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Roll No: 2023-BSE-077

Class: BSE5-B

Lab 05

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

- Run java to see suggestion → task1_java_suggestion.png

```
sadafriaz@2023-bse-077:~$ java
Command 'java' not found, but can be installed with:
sudo apt install openjdk-17-jre-headless  # version 17.0.16+8~us1-0ubuntu1~24.04.1, or
sudo apt install openjdk-21-jre-headless  # version 21.0.8+9~us1-0ubuntu1~24.04.1
sudo apt install default-jre              # version 2:1.17-75
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
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
sadafriaz@2023-bse-077:~$ _
```

- Install suggested Java package → task1_java_install.png

```
Adding debian:Security_Communication_ECC_RootCA1.pem
Adding debian:Security_Communication_RootCA2.pem
Adding debian:Security_Communication_RootCA3.pem
Adding debian:Security_Communication_Root_CA.pem
Adding debian:SSL.com_EV_Root_Certification_Authority_ECC.pem
Adding debian:SSL.com_EV_Root_Certification_Authority_RSA_R2.pem
Adding debian:SSL.com_Root_Certification_Authority_ECC.pem
Adding debian:SSL.com_Root_Certification_Authority_RSA.pem
Adding debian:SSL.com_TLS_ECC_Root_CA_2022.pem
Adding debian:SSL.com_TLS_RSA_Root_CA_2022.pem
Adding debian:Starfield_Class_2_CA.pem
Adding debian:Starfield_Root_Certificate_Authority_-_G2.pem
Adding debian:Starfield_Services_Root_Certificate_Authority_-_G2.pem
Adding debian:SwissSign_Gold_CA_-_G2.pem
Adding debian:SwissSign_Silver_CA_-_G2.pem
Adding debian:SZAFIR_ROOT_CA2.pem
Adding debian:Telia_Root_CA_v2.pem
Adding debian:TeliaSonera_Root_CA_v1.pem
Adding debian:TrustAsia_Global_Root_CA_G3.pem
Adding debian:TrustAsia_Global_Root_CA_G4.pem
Adding debian:Trustwave_Global_Certification_Authority.pem
Adding debian:Trustwave_Global_ECC_P256_Certification_Authority.pem
Adding debian:Trustwave_Global_ECC_P384_Certification_Authority.pem
Adding debian:T-TeleSec_GlobalRoot_Class_2.pem
Adding debian:T-TeleSec_GlobalRoot_Class_3.pem
Adding debian:TUBITAK_Kamu_SM_SSL_Kok_Sertifikasi_-_Surum_1.pem
Adding debian:TunTrust_Root_CA.pem
Adding debian:TWCA_Global_Root_CA.pem
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.
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.
sadafriaz@2023-bse-077:~$ _
```

-

- Verify Java version → task1_java_version.png

```
sadafriaz@2023-bse-077:~$ java --version
openjdk 17.0.16 2025-07-15
OpenJDK Runtime Environment (build 17.0.16+8-Ubuntu-0ubuntu124.04.1)
OpenJDK 64-Bit Server VM (build 17.0.16+8-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
sadafriaz@2023-bse-077:~$
```

- Remove Java package → task1_java_remove.png

```
sadafriaz@2023-bse-077:~$ sudo apt remove openjdk-17-jre-headless -y
[sudo] password for sadafriaz:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  alsa-topology-conf alsa-ucm-conf ca-certificates-java java-common libasound2-data libasound2t64 libavahi-client3 libavahi-common-data libavahi-common3
  libcups2t64 libgraphite2-3 libharfbuzz0b liblcms2-2 libpcsclite1 squashfs-tools
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  openjdk-17-jre-headless
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 193 MB disk space will be freed.
(Reading database ... 126185 files and directories currently installed.)
Removing openjdk-17-jre-headless:amd64 (17.0.16+8~us1-0ubuntu1~24.04.1) ...
sadafriaz@2023-bse-077:~$
```

- Confirm Java not found → task1_java_not_found.png

```
Removing openjdk-17-jre-headless:amd64 (17.0.16+8
sadafriaz@2023-bse-077:~$ java
-bash: /usr/bin/java: No such file or directory
sadafriaz@2023-bse-077:~$ _
```

- Clear shell command hash → task1_hash_clear.png

```
sadafriaz@2023-bse-077:~$ hash -r
sadafriaz@2023-bse-077:~$
```

Task 2 – Install & remove Java using apt-get

Subheadings:

- Update package index → task2_aptget_install.png

```
        Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
        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 [208 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 [208 B]
        Fetched 200 kB in 3s (70.9 kB/s)
        Reading package lists... Done
        sadafriaz@2023-bse-077:~$ sudo apt-get install openjdk-17-jre-headless -y
        [sudo] password for sadafriaz:
        Reading package lists... Done
        Building dependency tree... Done
        Reading state information... Done
        The following package was automatically installed and is no longer required:
          squashfs-tools
        Use 'sudo apt autoremove' to remove it.
        Suggested packages:
          libnss-mdns fonts-dejavu-extra fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei | fonts-wqy-zenhei fonts-indic
        The following NEW packages will be installed:
          openjdk-17-jre-headless
        0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
        Need to get 48.0 MB of archives.
        After this operation, 193 MB of additional disk space will be used.
        Get:1 http://security.ubuntu.com/ubuntu noble-security/main amd64 openjdk-17-jre-headless amd64 17.0.16+8~us1-0ubuntu1~24.04.1 [48.0 MB]
        Fetched 48.0 MB in 1min 54s (421 kB/s)
        Selecting previously unselected package openjdk-17-jre-headless:amd64.
        (Reading database ... 125898 files and directories currently installed.)
        Preparing to unpack .../openjdk-17-jre-headless_17.0.16+8~us1-0ubuntu1~24.04.1_amd64.deb ...
        Unpacking openjdk-17-jre-headless:amd64 (17.0.16+8~us1-0ubuntu1~24.04.1) ...
        Setting up openjdk-17-jre-headless:amd64 (17.0.16+8~us1-0ubuntu1~24.04.1) ...
        update-alternatives: using /usr/lib/jvm/java-17-openjdk-amd64/bin/java to provide /usr/bin/java (java) in auto mode
        update-alternatives: using /usr/lib/jvm/java-17-openjdk-amd64/bin/jpackage to provide /usr/bin/jpackage (jpackage) in auto mode
        update-alternatives: using /usr/lib/jvm/java-17-openjdk-amd64/bin/keytool to provide /usr/bin/keytool (keytool) in auto mode
        update-alternatives: using /usr/lib/jvm/java-17-openjdk-amd64/bin/rmiregistry to provide /usr/bin/rmiregistry (rmiregistry) in auto mode
        update-alternatives: using /usr/lib/jvm/java-17-openjdk-amd64/lib/jexec to provide /usr/bin/jexec (jexec) in auto mode
        Processing triggers for ca-certificates-java (20240118) ...
        done.
        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.
```

- Verify Java version → task2_java_version_after_aptget.png


```
No VM guests are running outdated hypervisor (qemu) binaries on this host.
sadafriaz@2023-bse-077:~$ java  -version
openjdk version "17.0.16" 2025-07-15
OpenJDK Runtime Environment (build 17.0.16+8-Ubuntu-0ubuntu124.04.1)
OpenJDK 64-Bit Server VM (build 17.0.16+8-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
sadafriaz@2023-bse-077:~$ java  --version
openjdk 17.0.16 2025-07-15
OpenJDK Runtime Environment (build 17.0.16+8-Ubuntu-0ubuntu124.04.1)
OpenJDK 64-Bit Server VM (build 17.0.16+8-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
sadafriaz@2023-bse-077:~$
```

- Remove Java → task2_aptget_remove.png


```
sadafriaz@2023-bse-077:~$ sudo apt-get remove openjdk-17-jre-headless -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  alsa-topology-conf alsa-ucm-conf ca-certificates-java java-common libasound2-data libasound2t64 libavahi-client3 libavahi-common-data libavahi-common3
  libcups2t64 libgraphite2-3 libharfbuzz0b liblcms2-2 libpcsclite1 squashfs-tools
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  openjdk-17-jre-headless
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 193 MB disk space will be freed.
(Reading database ... 126185 files and directories currently installed.)
Removing openjdk-17-jre-headless:amd64 (17.0.16+8~us1-0ubuntu1~24.04.1) ...
```

- Confirm Java missing → task2_hash_after_remove.png


```
sadafriaz@2023-bse-077:~$ hash -r
sadafriaz@2023-bse-077:~$ java
Command 'java' not found, but can be installed with:
sudo apt install openjdk-17-jre-headless  # version 17.0.16+8~us1-0ubuntu1~24.04.1, or
sudo apt install openjdk-21-jre-headless  # version 21.0.8+9~us1-0ubuntu1~24.04.1
sudo apt install default-jre              # version 2:1.17-75
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
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
sadafriaz@2023-bse-077:~$ _
```

Task 3 – apt update vs apt upgrade

- Run apt update → task3_apt_update.png

```
sadafriaz@2023-bse-077:~$ sudo apt update
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:2 http://pk.archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://pk.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://pk.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.
sadafriaz@2023-bse-077:~$
```

- Run apt upgrade → task3_apt_upgrade.png

```
sadafriaz@2023-bse-077:~$ 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:
  alsa-topology-conf alsa-ucm-conf ca-certificates-java java-common libasound2-data libasound2t64 libavahi-client3 libavahi-common-data libavahi-common3
  libcups2t64 libgraphite2-3 libharfbuzz0b liblcms2-2 libpcsclite1 squashfs-tools
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
sadafriaz@2023-bse-077:~$
```

- Explain difference → task3_explanation.png

```
sadafriaz@2023-bse-077:~$ cat ~/apt_update_vs_upgrade.md
apt update refreshes the local list of available packages from repositories.
apt upgrade installs the latest versions of currently installed packages.
sadafriaz@2023-bse-077:~$
```

Task 4 – Install Visual Studio Code via snap

- Install VS Code → task4_snap_install.png

```
sadafriaz@2023-bse-077:~$ sudo snap install --classic --edge
error: the required argument `<snap> (at least 1 argument)` was not provided
sadafriaz@2023-bse-077:~$ sudo snap install --classic code  --edge
2025-10-25T18:07:46Z INFO Waiting for automatic snapd restart...
code 7d842fb8 from Visual Studio Code (vscode✦) installed
Channel latest/edge for code is closed; temporarily forwarding to stable.
sadafriaz@2023-bse-077:~$ _
```

- Verify snap installation → task4_snap_list.png

```
Channel latest/edge for code is closed; temporarily forward
sadafriaz@2023-bse-077:~$ snap list code
Name  Version   Rev  Tracking     Publisher  Notes
code  7d842fb8  211  latest/edge  vscode✦    classic
sadafriaz@2023-bse-077:~$
```

- Check Code version → task4_code_version_or_info.png

```
sadafriaz@2023-bse-077:~$ code --version
1.105.1
7d842fb85a0275a4a8e4d7e040d2625abbf7f084
x64
sadafriaz@2023-bse-077:~$
```

- Show snap binary location → task4_snap_bin_location.png

```
sadafriaz@2023-bse-077:~$ ls -l /snap/bin  | grep code
lrwxrwxrwx 1 root root 13 Oct 25 18:17 code -> /usr/bin/snap
lrwxrwxrwx 1 root root 13 Oct 25 18:17 code.url-handler -> /usr/bin/snap
sadafriaz@2023-bse-077:~$
```

Task 5 – Install XFCE GUI + XRDP and launch VS Code

- Update & upgrade system → task5_update.png

```
sadafriaz@2023-bse-077:~$ sudo apt update && sudo apt upgrade -y
Hit:1 http://pk.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://pk.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://pk.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 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.
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:
  alsa-topology-conf alsa-ucm-conf ca-certificates-java java-common libasound2-data libasound2t64 libavahi-client3 libavahi-common-data libavahi-common3
  libcups2t64 libgraphite2-3 libharfbuzz0b liblcms2-2 libpcsclite1
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
sadafriaz@2023-bse-077:~$
```

- Install XFCE → task5_xfce_install.png

```
Setting up indicator-datetime (15.10421.04.20210504-0ubuntu0) ...
Setting up xfce4-goodies:amd64 (4.18.2build1) ...
Setting up yelp (42.2-1ubuntu0.24.04.1) ...
Setting up libebook-1.2-21t64:amd64 (3.52.3-0ubuntu1) ...
Setting up evolution-data-server (3.52.3-0ubuntu1) ...
Setting up mate-user-guide (1.26.2-1) ...
Processing triggers for dictionaries-common (1.29.7) ...
aspell-autobuildhash: processing: en [en-common].
aspell-autobuildhash: processing: en [en-variant_0].
aspell-autobuildhash: processing: en [en-variant_1].
aspell-autobuildhash: processing: en [en-variant_2].
aspell-autobuildhash: processing: en [en-w_accents-only].
aspell-autobuildhash: processing: en [en-wo_accents-only].
aspell-autobuildhash: processing: en [en_AU-variant_0].
aspell-autobuildhash: processing: en [en_AU-variant_1].
aspell-autobuildhash: processing: en [en_AU-w_accents-only].
aspell-autobuildhash: processing: en [en_AU-wo_accents-only].
aspell-autobuildhash: processing: en [en_CA-variant_0].
aspell-autobuildhash: processing: en [en_CA-variant_1].
aspell-autobuildhash: processing: en [en_CA-w_accents-only].
aspell-autobuildhash: processing: en [en_CA-wo_accents-only].
aspell-autobuildhash: processing: en [en_GB-ise-w_accents-only].
aspell-autobuildhash: processing: en [en_GB-ise-wo_accents-only].
aspell-autobuildhash: processing: en [en_GB-ize-w_accents-only].
aspell-autobuildhash: processing: en [en_GB-ize-wo_accents-only].
aspell-autobuildhash: processing: en [en_GB-variant_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.
sadafriaz@2023-bse-077:~$ _
```

- Install & enable XRDP → task5_xrdp_enable.png

```
sadafriaz@2023-bse-077:~$ 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
sadafriaz@2023-bse-077:~$
```

- Verify XRDP status → task5_xrdp_status.png

```
sadafriaz@2023-bse-077:~$ 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
sadafriaz@2023-bse-077:~$ sudo systemctl status xrdp
● xrdp.service - xrdp daemon
     Loaded: loaded (/usr/lib/systemd/system/xrdp.service; enabled; preset: enabled)
     Active: active (running) since Sat 2025-10-25 19:18:55 UTC; 6min ago
       Docs: man:xrdp(8)
             man:xrdp.ini(5)
   Main PID: 16699 (xrdp)
      Tasks: 1 (limit: 2210)
     Memory: 868.0K (peak: 1.3M)
        CPU: 13ms
     CGroup: /system.slice/xrdp.service
             └─16699 /usr/sbin/xrdp

Oct 25 19:18:54 2023-bse-077 systemd[1]: Starting xrdp.service - xrdp daemon...
Oct 25 19:18:54 2023-bse-077 xrdp[16698]: [INFO ] address [0.0.0.0] port [3389] mode 1
Oct 25 19:18:54 2023-bse-077 xrdp[16698]: [INFO ] listening to port 3389 on 0.0.0.0
Oct 25 19:18:54 2023-bse-077 xrdp[16698]: [INFO ] xrdp_listen_pp done
Oct 25 19:18:54 2023-bse-077 systemd[1]: xrdp.service: Can't open PID file /run/xrdp/xrdp.pid (yet?) after start: No such file or directory
Oct 25 19:18:55 2023-bse-077 systemd[1]: Started xrdp.service - xrdp daemon.
Oct 25 19:18:56 2023-bse-077 xrdp[16699]: [INFO ] starting xrdp with pid 16699
Oct 25 19:18:56 2023-bse-077 xrdp[16699]: [INFO ] address [0.0.0.0] port [3389] mode 1
Oct 25 19:18:56 2023-bse-077 xrdp[16699]: [INFO ] listening to port 3389 on 0.0.0.0
Oct 25 19:18:56 2023-bse-077 xrdp[16699]: [INFO ] xrdp_listen_pp done
sadafriaz@2023-bse-077:~$ _
```

- Configure XFCE session → task5_xsession.png

```
Oct 25 19:18:56 2023-bse-077 xrdp[16699]: [INFO ] xrdp_listen_pp done
sadafriaz@2023-bse-077:~$ echo xfce4-session  > ~/.xsession
sadafriaz@2023-bse-077:~$
```

- Connect via RDP → task5_rdp_connect.png

```
sadafriaz@2023-bse-077: $ echo xfce4-session  > ~.xsession
sadafriaz@2023-bse-077:~$ ss -ltnp | grep 3389
LISTEN 0        2                       *:3389              *:*
sadafriaz@2023-bse-077:~$
```

- Launch VS Code in GUI → task5_vscode_launch.png
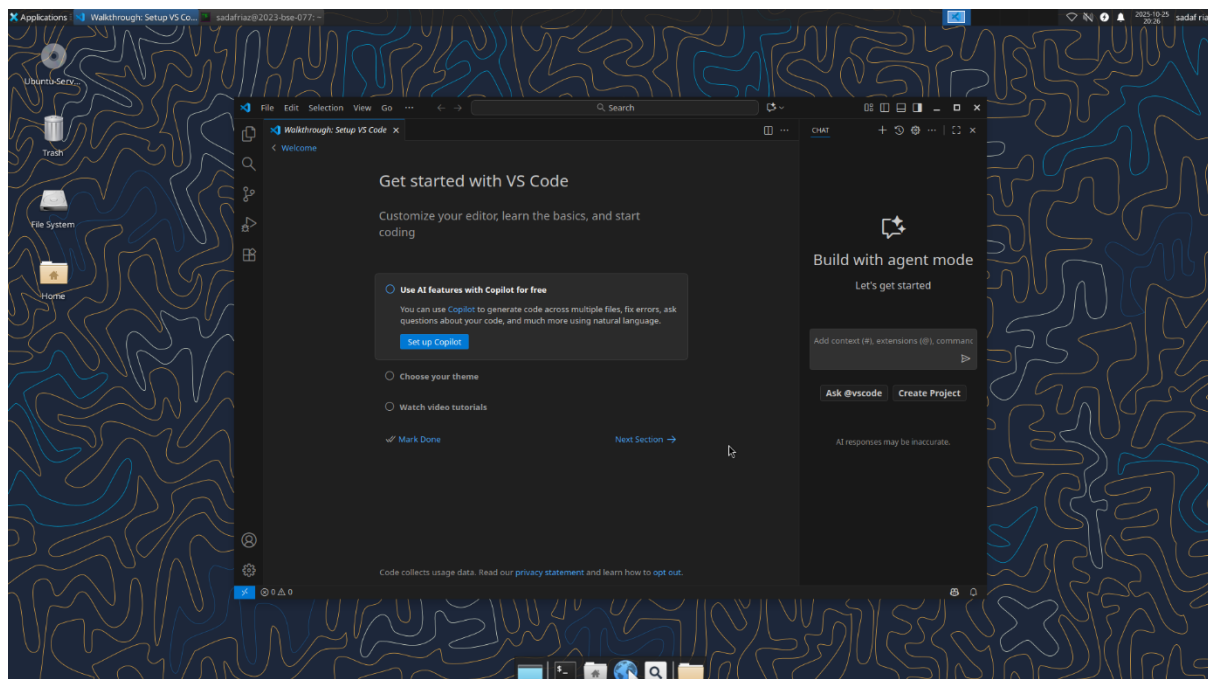
Task 6 – Install lightdm-gtk-greeter & GUI verification

Install LightDM & greeter → task6_lightdm install.png

```
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 /
de
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.
sadafriaz@2023-bse-077:~$
```

- Configure LightDM → task6_lightdm_config.png

```
autologin-user-timeout=0
sadafriaz@2023-bse-077:~$ echo -e "[Seat:*]\ngreeter-session=lightdm-gtk-greeter\nuser-session=xfce\nautologin-user-timeout=0"| sudo tee /etc/lightdm/lightdm.co
nf.d/99-xfce.conf
[Seat:*]
greeter-session=lightdm-gtk-greeter
user-session=xfce
autologin-user-timeout=0
sadafriaz@2023-bse-077:~$ echo -e "[Seat:*]\ngreeter-session=lightdm-gtk-greeter\nuser-session=xfce\nautologin-user-timeout=0"| sudo tee /etc/lightdm/lightdm.co
```

- Clean session files & permissions → task6_lightdm_cleanup.png

```
sadafriaz@2023-bse-077:~$
sadafriaz@2023-bse-077:~$ sudo  rm -f /var/lib/lightdm/ .Xauthority
rm: cannot remove '/var/lib/lightdm/': Is a directory
sadafriaz@2023-bse-077:~$ sudo rm -f /var/lib/lightdm/.Xauthority
sadafriaz@2023-bse-077:~$ sudo rm -f ~/.Xauthority
sadafriaz@2023-bse-077:~$ sudo rm -f ~/.cache/sessions
rm: cannot remove '/home/sadafriaz/.cache/sessions': Is a directory
sadafriaz@2023-bse-077:~$ sudo rm -f ~/ .cache/sessions
rm: cannot remove '/home/sadafriaz/': Is a directory
rm: cannot remove '.cache/sessions': Is a directory
sadafriaz@2023-bse-077:~$ sudo rm -rf ~/.cache/sessions
sadafriaz@2023-bse-077:~$ sudo chown -R $USER:$USER /home/$USER
sadafriaz@2023-bse-077:~$ _
```
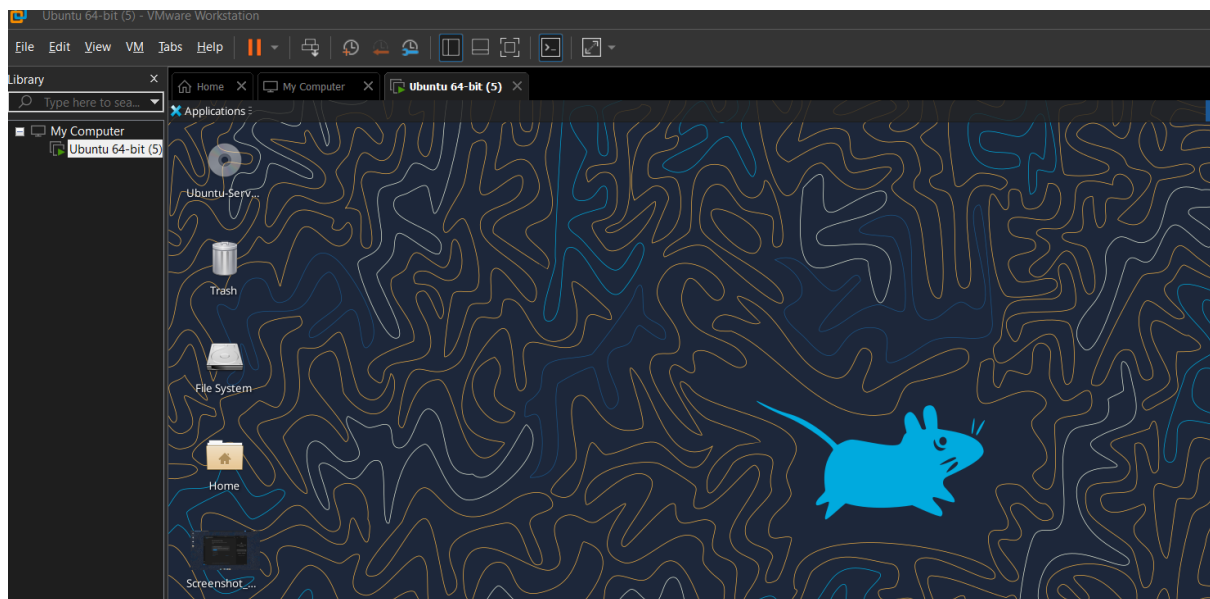
- Restart LightDM → task6_lightdm_restart.png
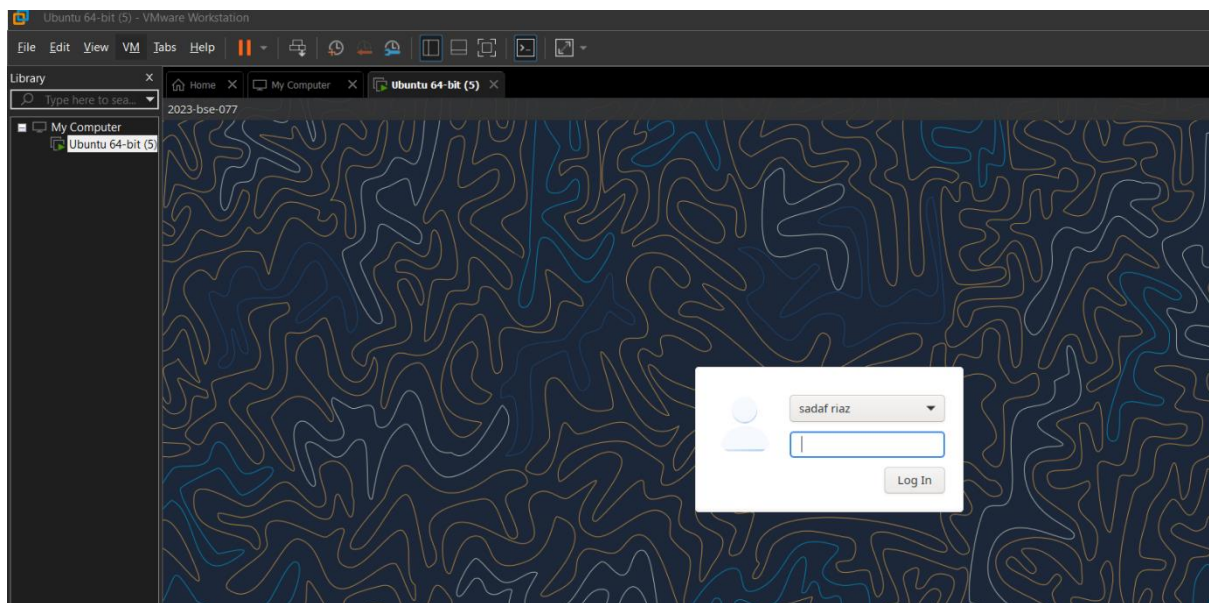
- Enable GUI boot → task6_gui_enable_boot.png


```
Synchronizing state of lightdm.service with SysV service script with /usr/lib/sy
stemd/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 s
ystemctl.

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.
sadafriaz@2023-bse-077:~/Desktop$ sudo system set-default graphical.target
sudo: system: command not found
sadafriaz@2023-bse-077:~/Desktop$ sudo systemctl set-default graphical.target
Removed "/etc/systemd/system/default.target".
Created symlink /etc/systemd/system/default.target → /usr/lib/systemd/system/gra
phical.target.
sadafriaz@2023-bse-077:~/Desktop$
```

- GUI after reboot → task6_after_reboot_gui.png
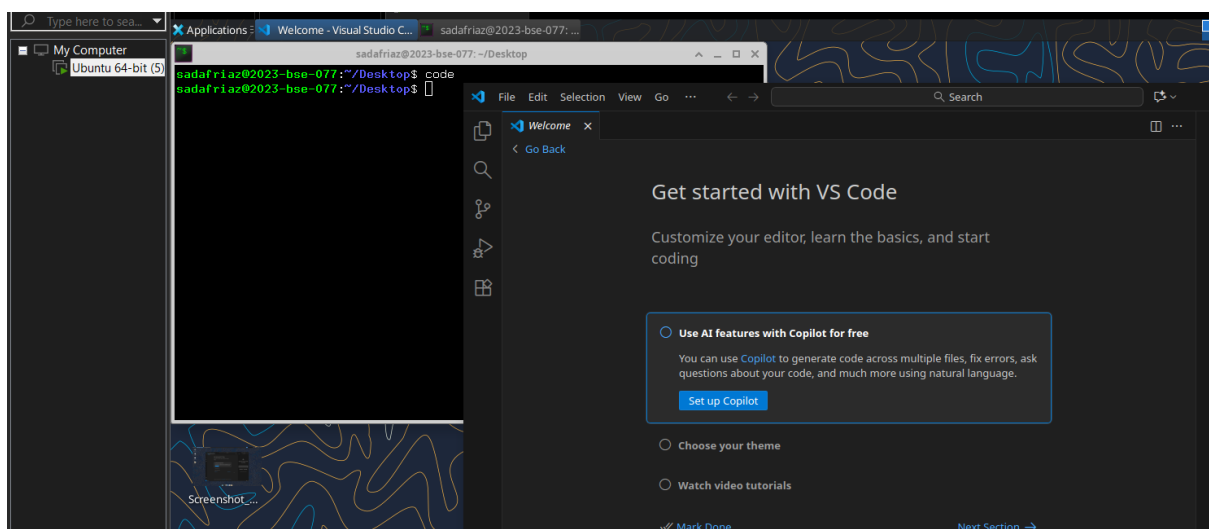

- CLI after reboot → task6_after_reboot_cli.png

- Start GUI manually → task6_gui_start.png
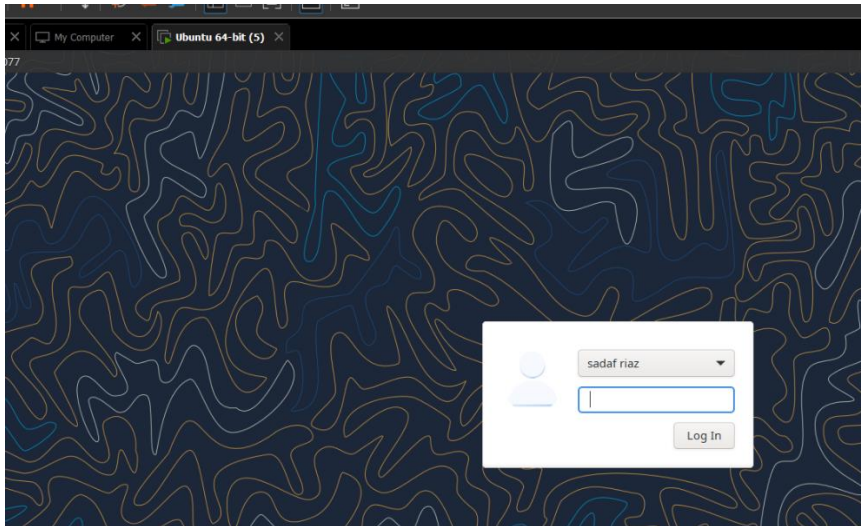
- Stop GUI manually → task6_gui_stop.png
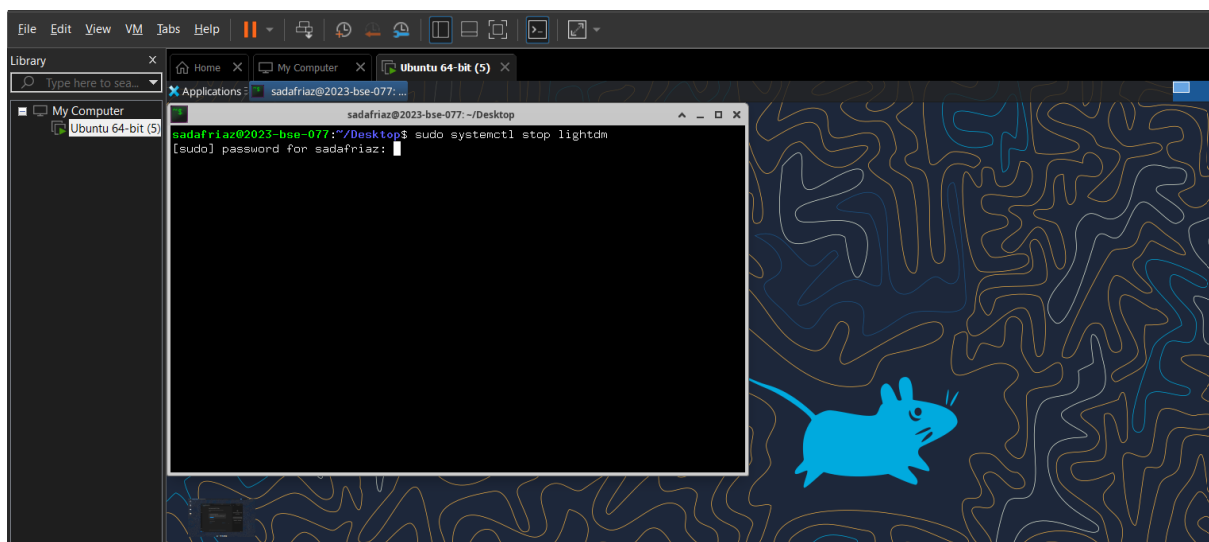
- Launch VS Code in GUI → task6_vscode_launch.png

Task 7 – Install Google Chrome via apt repository/key

- Attempt install (fail) → task7_install_chrome_error.png

```
sadafriaz@2023-bse-077:~$ sudo apt install google-chrome-stable -y
[sudo] password for sadafriaz:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package google-chrome-stable
sadafriaz@2023-bse-077:~$
```

- List /etc/apt → task7_ls_etc_apt.png

```
Reading state information... Done
E: Unable to locate package google-chrome-stable
sadafriaz@2023-bse-077:~$ ls -la /etc/apt
total 48
drwxr-xr-x   9 root root  4096 Oct 15 09:39 .
drwxr-xr-x 141 root root 12288 Oct 25 19:18 ..
drwxr-xr-x   2 root root  4096 Oct 25 17:52 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 15 09:59 sources.list
drwxr-xr-x   2 root root  4096 Oct 15 09:59 sources.list.d
drwxr-xr-x   2 root root  4096 Aug  5 17:01 trusted.gpg.d
sadafriaz@2023-bse-077:~$
```

- View sources.list → task7_cat_sources_list.png

```
drwxr-xr-x   2 root root  4096 Aug  5 17:01 trusted.gpg.d
sadafriaz@2023-bse-077:~$ cat /etc/apt/sources.list
# Ubuntu sources have moved to /etc/apt/sources.list.d/ubuntu.sources
sadafriaz@2023-bse-077:~$
```

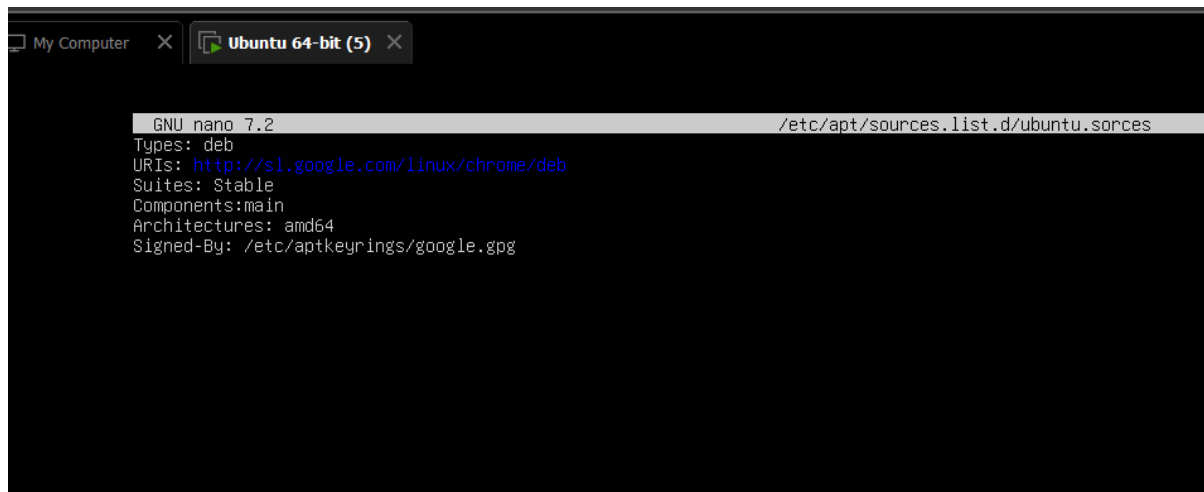- List sources.list.d → task7_ls_sources_list_d.png

```
sadafriaz@2023-bse-077:~$ ls -la /etc/apt/sources.list.d/
total 16
drwxr-xr-x 2 root root 4096 Oct 15 09:59 .
drwxr-xr-x 9 root root 4096 Oct 15 09:39 ..
-rw-r--r-- 1 root root  386 Oct 15 09:39 ubuntu.sources
-rw-r--r-- 1 root root 2552 Aug  5 17:02 ubuntu.sources.curtin.orig
sadafriaz@2023-bse-077:~$
```

- Check ubuntu.sources → task7_cat_ubuntu_sources.png

```
sadafriaz@2023-bse-077:~$ cat /etc/apt/sources.list.d/ubuntu.sources
Types: deb
URIs: http://pk.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
sadafriaz@2023-bse-077:~$ _
```

- Edit ubuntu.sources → task7_edit_ubuntu_sources.png

```
  My Computer  X   Ubuntu 64-bit (5)  X

  GNU nano 7.2                                    /etc/apt/sources.list.d/ubuntu.sorces
Types: deb
URIs: http://sl.google.com/linux/chrome/deb
Suites: Stable
Components:main
Architectures: amd64
Signed-By: /etc/aptkeyrings/google.gpg
```

- Add Google key → task7_add_key.png

```
sadafriaz@2023-bse-077:~$ sudo rm -f /etc/apt/sources.list.d/google-chrome.list
sadafriaz@2023-bse-077:~$ sudo mkdir -p /etc/apt/keyrings
sadafriaz@2023-bse-077:~$ sudo 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
sadafriaz@2023-bse-077:~$ 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
deb [arch=amd64 signed-by=/etc/apt/keyrings/google.gpg] http://dl.google.com/linux/chrome/deb/ stable main
sadafriaz@2023-bse-077:~$ _
```

- Install Chrome → task7_install_chrome.png

```
Unpacking google-chrome-stable (141.0.7390.122-1) ...
Setting up google-chrome-stable (141.0.7390.122-1) ...
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/x-www-browser
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/gnome-www-bro
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/google-chrome
Processing triggers for mate-menus (1.26.1-1build3) ...
Processing triggers for desktop-file-utils (0.27-2build1) ...
Processing triggers for bamfdaemon (0.5.6+22.04.20220217-0ubuntu5) ...
Rebuilding /usr/share/applications/bamf-2.index...
Processing triggers for man-db (2.12.0-4build2) ...
sadafriaz@2023-bse-077:/tmp$ google-chrome --version

Google Chrome 141.0.7390.122
sadafriaz@2023-bse-077:/tmp$
sadafriaz@2023-bse-077:/tmp$ _
```

- Cleanup before alternate method → task7_alternate_remove.png,
  task7_alternate_edit.png, task7_remove_key.png

```
google-chrome-141.0.7390.122
sadafriaz@2023-bse-077:/tmp$
sadafriaz@2023-bse-077:/tmp$ 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:
  ca-certificates-java java-common
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 0 not upgraded.
After this operation, 396 MB disk space will be freed.
(Reading database ... 193012 files and directories currently installed.)
Removing google-chrome-stable (141.0.7390.122-1) ...
Processing triggers for desktop-file-utils (0.27-2build1) ...
Processing triggers for mate-menus (1.26.1-1build3) ...
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...
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.
sadafriaz@2023-bse-077:/tmp$
```

```
  GNU nano 7.2                                          /etc/apt/sources.list.d/ubuntu.sourc
sudo nano /etc/apt/sources.list.d/ubuntu.sources
```

```
sadafriaz@2023-bse-077:/tmp$ sudo rm -f /etc/apt/keyrings/google.gpg
```

- Create google-chrome.list → task7_create_google_chrome_list.png

```
sadafriaz@2023-bse-077:/tmp$ sudo rm -f /etc/apt/keyrings/google.gpg

sadafriaz@2023-bse-077:/tmp$ echo "deb [arch=amd64 signed-by=/etc/apt/keyrings/google.gpg] http://dl.google.com/linux/chrome/deb/ stable main" | sudo tee /etc/a
pt/sources.list.d/google-chrome.list > /dev/null
sadafriaz@2023-bse-077:/tmp$
sadafriaz@2023-bse-077:/tmp$
```

- Verify file → task7_list_sources_after_create.png

```
sadafriaz@2023-bse-077:/tmp$
sadafriaz@2023-bse-077:/tmp$ ls -la /etc/apt/sources.list.d/

total 20
drwxr-xr-x 2 root root 4096 Oct 26 11:57 .
drwxr-xr-x 9 root root 4096 Oct 15 09:39 ..
-rw-r--r-- 1 root root  107 Oct 26 11:59 google-chrome.list
-rw-r--r-- 1 root root   52 Oct 26 11:57 ubuntu.sources
-rw-r--r-- 1 root root 2552 Aug  5 17:02 ubuntu.sources.curtin.orig
sadafriaz@2023-bse-077:/tmp$
sadafriaz@2023-bse-077:/tmp$
```

- Add key again → task7_add_key_alt.png

```
sadafriaz@2023-bse-077:/tmp$ sudo mkdir -p /etc/apt/keyrings

cusadafriaz@2023-bse-077:/tmp$ rl -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)
Enter new filename: rl: command not found

gpg: signal Interrupt caught ... exiting

sadafriaz@2023-bse-077:/tmp$ sudo mkdir -p /etc/apt/keyrings
sadafriaz@2023-bse-077:/tmp$ 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
sadafriaz@2023-bse-077:/tmp$
```

- Update & install Chrome → task7_apt_update_alt.png, task7_install_chrome_alt.png

```
sadafriaz@2023-bse-077:/tmp$ sudo mkdir -p /etc/apt/keyrings
sadafriaz@2023-bse-077:/tmp$ curl -fSSL https://dl.google.com/linux/]
File '/etc/apt/keyrings/google.gpg' exists. Overwrite? (y/N) y
sadafriaz@2023-bse-077:/tmp$ sudo apt update


Hit:1 http://dl.google.com/linux/chrome/deb stable InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
sadafriaz@2023-bse-077:/tmp$ _
```

```
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 0 not upgraded.
Need to get 120 MB of archives.
After this operation, 396 MB of additional disk space will be used.
Get:1 http://dl.google.com/linux/chrome/deb stable/main amd64 google-chrome-stable amd64 141.0.7390.122-1 [120 MB]
Fetched 120 MB in 1min 19s (1,514 kB/s)
Selecting previously unselected package google-chrome-stable.
(Reading database ... 192730 files and directories currently installed.)
Preparing to unpack .../google-chrome-stable_141.0.7390.122-1_amd64.deb ...
Unpacking google-chrome-stable (141.0.7390.122-1) ...
Setting up google-chrome-stable (141.0.7390.122-1) ...
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 mate-menus (1.26.1-1build3) ...
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.
sadafriaz@2023-bse-077:/tmp$ google-chrome --version

Google Chrome 141.0.7390.122
sadafriaz@2023-bse-077:/tmp$
sadafriaz@2023-bse-077:/tmp$ _
```

Task 8 – Install applications via PPA (Audacity & OBS)

Subheadings:

- Add Audacity PPA → task8_add_ppa_audacity.png

```
sadafriaz@2023-bse-077:~$ sudo add-apt-repository ppa:ubuntuhandbook1/audacity -y

[sudo] password for sadafriaz:
Sorry, try again.
[sudo] password for sadafriaz:
Sorry, try again.
[sudo] password for sadafriaz:
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 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 [1,215 B]
Get:3 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease [18.1 kB]
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]
Fetched 22.7 kB in 3s (7,418 B/s)
Reading package lists... Done
sadafriaz@2023-bse-077:~$ _
```

- Update apt → task8_apt_update_audacity.png

```
sadafriaz@2023-bse-077:~$ 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
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
sadafriaz@2023-bse-077:~$ _
```

- Error:

```
or been moved out of incoming.
The following information may help to resolve the situation:

The following packages have unmet dependencies:
 audacity : Depends: libflac++10 (>= 1.3.1) but it is not installable
            Depends: libid3tag0 (>= 0.15.1b) but it is not installable
            Depends: liblilv-0-0 (>= 0.24.0~dfsg0) but it is not installable
            Depends: libopusfile0 (>= 0.5) but it is not installable
            Depends: libportaudio2 (>= 19+svn20101113) but it is not installable
            Depends: libportmidi0 but it is not installable
            Depends: libportsmf0t64 (>= 0.1~svn20101010) but it is not installable
            Depends: libsbsms10 (>= 2.3.0) but it is not installable
            Depends: libsoundtouch1 (>= 2.0.0) but it is not installable
            Depends: libsuil-0-0 (>= 0.8.0~dfsg0) but it is not installable
            Depends: libvamp-hostsdk3v5 (>= 2.10.0) but it is not installable
            Depends: libwxbase3.2-1t64 (>= 3.2.4+dfsg) but it is not installable
            Depends: libwxgtk3.2-1t64 (>= 3.2.4+dfsg) but it is not installable
E: Unable to correct problems, you have held broken packages.
sadafriaz@2023-bse-077:~$
sadafriaz@2023-bse-077:~$ sudo apt --fix-broken install -y


Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  ca-certificates-java java-common
Use 'sudo apt autoremove' to remove them.
o apt 0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
clean
```
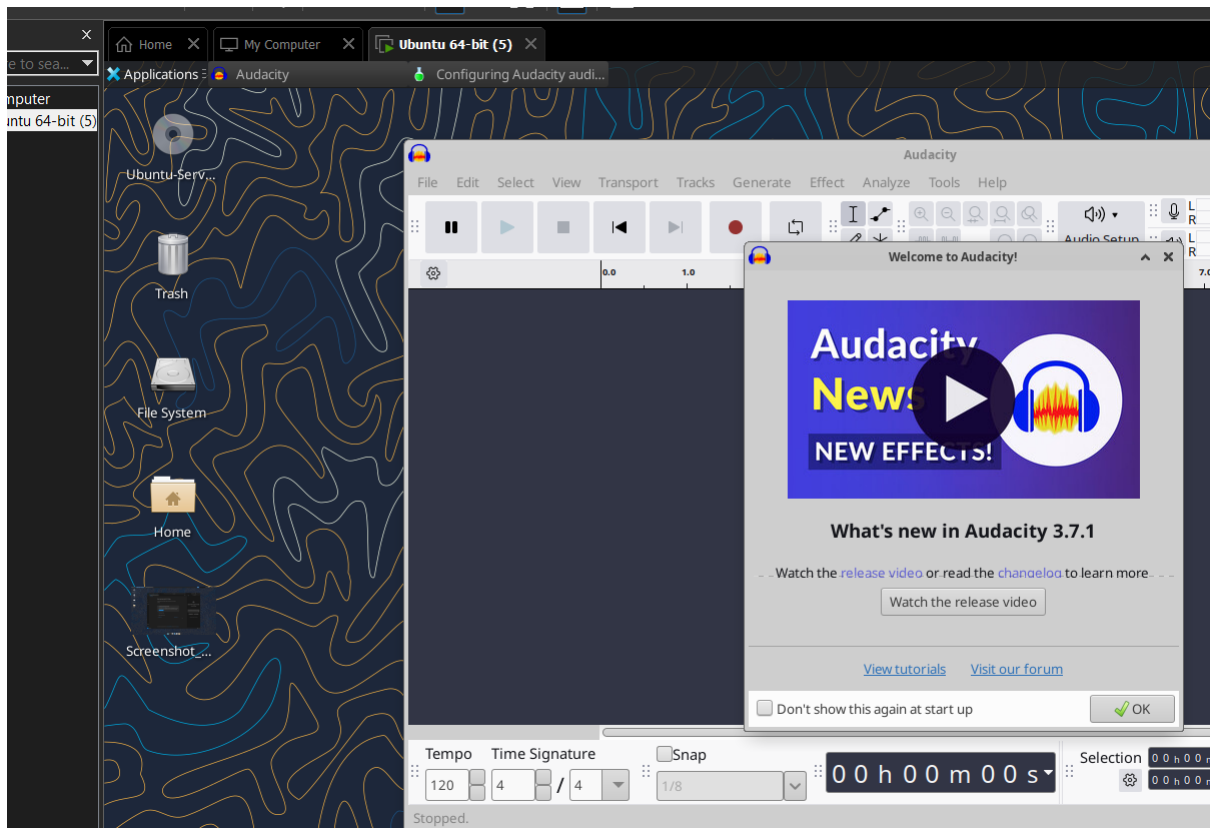
- Install Audacity → task8_install_audacity.png

```
Reading package lists... Done
sadafriaz@2023-bse-077:~$ sudo snap install audacity


audacity 3.7.1 from Snapcrafters♦ installed
sadafriaz@2023-bse-077:~$
```
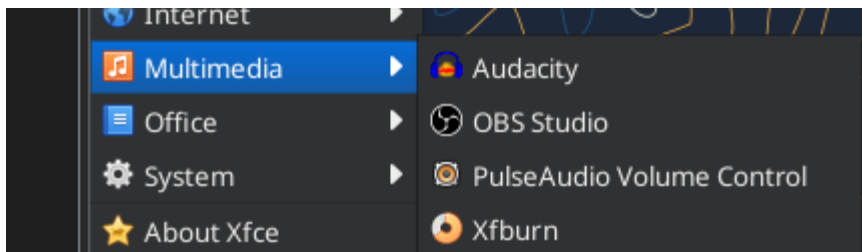
- Launch Audacity → task8_audacity_launch.png / task8_audacity_version.png
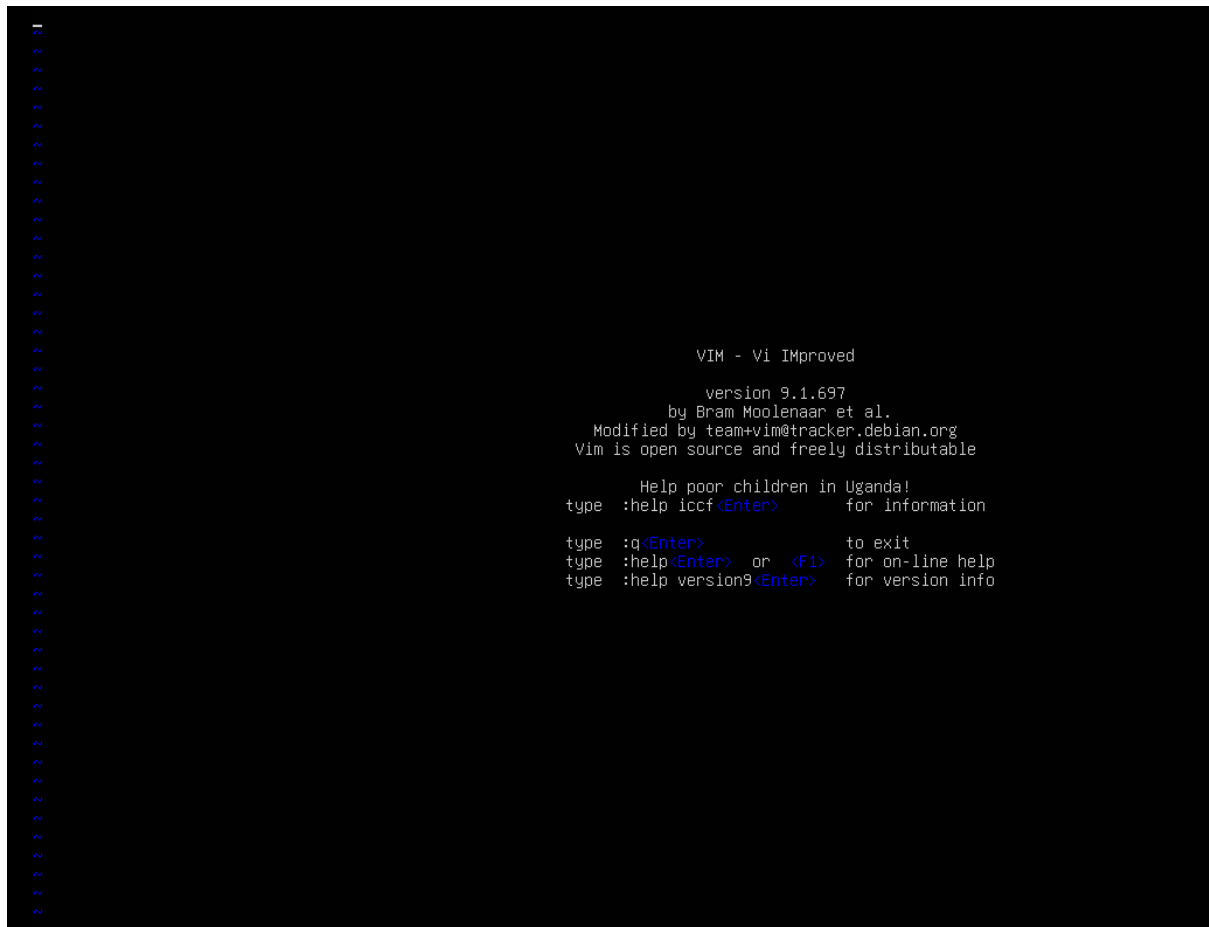
- Install OBS → task8_install_obs.png


```
5) sadafriaz@2023-bse-077:~$ sudo snap install obs-studio
[sudo] password for sadafriaz:
obs-studio 32.0.0 from Snapcrafters✪ installed
sadafriaz@2023-bse-077:~$
```

-
- Launch OBS → task8_obs_launch.png / task8_obs_version.png
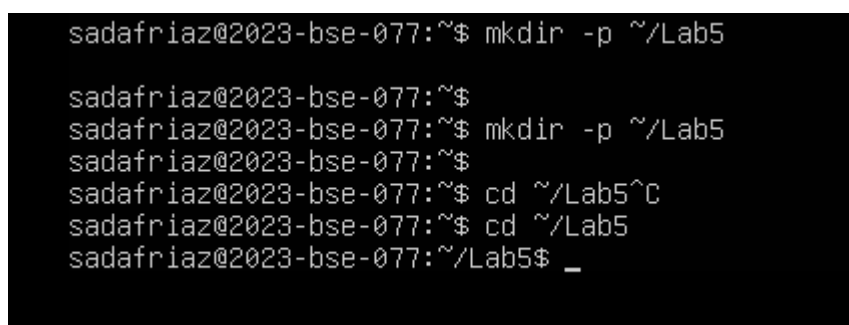
Task 9 – Create Kubernetes sample YAML using vim

- Check vim installed → task9_vim_check.png

- Create Lab5 directory → task9_mkdir_cd.png

- Create YAML in vim → task9_vim_edit.png

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

- Verify saved YAML → task9_k8s_saved.png

```
"k8s-sample.yaml" [New] 21L, 294B written
sadafriaz@2023-bse-077:~/Lab5$ la -la
total 12
drwxrwxr-x  2 sadafriaz sadafriaz 4096 Oct 30 16:26 .
drwxr-x--- 22 sadafriaz sadafriaz 4096 Oct 30 16:26 ..
-rw-rw-r--  1 sadafriaz sadafriaz  294 Oct 30 16:26 k8s-sample.yaml
sadafriaz@2023-bse-077:~/Lab5$
```

Task 10 – Edit Kubernetes YAML: add annotation & discard changes

- Add annotation & save → task10_verify_annotation.png

```
k8s-sample.yaml 24L, 354B written
sadafriaz@2023-bse-077:~/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: Always
                            annotations:

                                lab: lesson11
sadafriaz@2023-bse-077:~/Lab5$ _
```

- Enter temporary edit → task10_verify_entering_temp_data.png

```
containers:

        - name: nginx

            image: nginx:1.19

                ports:

                    - containerPort: 80

                        restartPolicy: Always
                        annotations:

                            lab: lesson11
                            # temp: do-not-keep
~
~
```

- Discard temporary edit → task10_verify_no_temp_comment.png

```
sadafriaz@2023-bse-077:~/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: Always
                            annotations:

                                lab: lesson11
sadafriaz@2023-bse-077:~/Lab5$
```

-

Task 11 – Vim editing practice

- Delete single line & undo → task11_dd_delete_and_undo.png

- Delete multiple lines & undo → task11_delete3_and_undo.png

- Navigate to first line → task11_line1.png

- Navigate last line / $ / 0 → task11_navigation.png

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

- Search nginx → task12_search_nginx.png

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

- Add occurrences → task12_added_occurrences.png

```
apiVersion: v1
kind: Pod
metadata:
    # nginx test 1
    #
    # # nginx test 2
    name: nginx-god
    spec:
        containers:
            - name: nginx
                image: nginx:1.19
                    ports:
                        - containerPort: 80
                            restartPolicy: Always
                            annotations:
                                lab: lesson11
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"k8s-sample.yaml" 26L, 433B written
```

- Cycle matches → task12_cycle_matches.png


```
apiVersion: v1
kind: Pod
metadata:
    # nginx test 1
    #
    # # nginx test 2
    name: nginx-god

    spec:
        containers:
            - name: nginx
                image: nginx:1.19
                    ports:
                        - containerPort: 80
                        restartPolicy: Always
                        annotations:
                            lab: lesson11
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/nginx
```

- Substitute nginx → webapp → task12_substitute_result.png


```
apiVersion: v1

kind: Pod

metadata:
    # webapp test 1
    #
    # # webapp test 2
    name: webapp-god

    spec:
        containers:
            - name: webapp
                image: webapp:1.19
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                    ports:
                        - containerPort: 80

                        restartPolicy: Always
                        annotations:

                            lab: lesson11
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5 substitutions on 5 lines
```

- Undo & quit → task12_undo_and_quit.pn

```
apiVersion: v1

kind: Pod

metadata:
  # nginx test 1
  #
  # # nginx test 2
  name: nginx-god

  spec:

    containers:

      - name: nginx

        image: nginx:1.19

        ports:

          - containerPort: 80

            restartPolicy: Always
            annotations:

              lab: lesson11
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~
5 changes; before #5  93 seconds ago
```