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Roll_No : 2023-BSE-073

Subject: Cloud Computing

Semester & Section : V-B

Lab :05

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

- task1_java_suggestion.png


```
zuha@zuha:~/lab4/workspace/python_project$ java
Command 'java' not found, but can be installed with:
sudo apt install openjdk-17-jre-headless   # version 17.0.14+7-1~24.04, or
sudo apt install openjdk-21-jre-headless   # version 21.0.6+7-1~24.04.1
sudo apt install default-jre               # version 2:1.17-75
sudo apt install openjdk-11-jre-headless   # version 11.0.26+4-1ubuntu1~24.04
sudo apt install openjdk-8-jre-headless    # version 8u442-b06~us1-0ubuntu1~24.04
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
```

\\

- task1_java_install.png


```
zuha@zuha:~/lab4/workspace/python_project$ sudo apt install default-jdk
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-common at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service
  default-jdk-headless default-jre default-jre-headless fontconfig fonts-dejavu-extra gsettings-desktop-schemas gtk-update-icon-cache hicolor-icon-theme
  humanity-icon-theme java-common libasound2-data libasound2t64 libatk-bridge2.0-0t64 libatk-wrapper-java libatk-wrapper-java-jni libatk1.0-0t64
  libatspi2.0-0t64 libavahi-client3 libavahi-common-data libavahi-common3 libcairo-gobject2 libcairo2 libcolord2 libcups2t64 libdatrie1 libdconf1
  libdrm-amdgpu1 libdrm-intel1 libepoxy0 libgbm1 libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin libgdk-pixbuf2.0-common libgif7 libgl1 libgl1-mesa-dri libglvnd0
  libglx-mesa0 libglx0 libgraphite2-3 libgtk-3-0t64 libgtk-3-bin libgtk-3-common libharfbuzz0b libice-dev libice6 liblcms2-2 libllvm19 libpango-1.0-0
  libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpcsclite1 libpixman-1-0 libpthread-stubs0-dev librsvg2-2 librsvg2-common libsm-dev libsm6
  libthai-data libthai0 libvulkan1 libwayland-client0 libwayland-cursor0 libwayland-egl1 libwayland-server0 libx11-dev libx11-xcb1 libxau-dev libxaw7
  libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0 libxcb1-dev libxcomposite1
  libxcursor1 libxdamage1 libxdmcp-dev libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxrandr2 libxrender1 libxshmfence1 libxt-dev libxt6t64
  libxtst6 libxv1 libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers openjdk-21-jdk openjdk-21-jdk-headless openjdk-21-jre openjdk-21-jre-headless
  session-migration ubuntu-mono x11-common x11-utils x11proto-dev xorg-sgml-doctools xtrans-dev
Suggested packages:
  alsa-utils libasound2-plugins colord cups-common gvfs libice-doc liblcms2-utils pcscd librsvg2-bin libsm-doc libx11-doc libxcb-doc libxt-doc openjdk-21-dem
  openjdk-21-source visualvm libnss-mdns fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei | fonts-wqy-zenhei fonts-indic mesa-utils
Recommended packages:
  luit
The following NEW packages will be installed:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-common at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service default-jdk
  default-jdk-headless default-jre default-jre-headless fontconfig fonts-dejavu-extra gsettings-desktop-schemas gtk-update-icon-cache hicolor-icon-theme
  humanity-icon-theme java-common libasound2-data libasound2t64 libatk-bridge2.0-0t64 libatk-wrapper-java libatk-wrapper-java-jni libatk1.0-0t64
  libatspi2.0-0t64 libavahi-client3 libavahi-common-data libavahi-common3 libcairo-gobject2 libcairo2 libcolord2 libcups2t64 libdatrie1 libdconf1
  libdrm-amdgpu1 libdrm-intel1 libepoxy0 libgbm1 libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin libgdk-pixbuf2.0-common libgif7 libgl1 libgl1-mesa-dri libglvnd0
  libglx-mesa0 libglx0 libgraphite2-3 libgtk-3-0t64 libgtk-3-bin libgtk-3-common libharfbuzz0b libice-dev libice6 liblcms2-2 libllvm19 libpango-1.0-0
  libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpcsclite1 libpixman-1-0 libpthread-stubs0-dev librsvg2-2 librsvg2-common libsm-dev libsm6
  libthai-data libthai0 libvulkan1 libwayland-client0 libwayland-cursor0 libwayland-egl1 libwayland-server0 libx11-dev libx11-xcb1 libxau-dev libxaw7
  libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0 libxcb1-dev libxcomposite1
  libxcursor1 libxdamage1 libxdmcp-dev libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxrandr2 libxrender1 libxshmfence1 libxt-dev libxt6t64
  libxtst6 libxv1 libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers openjdk-21-jdk openjdk-21-jdk-headless openjdk-21-jre openjdk-21-jre-headless
  session-migration ubuntu-mono x11-common x11-utils x11proto-dev xorg-sgml-doctools xtrans-dev
0 upgraded, 121 newly installed, 0 to remove and 0 not upgraded.
Need to get 204 MB of archives.
After this operation, 651 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y_
```

```
After this operation, 651 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libgdk-pixbuf2.0-common all 2.42.10+dfsg-3ubuntu3.2 [8,192 B]
Get:2 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libgdk-pixbuf-2.0-0 amd64 2.42.10+dfsg-3ubuntu3.2 [147 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gtk-update-icon-cache amd64 3.24.41-4ubuntu1.3 [51.9 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble/main amd64 hicolor-icon-theme all 0.17-2 [9,976 B]
Get:5 http://archive.ubuntu.com/ubuntu noble/main amd64 humanity-icon-theme all 0.6.16 [1,282 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/main amd64 ubuntu-mono all 24.04-0ubuntu1 [151 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/main amd64 adwaita-icon-theme all 46.0-1 [723 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble/main amd64 alsa-topology-conf all 1.2.5.1-2 [15.5 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libasound2-data all 1.2.11-1ubuntu0.1 [21.1 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libasound2t64 amd64 1.2.11-1ubuntu0.1 [399 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 alsa-ucm-conf all 1.2.10-1ubuntu5.7 [66.4 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble/main amd64 at-spi2-common all 2.52.0-1build1 [8,674 B]
Get:13 http://archive.ubuntu.com/ubuntu noble/main amd64 libx16 amd64 2:1.8.1-1build1 [32.4 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble/main amd64 libatspi2.0-0t64 amd64 2.52.0-1build1 [80.5 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble/main amd64 x11-common all 1:7.7+23ubuntu3 [21.7 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble/main amd64 libxtst6 amd64 2:1.2.3-1.1build1 [12.6 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble/main amd64 libdconf1 amd64 0.40.0-4build2 [39.4 kB]
Get:18 http://archive.ubuntu.com/ubuntu noble/main amd64 dconf-service amd64 0.40.0-4build2 [27.5 kB]
Get:19 http://archive.ubuntu.com/ubuntu noble/main amd64 dconf-gsettings-backend amd64 0.40.0-4build2 [22.1 kB]
Get:20 http://archive.ubuntu.com/ubuntu noble/main amd64 session-migration amd64 0.3.9build1 [9,034 B]
Get:21 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gsettings-desktop-schemas all 46.1-0ubuntu1 [35.6 kB]
Get:22 http://archive.ubuntu.com/ubuntu noble/main amd64 at-spi2-core amd64 2.52.0-1build1 [56.6 kB]
Get:23 http://archive.ubuntu.com/ubuntu noble/main amd64 ca-certificates-java all 20240118 [11.6 kB]
Get:24 http://archive.ubuntu.com/ubuntu noble/main amd64 java-common all 0.75+exp1 [6,798 B]
Get:25 http://archive.ubuntu.com/ubuntu noble/main amd64 liblcms2-2 amd64 2.14-2build1 [161 kB]
Get:26 http://archive.ubuntu.com/ubuntu noble/main amd64 libpcsclite1 amd64 2.0.3-1build1 [21.4 kB]
Get:27 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 openjdk-21-jre-headless amd64 21.0.8+9~us1-0ubuntu1~24.04.1 [46.4 MB]
19% [27 openjdk-21-jre-headless 34.9 MB/46.4 MB 75%]                                                    3,724 kB/s 44s
```

- task1_java_version.png

```
zuha@zuha:~/lab4/workspace/python_project$ java -version
openjdk version "25" 2025-09-16
OpenJDK Runtime Environment (build 25+36-Ubuntu-124.04.2)
OpenJDK 64-Bit Server VM (build 25+36-Ubuntu-124.04.2, mixed mode, sharing)
```

- task1_java_remove.png

```
zuha@zuha:~/lab4/workspace/python_project$ sudo apt remove openjdk-25-jdk -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 at-spi2-common at-spi2-core dconf-gsettings-backend dconf-service fontconfig gsettings-desktop-schemas gtk-update-icon-cache
  hicolor-icon-theme humanity-icon-theme libatk-bridge2.0-0t64 libatk-wrapper-java libatk-wrapper-java-jni libatk1.0-0t64 libatspi2.0-0t64 libcairo-gobject2
  libcairo2 libcolord2 libdatrie1 libdconf1 libdrm-amdgpu1 libdrm-intel1 libepoxy0 libgbm1 libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin libgdk-pixbuf2.0-common
  libgif7 libgl1 libgl1-mesa-dri libglvnd0 libglx-mesa0 libgtk-3-0t64 libgtk-3-bin libgtk-3-common libice-dev libice6 libllvm20 libpango-1.0-0
  libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpixman-1-0 libpthread-stubs0-dev librsvg2-2 librsvg2-common libsm-dev libsm6 libthai-data libthai0
  libvulkan1 libwayland-client0 libwayland-cursor0 libwayland-egl1 libwayland-server0 libx11-dev libx11-xcb1 libxau-dev libxaw7 libxcb-dri3-0 libxcb-glx0
  libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0 libxcb1-dev libxcomposite1 libxcursor1 libxdamage1
  libxdmcp-dev libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxrandr2 libxrender1 libxshmfence1 libxt-dev libxt6t64 libxtst6 libxv1
  libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers openjdk-25-jdk-headless openjdk-25-jre session-migration ubuntu-mono x11-common x11-utils
  x11proto-dev xorg-sgml-doctools xtrans-dev
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  openjdk-25-jdk
0 upgraded, 0 newly installed, 1 to remove and 67 not upgraded.
After this operation, 3,943 kB disk space will be freed.
(Reading database ... 102345 files and directories currently installed.)
Removing openjdk-25-jdk:amd64 (25+36-1~24.04.2) ...
```

- task1_java_not_found.png

```
zuha@zuha:~/lab4/workspace/python_project$ java
Usage: java [java options...] <application> [application arguments...]

Where <application> is one of:
  <mainclass>                to execute the main method of a compiled main class
  -jar <jarfile>.jar         to execute the main class of a JAR archive
  -m <module>[/<mainclass>]  to execute the main class of a module
  <sourcefile>.java          to compile and execute a source-file program

Where key java options include:
  --class-path <class path>
    where <class path> is a list of directories and JAR archives to search for class files, separated by ":"
  --module-path <module path>
    where <module path> is a list of directories and JAR archives to search for modules, separated by ":"
  -version
    to print product version to the error stream and exit

For additional help on usage:         java --help
For an interactive Java environment:   jshell
```

- task1_hash_clear.png

```
zuha@zuha:~/lab4/workspace/python_project$ hash -r
zuha@zuha:~/lab4/workspace/python_project$ java
Usage: java [java options...] <application> [application arguments...]

Where <application> is one of:
  <mainclass>                to execute the main method of a compiled main class
  -jar <jarfile>.jar         to execute the main class of a JAR archive
  -m <module>[/<mainclass>]  to execute the main class of a module
  <sourcefile>.java          to compile and execute a source-file program

Where key java options include:
  --class-path <class path>
    where <class path> is a list of directories and JAR archives to search for class files, separated by ":"
  --module-path <module path>
    where <module path> is a list of directories and JAR archives to search for modules, separated by ":"
  -version
    to print product version to the error stream and exit

For additional help on usage:           java --help
For an interactive Java environment:     jshell
```

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

- task2_aptget_install.png

```
zuha@zuha:~/lab4/workspace/python_project$ sudo apt-get update
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://security.ubuntu.com/ubuntu noble-security 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
```

```
zuha@zuha:~/lab4/workspace/python_project$ sudo apt-get install 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:
  libice-dev libpthread-stubs0-dev libsm-dev libx11-dev libxau-dev libxcb1-dev libxdmcp-dev libxt-dev openjdk-25-jdk-headless openjdk-25-jre x11proto-dev
  xorg-sgml-doctools xtrans-dev
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Suggested packages:
  libnss-mdns fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei | fonts-wqy-zenhei fonts-indic
The following NEW packages will be installed:
  default-jre default-jre-headless openjdk-21-jre openjdk-21-jre-headless
0 upgraded, 4 newly installed, 0 to remove and 67 not upgraded.
Need to get 46.6 MB of archives.
After this operation, 203 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 openjdk-21-jre-headless amd64 21.0.8+9~us1-0ubuntu1~24.04.1 [46.4 MB]
1% [1 openjdk-21-jre-headless 327 kB/46.4 MB 1%]
```

- task2_java_version_after_aptget.png

```
zuha@zuha:~/lab4/workspace/python_project$ java -version
openjdk version "25" 2025-09-16
OpenJDK Runtime Environment (build 25+36-Ubuntu-124.04.2)
OpenJDK 64-Bit Server VM (build 25+36-Ubuntu-124.04.2, mixed mode, sharing)
```

- task2_aptget_remove.png

```
zuha@zuha:~/lab4/workspace/python_project$ 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:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  default-jre
0 upgraded, 0 newly installed, 1 to remove and 67 not upgraded.
After this operation, 6,144 B disk space will be freed.
(Reading database ... 102678 files and directories currently installed.)
Removing default-jre (2:1.21-75+exp1) ...
```

- task2_hash_after_remove.png

```
zuha@zuha:~/lab4/workspace/python_project$ hash -r
zuha@zuha:~/lab4/workspace/python_project$ java
Usage: java [java options...] <application> [application arguments...]

Where <application> is one of:
  <mainclass>               to execute the main method of a compiled main class
  -jar <jarfile>.jar        to execute the main class of a JAR archive
  -m <module>[/<mainclass>] to execute the main class of a module
  <sourcefile>.java         to compile and execute a source-file program

Where key java options include:
  --class-path <class path>
    where <class path> is a list of directories and JAR archives to search for class files, separated by ":"
  --module-path <module path>
    where <module path> is a list of directories and JAR archives to search for modules, separated by ":"
  -version
    to print product version to the error stream and exit

For additional help on usage:         java --help
For an interactive Java environment:   jshell
```

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

- task3_apt_update.png

```
zuha@zuha:~/lab4/workspace/python_project$ 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
67 packages can be upgraded. Run 'apt list --upgradable' to see them.
zuha@zuha:~/lab4/workspace/python_project$
```

- task3_apt_upgrade.png

```
zuha@zuha:~/lab4/workspace/python_project$ 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:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  linux-headers-6.8.0-86 linux-headers-6.8.0-86-generic linux-image-6.8.0-86-generic linux-modules-6.8.0-86-generic linux-modules-extra-6.8.0-86-generic
  linux-tools-6.8.0-86 linux-tools-6.8.0-86-generic
The following packages will be upgraded:
  bind9-dnsutils bind9-host bind9-libs cloud-init coreutils distro-info-data dpkg firmware-sof-signed fwupd landscape-common libc-bin libc-dev-bin
  libc-devtools libc6 libc6-dev libfwupd2 libnss-systemd libpam-modules libpam-modules-bin libpam-runtime libpam-systemd libpam0g libpython3.12-minimal
  libpython3.12-stdlib libpython3.12t64 libsqlite3-0 libssl3t64 libsystemd-shared libsystemd0 libtiff6 libudev1 libudisks2-0 libxml2 linux-firmware
  linux-generic linux-headers-generic linux-image-generic linux-libc-dev linux-tools-common locales open-vm-tools openssh-client openssh-server
  openssh-sftp-server openssl powermgmt-base python3-software-properties python3.12 python3.12-minimal snapd software-properties-common sosreport systemd
  systemd-dev systemd-hwe-hwdb systemd-resolved systemd-sysv systemd-timesyncd tcpdump ubuntu-drivers-common udev udisks2 vim vim-common vim-runtime vim-tiny
  xxd
67 upgraded, 7 newly installed, 0 to remove and 0 not upgraded.
37 standard LTS security updates
Need to get 829 MB of archives.
After this operation, 308 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

- task3_explanation.png

```
zuha@zuha:~/lab4/workspace/python_project$ nano ~/apt_update_vs_upgrade.md
```

```
zuha@zuha:~/lab4/workspace/python_project$ cat ~/apt_update_vs_upgrade.md
my name is zuha and this is my lab 4
my roll no is 2023-bse-073
i am the student of software engineering
and this is my 3rd year of my bacholrs degree
```

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

- task4_snap_install.png

```
zuha@zuha:~/lab4/workspace/python_project$ sudo snap install --classic code
2025-10-24T07:54:14Z INFO Waiting for automatic snapd restart...
code 7d842fb8 from Visual Studio Code (vscode♦) installed
```

- task4_snap_list.png

```
zuha@zuha:~/lab4/workspace/python_project$ snap list code
Name   Version   Rev   Tracking        Publisher   Notes
code   7d842fb8   211   latest/stable   vscode♦     classic
```

- task4_code_version_or_info.png

```
zuha@zuha:~/lab4/workspace/python_project$ code --version
1.105.1
7d842fb85a0275a4a8e4d7e040d2625abbf7f084
x64
```

- task4_snap_bin_location.png

```
zuha@zuha:~/lab4/workspace/python_project$ ls -l /snap/bin | grep code
lrwxrwxrwx 1 root root 13 Oct 24 07:58 code -> /usr/bin/snap
lrwxrwxrwx 1 root root 13 Oct 24 07:58 code.url-handler -> /usr/bin/snap
```

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

- task5_update.png

```
PS C:\Users\S Y S> ssh zuha@192.168.231.132
The authenticity of host '192.168.231.132 (192.168.231.132)' can't be established.
ED25519 key fingerprint is SHA256:yYpWEhgC6pc2twYcVXW9hmvgtndybT5KkLLN8Iq4qRo.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.231.132' (ED25519) to the list of known hosts.
zuha@192.168.231.132's password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-86-generic x86_64)

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

 System information as of Mon Oct 27 06:58:55 AM UTC 2025

  System load:  0.06              Processes:             230
  Usage of /:   84.2% of 9.75GB   Users logged in:       1
  Memory usage: 9%                IPv4 address for ens33: 192.168.231.132
  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


Last login: Fri Oct 24 05:42:24 2025 from 192.168.231.132
```

- task5_xfce_install.png

```
zuha@zuha:~$ sudo apt update && sudo apt upgrade -y
Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
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
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.5 kB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:7 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Fetched 200 kB in 2s (81.2 kB/s)
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
The following packages were automatically installed and are no longer required:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
Get more security updates through Ubuntu Pro with 'esm-apps' enabled:
  libzvbi-common libavcodec60 libzvbi0t64 libavutil58 libswresample4 7zip
Learn more about Ubuntu Pro at https://ubuntu.com/pro
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

- task5_xrdp_enable.png

```
zuha@zuha:~$ sudo apt install xfce4 xfce4-goodies -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
xfce4 is already the newest version (4.18).
xfce4-goodies is already the newest version (4.18.2build1).
The following packages were automatically installed and are no longer required:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

- task5_xrdp_status.png

- task5_xsession.png

- task5_rdp_connect.png


```
zuha@zuha:~$ echo xfce4-session > ~/.xsession
```

- task5_vscode_launch.png
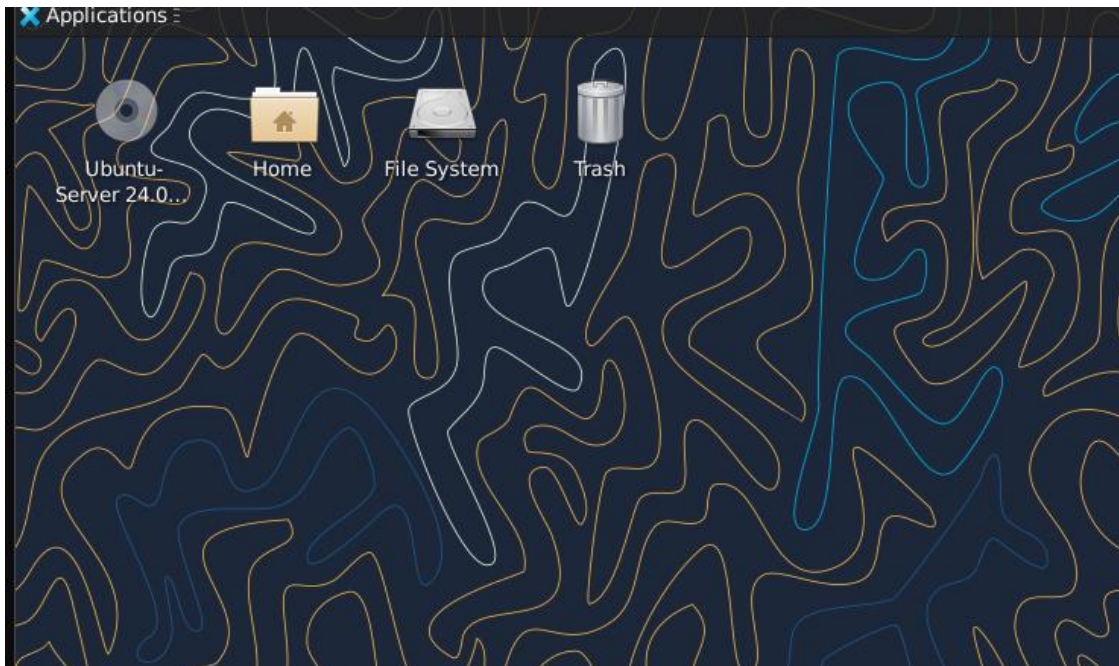
Task 6 - Install lightdm-gtk-greeter and GUI verification - start GUI, open VS Code, take snapshot, then end (GUI)

- task6_lightdm_install.png

```
zuha@zuha:~$ sudo apt install lightdm lightdm-gtk-greeter -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
lightdm is already the newest version (1.30.0-0ubuntu14).
lightdm-gtk-greeter is already the newest version (2.0.9-0ubuntu3).
The following packages were automatically installed and are no longer required:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

- task6_lightdm_config.png

```
zuha@zuha:~$ sudo mkdir -p /etc/lightdm/lightdm.conf.d
zuha@zuha:~$ 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
```

- task6_lightdm_cleanup.png

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

- task6_lightdm_restart.png

```
zuha@zuha:~$ sudo systemctl restart lightdm
```

- task6_gui_enable_boot.png

```
zuha@zuha:~$ sudo systemctl enable lightdm
sudo systemctl set-default graphical.target
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.
```

- task6_after_reboot_gui.png

```
zuha@zuha:~$ sudo reboot

Broadcast message from root@zuha on pts/1 (Tue 2025-11-04 07:07:19 UTC):

The system will reboot now!
```

- task6_gui_disable_boot.png

```
zuha@zuha:~$ sudo systemctl set-default multi-user.target
sudo systemctl disable lightdm
[sudo] password for zuha:
Removed "/etc/systemd/system/default.target".
Created symlink /etc/systemd/system/default.target → /usr/lib/systemd/system/multi-user.target.
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
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.
```

- task6_after_reboot_cli.png

```
zuha@zuha:~$ sudo reboot

Broadcast message from root@zuha on pts/1 (Tue 2025-11-04 07:11:50 UTC):

The system will reboot now!
```

- task6_gui_start.png

```
zuha@zuha:~$ sudo systemctl start lightdm
[sudo] password for zuha:
zuha@zuha:~$ sudo systemctl stop lightdm
```

- task6_gui_stop.png

```
zuha@zuha:~$ sudo systemctl start lightdm
[sudo] password for zuha:
zuha@zuha:~$ sudo systemctl stop lightdm
```

- task6_gui_start_command.png

```
zuha@zuha:~$ sudo systemctl start lightdm
```

- task6_vscode_launch.png

```
zuha@zuha:~$ code
```

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

- task7_install_chrome_error.png

```
zuha@zuha:~$ 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
```

- task7_ls_etc_apt.png

```
zuha@zuha:~$ ls -la /etc/apt
total 48
drwxr-xr-x    9 root root  4096 Oct 24 09:54 .
drwxr-xr-x 143 root root 12288 Oct 27 05:37 ..
drwxr-xr-x    2 root root  4096 Oct 24 07:46 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 24 09:56 sources.list
drwxr-xr-x    2 root root  4096 Oct 24 09:56 sources.list.d
drwxr-xr-x    2 root root  4096 Aug  5 17:01 trusted.gpg.d
```

- task7_cat_sources_list.png

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

- task7_ls_sources_list_d.png

```
zuha@zuha:~$ ls -la /etc/apt/sources.list.d/
total 16
drwxr-xr-x 2 root root 4096 Oct 24 09:56 .
drwxr-xr-x 9 root root 4096 Oct 24 09:54 ..
-rw-r--r-- 1 root root  382 Oct 24 09:56 ubuntu.sources
-rw-r--r-- 1 root root 2552 Aug  5 17:02 ubuntu.sources.curtin.orig
```

- task7_cat_ubuntu_sources.png

```
zuha@zuha:~$ 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
```

- task7_edit_ubuntu_sources.png

```
zuha@zuha:~$ sudo nano /etc/apt/sources.list.d/ubuntu.sources
```

- task7_add_key.png

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

- task7_apt_update.png

```
2. Unable to locate package google chrome stable
zuha@zuha:~$ sudo apt update
Get:1 http://dl.google.com/linux/chrome/deb stable InRelease [1,825 B]
Get:2 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:3 http://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,209 B]
Hit:4 http://archive.ubuntu.com/ubuntu noble InRelease
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1,298 kB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [213 kB]
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]
Get:9 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [2,131 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1,581 kB]
Get:13 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [483 kB]
Get:14 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:15 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [906 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble-updates/main Translation-en [298 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [175 kB]
Get:18 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [203 kB]
Get:19 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [15.4 kB]
Get:20 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.3 kB]
Get:21 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [19.4 kB]
Get:22 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [208 B]
Get:23 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [2,240 kB]
Ign:23 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages
Get:24 http://archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [508 kB]
Ign:25 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components
Get:26 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [1,498 kB]
Get:27 http://archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [303 kB]
Get:28 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [378 kB]
Get:29 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [31.4 kB]
Get:30 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:31 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7,132 B]
Get:32 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [212 B]
Get:33 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [11.0 kB]
Get:34 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:23 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [2,240 kB]
Get:25 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Fetched 12.8 MB in 3min 12s (66.5 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
10 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

- task7_install_chrome.png

```
zuha@zuha:~$ sudo apt install google-chrome-stable -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
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 10 not upgraded.
Need to get 119 MB of archives.
After this operation, 395 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 fonts-liberation all 1:2.1.5-3 [1,603 kB]
Get:2 http://dl.google.com/linux/chrome/deb stable/main amd64 google-chrome-stable amd64 142.0.7444.59-1 [118 MB]
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 1min 14s (1,624 kB/s)
Selecting previously unselected package fonts-liberation.
(Reading database ... 181304 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.
```

- task7_alternate_remove.png

```
zuha@zuha:~$ sudo apt remove google-chrome-stable -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  google-chrome-stable
0 upgraded, 0 newly installed, 1 to remove and 10 not upgraded.
After this operation, 390 MB disk space will be freed.
(Reading database ... 181614 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...
```

- task7_alternate_edit.png

```
zuha@zuha:~$ sudo nano /etc/apt/sources.list.d/ubuntu.sources
```

- task7_remove_key.png

```
zuha@zuha:~$ sudo rm -f /etc/apt/keyrings/google.gpg
```

- task7_create_google_chrome_list.png

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

- task7_list_sources_after_create.png

```
zuha@zuha:~$ 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 24 09:54 ..
-rw-r--r-- 1 root root  107 Nov  4 07:34 google-chrome.list
-rw-r--r-- 1 root root  384 Nov  4 07:33 ubuntu.sources
-rw-r--r-- 1 root root 2552 Aug  5 17:02 ubuntu.sources.curtin.orig
```

- task7_add_key_alt.png

```
zuha@zuha:~$ sudo mkdir -p /etc/apt/keyrings
zuha@zuha:~$ curl -fsSL https://dl.google.com/linux/linux_signing_key.pub | sudo gpg --dearmor -o /etc/apt/keyrings/google.gpg
File '/etc/apt/keyrings/google.gpg' exists. Overwrite? (y/N) y
```

- task7_apt_update_alt.png

```
zuha@zuha:~$ sudo apt update
Hit:1 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
10 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

- task7_install_chrome_alt.png

```
zuha@zuha:~$ sudo apt install google-chrome-stable -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  google-chrome-stable
0 upgraded, 1 newly installed, 0 to remove and 10 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]
Fetched 118 MB in 1min 16s (1,557 kB/s)
Selecting previously unselected package google-chrome-stable.
(Reading database ... 181333 files and directories currently installed.)
Preparing to unpack .../google-chrome-stable_142.0.7444.59-1_amd64.deb ...
Unpacking google-chrome-stable (142.0.7444.59-1) ...
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 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.
```

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

- task8_add_ppa_audacity.png

```
zuha@zuha:~$ 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.
Hit:1 http://dl.google.com/linux/chrome/deb stable InRelease
Get:2 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease [18.1 kB]
Hit:3 http://security.ubuntu.com/ubuntu noble-security InRelease
Get:4 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble/main amd64 Packages [1,064 B]
Get:5 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble/main Translation-en [492 B]
Ign:6 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:7 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:8 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:6 http://archive.ubuntu.com/ubuntu noble InRelease
Fetched 19.6 kB in 32s (617 B/s)
Reading package lists... Done
```

- task8_apt_update_audacity.png

```
zuha@zuha:~$ sudo apt update
Hit:1 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:2 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:6 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
10 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

- task8_install_audacity.png

- task8_audacity_launch.png or task8_audacity_version.png


```
zuha@zuha:~$ audacity --version
audacity
Command 'audacity' not found, but can be installed with:
sudo snap install audacity  # version 3.7.1, or
sudo apt  install audacity  # version 3.4.2+dfsg-1
See 'snap info audacity' for additional versions.
Command 'audacity' not found, but can be installed with:
sudo snap install audacity  # version 3.7.1, or
sudo apt  install audacity  # version 3.4.2+dfsg-1
See 'snap info audacity' for additional versions.
zuha@zuha:~$
```

- task8_add_ppa_obs.png

```
zuha@zuha:~$ sudo add-apt-repository ppa:obsproject/obs-studio -y
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://dl.google.com/linux/chrome/deb stable InRelease
Get:2 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble InRelease [17.8 kB]
Hit:3 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security 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]
Hit: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
Fetched 19.1 kB in 56s (343 B/s)
Reading package lists... Done
```

- task8_apt_update_obs.png

```
zuha@zuha:~$ sudo apt update
Hit:1 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:2 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble 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
Ign:7 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:7 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
10 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

- task8_install_obs.png

```
zuha@zuha:~$ sudo apt install obs-studio -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  default-jre-headless openjdk-21-jre openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libaacs0 libass9 libavdevice60 libavfilter9 libavformat60 libb2-1 libbdplus0 libblas3 libbluray2 libbs2b0 libchromaprint1 libcjson1 libdc1394-25 libdecor-0-0 libdecor-0-plugin-1-gtk libdouble-conversion3 libfdk-aac2
  libfftw3-double3 libflite1 libgfortran5 libgme0 liblapack3 liblilv-0-0 libluajit-5.1-2 libluajit-5.1-common libmbedcrypto7t64 libmbedtls14t64 libmbedx509-1t64 libmd4c0 libmysofa1 libnorm1t64 libopenal-data libopenal1 libopenmpt0t64
  libpcre2-16-0 libpgm-5.3-0t64 libplacebo338 libpocketsphinx3 libpostproc57 libqrcodegencpp1 libqt6core6t64 libqt6dbus6t64 libqt6gui6t64 libqt6network6t64 libqt6opengl6t64 libqt6qml6 libqt6qmlmodels6 libqt6quick6 libqt6svg6
  libqt6waylandclient6 libqt6waylandcompositor6 libqt6waylandeglclienthwintegration6 libqt6waylandeglcompositorhwintegration6 libqt6widgets6t64 libqt6wlshellintegration6 libqt6xml6t64 librabbitmq4 librist4 librubberband2
  libsdl2-2.0-0 libserd-0-0 libsndio7.0 libsord-0-0 libsphinxbase3t64 libsratom-0-0 libsrt1.5-gnutls libsrt1.5-openssl libssh-4 libssh-gcrypt-4 libswscale7 libts0t64 libudfread0 libunibreak5 libvidstab1.1 libxcb-composite0
  libxcb-icccm4 libxcb-image0 libxcb-keysyms1 libxcb-render-util0 libxcb-xinerama0 libxcb-xkb1 libxkbcommon-x11-0 libzimg2 libzix-0-0 libzmq5 pocketsphinx-en-us qt6-gtk-platformtheme qt6-qpa-plugins qt6-translations-l10n qt6-wayland
Suggested packages:
  libbluray-bdj libfftw3-bin libfftw3-dev libportaudio2 qt6-qmltooling-plugins serdi sndiod sordi
The following NEW packages will be installed:
  libaacs0 libass9 libavdevice60 libavfilter9 libavformat60 libb2-1 libbdplus0 libblas3 libbluray2 libbs2b0 libchromaprint1 libcjson1 libdc1394-25 libdecor-0-0 libdecor-0-plugin-1-gtk libdouble-conversion3 libfdk-aac2
  libfftw3-double3 libflite1 libgfortran5 libgme0 liblapack3 liblilv-0-0 libluajit-5.1-2 libluajit-5.1-common libmbedcrypto7t64 libmbedtls14t64 libmbedx509-1t64 libmd4c0 libmysofa1 libnorm1t64 libopenal-data libopenal1 libopenmpt0t64
  libpcre2-16-0 libpgm-5.3-0t64 libplacebo338 libpocketsphinx3 libpostproc57 libqrcodegencpp1 libqt6core6t64 libqt6dbus6t64 libqt6gui6t64 libqt6network6t64 libqt6opengl6t64 libqt6qml6 libqt6qmlmodels6 libqt6quick6 libqt6svg6
  libqt6waylandclient6 libqt6waylandcompositor6 libqt6waylandeglclienthwintegration6 libqt6waylandeglcompositorhwintegration6 libqt6widgets6t64 libqt6wlshellintegration6 libqt6xml6t64 librabbitmq4 librist4 librubberband2
  libsdl2-2.0-0 libserd-0-0 libsndio7.0 libsord-0-0 libsphinxbase3t64 libsratom-0-0 libsrt1.5-gnutls libsrt1.5-openssl libssh-gcrypt-4 libswscale7 libts0t64 libudfread0 libunibreak5 libvidstab1.1 libxcb-composite0 libxcb-icccm4
  libxcb-image0 libxcb-keysyms1 libxcb-render-util0 libxcb-xinerama0 libxcb-xkb1 libxkbcommon-x11-0 libzimg2 libzix-0-0 libzmq5 obs-studio pocketsphinx-en-us qt6-gtk-platformtheme qt6-qpa-plugins qt6-translations-l10n qt6-wayland
The following packages will be upgraded:
  libssh-4
1 upgraded, 90 newly installed, 0 to remove and 9 not upgraded.
Need to get 182 MB/183 MB of archives.
After this operation, 536 MB of additional disk space will be used.
Get:1 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble/main amd64 obs-studio amd64 32.0.2-0obsproject1-noble [105 MB]
Ign:2 http://archive.ubuntu.com/ubuntu noble/universe amd64 libaacs0 amd64 0.11.1-2build1
Get:3 http://archive.ubuntu.com/ubuntu noble/universe amd64 libunibreak5 amd64 5.1-2build1 [25.0 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble/universe amd64 libass9 amd64 1:0.17.1-2build1 [104 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble/universe amd64 libudfread0 amd64 1.1.2-1build1 [19.0 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/universe amd64 libbluray2 amd64 1:1.3.4-1build1 [159 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/universe amd64 libchromaprint1 amd64 1.5.1-5 [30.5 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble/universe amd64 libgme0 amd64 0.6.3-7build1 [134 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble/universe amd64 libopenmpt0t64 amd64 0.7.3-1.1build1 [647 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble/main amd64 librabbitmq4 amd64 0.11.0-1build2 [37.4 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble/universe amd64 libcjson1 amd64 1.7.17-1 [24.8 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble/universe amd64 libmbedcrypto7t64 amd64 2.28.8-1 [209 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble/universe amd64 librist4 amd64 0.2.10+dfsg-2 [74.9 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsrt1.5-gnutls amd64 1.5.3-1build2 [316 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libssh-gcrypt-4 amd64 0.10.6-2ubuntu0.2 [224 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble/universe amd64 libnorm1t64 amd64 1.5.9+dfsg-3.1build1 [154 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble/universe amd64 libpgm-5.3-0t64 amd64 5.3.128-dfsg-2.1build1 [167 kB]
Get:18 http://archive.ubuntu.com/ubuntu noble/universe amd64 libzmq5 amd64 4.3.5-1build2 [260 kB]
Get:19 http://archive.ubuntu.com/ubuntu noble/universe amd64 libavformat60 amd64 7:6.1.1-3ubuntu5 [1,153 kB]
Get:20 http://archive.ubuntu.com/ubuntu noble/universe amd64 libbs2b0 amd64 3.1.0+dfsg-7build1 [10.6 kB]
Get:21 http://archive.ubuntu.com/ubuntu noble/universe amd64 libflite1 amd64 2.2-6build3 [13.6 MB]
Get:22 http://archive.ubuntu.com/ubuntu noble/universe amd64 libmysofa1 amd64 1.3.2+dfsg-2ubuntu2 [1,158 kB]
Get:23 http://archive.ubuntu.com/ubuntu noble/universe amd64 libplacebo338 amd64 6.338.2-2build1 [2,654 kB]
Get:24 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libblas3 amd64 3.12.0-3build1.1 [238 kB]
Get:25 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libgfortran5 amd64 14.2.0-4ubuntu2~24.04 [916 kB]
Get:26 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 liblapack3 amd64 3.12.0-3build1.1 [2,646 kB]
Get:27 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsphinxbase3t64 amd64 0.8+5prealpha+1-17build2 [126 kB]
Get:28 http://archive.ubuntu.com/ubuntu noble/universe amd64 libpocketsphinx3 amd64 0.8.0+real5prealpha+1-15ubuntu5 [133 kB]
Get:29 http://archive.ubuntu.com/ubuntu noble/universe amd64 libpostproc57 amd64 7:6.1.1-3ubuntu5 [49.9 kB]
Get:30 http://archive.ubuntu.com/ubuntu noble/main amd64 libfftw3-double3 amd64 3.3.10-1ubuntu3 [838 kB]
Get:31 http://archive.ubuntu.com/ubuntu noble/universe amd64 librubberband2 amd64 3.3.0+dfsg-2build1 [130 kB]
Get:32 http://archive.ubuntu.com/ubuntu noble/universe amd64 libswscale7 amd64 7:6.1.1-3ubuntu5 [193 kB]
Get:33 http://archive.ubuntu.com/ubuntu noble/universe amd64 libvidstab1.1 amd64 1.1.0-2build1 [38.5 kB]
Get:34 http://archive.ubuntu.com/ubuntu noble/universe amd64 libzimg2 amd64 3.0.5+ds1-1build1 [254 kB]
Get:35 http://archive.ubuntu.com/ubuntu noble/universe amd64 libavfilter9 amd64 7:6.1.1-3ubuntu5 [4,235 kB]
Get:36 http://archive.ubuntu.com/ubuntu noble/universe amd64 libdc1394-25 amd64 2.2.6-4build1 [99.1 kB]
Get:37 http://archive.ubuntu.com/ubuntu noble/universe amd64 libopenal-data all 1:1.23.1-4build1 [161 kB]
Get:38 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsndio7.0 amd64 1.9.0-0.3build3 [29.6 kB]
Get:39 http://archive.ubuntu.com/ubuntu noble/universe amd64 libopenal1 amd64 1:1.23.1-4build1 [540 kB]
```

zuha@zuha:~$ sudo apt install obs-studio -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done

```
Setting up libavformat60:amd64 (7:6.1.1-3ubuntu5) ...
Setting up libluajit-5.1-2:amd64 (2.1.0+git20231223.c525bcb+dfsg-1) ...
Setting up libqt6xml6t64:amd64 (6.4.2+dfsg-21.1build5) ...
Setting up libsphinxbase3t64:amd64 (0.8+5prealpha+1-17build2) ...
Setting up libass9:amd64 (1:0.17.1-2build1) ...
Setting up libqt6gui6t64:amd64 (6.4.2+dfsg-21.1build5) ...
Setting up libmbedtls14t64:amd64 (2.28.8-1) ...
Setting up libsord-0-0:amd64 (0.16.16-2build1) ...
Setting up libsratom-0-0:amd64 (0.6.16-1build1) ...
Setting up libqt6network6t64:amd64 (6.4.2+dfsg-21.1build5) ...
Setting up liblilv-0-0:amd64 (0.24.22-1build1) ...
Setting up libqt6widgets6t64:amd64 (6.4.2+dfsg-21.1build5) ...
Setting up qt6-qpa-plugins:amd64 (6.4.2+dfsg-21.1build5) ...
Setting up libqt6qml6:amd64 (6.4.2+dfsg-4build3) ...
Setting up libqt6opengl6t64:amd64 (6.4.2+dfsg-21.1build5) ...
Setting up libqt6qmlmodels6:amd64 (6.4.2+dfsg-4build3) ...
Setting up libpocketsphinx3:amd64 (0.8.0+real5prealpha+1-15ubuntu5) ...
Setting up libqt6svg6:amd64 (6.4.2-4ubuntu3) ...
Setting up libqt6waylandclient6:amd64 (6.4.2-5build3) ...
Setting up qt6-gtk-platformtheme:amd64 (6.4.2+dfsg-21.1build5) ...
Setting up libqt6quick6:amd64 (6.4.2+dfsg-4build3) ...
Setting up libqt6wlshellintegration6:amd64 (6.4.2-5build3) ...
Setting up libqt6waylandcompositor6:amd64 (6.4.2-5build3) ...
Setting up libqt6waylandeglcompositorhwintegration6:amd64 (6.4.2-5build3) ...
Setting up libqt6waylandeglclienthwintegration6:amd64 (6.4.2-5build3) ...
Setting up libavfilter9:amd64 (7:6.1.1-3ubuntu5) ...
Setting up qt6-wayland:amd64 (6.4.2-5build3) ...
Setting up libavdevice60:amd64 (7:6.1.1-3ubuntu5) ...
Setting up obs-studio (32.0.2-0obsproject1~noble) ...
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) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1.1ubuntu3) ...
Processing triggers for libc-bin (2.39-0ubuntu8.6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...
 systemctl restart cups-browsed.service

Service restarts being deferred:
 systemctl restart NetworkManager.service

No containers need to be restarted.

User sessions running outdated binaries:
 zuha @ user manager service: systemd[1249]

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

- task8_obs_launch.png or task8_obs_version.png

```
zuha@zuha:~$ obs --version
obs
OBS Studio - 32.0.2
qt.qpa.xcb: could not connect to display
qt.qpa.plugin: Could not load the Qt platform plugin "xcb" in "" even though it was found.
This application failed to start because no Qt platform plugin could be initialized. Reinstalling the application may fix this problem.

Available platform plugins are: linuxfb, wayland-egl, wayland, vnc, minimal, xcb, eglfs, offscreen, minimalegl, vkkhrdisplay.

Aborted (core dumped)
```
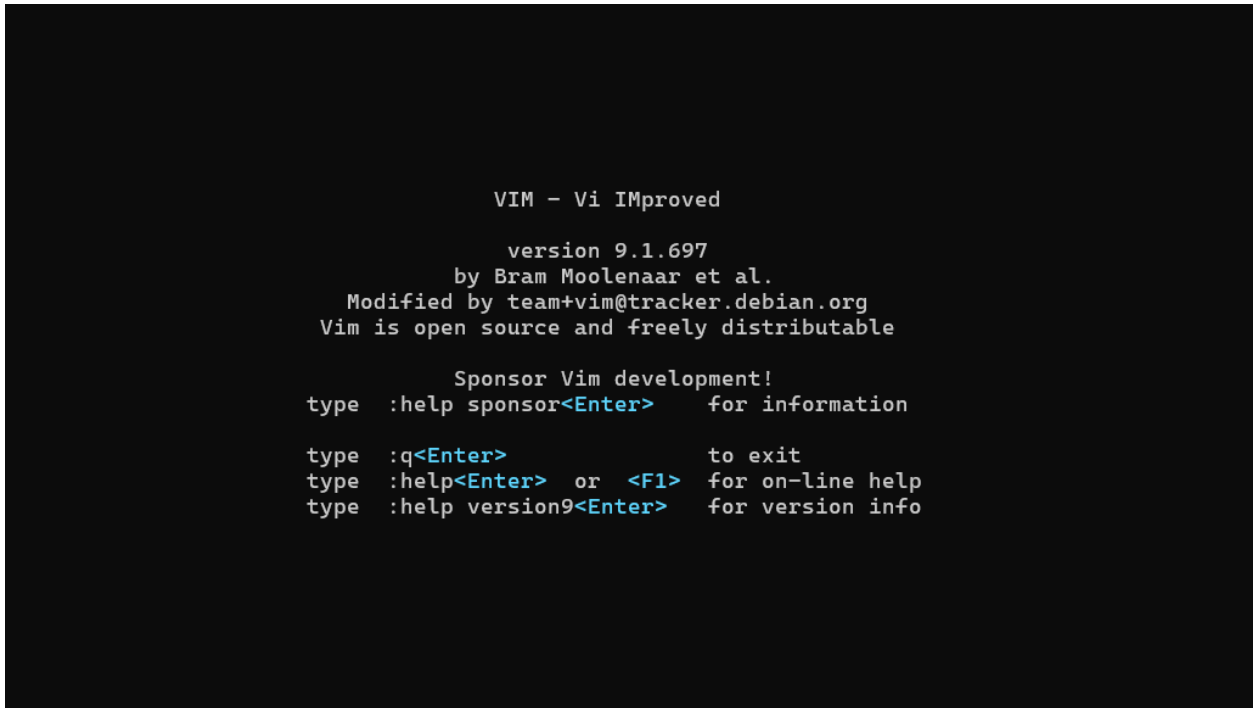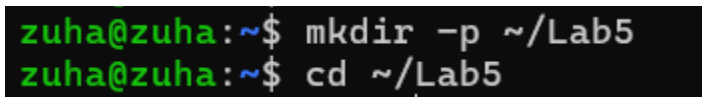
Task 9 - Create a Kubernetes sample YAML using vim

- task9_vim_check.png

- task9_vim_install.png (only if you installed vim)

- task9_mkdir_cd.png

- task9_vim_edit.png

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

~
~
```

- task9_k8s_saved.png

```
zuha@zuha:~/Lab5$ vim k8s-sample.yaml
zuha@zuha:~/Lab5$ la -la
total 12
drwxrwxr-x  2 zuha zuha 4096 Nov  4 08:08 .
drwxr-x--- 20 zuha zuha 4096 Nov  4 08:08 ..
-rw-rw-r--  1 zuha zuha  170 Nov  4 08:08 k8s-sample.yaml
```

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

- task10_verify_annotation.png

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:1.19
    ports:
    - containerPort: 80
  restartPolicy: Alway
annotations:
  lab: lesson11s
~
~
~
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~
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~
~
~
~
~
~
~
~
~
~
~
:wq
```

- task10_verify_entering_temp_data.png

```
zuha@zuha:~/Lab5$ cat k8s-sample.yaml
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:1.19
    ports:
    - containerPort: 80
  restartPolicy: Alway
annotations:
  lab: lesson11s
```

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:1.19
    ports:
    - containerPort: 80
  restartPolicy: Alway
annotations:
  lab: lesson11s
    # temp: do-not-keep
~
~
~
~
~
~
~
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~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
:q!
```

- task10_verify_no_temp_comment.png

```
zuha@zuha:~/Lab5$ cat k8s-sample.yaml
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:1.19
    ports:
    - containerPort: 80
  restartPolicy: Alway
annotations:
  lab: lesson11s
```

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

- task11_dd_delete_and_undo.png

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    ports:
    - containerPort: 80
  restartPolicy: Alway
annotations:
  lab: lesson11s
~
~
~
```

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:1.19
    ports:
    - containerPort: 80
  restartPolicy: Alway
annotations:
  lab: lesson11s
~
~
```

- task11_delete3_and_undo.png

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
  restartPolicy: Alway
annotations:
  lab: lesson11s
~
```

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:1.19
    ports:
    - containerPort: 80
  restartPolicy: Alway
annotations:
  lab: lesson11s
```

- task11_line1.png

```
apiVersion: v1
kind: Pod
```

- task11_navigation.png

```
    restartPolicy: Al
annotations:
  lab: lesson11s
```

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

- task12_search_nginx.png

```
containers:
- name: nginx
  image: nginx:1.19
```

```
- name: webapp
  image: webapp:1.19
  ports:
```

- task12_n_and_N_navigation.png

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:1.19
    ports:
    - containerPort: 80
    restartPolicy: Alway
annotations:
  lab: lesson11s
~
```

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:1.19
    ports:
    - containerPort: 80
    restartPolicy: Alway
annotations:
  lab: lesson11s
~
~
```

- task12_added_occurrences.png

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:1.19
    ports:
    - containerPort: 80
  restartPolicy: Alway
annotations:
  lab: lesson11s
~
```

- task12_cycle_matches.png

```
containers:
- name: /nginx
    image: nginx:1.19
```

```
containers:
- name: /nginx
```

- task12_substitute_result.png

```
apiVersion: v1
kind: Pod
metadata:
  name: webapp-pod
spec:
  containers:
  - name: webapp
    image: webapp:1.19
    ports:
    - containerPort: 80
  restartPolicy: Alway
annotations:
  lab: lesson11s
~
~
```

- task12_undo_and_quit.png