LAB 05

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DEPARTMENT: BSE(5B)

LAB TASK

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

task1_java_suggestion

```
shumail@shumail1:~$ 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-11-jre-headless  # version 11.0.28+6-1ubuntu1~24.04.1
sudo apt install openjdk-25-jre-headless  # version 25+36-1~24.04.2
sudo apt install openjdk-8-jre-headless   # version 8u462-ga~us1-0ubuntu2~24.04.2
sudo apt install openjdk-19-jre-headless  # version 19.0.2+7-4
sudo apt install openjdk-20-jre-headless  # version 20.0.2+9-1
sudo apt install openjdk-22-jre-headless  # version 22~22ea-1
shumail@shumail1:~$ sudo apt install
[sudo] password for shumail:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 26 not upgraded.
shumail@shumail1:~$ 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-11-jre-headless  # version 11.0.28+6-1ubuntu1~24.04.1
sudo apt install openjdk-25-jre-headless  # version 25+36-1~24.04.2
sudo apt install openjdk-8-jre-headless   # version 8u462-ga~us1-0ubuntu2~24.04.2
sudo apt install openjdk-19-jre-headless  # version 19.0.2+7-4
sudo apt install openjdk-20-jre-headless  # version 20.0.2+9-1
sudo apt install openjdk-22-jre-headless  # version 22~22ea-1
```

task1_java_install

```
sudo apt install openjdk-22-jre-headless  # version 22.22ea-1
shumail@shumail1:~$ sudo apt install default-jre -y
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-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 libice6 liblcms2-2 libllvm20 libpango-1.0-0 libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpcsclite1
  libpixman-1-0 librsvg2-2 librsvg2-common libsm6 libthai-data libthai0 libvulkan1 libwayland-client0 libwayland-cursor0 libwayland-egl1 libwayland-server0
  libx11-xcb1 libxaw7 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0
  libxcomposite1 libxcursor1 libxdamage1 libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxrandr2 libxrender1 libxshmfence1 libxt6t64 libxtst6
  libxv1 libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers openjdk-21-jre openjdk-21-jre-headless session-migration ubuntu-mono x11-common
  x11-utils
Suggested packages:
  alsa-utils libasound2-plugins colord cups-common gvfs liblcms2-utils pcscd librsvg2-bin 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-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 libice6 liblcms2-2 libllvm20 libpango-1.0-0 libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpcsclite1
  libpixman-1-0 librsvg2-2 librsvg2-common libsm6 libthai-data libthai0 libvulkan1 libwayland-client0 libwayland-cursor0 libwayland-egl1 libwayland-server0
  libx11-xcb1 libxaw7 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0
  libxcomposite1 libxcursor1 libxdamage1 libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxrandr2 libxrender1 libxshmfence1 libxt6t64 libxtst6
  libxv1 libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers openjdk-21-jre openjdk-21-jre-headless session-migration ubuntu-mono x11-common
  x11-utils
0 upgraded, 106 newly installed, 0 to remove and 26 not upgraded.
Need to get 120 MB of archives.
After this operation, 561 MB of additional disk space will be used.
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]
3% [7 adwaita-icon-theme 666 kB/723 kB 92%]                                                    169 kB/s 11min 32s
```

task1_java_version

```
No VM guests are running outdated hypervisor (qemu) binaries on this host.
shumail@shumail1:~$ java --version
openjdk 21.0.8 2025-07-15
OpenJDK Runtime Environment (build 21.0.8+9-Ubuntu-0ubuntu124.04.1)
OpenJDK 64-Bit Server VM (build 21.0.8+9-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
shumail@shumail1:~$
```

task1_java_remove.

```
OpenJDK 64-Bit Server VM (build 21.0.8+9-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
shumail@shumail1:~$ sudo apt remove default-jre -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-common at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service
  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 libice6 liblcms2-2 libllvm20 libpango-1.0-0 libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpcsclite1
  libpixman-1-0 librsvg2-2 librsvg2-common libsm6 libthai-data libthai0 libvulkan1 libwayland-client0 libwayland-cursor0 libwayland-egl1 libwayland-server0
  libx11-xcb1 libxaw7 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0
  libxcomposite1 libxcursor1 libxdamage1 libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxrandr2 libxrender1 libxshmfence1 libxt6t64 libxtst6
  libxv1 libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers openjdk-21-jre openjdk-21-jre-headless session-migration ubuntu-mono x11-common
  x11-utils
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  default-jre
0 upgraded, 0 newly installed, 1 to remove and 26 not upgraded.
After this operation, 6,144 B disk space will be freed.
(Reading database ... 98951 files and directories currently installed.)
Removing default-jre (2:1.21-75+exp1) ...
```

task1_java_not_found

```
                    set a system property
   -verbose:[class|module|gc|jni]
                    enable verbose output for the given subsystem
   -version        print product version to the error stream and exit
   --version       print product version to the output stream and exit
   -showversion    print product version to the error stream and continue
   --show-version
                    print product version to the output stream and continue
   --show-module-resolution
                    show module resolution output during startup
   -? -h -help
                    print this help message to the error stream
   --help          print this help message to the output stream
   -X              print help on extra options to the error stream
   --help-extra    print help on extra options to the output stream
   -ea[:<packagename>...|:<classname>]
   -enableassertions[:<packagename>...|:<classname>]
                    enable assertions with specified granularity
   -da[:<packagename>...|:<classname>]
   -disableassertions[:<packagename>...|:<classname>]
                    disable assertions with specified granularity
   -esa | -enablesystemassertions
                    enable system assertions
   -dsa | -disablesystemassertions
                    disable system assertions
   -agentlib:<libname>[=<options>]
                    load native agent library <libname>, e.g. -agentlib:jdwp
                    see also -agentlib:jdwp=help
   -agentpath:<pathname>[=<options>]
                    load native agent library by full pathname
   -javaagent:<jarpath>[=<options>]
                    load Java programming language agent, see java.lang.instrument
   -splash:<imagepath>
                    show splash screen with specified image
                    HiDPI scaled images are automatically supported and used
                    if available. The unscaled image filename, e.g. image.ext,
                    should always be passed as the argument to the -splash option.
                    The most appropriate scaled image provided will be picked up
                    automatically.
                    See the SplashScreen API documentation for more information
   @argument files
                    one or more argument files containing options
   --disable-@files
                    prevent further argument file expansion
   --enable-preview
                    allow classes to depend on preview features of this release
 o specify an argument for a long option, you can use --<name>=<value> or
 -<name> <value>.
```

```
                    allow classes to depend on preview features of this release
   To specify an argument for a long option, you can use --<name>=<value> or
   --<name> <value>.

   shumail@shumail1:~$ hash -r
   shumail@shumail1:~$ java
```

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

task2_aptget_install

```
shumail@shumail1:~$ sudo apt-get update
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Get:5 http://archive.ubuntu.com/ubuntu noble/main Translation-en_GB [468 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/restricted Translation-en_GB [3,528 B]
Get:7 http://archive.ubuntu.com/ubuntu noble/universe Translation-en_GB [797 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble/multiverse Translation-en_GB [96.8 kB]
Fetched 1,365 kB in 36s (38.4 kB/s)
Reading package lists... Done
shumail@shumail1:~$ sudo apt-get install default-jre -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  default-jre
0 upgraded, 1 newly installed, 0 to remove and 26 not upgraded.
Need to get 922 B of archives.
After this operation, 6,144 B of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 default-jre amd64 2:1.21-75+exp1 [922 B]
Fetched 922 B in 1s (854 B/s)
Selecting previously unselected package default-jre.
(Reading database ... 98950 files and directories currently installed.)
Preparing to unpack .../default-jre_2%3a1.21-75+exp1_amd64.deb ...
Unpacking default-jre (2:1.21-75+exp1) ...
Setting up default-jre (2:1.21-75+exp1) ...
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.
_
```

task2_java_version_after_aptget

```
shumail@shumail1:~$ java --version
openjdk 21.0.8 2025-07-15
OpenJDK Runtime Environment (build 21.0.8+9-Ubuntu-0ubuntu124.04.1)
OpenJDK 64-Bit Server VM (build 21.0.8+9-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
shumail@shumail1:~$
```

task2_aptget_remove

```
OpenJDK 64-Bit Server VM (build 21.0.8+9-Ubuntu-0ubuntu124.04.1, mixed mode, sharing)
shumail@shumail1:~$ sudo apt-get remove default-jre -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-common at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service
  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 libice6 liblcms2-2 libllvm20 libpango-1.0-0 libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpcsclite1
  libpixman-1-0 librsvg2-2 librsvg2-common libsm6 libthai-data libthai0 libvulkan1 libwayland-client0 libwayland-cursor0 libwayland-egl1 libwayland-server0
  libx11-xcb1 libxaw7 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0
  libxcomposite1 libxcursor1 libxdamage1 libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxrandr2 libxrender1 libxshmfence1 libxt6t64 libxtst6
  libxv1 libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers openjdk-21-jre openjdk-21-jre-headless session-migration ubuntu-mono x11-common
  x11-utils
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  default-jre
0 upgraded, 0 newly installed, 1 to remove and 26 not upgraded.
After this operation, 6,144 B disk space will be freed.
(Reading database ... 98951 files and directories currently installed.)
Removing default-jre (2:1.21-75+exp1) ...
```

task2_hash_after_remove

```
(Reading database ... 98951 files and directories currently installed
  Removing default-jre (2:1.21-75+exp1) ...
  shumail@shumail1:~$ hash -r
  shumail@shumail1:~$ java
```

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

task3_apt_update


```
                        should always be passed as the argument to the -splash option.
                        The most appropriate scaled image provided will be picked up
                        automatically.
                        See the SplashScreen API documentation for more information
        @argument files
                        one or more argument files containing options
        --disable-@files
                        prevent further argument file expansion
        --enable-preview
                        allow classes to depend on preview features of this release
    To specify an argument for a long option, you can use --<name>=<value> or
    --<name> <value>.

    shumail@shumail1:~$ sudo apt 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... 13%
```

task3_apt_upgrade


```
shumail@shumail1:~$ 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:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-common at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service
  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 libice6 liblcms2-2 libllvm20 libpango-1.0-0 libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpcsclite1
  libpixman-1-0 librsvg2-2 librsvg2-common libsm6 libthai-data libthai0 libvulkan1 libwayland-client0 libwayland-cursor0 libwayland-egl1 libwayland-server0
  libx11-xcb1 libxau7 libxcb-dri3-0 libxcb-glx0 libxcb-present0 libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0
  libxcomposite1 libxcursor1 libxdamage1 libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxrandr2 libxrender1 libxshmfence1 libxt6t64 libxtst6
  libxv1 libxxf86dga1 libxxf86vm1 mesa-libgallium mesa-vulkan-drivers openjdk-21-jre openjdk-21-jre-headless session-migration ubuntu-mono x11-common
  x11-utils
Use 'sudo apt autoremove' to remove them.
The following packages will be upgraded:
  cloud-init coreutils distro-info-data fwupd landscape-common libfwupd2 libnss-systemd libpam-systemd libsystemd-shared libsystemd0 libudev1 openssh-client
  powermgmt-base python3-software-properties snapd software-properties-common sosreport systemd systemd-dev systemd-hwe-hwdb systemd-resolved systemd-sysv
  systemd-timesyncd tcpdump ubuntu-drivers-common udev
26 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 51.6 MB of archives.
After this operation, 3,360 kB of additional disk space will be used.
```

task3_explanation


```
  GNU nano 7.2                                    apt_update_vs_upgrade.md *
'apt update' updates the local package index with the latest information from repositories.
It does not install or upgrade any packages.
'apt upgrade' installs the newest versions of the currently installed packages.
It uses the updated package list provided by 'apt update'.
In short, 'apt update' refreshes package info, while 'apt upgrade' applies the updates.




File Name to Write: apt_update_vs_upgrade.md
^G Help            M-D DOS Format        M-A Append         M-B Backup File
^C Cancel          M-M Mac Format        M-P Prepend        ^T Browse
```

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

task4_snap_install

```
shumail@shumail1:~$ sudo snap install --classic code
Download snap "snapd" (25577) from channel "stable"                          |
```

task4_snap_list

```
code 7d842fb8 from Visual Studio Code (vscode♦) installed
shumail@shumail1:~$ snap list code
Name   Version   Rev   Tracking        Publisher   Notes
code   7d842fb8  211   latest/stable   vscode♦     classic
shumail@shumail1:~$
```

task4_code_version_or_info

```
code  7d842fb8  211  latest/stable  vscode♦    classic
shumail@shumail1:~$ code --version
1.105.1
7d842fb85a0275a4a8e4d7e040d2625abbf7f084
x64
shumail@shumail1:~$ _
```

task4_snap_bin_location

```
shumail@shumail1:~$ ls -l /snap/bin ~ grep code
ls: cannot access 'grep': No such file or directory
ls: cannot access 'code': No such file or directory
/home/shumail:
total 8
-rw-rw-r-- 1 shumail shumail  366 Oct 30 17:18 apt_update_vs_upgrade.md
drwx------ 3 shumail shumail 4096 Oct 30 17:44 snap

/snap/bin:
total 0
lrwxrwxrwx 1 root root 13 Oct 30 17:42 code -> /usr/bin/snap
lrwxrwxrwx 1 root root 13 Oct 30 17:42 code.url-handler -> /usr/bin/snap
shumail@shumail1:~$ _
```

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

task5_update

```
shumail@shumail1:~$ ssh shumail@192.168.183.132
The authenticity of host '192.168.183.132 (192.168.183.132)' can't be established.
ED25519 key fingerprint is SHA256:zqVjpZWoA1zF0UludwCoIku7avyQy/iZhwYgHCBMXQU.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.183.132' (ED25519) to the list of known hosts.
shumail@192.168.183.132's password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-87-generic x86_64)

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

 System information as of Thu 30 Oct 18:00:30 UTC 2025

  System load:  0.08               Processes:             223
  Usage of /:   46.5% of 13.67GB   Users logged in:       1
  Memory usage: 10%                IPv4 address for ens33: 192.168.183.132
  Swap usage:   0%


Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

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


Last login: Thu Oct 30 17:56:55 2025 from 192.168.183.1
shumail@shumail1:~$ sudo apt update && sudo apt upgrade -y
[sudo] password for shumail:
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... 99%
```

task5_xfce_install

```
libgnome-menu-3-0 libgnome-panel1 libgnomekbd-common libgnomekbd8 libgoa-1.0-0b libgoa-1.0-common libgomp1 libgphoto2-6t64 libgphoto2-l10n
libgphoto2-port12t64 libgraphene-1.0-0 libgs-common libgs10 libgs10-common libgsm1 libgspell-1-2 libgspell-1-common libgstreamer-gl1.0-0
libgstreamer-plugins-base1.0-0 libgstreamer-plugins-good1.0-0 libgtk-4-1 libgtk-4-bin libgtk-4-common libgtk-4-media-gstreamer libgtk-layer-shell0
libgtk2.0-0t64 libgtk2.0-bin libgtk2.0-common libgtkmm-3.0-1t64 libgtksourceview-4-0 libgtksourceview-4-common libgtop-2.0-11 libgtop2-common
libgweather-4-0t64 libgweather-4-common libhandy-1-0 libharfbuzz-gobject0 libharfbuzz-icu0 libhtml-form-perl libhtml-format-perl libhtml-parser-perl
libhtml-tagset-perl libhtml-tree-perl libhttp-cookies-perl libhttp-daemon-perl libhttp-date-perl libhttp-message-perl libhttp-negotiate-perl
libhunspell-1.7-0 libhwy1t64 libhyphen0 libibus-1.0-5 libical3t64 libidn12 libido3.0-1-0 libiec61883-0 libieee1284-3t64 libigdgmm12 libijs-0.35
libindicator3-7 libinput-bin libinput10 libio-html-perl libio-socket-ssl-perl libio-stringy-perl libipc-system-simple-perl libisl23 libisofs6t64
libjack-jackd2-0 libjavascriptcoregtk-4.1-0 libjbig2dec0 libjxl0.7 libkeybinder-3.0-0 libldb2 liblightdm-gobject-1-0 liblouis-data liblouis20
liblouisutdml-bin liblouisutdml-data liblouisutdml9t64 libltdl7 liblup-mediatypes-perl liblup-protocol-https-perl libmailtools-perl libmanette-0.2-0
libmessaging-menu0 libmousepad0 libmp3lame0 libmpc3 libmpg123-0t64 libmsgraph-0-1 libmtdev1t64 libmtp-common libmtp-runtime libmtp9t64
libnautilus-extension4 libndp0 libnet-dbus-perl libnet-http-perl libnet-smtp-ssl-perl libnet-ssleay-perl libnfs14 libnm0 libnma-common libnma0 libnotify-bin
libnotify4 libnss-mdns libogg0 libopengl0 libopenjp2-7 libopus0 liborc-0.4-0t64 libpam-gnome-keyring libpangomm-1.4-1v5 libpangoxft-1.0-0 libpaper-utils
libpaper1 libphonenumber8 libpipewire-0.3-0t64 libpipewire-0.3-common libpoppler-cpp0t64 libpoppler-glib8t64 libpoppler134 libppd2 libppd2-common
libprotobuf32t64 libproxy1v5 libpulse-mainloop-glib0 libpulse0 libpwquality-common libpwquality1 libqpdf29t64 librencode4 libravie0 libraw1394-11
libsamplerate0 libsane-common libsane1 libsecret-1-0 libsecret-common libshine3 libshout3 libsigc++-2.0-0v5 libsmbclient0 libsnapd-glib-2-1 libsnappy1v5
libsndfile1 libsnmp-base libsnmp40t64 libsoup-2.4-1 libsoup-3.0-0 libsoup-3.0-common libsoup2.4-common libsoxr0 libspa-0.2-modules libspeex1 libspeexdsp1
libstartup-notification0 libsuresample4 libtag1v5 libtag1v5-vanilla libtagc0 libtalloc2 libtdb1 libteamdctl0 libtevent0t64 libtheora0
libthunarx-3-0 libtie-ixhash-perl libtimedate-perl libtimezonemap-data libtimezonemap1 libtry-tiny-perl libtumbler-1-0t64 libtwolame0
libunity-control-center1 libunity-gtk2-parser0 libunity-gtk3-parser0 libunity-settings-daemon1 liburi-perl libv4l-0t64 libv4lconvert0t64 libva-drm2
libva-x11-2 libva2 libvdpau1 libvisual-0.4-0 libvorbis0a libvorbisenc2 libvorbisfile3 libvpl2 libvpx9 libvte-2.91-0 libvte-2.91-common libwacom-common
libwacom9 libwavpack1 libwbclient0 libwebkit2gtk-4.1-0 libwebpdemux2 libwebpmux3 libwebrtc-audio-processing1 libwhoopsie-preferences0 libwhoopsie0
libwnck-3-0 libwnck-3-common libwoff1 libwww-perl libwww-robotrules-perl libx11-protocol-perl libx264-164 libx265-199 libxapian30 libxatracker2
libxcb-damage0 libxcb-dri2-0 libxcb-util1 libxcvt0 libxfce4panel-2.0-4 libxfce4ui-2-0 libxfce4ui-common libxfce4ui-utils libxfce4util-bin
libxfce4util-common libxfce4util7 libxfconf-0-3 libxfont2 libxkbregistry0 libxklavier16 libxml-parser-perl libxml-twig-perl libxml-xpathengine-perl
libxnvctrl0 libxpresent1 libxres1 libxss1 libxvidcore4 libxvmc1 libyelp0 libzeitgeist-2.0-0 libzvbi-common libzvbi0t64 light-locker light-locker-settings
lightdm lm-sensors mesa-va-drivers mesa-vdpau-drivers mobile-broadband-provider-info mousepad mousetweaks nautilus-data nautilus-extension-gnome-terminal
network-manager network-manager-gnome network-manager-pptp notification-daemon ocl-icd-libopencl1 p11-kit p11-kit-modules p7zip-full pavucontrol
perl-openssl-defaults pinentry-gnome3 pkexec plymouth-label policykit-1 policykit-1-gnome poppler-data poppler-utils ppp pptp-linux pulseaudio
pulseaudio-utils python3-cairo python3-cups python3-cupshelpers python3-ibus-1.0 python3-psutil python3-xdg ristretto rtkit samba-libs sane-airscan
sane-utils sgml-data sound-theme-freedesktop ssl-cert system-config-printer system-config-printer-common system-config-printer-udev tango-icon-theme thunar
thunar-archive-plugin thunar-data thunar-media-tags-plugin thunar-volman tumbler tumbler-common ubuntu-touch-sounds unity-control-center unity-greeter
unity-gtk-module-common unity-gtk2-module unity-gtk3-module unity-settings-daemon unity-settings-daemon-schemas unzip update-inetd va-driver-all
vdpau-driver-all wamerican whoopsie whoopsie-preferences wpasupplicant x11-apps x11-session-utils x11-xserver-utils xarchiver xbitmaps xcvt
xdg-dbus-proxy xdg-desktop-portal xdg-desktop-portal-gtk xdg-utils xfburn xfce4 xfce4-appfinder xfce4-battery-plugin xfce4-clipman xfce4-clipman-plugin
xfce4-cpufreq-plugin xfce4-cpugraph-plugin xfce4-dict xfce4-diskperf-plugin xfce4-fsguard-plugin xfce4-genmon-plugin xfce4-goodies xfce4-helpers
xfce4-mailwatch-plugin xfce4-netload-plugin xfce4-notifyd xfce4-panel xfce4-places-plugin xfce4-power-manager xfce4-power-manager-data
xfce4-power-manager-plugins xfce4-pulseaudio-plugin xfce4-screenshooter xfce4-sensors-plugin xfce4-session xfce4-settings xfce4-smartbookmark-plugin
xfce4-systemload-plugin xfce4-taskmanager xfce4-terminal xfce4-timer-plugin xfce4-verve-plugin xfce4-wavelan-plugin xfce4-weather-plugin
xfce4-whiskermenu-plugin xfce4-xkb-plugin xfconf xfdesktop4 xfdesktop4-data xfonts-base xfonts-encodings xfonts-scalable xfonts-utils xfwm4 xiccd xinit
xinput xorg xorg-docs-core xserver-common xserver-xorg xserver-xorg-core xserver-xorg-input-all xserver-xorg-input-libinput xserver-xorg-input-wacom
xserver-xorg-legacy xserver-xorg-video-all xserver-xorg-video-amdgpu xserver-xorg-video-ati xserver-xorg-video-fbdev xserver-xorg-video-intel
xserver-xorg-video-nouveau xserver-xorg-video-qxl xserver-xorg-video-radeon xserver-xorg-video-vesa xserver-xorg-video-vmware yelp-xsl zeitgeist-core
0 upgraded, 630 newly installed, 0 to remove and 0 not upgraded.
Need to get 264 MB of archives.
After this operation, 1,000 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 bluez amd64 5.72-0ubuntu5.5 [1,361 kB]
Get:2 http://security.ubuntu.com/ubuntu noble-security/main amd64 xserver-common all 2:21.1.12-1ubuntu1.5 [34.6 kB]
Get:3 http://security.ubuntu.com/ubuntu noble-security/main amd64 xserver-xorg-core amd64 2:21.1.12-1ubuntu1.5 [1,476 kB]
0% [1 bluez 779 kB/1,361 kB 57%] [3 xserver-xorg-core 723 kB/1,476 kB 49%]                                    193 kB/s 22min 40s
```

task5_xrdp_enable

```
No VM guests are running outdated hypervisor (qemu) binaries on this host.
shumail@shumail1:~$ sudo apt install xrdp -y
[sudo] password for shumail:
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 default-jre-headless fonts-dejavu-extra java-common libatk-wrapper-java libatk-wrapper-java-jni libgif7 openjdk-21-jre
  openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libfuse2t64 libpipewire-0.3-modules-xrdp pipewire-module-xrdp xorgxrdp
Suggested packages:
  pipewire-bin guacamole
The following NEW packages will be installed:
  libfuse2t64 libpipewire-0.3-modules-xrdp pipewire-module-xrdp xorgxrdp xrdp
0 upgraded, 5 newly installed, 0 to remove and 0 not upgraded.
Need to get 715 kB of archives.
After this operation, 3,895 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/universe amd64 libfuse2t64 amd64 2.9.9-8.1build1 [89.9 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble/universe amd64 xrdp amd64 0.9.24-4 [536 kB]
20% [2 xrdp 54.9 kB/536 kB 10%]
```

```
    No VM guests are running outdated hypervisor (qemu) binaries on this host.
    shumail@shumail1:~$ 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
    shumail@shumail1:~$
```

task5_xrdp_status

```
shumail@shumail1:~$ sudo systemctl status xrdp
● xrdp.service - xrdp daemon
     Loaded: loaded (/usr/lib/systemd/system/xrdp.service; enabled; preset: enabled)
     Active: active (running) since Thu 2025-10-30 18:19:29 UTC; 1min 50s ago
       Docs: man:xrdp(8)
             man:xrdp.ini(5)
   Main PID: 37339 (xrdp)
      Tasks: 1 (limit: 4548)
     Memory: 876.0K (peak: 1.5M)
        CPU: 53ms
     CGroup: /system.slice/xrdp.service
             └─37339 /usr/sbin/xrdp

Oct 30 18:19:28 shumail1 systemd[1]: Starting xrdp.service - xrdp daemon...
Oct 30 18:19:28 shumail1 xrdp[37337]: [INFO ] address [0.0.0.0] port [3389] mode 1
Oct 30 18:19:28 shumail1 xrdp[37337]: [INFO ] listening to port 3389 on 0.0.0.0
Oct 30 18:19:28 shumail1 xrdp[37337]: [INFO ] xrdp_listen_pp done
Oct 30 18:19:28 shumail1 systemd[1]: xrdp.service: Can't open PID file /run/xrdp/xrdp.pid (yet?) after start: No such file or directory
Oct 30 18:19:29 shumail1 systemd[1]: Started xrdp.service - xrdp daemon.
Oct 30 18:19:30 shumail1 xrdp[37339]: [INFO ] starting xrdp with pid 37339
Oct 30 18:19:30 shumail1 xrdp[37339]: [INFO ] address [0.0.0.0] port [3389] mode 1
Oct 30 18:19:30 shumail1 xrdp[37339]: [INFO ] listening to port 3389 on 0.0.0.0
Oct 30 18:19:30 shumail1 xrdp[37339]: [INFO ] xrdp_listen_pp done
shumail@shumail1:~$
```
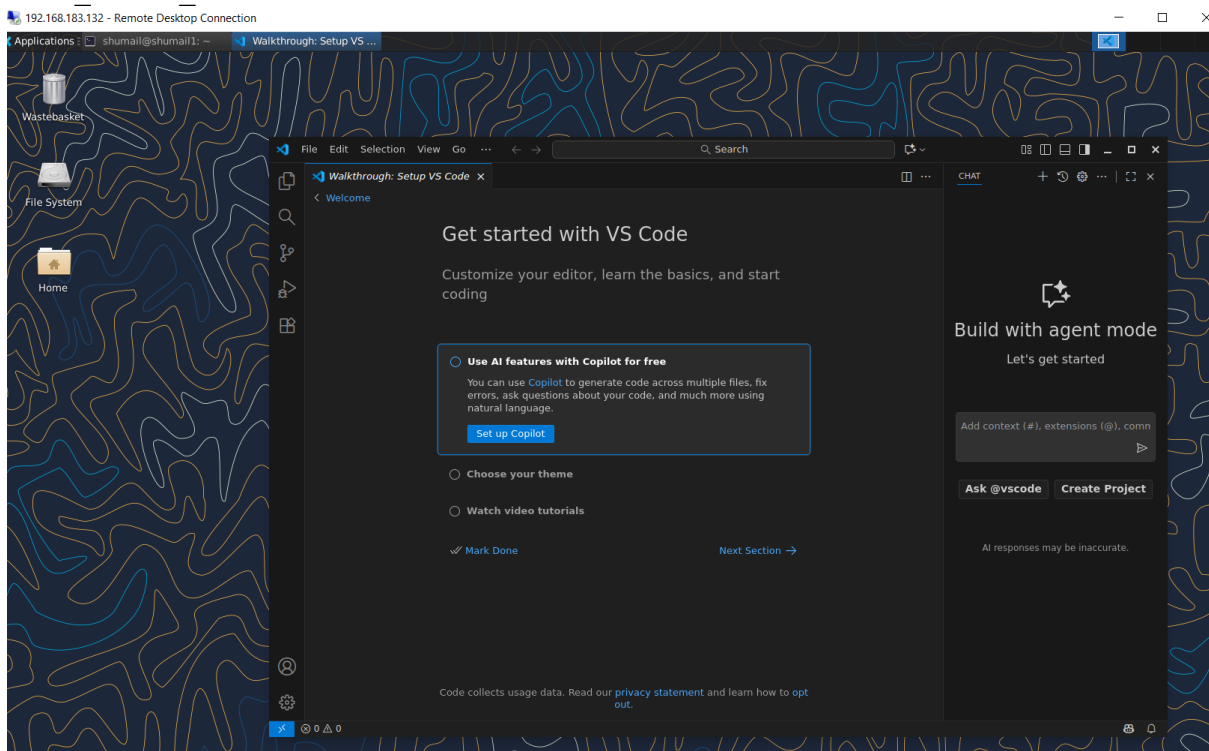
task5_xsession

task5_rdp_connect
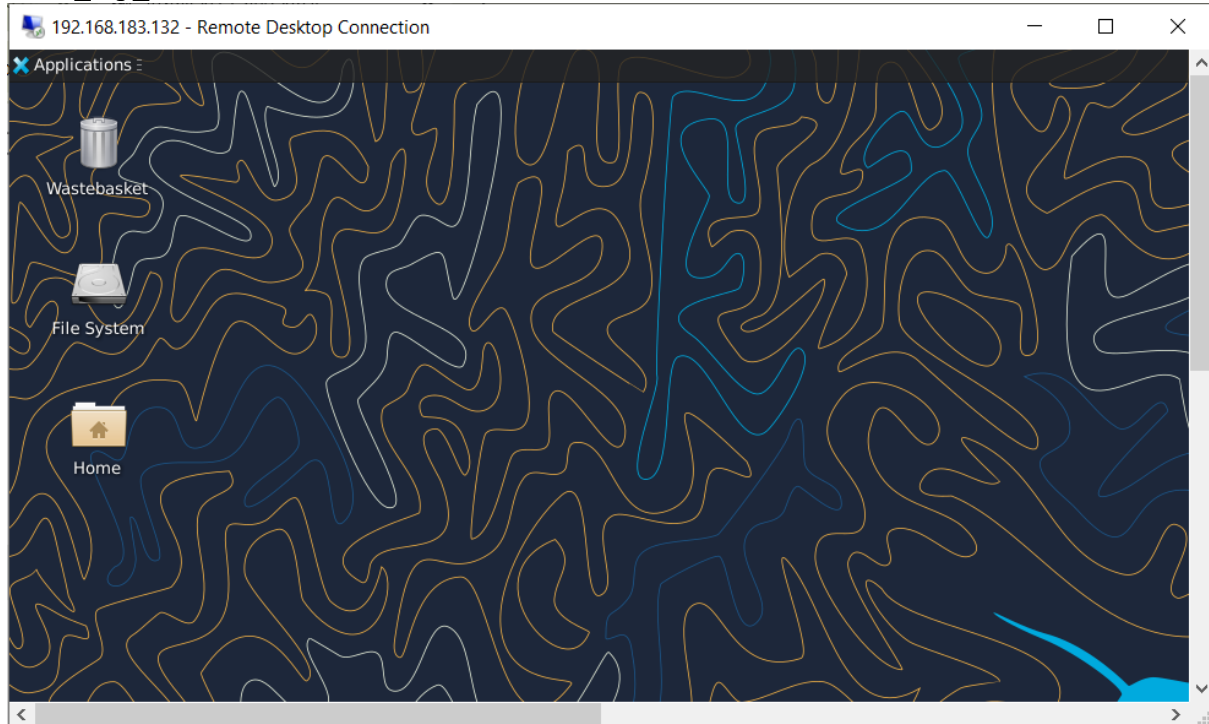
task5_vscode_launch

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

task6_lightdm_install

```
shumail@shumail1:~$ sudo apt install lightdm lightdm-gtk-greeter -y
[sudo] password for shumail:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
lightdm is already the newest version (1.30.0-0ubuntu14).
lightdm set to manually installed.
The following packages were automatically installed and are no longer required:
  ca-certificates-java default-jre-headless fonts-dejavu-extra java-common libatk-wrapper-java libatk-wrapper-java-jni libgif7 openjdk-21-jre
  openjdk-21-jre-headless
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  gnome-accessibility-themes gnome-themes-extra gnome-themes-extra-data gtk2-engines-pixbuf
The following NEW packages will be installed:
  gnome-accessibility-themes gnome-themes-extra gnome-themes-extra-data gtk2-engines-pixbuf lightdm-gtk-greeter
0 upgraded, 5 newly installed, 0 to remove and 0 not upgraded.
Need to get 2,495 kB of archives.
After this operation, 7,003 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 gnome-accessibility-themes all 3.28-2ubuntu5 [2,296 kB]
16% [1 gnome-accessibility-themes 495 kB/2,296 kB 22%]
```

task6_lightdm_config

```
shumail@shumail1:~$ sudo mkdir -p /etc/lightdm/lightdm.conf.d
shumail@shumail1:~$ 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:*]#ngreeter-session=lightdm-gtk-greeter#nuser-session=xfce#nautologin-user-timeout=0@ /home/shumail sudo tee /etc/lightdm/lightdm.conf.d/99-xfce.conf
shumail@shumail1:~$
shumail@shumail1:~$ 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:*]#ngreeter-session=lightdm-gtk-greeter#nuser-session=xfce#nautologin-user-timeout=0@ /home/shumail sudo tee /etc/lightdm/lightdm.conf.d/99-xfce.conf
shumail@shumail1:~$
```

task6_lightdm_cleanup

```
shumail@shumail1:~$ sudo rm -f /var/lib/lightdm/.Xauthority
shumail@shumail1:~$ sudo rm -f ¬/.Xauthority
shumail@shumail1:~$ sudo rm -rf ¬/.cache/sessions
shumail@shumail1:~$ sudo chown -R $USER:$USER /home/$USER
```

task6_lightdm_restart

task6_gui_enable_boot


```
● lightdm.service - Light Display Manager
     Loaded: loaded (/usr/lib/systemd/system/lightdm.service; indirect; preset: enabled)
     Active: active (running) since Thu 2025-10-30 19:51:25 UTC; 7min ago
       Docs: man:lightdm(1)
    Process: 1381 ExecStartPre=/bin/sh -c [ "$(basename $(cat /etc/X11/default-display-manager 2>/dev/null))" = "lightdm" ] (c▮
   Main PID: 1386 (lightdm)
      Tasks: 6 (limit: 4545)
     Memory: 140.9M (peak: 141.5M)
        CPU: 4.840s
     CGroup: /system.slice/lightdm.service
             ├─1386 /usr/sbin/lightdm
             └─1410 /usr/lib/xorg/Xorg -core :0 -seat seat0 -auth /var/run/lightdm/root/:0 -nolisten tcp vt7 -novtswitch

Oct 30 19:51:25 shumail1 systemd[1]: Starting lightdm.service - Light Display Manager...
Oct 30 19:51:25 shumail1 systemd[1]: Started lightdm.service - Light Display Manager.
Oct 30 19:51:29 shumail1 lightdm[1469]: pam_unix(lightdm-greeter:session): session opened for user lightdm(uid=112) by (uid=0)
Oct 30 19:51:30 shumail1 lightdm[1469]: gkr-pam: couldn't unlock the login keyring.
Oct 30 19:51:33 shumail1 lightdm[1549]: pam_succeed_if(lightdm:auth): requirement "user ingroup nopasswdlogin" not met by user▮
Oct 30 19:52:43 shumail1 lightdm[1549]: gkr-pam: unable to locate daemon control file
Oct 30 19:52:43 shumail1 lightdm[1549]: gkr-pam: stashed password to try later in open session
Oct 30 19:52:43 shumail1 lightdm[1549]: pam_unix(lightdm:session): session opened for user shumail(uid=1000) by (uid=0)
Oct 30 19:52:43 shumail1 lightdm[1549]: gkr-pam: unlocked login keyring
~
shumail@shumail1:~$ sudo systemctl set-default graphical.target
Created symlink /etc/systemd/system/default.target → /usr/lib/systemd/system/graphical.target.
shumail@shumail1:~$ ▮
```

task6_after_reboot_gui

task6_gui_disable_boot


```
shumail@shumail1:~$ sudo systemctl set-default multi-user.target
Removed "/etc/systemd/system/default.target".
Created symlink /etc/systemd/system/default.target → /usr/lib/systemd/system/multi-user.target.
shumail@shumail1:~$ sudo systemctl disablelightdm
Unknown command verb 'disablelightdm'.
shumail@shumail1:~$ sudo systemctl disable lightdm
Synchronizing state of lightdm.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install disable lightdm
Removed "/etc/systemd/system/display-manager.service".
shumail@shumail1:~$ ▮
```

task6_after_reboot_cli

```
Removed "/etc/systemd/system/display-manager.service".
shumail@shumail1:~$ sudo reboot
```

task6_gui_start
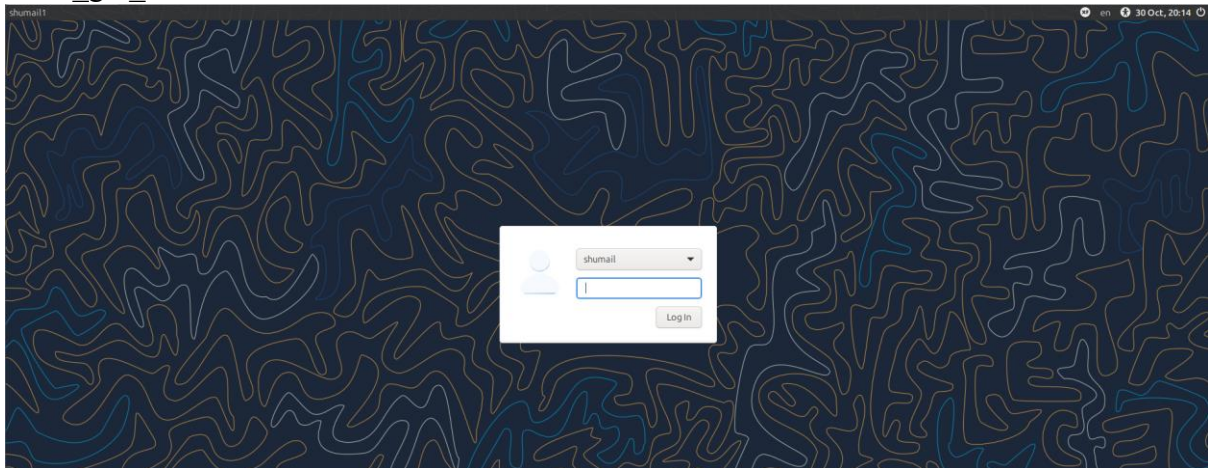
task6_gui_stop

```
shumail@shumail1:~$ sudo systemctl stop lightdm
[sudo] password for shumail:
shumail@shumail1:~$ _
```

task6_gui_start_command

```
shumail@shumail1:~$
shumail@shumail1:~$
shumail@shumail1:~$ sudo systemctl stop lightdm
[sudo] password for shumail:
shumail@shumail1:~$ sudo systemctl start lightdm_
```

task6_vscode_launch
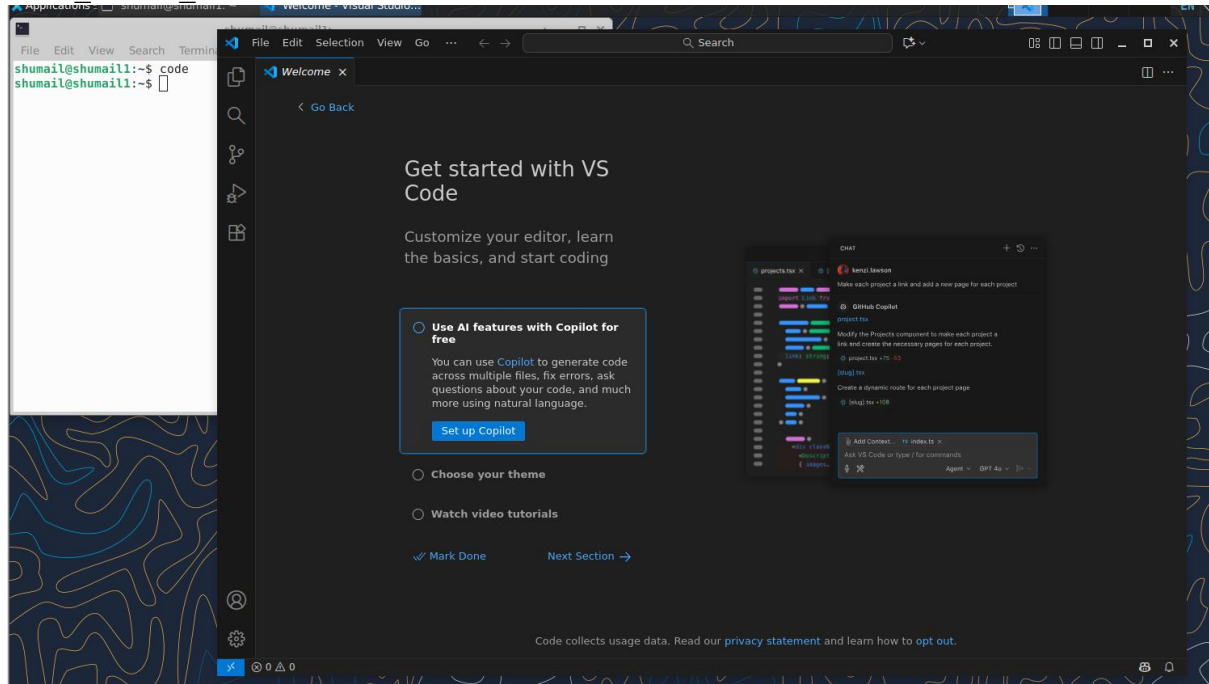
Task 7 - Install Google Chrome by adding its apt source & key (Chrome)

task7_install_chrome_error


```
shumail@shumail1:~$
shumail@shumail1:~$ sudo apt install google-chrome-stable -y

[sudo] password for shumail:
Sorry, try again.
[sudo] password for shumail:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package google-chrome-stable
shumail@shumail1:~$ _
```

task7_ls_etc_apt


```
shumail@shumail1:~$ ls -la /etc/apt

total 48
drwxr-xr-x   9 root root  4096 Oct 30 16:09 .
drwxr-xr-x 142 root root 12288 Oct 30 19:02 ..
drwxr-xr-x   2 root root  4096 Oct 30 17:11 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 30 16:35 sources.list
drwxr-xr-x   2 root root  4096 Oct 30 16:35 sources.list.d
drwxr-xr-x   2 root root  4096 Aug  5 17:01 trusted.gpg.d
shumail@shumail1:~$
shumail@shumail1:~$
```

task7_cat_sources_list

```
shumail@shumail1:~$
shumail@shumail1:~$ cat /etc/apt/sources.list
# Ubuntu sources have moved to /etc/apt/sources.list.d/ubuntu.sources
shumail@shumail1:~$ _
```

task7_ls_sources_list_d

```
shumail@shumail1:~$ ls -la /etc/apt/sources.list.d/
total 16
drwxr-xr-x 2 root root 4096 Oct 30 16:35 .
drwxr-xr-x 9 root root 4096 Oct 30 16:09 ..
-rw-r--r-- 1 root root  383 Oct 30 16:09 ubuntu.sources
-rw-r--r-- 1 root root 2552 Aug  5 17:02 ubuntu.sources.curtin.orig
shumail@shumail1:~$ _
```

task7_cat_ubuntu_sources

```
-rw-r--r-- 1 root root 2552 Aug  5 17:02 ubuntu.sources.curtin.orig
shumail@shumail1:~$ 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
shumail@shumail1:~$
```

task7_edit_ubuntu_sources

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

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

Types: deb

URIs: http://dl.google.com/linux/chrome/deb/

Suites: stable

Components: main

Architectures: amd64

Signed-By: /etc/apt/keyrings/google.gpg




File Name to Write: /etc/apt/sources.list.d/ubuntu.sources
^G Help          M-D DOS Format      M-A Append       M-B Backup File
^C Cancel        M-M Mac Format      M-P Prepend      ^T Browse
```

task7_add_key

```
shumail@shumail1:~$ curl -fsSL https://dl.google.com/linux/linux_signing_key.pub ~ sudo gpg --dearmor -o /etc/apt/keyrings/google.gpg
curl: option --dearmor: is unknown
curl: try 'curl --help' or 'curl --manual' for more information
```

task7_apt_update

```
deb [arch=amd64 signed-by=/usr/share/keyrings/google-linux-signing-keyring.gpg] http
shumail@shumail1:~$ sudo apt update

Get:1 http://dl.google.com/linux/chrome/deb stable InRelease [1,825 B]
Get:2 http://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,210 B]
Fetched 3,035 B in 4s (819 B/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
shumail@shumail1:~$ _
```

task7_install_chrome

```
shumail@shumail1:~$ sudo dpkg -i google-chrome-stable_current_amd64.deb
Selecting previously unselected package google-chrome-stable.
(Reading database ... 141844 files and directories currently installed.)
Preparing to unpack google-chrome-stable_current_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 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) ...
shumail@shumail1:~$ sudo apt -f install -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
shumail@shumail1:~$ _
```

```
shumail@shumail1:~$ google-chrome-stable --version
Google Chrome 142.0.7444.59
shumail@shumail1:~$
shumail@shumail1:~$ sudo apt install google-chrome-stable -y

Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
google-chrome-stable is already the newest version (142.0.7444.59-1).
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
shumail@shumail1:~$ _
```

task7_alternate_remove

```
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
shumail@shumail1:~$ sudo apt remove google-chrome-stable -y

Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  google-chrome-stable
0 upgraded, 0 newly installed, 1 to remove and 1 not upgraded.
After this operation, 390 MB disk space will be freed.
(Reading database ... 142125 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...
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.
shumail@shumail1:~$ _
```

task7_alternate_edit

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




















                                        [ Read 0 lines ]
^G Help       ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo      M-A Set Mark  M-] To Bracket M-Q Previous
^X Exit       ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^/ Go To Line M-E Redo      M-6 Copy      ^Q Where Was  M-W Next
```
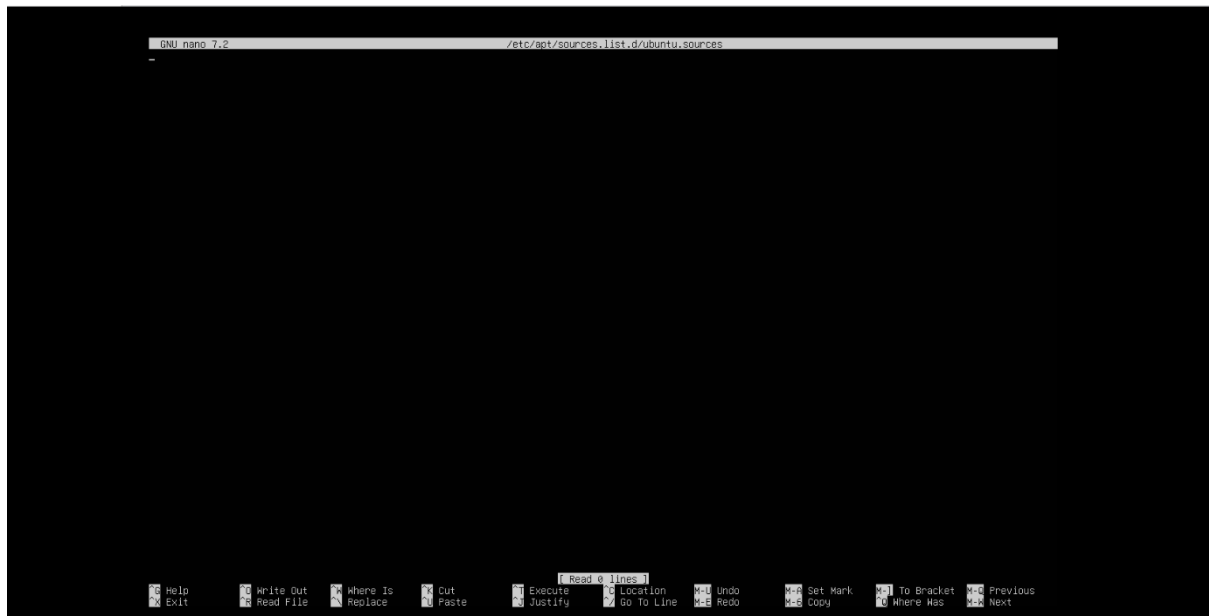
task7_remove_key

```
    shumail@shumail1:~$ sudo rm -f /etc/apt/keyrings/google.gpg
    shumail@shumail1:~$ _
```

task7_create_google_chrome_list

```
shumail@shumail1:~$ sudo rm -f /etc/apt/keyrings/google.gpg
shumail@shumail1:~$ echo "deb [arch=amd64 signed-by=/etc/apt/keyrings/google.gpg] http://dl.google.com/linux/chrome/deb/ stable main" | sudo tee /etc/apt/source
s.list.d/google-chrome.list > /dev/null
shumail@shumail1:~$ _
```

task7_list_sources_after_create

```
s.list.d/google-chrome.list > /dev/null
shumail@shumail1:~$ ls -la /etc/apt/sources.list.d/

total 20
drwxr-xr-x 2 root root 4096 Oct 31 11:18 .
drwxr-xr-x 9 root root 4096 Oct 31 11:05 ..
-rw-r--r-- 1 root root  107 Oct 31 11:20 google-chrome.list
-rw-r--r-- 1 root root    0 Oct 31 11:13 ubuntu.sources
-rw-r--r-- 1 root root  540 Oct 31 10:20 ubuntu.sources.bak
-rw-r--r-- 1 root root 2552 Aug  5 17:02 ubuntu.sources.curtin.orig
shumail@shumail1:~$
shumail@shumail1:~$ _
```

task7_add_key_alt

```
shumail@shumail1:~$
shumail@shumail1:~$ sudo mkdir -p /etc/apt/keyrings
shumail@shumail1:~$ curl -fsSL https://dl.google.com/linux/linux_signing_key.pub | sudo gpg --dearmor -o /etc/apt/keyrings/google.gpg
shumail@shumail1:~$
shumail@shumail1:~$ _
```

task7_apt_update_alt

```
shumail@shumail1:~$ sudo apt update
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:5 http://archive.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
shumail@shumail1:~$
```

task7_install_chrome_alt

```
1 package can be upgraded. Run 'apt list --upgradable' to see it.
shumail@shumail1:~$ sudo apt install google-chrome-stable -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  google-chrome-stable
0 upgraded, 1 newly installed, 0 to remove and 1 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]
16% [1 google-chrome-stable 23.2 MB/118 MB 20%]_
```

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

task8_add_ppa_audacity

```
shumail@shumail1:~$ sudo add-apt-repository ppa:ubuntuhandbook1/audacity -y
[sudo] password for shumail:
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
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Get:3 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease [18.1 kB]
Hit:4 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:6 http://archive.ubuntu.com/ubuntu noble-security InRelease
Get:7 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble/main amd64 Packages [1,064 B]
Get:8 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble/main Translation-en [492 B]
Fetched 19.6 kB in 4s (4,868 B/s)
Reading package lists... Done
shumail@shumail1:~$
```

task8_apt_update_audacity

```
shumail@shumail1:~$ 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 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/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://archive.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
shumail@shumail1:~$ _
```

task8_install_audacity.

```
shumail@shumail1:~$ sudo apt install audacity -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  audacity-data libdouble-conversion3 libflac++10 libid3tag0 liblilv-0-0 libmd4c0 libopusfile0 libpcre2-16-0 libpcre2-32-0 libportaudio2 libportmidi0
  libportsmf0t64 libqt5core5t64 libqt5dbus5t64 libqt5gui5t64 libqt5network5t64 libqt5qml5 libqt5qmlmodels5 libqt5quick5 libqt5svg5 libqt5waylandclient5
  libqt5waylandcompositor5 libqt5widgets5t64 libqt5x11extras5 libsbsms10 libserd-0-0 libsord-0-0 libsoundtouch1 libsratom-0-0 libsuil-0-0 libvamp-hostsdk3v5
  libuwbase3.2-1t64 libuwxgtk3.2-1t64 libxcb-icccm4 libxcb-image0 libxcb-keysyms1 libxcb-render-util0 libxcb-xinerama0 libxcb-xinput0 libxcb-xkb1
  libxkbcommon-x11-0 libzix-0-0 qt5-gtk-platformtheme qttranslations5-l10n qtwayland5
Suggested packages:
  ladspa-plugin qgnomeplatform-qt5 qt5-image-formats-plugins qt5-qmltooling-plugins serdi sordi
The following NEW packages will be installed:
  audacity audacity-data libdouble-conversion3 libflac++10 libid3tag0 liblilv-0-0 libmd4c0 libopusfile0 libpcre2-16-0 libpcre2-32-0 libportaudio2 libportmidi0
  libportsmf0t64 libqt5core5t64 libqt5dbus5t64 libqt5gui5t64 libqt5network5t64 libqt5qml5 libqt5qmlmodels5 libqt5quick5 libqt5svg5 libqt5waylandclient5
  libqt5waylandcompositor5 libqt5widgets5t64 libqt5x11extras5 libsbsms10 libserd-0-0 libsord-0-0 libsoundtouch1 libsratom-0-0 libsuil-0-0 libvamp-hostsdk3v5
  libuwbase3.2-1t64 libuwxgtk3.2-1t64 libxcb-icccm4 libxcb-image0 libxcb-keysyms1 libxcb-render-util0 libxcb-xinerama0 libxcb-xinput0 libxcb-xkb1
  libxkbcommon-x11-0 libzix-0-0 qt5-gtk-platformtheme qttranslations5-l10n qtwayland5
0 upgraded, 46 newly installed, 0 to remove and 1 not upgraded.
Need to get 33.0 MB of archives.
After this operation, 131 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 libflac++10 amd64 1.4.3+ds-2.1ubuntu2 [30.8 kB]
Get:2 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble/main amd64 audacity-data all 3.7.5-0build1~ubuntu24.04 [2,671 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble/universe amd64 libid3tag0 amd64 0.15.1b-14build1 [33.6 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble/universe amd64 libserd-0-0 amd64 0.32.2-1 [43.6 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble/universe amd64 libzix-0-0 amd64 0.4.2-2build1 [23.6 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsord-0-0 amd64 0.16.16-2build1 [15.8 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsratom-0-0 amd64 0.6.16-1build1 [17.3 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble/universe amd64 liblilv-0-0 amd64 0.24.22-1build1 [41.0 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble/universe amd64 libopusfile0 amd64 0.12-4build3 [44.7 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble/universe amd64 libportaudio2 amd64 19.6.0-1.2build3 [67.9 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble/universe amd64 libportmidi0 amd64 1:217-6.1build3 [18.1 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble/universe amd64 libportsmf0t64 amd64 0.1~svn20101010-7build1 [60.3 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsbsms10 amd64 2.3.0-1build1 [112 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsoundtouch1 amd64 2.3.2+ds1-1build1 [60.5 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble/universe amd64 libsuil-0-0 amd64 0.10.20-1build1 [20.5 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble/universe amd64 libvamp-hostsdk3v5 amd64 2.10.0-4build1 [92.3 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libpcre2-32-0 amd64 10.42-4ubuntu2.1 [197 kB]
Get:18 http://archive.ubuntu.com/ubuntu noble/universe amd64 libuwbase3.2-1t64 amd64 3.2.4+dfsg-4build1 [899 kB]
Get:19 http://archive.ubuntu.com/ubuntu noble/universe amd64 libuwxgtk3.2-1t64 amd64 3.2.4+dfsg-4build1 [4,535 kB]
12% [2 audacity-data 289 kB/2,671 kB 11%] [19 libuwxgtk3.2-1t64 4,096 B/4,535 kB 0%]_
```

task8_audacity_launch

task8_add_ppa_obs


```
shumail@shumail1:~$ sudo add-apt-repository ppa:obsproject/obs-studio -y
[sudo] password for shumail:

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://archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-security InRelease
Get:5 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble InRelease [17.8 kB]
Hit:6 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease
Get:7 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble/main amd64 Packages [1,172 B]
Get:8 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble/main Translation-en [160 B]
Hit:9 http://dl.google.com/linux/chrome/deb stable InRelease
Fetched 19.1 kB in 7s (2,890 B/s)
_
```

task8_apt_update_obs


```
shumail@shumail1:~$ 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://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:5 http://archive.ubuntu.com/ubuntu noble-security InRelease
Hit:6 https://ppa.launchpadcontent.net/obsproject/obs-studio/ubuntu noble InRelease
Hit:7 https://ppa.launchpadcontent.net/ubuntuhandbook1/audacity/ubuntu noble InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
shumail@shumail1:~$ _
```

task8_install_obs

task8_obs_version

task8_obs_launch

Task 9 - Create a Kubernetes sample YAML using vim

task9_vim_check

task9_mkdir_cd

```
shumail@shumail1:~$ mkdir -p ~/Lab5
shumail@shumail1:~$ cd ~/Lab5
shumail@shumail1:~/Lab5$ _
```

task9_vim_edit

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

-- INSERT --   21,56   All

task9_k8s_saved
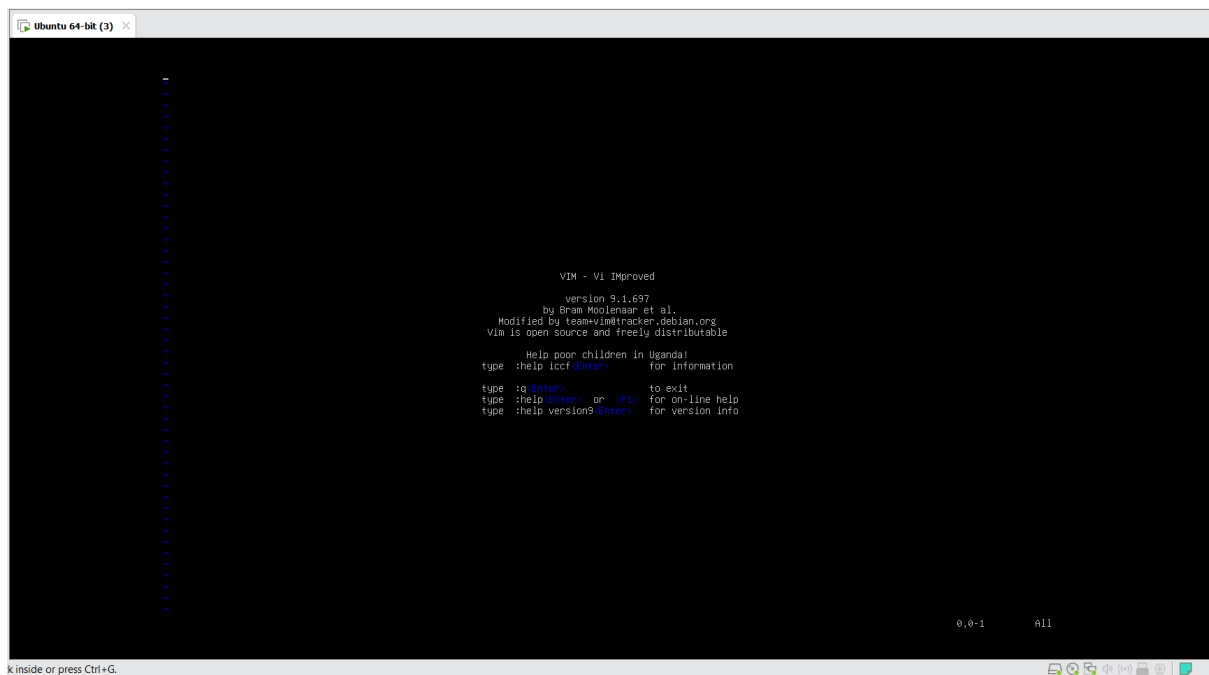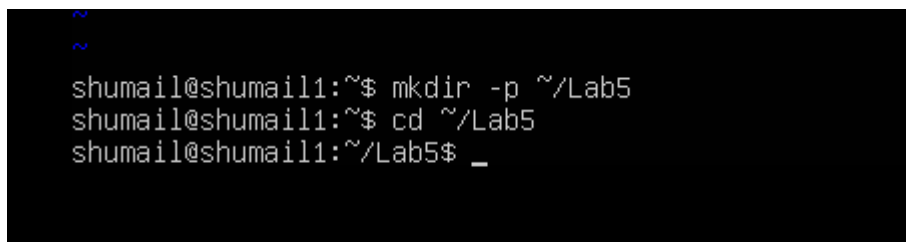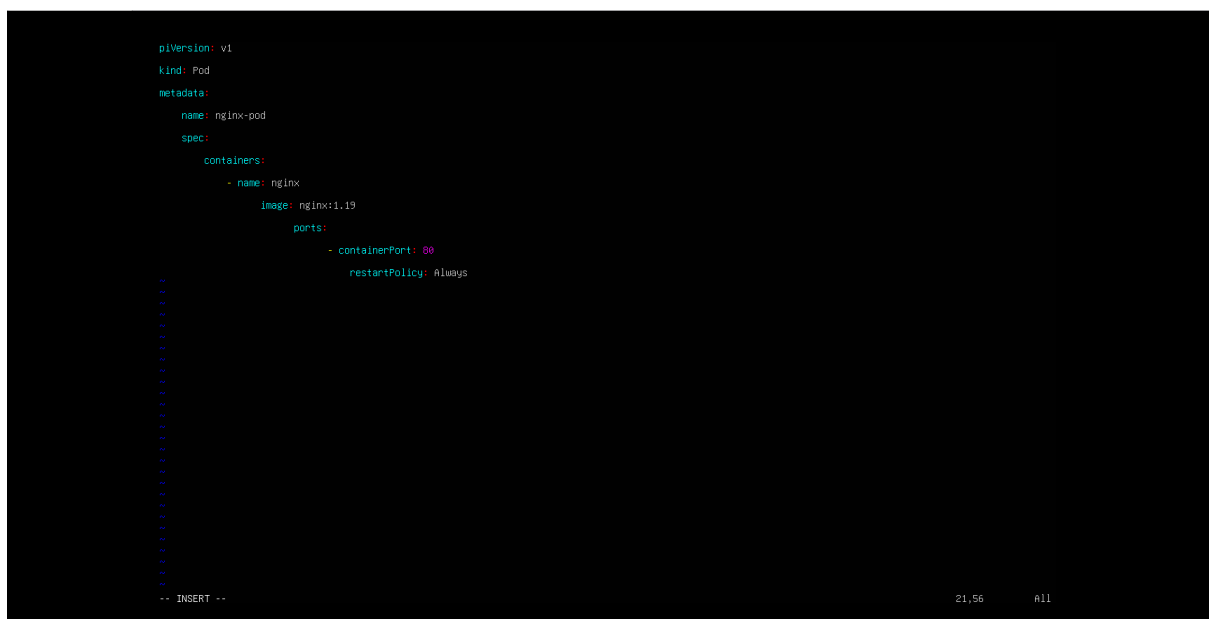
```
                    name: nginx-pod
                    spec:
                        containers:
                            - name: nginx
                                image: nginx:1.19
                                    ports:
                                        - containerPort: 80
                                            restartPolicy: Always
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        ~
        "k8s-sample.yaml" [New] 21L, 293B written
        shumail@shumail1:~/Lab5$ ls -la
        total 12
        drwxrwxr-x  2 shumail shumail 4096 Oct 31 14:52 .
        drwxr-x--- 20 shumail shumail 4096 Oct 31 14:52 ..
        -rw-rw-r--  1 shumail shumail  293 Oct 31 14:52 k8s-sample.yaml
        shumail@shumail1:~/Lab5$
```

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

task10_verify_annotation

```
        ~
        "k8s-sample.yaml" 23L, 325B written
        shumail@shumail1:~/Lab5$ cat k8s-sample.yaml
        piVersion: v1

        kind: Pod

        metadata: annotations:

            lab: lesson11

            name: nginx-pod

            spec:

                containers:

                    - name: nginx

                        image: nginx:1.19

                            ports:

                                - containerPort: 80

                                    restartPolicy: Always
        shumail@shumail1:~/Lab5$
```

task10_verify_entering_temp_data

task10_verify_no_temp_comment

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

task11_dd_delete_and_undo

```
piVersion: v1
kind: Pod
metadata: annotations:
    lab: lesson11
    name: nginx-pod
    spec:
        containers:
            - name: nginx
                image: nginx:1.19
                    ports:
                        - containerPort: 80
                            restartPolicy: Always
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
1 more line; before #1  16 seconds ago                                    17,19        All
```

task11_delete3_and_undo

```
piVersion: v1
kind: Pod
metadata: annotations:
    lab: lesson11
    name: nginx-pod
    spec:
        containers:
            - name: nginx

                        - containerPort: 00
                            restartPolicy: Always
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
3 fewer lines                                                            17,0-1       All
```

```
piVersion: v1
kind: Pod
metadata: annotations:
    lab: lesson11
    name: nginx-pod
    spec:
        containers:
            - name: nginx
                image: nginx:1.19
                    ports:
                        - containerPort: 80
                            restartPolicy: Always
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
3 more lines: before #11   44 seconds ago                                    17,19        All
```

task11_line1

```
piVersion: v1
kind: Pod
metadata: annotations:
    lab: lesson11
    name: nginx-pod
    spec:
        containers:
            - name: nginx
                image: nginx:1.19
                    ports:
                        - containerPort: 80
                            restartPolicy: Always
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
3 more lines: before #11   44 seconds ago                          1111g    1,1      All
```

task11_line1


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

3 more lines: before #11 44 seconds ago   21,49   All

task11_navigation

```
piVersion: v1
kind: Pod
metadata: annotations:
    lab: lesson11
    name: nginx-pod
    spec:
        containers:
            - name: nginx
                image: nginx:1.19
                    ports:
                        - containerPort: 80
                            restartPolicy: Always
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
3 more lines: before #11  44 seconds ago                                    21,49        All
```

```
piVersion: v1
kind: Pod
metadata: annotations:
    lab: lesson11
    name: nginx-pod
    spec:
        containers:
            - name: nginx
                image: nginx:1.19
                    ports:
_                       - containerPort: 80
                            restartPolicy: Always
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
3 more lines; before #11  44 seconds ago                                    21,1         All
```

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

task12_search_nginx

```
piVersion: v1
kind: Pod
metadata: annotations:
    lab: lesson11
    name: nginx-pod
    spec:
        containers:
            - name: nginx
                image: nginx:1.19
                    ports:
                        - containerPort: 80
                            restartPolicy: Always
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
search hit BOTTOM, continuing at TOP                                    9,11        All
```

task12_n_and_N_navigation

```
piVersion: v1
kind: Pod
metadata: annotations:
    lab: lesson11
    name: nginx-pod
    spec:
        containers:
            - name: nginx
                image: nginx:1.19
                    ports:
                        - containerPort: 80
                            restartPolicy: Always
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
/nginx                                                                 17,26       All
```

task12_added_occurrences

task12_cycle_matches

```
piVersion: v1

kind: Pod

metadata: annotations:

    lab: lesson11
# nginx added manually
# nginx second occurrence

    name: nginx-pod

    spec:

        containers:

            - name: nginx

                image: nginx:1.19

                ports:

                    - containerPort: 80

                        restartPolicy: Always
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~
search hit BOTTOM, continuing at TOP                                    8,3        All
```

task12_cycle_matchess


```
piVersion: v1

kind: Pod

metadata: annotations:

    lab: lesson11
# nginx added manually
# nginx second occurrence

    name: nginx-pod

    spec:

        containers:

            - name: nginx

                image: nginx:1.19

                ports:

                    - containerPort: 80

                        restartPolicy: Always
~
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~
/nginx                                                                  9,3        All
```

task12_cycle_matchesss

task12_cycle_matchessss

task12_substitute_result

```
piVersion: v1

kind: Pod

metadata: annotations:

    lab: lesson11
# webapp added manually
# webapp second occurrence

    name: webapp-pod

    spec:

        containers:

            - name: webapp

                image: webapp:1.19

                    ports:

                        - containerPort: 80

                            restartPolicy: Always
```

```
5 substitutions on 5 lines                                    19,19        All
```

task12_undo_and_quit


```
piVersion: v1

kind: Pod

metadata: annotations:

    lab: lesson11
# nginx added manually
# nginx second occurrence

    name: nginx-pod

    spec:

        containers:

            - name: nginx

                image: nginx:1.19

                    ports:

                        - containerPort: 80

                            restartPolicy: Always
```

```
5 changes; before #1  50 seconds ago                          8,1          All
```