keyrings/google.gpg
```

[Wrote 17 lines]

```
khadija@ubuntu:~$ curl -fsSL https://dl.google.com/linux/linux_signing_key.pub | sudo gpg --dearmor -o /etc/apt/keyrings/google.gpg
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo apt update
```

```
Get:1 http://dl.google.com/linux/chrome/deb stable InRelease [1,825 B]
Get:2 http://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,209 B]
Hit:3 http://archive.ubuntu.com/ubuntu noble InRelease
Get:4 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1,581 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble-updates/main Translation-en [298 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [175 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [15.4 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [2,240 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [508 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:13 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [378 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:15 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7,132 B]
Get:16 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [212 B]
Get:17 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [11.0 kB]
Get:18 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Fetched 5,469 kB in 47s (116 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
```



```

khadija@ubuntu:~$ sudo apt install google-chrome-stable -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  fonts-liberation fonts-liberation-sans-narrow
The following NEW packages will be installed:
  fonts-liberation fonts-liberation-sans-narrow google-chrome-stable
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 119 MB of archives.
After this operation, 395 MB of additional disk space will be used.
Get:1 http://dl.google.com/linux/chrome/deb stable/main amd64 google-chrome-stable amd64 142.0.7444.59-1 [118 MB]
Get:2 http://archive.ubuntu.com/ubuntu noble/main amd64 fonts-liberation all 1:2.1.5-3 [1,603 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble/main amd64 fonts-liberation-sans-narrow all 1:1.07.6-4 [197 kB]
Fetched 119 MB in 16s (7,244 kB/s)
Selecting previously unselected package fonts-liberation.
(Reading database ... 179831 files and directories currently installed.)
Preparing to unpack .../fonts-liberation_1%3a2.1.5-3_all.deb ...
Unpacking fonts-liberation (1:2.1.5-3) ...
Selecting previously unselected package google-chrome-stable.
Preparing to unpack .../google-chrome-stable_142.0.7444.59-1_amd64.deb ...
Unpacking google-chrome-stable (142.0.7444.59-1) ...
Selecting previously unselected package fonts-liberation-sans-narrow.
Preparing to unpack .../fonts-liberation-sans-narrow_1%3a1.07.6-4_all.deb ...
Unpacking fonts-liberation-sans-narrow (1:1.07.6-4) ...
Setting up fonts-liberation (1:2.1.5-3) ...
Setting up fonts-liberation-sans-narrow (1:1.07.6-4) ...
Setting up google-chrome-stable (142.0.7444.59-1) ...
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/x-www-browser (x-www-browser) in auto mode
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/gnome-www-browser (gnome-www-browser) in auto mode
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/google-chrome (google-chrome) in auto mode
Processing triggers for gnome-menus (3.36.0-1.1ubuntu3) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for fontconfig (2.15.0-1.1ubuntu2) ...
Processing triggers for bamfdaemon (0.5.6+22.04.20220217-0ubuntu5) ...
Rebuilding /usr/share/applications/bamf-2.index...
Processing triggers for desktop-file-utils (0.27-2build1) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.

```

```

khadija@ubuntu:~$ sudo apt remove google-chrome-stable -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  google-chrome-stable
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 390 MB disk space will be freed.
(Reading database ... 180141 files and directories currently installed.)
Removing google-chrome-stable (142.0.7444.59-1) ...
Processing triggers for desktop-file-utils (0.27-2build1) ...
Processing triggers for gnome-menus (3.36.0-1.1ubuntu3) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for bamfdaemon (0.5.6+22.04.20220217-0ubuntu5) ...
Rebuilding /usr/share/applications/bamf-2.index...

```

```

khadija@ubuntu: ~
GNU nano 7.2 /etc/apt/sources.list.d/ubuntu.sources
Types: deb
URIs: http://archive.ubuntu.com/ubuntu/
Suites: noble noble-updates noble-backports
Components: main restricted universe multiverse
Signed-By: /usr/share/keyrings/ubuntu-archive-keyring.gpg

Types: deb
URIs: http://security.ubuntu.com/ubuntu/
Suites: noble-security
Components: main restricted universe multiverse
Signed-By: /usr/share/keyrings/ubuntu-archive-keyring.gpg

```

```
khadija@ubuntu:~$ khadija@ubuntu:~$ sudo rm -f /etc/apt/keyrings/google.gpg
khadija@ubuntu:~$
khadija@ubuntu:~$ echo "deb [arch=amd64 signed-by=/etc/apt/keyrings/google.gpg]
http://dl.google.com/linux/chrome/deb/ stable main" | sudo tee /etc/apt/source
s.list.d/google-chrome.list > /dev/null
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ ls -la /etc/apt/sources.list.d/
total 20
drwxr-xr-x 2 root root 4096 Nov  4 07:33 .
drwxr-xr-x 9 root root 4096 Oct 17 13:47 ..
-rw-r--r-- 1 root root 107 Nov  4 07:34 google-chrome.list
-rw-r--r-- 1 root root 383 Nov  4 07:31 ubuntu.sources
-rw-r--r-- 1 root root 2552 Aug  5 17:02 ubuntu.sources.curtin.orig
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo mkdir -p /etc/apt/keyrings
khadija@ubuntu:~$ curl -fsSL https://dl.google.com/linux/linux_signing_key.pub |
sudo gpg --dearmor -o /etc/apt/keyrings/google.gpg
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo apt update
Hit:1 http://dl.google.com/linux/chrome/deb stable InRelease
Get:2 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:3 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1,298 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [213 kB]
Hit:5 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:6 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Get:7 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.6 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [9,012 B]
Hit:9 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Get:10 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [2,131 kB]
65% [10 Packages 1,522 kB/2,131 kB 71%] 39.2 kB/s 5867% [10 Packages 1,683 kB/2,131 kB 79%]
//security.ubuntu.com/ubuntu noble-security/restricted Translation-en
Get:12 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:13 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [500 B]
Get:14 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [906 kB]
Get:15 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [203 kB]
Get:16 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.3 kB]
Get:17 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [19.4 kB]
Get:18 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [27.4 kB]
Get:19 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [5,708 B]
Get:20 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [208 B]
Get:21 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [384 B]
Get:11 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [483 kB]
Fetched 5,498 kB in 1min 21s (68.1 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
```

```
khadija@ubuntu:~$ sudo apt install google-chrome-stable -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  google-chrome-stable
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 118 MB of archives.
After this operation, 390 MB of additional disk space will be used.
Get:1 http://dl.google.com/linux/chrome/deb stable/main amd64 google-chrome-stable amd64 142.0.7444.59-1 [118 MB]
76% [1 google-chrome-stable 112 MB/118 MB 95%]
```

Task 8 - Install applications via PPA (Audacity & OBS) and launch

```
khadija@ubuntu:~$ sudo add-apt-repository ppa:ubuntuhandbook1/audacity -y
Repository: 'Types: deb
URIs: https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu/
Suites: noble
Components: main
'

Description:
Unofficial build of Audacity audio editor

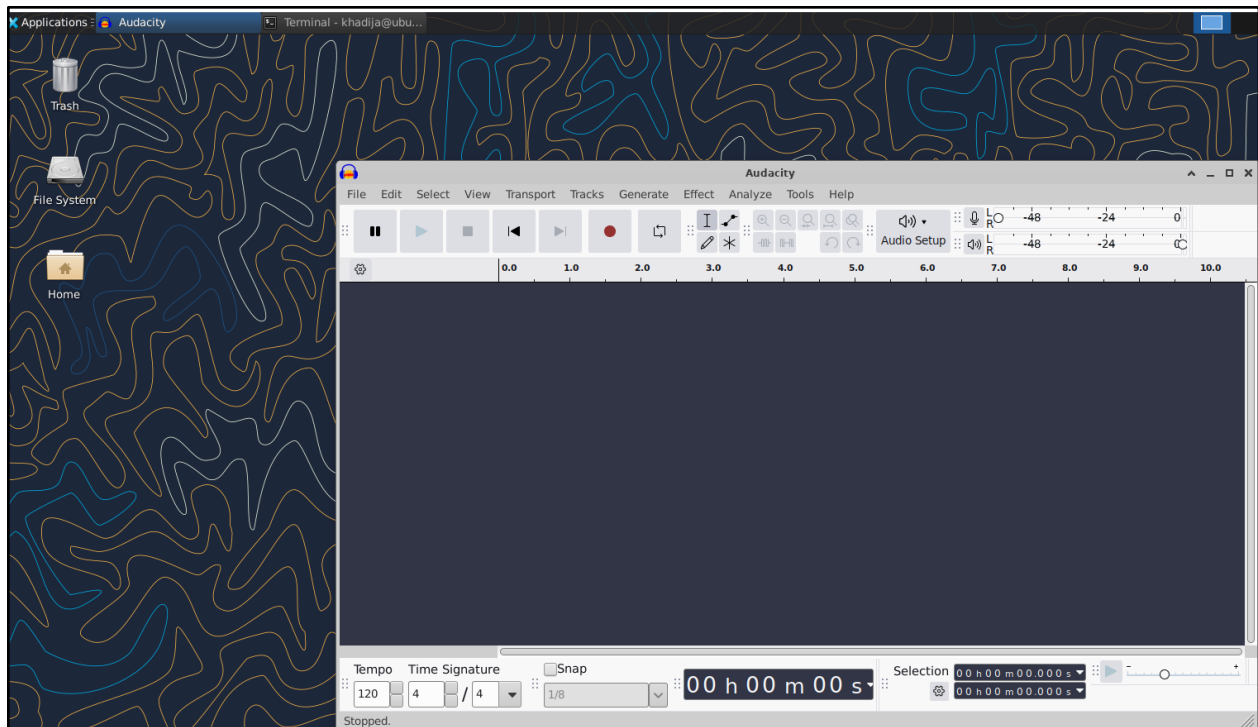
For help, please use Audacity forum: http://forum.audacityteam.org/

If the packages here are helpful, you may buy me a coffee:

https://ko-fi.com/ubuntuhandbook1
More info: https://launchpad.net/~ubuntuhandbook1/+archive/ubuntu/audacity
Adding repository.
Get:1 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease [18.1 kB]
Hit:2 http://dl.google.com/linux/chrome/deb stable InRelease
Get:3 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble/main amd64 Packages [1,064 B]
Get:4 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble/main Translation-en [492 B]
Hit:5 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:6 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:7 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:8 http://security.ubuntu.com/ubuntu noble-security InRelease
Fetched 19.6 kB in 57s (347 B/s)
Reading package lists... Done
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo apt update
Hit:1 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:5 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:6 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo apt install audacity -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  audacity-data libdouble-conversion3 libflac++10 libid3tag0 liblilv-0-0 libmd4c0 libopusfile0 libpcre2-16-0 libpcre2-
  libqt5qml5 libqt5qmlmodels5 libqt5quick5 libqt5svg5 libqt5waylandclient5 libqt5waylandcompositor5 libqt5widgets5t64
  libwxbase3.2-1t64 libwxgtk3.2-1t64 libxcb-icccm4 libxcb-image0 libxcb-keysyms1 libxcb-render-util0 libxcb-xinerama0
Suggested packages:
  ladspa-plugin qgnomeplatform-qt5 qt5-image-formats-plugins qt5-qmltooling-plugins serdi sordi
The following NEW packages will be installed:
  audacity audacity-data libdouble-conversion3 libflac++10 libid3tag0 liblilv-0-0 libmd4c0 libopusfile0 libpcre2-16-0
  libqt5qml5 libqt5qmlmodels5 libqt5quick5 libqt5svg5 libqt5waylandclient5 libqt5waylandcompositor5 libqt5widgets5t64
  libwxbase3.2-1t64 libwxgtk3.2-1t64 libxcb-icccm4 libxcb-image0 libxcb-keysyms1 libxcb-render-util0 libxcb-xinerama0
0 upgraded, 46 newly installed, 0 to remove and 0 not upgraded.
Need to get 33.0 MB of archives.
After this operation, 131 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 libflac++10 amd64 1.4.3+ds-2.1ubuntu2 [30.8 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble/universe amd64 libid3tag0 amd64 0.15.1b-14build1 [33.6 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble/universe amd64 libserd-0-0 amd64 0.32.2-1 [43.6 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble/universe amd64 libzix-0-0 amd64 0.4.2-2build1 [23.6 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsnd-0-0 amd64 0.16.16-2build1 [15.8 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsratom-0-0 amd64 0.6.16-1build1 [17.3 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/universe amd64 liblilv-0-0 amd64 0.24.22-1build1 [41.0 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble/universe amd64 libopusfile0 amd64 0.12-4build3 [44.7 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble/universe amd64 libportaudio2 amd64 19.6.0-1.2build3 [67.9 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble/universe amd64 libportmidi0 amd64 1:217-6.1build3 [18.1 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble/universe amd64 libportsmf0t64 amd64 0.1~svn20101010-7build1 [60.3 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsbasm10 amd64 2.3.0-1build1 [112 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsoundtouch1 amd64 2.3.2+ds1-1build1 [60.5 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsuil-0-0 amd64 0.10.20-1build1 [20.5 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble/universe amd64 libvamp-hostsdk3v5 amd64 2.10.0-4build1 [92.3 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libpcre2-32-0 amd64 10.42-4ubuntu2.1 [197 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble/universe amd64 libwxbase3.2-1t64 amd64 3.2.4+dfsg-4build1 [899 kB]
Get:18 http://archive.ubuntu.com/ubuntu noble/universe amd64 libwxgtk3.2-1t64 amd64 3.2.4+dfsg-4build1 [4,535 kB]
Get:19 http://archive.ubuntu.com/ubuntu noble/universe amd64 libdouble-conversion3 amd64 3.3.0-1build1 [40.3 kB]
Get:20 http://archive.ubuntu.com/ubuntu noble/universe amd64 libmd4c0 amd64 0.4.8-1build1 [42.3 kB]
Get:21 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libpcre2-16-0 amd64 10.42-4ubuntu2.1 [210 kB]
Get:22 http://archive.ubuntu.com/ubuntu noble/universe amd64 libqt5core5t64 amd64 5.15.13+dfsg-1ubuntu1 [2,011 kB]
Get:23 http://archive.ubuntu.com/ubuntu noble/universe amd64 libqt5dbus5t64 amd64 5.15.13+dfsg-1ubuntu1 [220 kB]
Get:24 http://archive.ubuntu.com/ubuntu noble/universe amd64 libqt5network5t64 amd64 5.15.13+dfsg-1ubuntu1 [723 kB]
```



```
khadija@ubuntu:~$ sudo add-apt-repository ppa:obsproject/obs-studio -y
[sudo] password for khadija:
Repository: 'Types: deb
URIs: https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu/
Suites: noble
Components: main
'

Description:
Latest stable release of OBS Studio
More info: https://launchpad.net/~obsproject/+archive/ubuntu/obs-studio
Adding repository.
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Get:2 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble InRelease [17.8 kB]
Hit:3 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:4 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease
Get:5 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble/main amd64 Packages [1,172 B]
Get:6 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble/main Translation-en [160 B]
Ign:7 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:8 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:9 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Ign:7 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:7 http://archive.ubuntu.com/ubuntu noble InRelease
Fetched 19.1 kB in 1min 9s (278 B/s)
Reading package lists... Done

khadija@ubuntu:~$ sudo apt update
Hit:1 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble InRelease
Hit:2 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:3 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:5 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:6 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:7 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
khadija@ubuntu:~$
```



```

khadija@ubuntu:~$ sudo apt install obs-studio -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libaacs0 libass9 libavdevice60 libavfilter9 libavformat60 libb2-1 libbdplus0 libblas3 libbluray2 libbs2b0 libch
  libgme0 liblapack3 liblua5.1-2 liblua5.1-common libmbcrypto7t64 libmbd1s14t64 libmbdx509-1t64 libmy
  libqrencodec1 libqt6core6t64 libqt6dbus6t64 libqt6gui6t64 libqt6network6t64 libqt6opengl6t64 libqt6qml6 libqt
  libqt6waylandeglcompositorhwhintegration6 libqt6widgets6t64 libqt6wmlshellintegration6 libqt6xml6t64 librabbitmq4
  libswscale7 libts0t64 libudfread0 libunibreak5 libvidstab1.1 libxcb-composite0 libzim2 libzmq5 pocketsphinx-en-
Suggested packages:
  libbluray-bdj libfftw3-bin libfftw3-dev qt6-qmltooling-plugins sndiod
The following NEW packages will be installed:
  libaacs0 libass9 libavdevice60 libavfilter9 libavformat60 libb2-1 libbdplus0 libblas3 libbluray2 libbs2b0 libch
  libgme0 liblapack3 liblua5.1-2 liblua5.1-common libmbcrypto7t64 libmbd1s14t64 libmbdx509-1t64 libmy
  libqrencodec1 libqt6core6t64 libqt6dbus6t64 libqt6gui6t64 libqt6network6t64 libqt6opengl6t64 libqt6qml6 libqt
  libqt6waylandeglcompositorhwhintegration6 libqt6widgets6t64 libqt6wmlshellintegration6 libqt6xml6t64 librabbitmq4
  libswscale7 libts0t64 libudfread0 libunibreak5 libvidstab1.1 libxcb-composite0 libzim2 libzmq5 obs-studio pocke
0 upgraded, 75 newly installed, 0 to remove and 0 not upgraded.
Need to get 182 MB of archives.
After this operation, 534 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/universe amd64 libaacs0 amd64 0.11.1-2build1 [62.9 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble/universe amd64 libunibreak5 amd64 5.1-2build1 [25.0 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble/universe amd64 libass9 amd64 1:0.17.1-2build1 [104 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble/universe amd64 libudfread0 amd64 1.1.2-1build1 [19.0 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble/universe amd64 libbluray2 amd64 1:1.3.4-1build1 [159 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/universe amd64 libchromaprint1 amd64 1.5.1-5 [30.5 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/universe amd64 libgme0 amd64 0.6.3-7build1 [134 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble/universe amd64 libopenmpt0t64 amd64 0.7.3-1.1build3 [647 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble/main amd64 librabbitmq4 amd64 0.11.0-1build2 [37.4 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble/universe amd64 libbson1 amd64 1.7.17-1 [24.8 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble/universe amd64 libmbcrypto7t64 amd64 2.28.8-1 [209 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble/universe amd64 librist4 amd64 0.2.10+dfsg-2 [74.9 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsrtp1.5-gnutls amd64 1.5.3-1build2 [316 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libssh-gcrypt-4 amd64 0.10.6-2ubuntu0.2 [224 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble/universe amd64 libnorm1t64 amd64 1.5.9+dfsg-3.1build1 [154 kB]

```

```

khadija@ubuntu:~$ obs --version
OBS Studio - 32.0.2
khadija@ubuntu:~$ obs

```

```

khadija@ubuntu:~$ obs
error: Crash sentinel location '/home/khadija/.config/obs-studio/.sentinel' does
not exist and unable to create directory:
filesystem error: cannot create directory: No such file or directory [/home/khad
ija/.config/obs-studio/.sentinel].
debug: Found portal inhibitor
debug: Attempted path: /usr/bin/./share/obs/obs-studio/locale/en-US.ini
debug: Attempted path: /usr/bin/./share/obs/obs-studio/locale.ini
debug: Attempted path: /usr/bin/./share/obs/obs-studio/themes
debug: Attempted path: /usr/bin/./share/obs/obs-studio/themes/
warning: Get on org.freedesktop.portal.Settings returned an invalid reply
error: Failed to rename basic scene collection file:
filesystem error: cannot rename: No such file or directory [/home/khadija/.confi
g/obs-studio/basic/scenes.json] [/home/khadija/.config/obs-studio/basic/scenes/U
ntitled.json]
info: Using EGL/X11
info: CPU Name: Intel(R) Core(TM) i7-7700 CPU @ 3.60GHz

```

Task 9 - Create a Kubernetes sample YAML using vim

```
khadija@ubuntu: ~  
  
VIM - Vi IMproved  
version 9.1.697  
by Bram Moolenaar et al.  
Modified by team+vim@tracker.debian.org  
Vim is open source and freely distributable  
  
Help poor children in Uganda!  
type :help iccf<Enter> for information  
  
type :q<Enter> to exit  
type :help<Enter> or <F1> for on-line help  
type :help version9<Enter> for version info  
  
-- REPLACE -- 0,1 All
```

```
khadija@ubuntu:~$ khadija@ubuntu:~$ mkdir -p ~/Lab5  
khadija@ubuntu:~$ cd ~/Lab5  
khadija@ubuntu:~/Lab5$ pwd  
/home/khadija/Lab5  
khadija@ubuntu:~/Lab5$
```

```
khadija@ubuntu: ~/Lab5  
apiVersion: v1  
kind: Pod  
metadata:  
  name: nginx-pod  
  spec:  
    containers:  
      - name: nginx  
        image: nginx:1.19  
        ports:  
          - containerPort: 80  
            restartPolicy: Always  
  
-- INSERT --
```



```
khadija@ubuntu:~/Lab5$ vim k8s-sample.yaml
khadija@ubuntu:~/Lab5$ ls -la
total 12
drwxrwxr-x  2 khadija khadija 4096 Nov  6 08:23 .
drwxr-x--- 23 khadija khadija 4096 Nov  6 08:23 ..
-rw-rw-r--  1 khadija khadija  284 Nov  6 08:23 k8s-sample.yaml
khadija@ubuntu:~/Lab5$
```

Task 10 - Edit the Kubernetes YAML - add annotation, verify, then discard temporary change

```
khadija@ubuntu:~/Lab5$ vim k8s-sample.yaml
khadija@ubuntu:~/Lab5$ khadija@ubuntu:~/Lab5$ cat k8s-sample.yaml
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
          restartPolicy: Always
khadija@ubuntu:~/Lab5$
```

```
khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec: # temp: do-not-keep
    containers:
      - name: nginx
        image: nginx:1.19
```

```
khadija@ubuntu:~/Lab5$ vim k8s-sample.yaml
khadija@ubuntu:~/Lab5$ khadija@ubuntu:~/Lab5$ cat k8s-sample.yaml
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
          restartPolicy: Always
khadija@ubuntu:~/Lab5$
```

Task 11 - Vim editing practice - delete, undo, numeric deletes, navigation

Image line deleted:

```

Select khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        ports:
          - containerPort: 80
        restartPolicy: Always

```

Deletion undone with 'u':

```

Select khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always

```

Deleting 3 lines using 'd3':

```

khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx

```

Action undone using 'u':

```
khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always
```

Using '1G':

```
khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always
```

Using 'G':

```

khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always

```

Using '\$':

```

khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always

```

Using '0':

```

khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always

```

```

khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
    name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always
Commands used: 1G, G, $, 0.

```

Task 12 - Vim search, add matches, substitute, undo

```

khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
    name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always

```

```

khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
    name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always

```

khadija@ubuntu: ~/Lab5

```
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always
```

khadija@ubuntu: ~/Lab5

```
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  occur: nginx
  occur2: nginx
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always
```

khadija@ubuntu: ~/Lab5

```
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
  name: nginx-pod
  occur: nginx
  occur2: nginx
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
        restartPolicy: Always
```



```
khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
    name: webapp-pod
    occur: webapp
    occur2: webapp
  spec:
    containers:
      - name: webapp
        image: webapp:1.19
        ports:
          - containerPort: 80
            restartPolicy: Always

khadija@ubuntu: ~/Lab5
apiVersion: v1
kind: Pod
metadata:
  annotations:
    lab: lesson11
    name: nginx-pod
    occur: nginx
    occur2: nginx
  spec:
    containers:
      - name: nginx
        image: nginx:1.19
        ports:
          - containerPort: 80
            restartPolicy: Always
```

Exam Evaluation Question

```
khadija@ubuntu:~$ sudo apt update
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:3 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble InRelease
Hit:4 http://dl.google.com/linux/chrome/deb stable InRelease
Get:5 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Hit:6 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease
Get:7 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [175 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:10 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [378 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:12 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7,144 B]
Get:13 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [212 B]
Get:14 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [11.0 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Fetched 824 kB in 6s (134 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
5 packages can be upgraded. Run 'apt list --upgradable' to see them.
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo apt install apt-transport-https ca-certificates curl software-properties-common -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ca-certificates is already the newest version (20240203).
ca-certificates set to manually installed.
curl is already the newest version (8.5.0-2ubuntu10.6).
curl set to manually installed.
software-properties-common is already the newest version (0.99.49.3).
software-properties-common set to manually installed.
The following NEW packages will be installed:
  apt-transport-https
0 upgraded, 1 newly installed, 0 to remove and 5 not upgraded.
Need to get 3,970 B of archives.
After this operation, 36.9 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 apt-transport-https all 2.8.3 [3,970 B]
Fetched 3,970 B in 0s (19.3 kB/s)
Selecting previously unselected package apt-transport-https.
(Reading database ... 184227 files and directories currently installed.)
Preparing to unpack .../apt-transport-https_2.8.3_all.deb ...
Unpacking apt-transport-https (2.8.3) ...
Setting up apt-transport-https (2.8.3) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o
/usr/share/keyrings/docker-archive-keyring.gpg
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share/keyrings/docker-archive-keyring.gpg] \
> https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable" | \
> sudo tee /etc/sources.list.d/docker.list > /dev/null
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo apt update
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:5 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease
Hit:6 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:7 http://dl.google.com/linux/chrome/deb stable InRelease
Get:8 https://download.docker.com/linux/ubuntu noble InRelease [48.5 kB]
Get:9 https://download.docker.com/linux/ubuntu noble/stable amd64 Packages [34.8 kB]
Fetched 83.2 kB in 2s (35.6 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
5 packages can be upgraded. Run 'apt list --upgradable' to see them.
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo apt install docker-ce docker-ce-cli containerd.io -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  docker-buildx-plugin docker-ce-rootless-extras docker-compose-plugin libslirp0 pigz slirp4netns
Suggested packages:
  cgroupfs-mount | cgroup-lite docker-model-plugin
The following NEW packages will be installed:
  containerd.io docker-buildx-plugin docker-ce docker-ce-cli docker-ce-rootless-extras docker-compose-plugin libslirp0 pigz slirp4netns
0 upgraded, 9 newly installed, 0 to remove and 5 not upgraded.
Need to get 105 MB of archives.
After this operation, 437 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/universe amd64 pigz amd64 2.8-1 [65.6 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble/main amd64 libslirp0 amd64 4.7.0-1ubuntu3 [63.8 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble/universe amd64 slirp4netns amd64 1.2.1-1build2 [34.9 kB]
Get:4 https://download.docker.com/linux/ubuntu noble/stable amd64 containerd.io amd64 1.7.28-2~ubuntu.24.04~noble [31.9 MB]
Get:5 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-ce-cli amd64 5:28.5.2-1~ubuntu.24.04~noble [16.0 MB]
Get:6 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-ce amd64 5:28.5.2-1~ubuntu.24.04~noble [19.8 MB]
Get:7 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-buildx-plugin amd64 0.29.1-1~ubuntu.24.04~noble [15.9 MB]
Get:8 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-ce-rootless-extras amd64 5:28.5.2-1~ubuntu.24.04~noble [6,382 kB]
Get:9 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-compose-plugin amd64 2.40.3-1~ubuntu.24.04~noble [14.3 MB]
Fetched 105 MB in 15s (6,806 kB/s)
Selecting previously unselected package containerd.io.
(Reading database ... 184231 files and directories currently installed.)
Preparing to unpack .../0-containerd.io_1.7.28-2~ubuntu.24.04~noble_amd64.deb ...
Unpacking containerd.io (1.7.28-2~ubuntu.24.04~noble) ...
Selecting previously unselected package docker-ce-cli.
Preparing to unpack .../1-docker-ce-cli_5%3a28.5.2-1~ubuntu.24.04~noble_amd64.deb ...
Unpacking docker-ce-cli (5:28.5.2-1~ubuntu.24.04~noble) ...
Selecting previously unselected package docker-ce.
Preparing to unpack .../2-docker-ce_5%3a28.5.2-1~ubuntu.24.04~noble_amd64.deb ...
Unpacking docker-ce (5:28.5.2-1~ubuntu.24.04~noble) ...
Selecting previously unselected package pigz.
Preparing to unpack .../3-pigz_2.8-1_amd64.deb ...
Unpacking pigz (2.8-1) ...
Unpacking pigz (2.8-1) ...#####
```

```
khadija@ubuntu:~$ docker --version
Docker version 28.5.2, build ecc6942
khadija@ubuntu:~$
```

```
khadija@ubuntu:~$ sudo systemctl start docker
khadija@ubuntu:~$ sudo systemctl enable docker
Synchronizing state of docker.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable docker
khadija@ubuntu:~$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/usr/lib/systemd/system/docker.service; enabled; preset: enabled)
   Active: active (running) since Thu 2025-11-06 09:09:58 UTC; 1min 53s ago
 TriggeredBy: ● docker.socket
    Docs: https://docs.docker.com
   Main PID: 6748 (dockerd)
      Tasks: 9
     Memory: 21.3M (peak: 21.6M)
        CPU: 375ms
    CGroup: /system.slice/docker.service
            └─6748 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock

Nov 06 09:09:56 ubuntu dockerd[6748]: time="2025-11-06T09:09:56.980228977Z" level=info msg="detected 127.0.0.53 nameserver, assuming systemd-resolved"
Nov 06 09:09:57 ubuntu dockerd[6748]: time="2025-11-06T09:09:57.027448181Z" level=info msg="Creating a containerd client" address=/run/containerd.sock
Nov 06 09:09:57 ubuntu dockerd[6748]: time="2025-11-06T09:09:57.098803250Z" level=info msg="Loading containers: start."
Nov 06 09:09:58 ubuntu dockerd[6748]: time="2025-11-06T09:09:58.520381685Z" level=info msg="Loading containers: done."
Nov 06 09:09:58 ubuntu dockerd[6748]: time="2025-11-06T09:09:58.541775008Z" level=info msg="Docker daemon" commit=89c5e8f containerd-snapshots=
Nov 06 09:09:58 ubuntu dockerd[6748]: time="2025-11-06T09:09:58.541896728Z" level=info msg="Initializing buildkit"
Nov 06 09:09:58 ubuntu dockerd[6748]: time="2025-11-06T09:09:58.579529328Z" level=info msg="Completed buildkit initialization"
Nov 06 09:09:58 ubuntu dockerd[6748]: time="2025-11-06T09:09:58.583501358Z" level=info msg="Daemon has completed initialization"
Nov 06 09:09:58 ubuntu systemd[1]: Started docker.service - Docker Application Container Engine.
Nov 06 09:09:58 ubuntu dockerd[6748]: time="2025-11-06T09:09:58.584874615Z" level=info msg="API listen on /run/docker.sock"
khadija@ubuntu:~$
```

END