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20 October 2024
Linux Administration Fall 2024
Lab #5 Installs, Updates, and Documentation

<u>Ubuntu Server</u>

1.) A repository is a server that stores software packages. In order to check the repository,
you must change into the directory. Using cd(change directory) and /etc/apt. After you've
done that you can see everything in that directory by using the ls command which will
display the directories along with the repositories which are located in sources.list.

```
aconcepcion@Alina:~$ cd /etc/apt
aconcepcion@Alina:/etc/apt$ ls
apt.conf.d  auth.conf.d  keyrings  preferences.d  preferences.d.save  sources.list  sources.list.d  trusted.gpg.d
aconcepcion@Alina:/etc/apt$
```
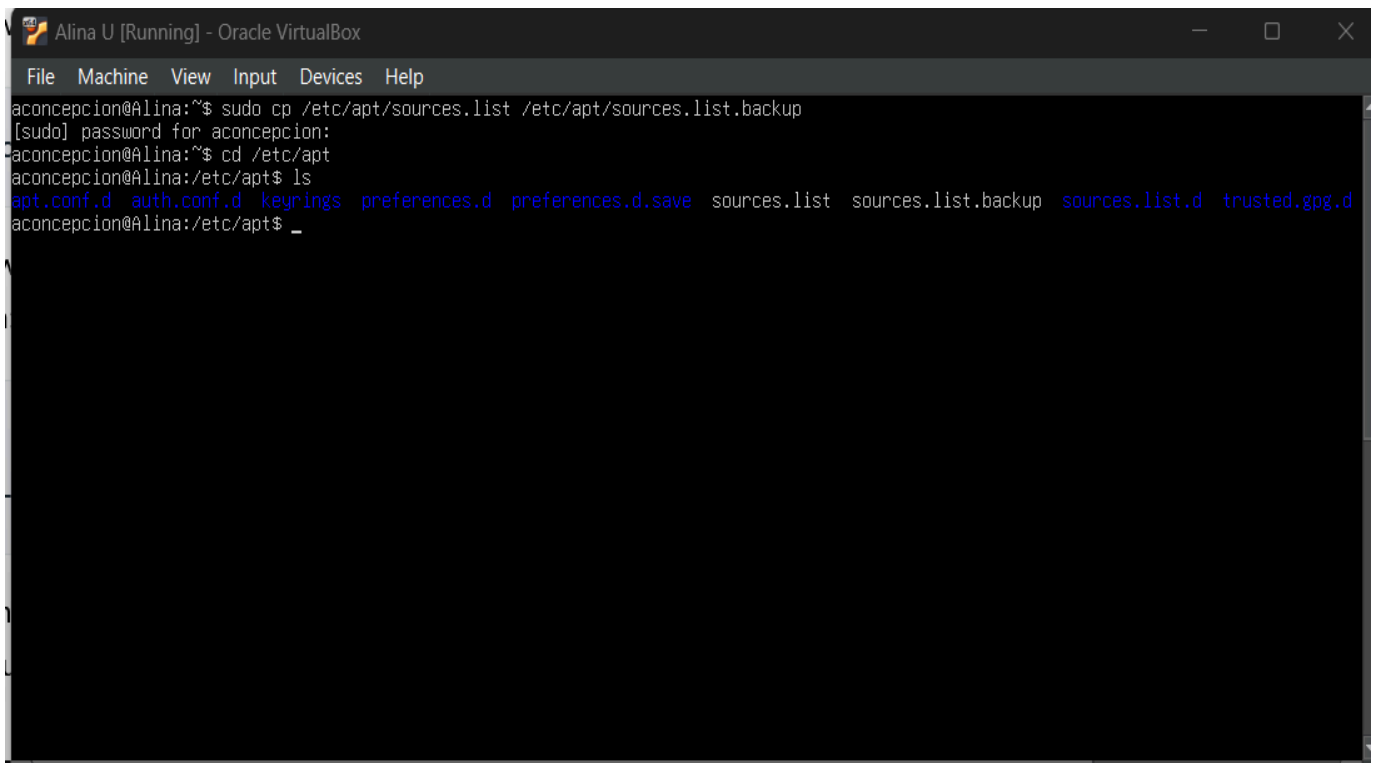
You can use ls -l for long listing and to display more information.

Screenshot of the repo directory. (October 20, 2024)

```
aconcepcion@Alina:~$ cd /etc/apt
aconcepcion@Alina:/etc/apt$ ls
apt.conf.d  auth.conf.d  keyrings  preferences.d  preferences.d.save  sources.list  sources.list.d  trusted.gpg.d
aconcepcion@Alina:/etc/apt$ ls -l
total 32
drwxr-xr-x 2 root root 4096 Sep 21 21:14 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 27 14:26 preferences.d
drwxr-xr-x 2 root root 4096 Aug 27 14:26 preferences.d.save
-rw-r--r-- 1 root root   70 Sep 21 21:14 sources.list
drwxr-xr-x 2 root root 4096 Sep 21 21:14 sources.list.d
drwxr-xr-x 2 root root 4096 Aug 27 14:21 trusted.gpg.d
aconcepcion@Alina:/etc/apt$
```

2.) Before adding a repository to our repository list we must make a backup of our current sources.list file. This is to ensure that we have the original if something went wrong. To make a backup I used ***Sudo cp /etc/apt/sources.list /etc/apt/sources.list.backup***, I used cp(copy) to copy the information from sources.list and create a new file called sources.list.backup. Then I used ls to confirm that the backup was added.

Screenshot of copying repository (October 22, 2024)

I used cat to display the contents of the sources.list.backup file but received a message that it had been moved to ***/etc/apt/sources.list.d/ubuntu.sources*** so I used cat again and put that path into the command line and as you can see in the screenshot, the contents of the file is displayed.

Screenshot of contents (October 22, 2024)

```
aconcepcion@Alina:~$ cd /etc/apt
aconcepcion@Alina:/etc/apt$ ls
apt.conf.d  auth.conf.d  keyrings  preferences.d  preferences.d.save  sources.list  sources.list.backup  sources.list.d  trusted.gpg.d
aconcepcion@Alina:/etc/apt$ cat sources.list.backup
# Ubuntu sources have moved to /etc/apt/sources.list.d/ubuntu.sources
aconcepcion@Alina:/etc/apt$ cat /etc/apt/sources.list.d/ubuntu.sources
Types: deb
URIs: http://us.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
aconcepcion@Alina:/etc/apt$ _
```

3.) There are two types of repositories we can add, PPA and official repositories. (Personal Package Archive), PPA's are used for non standard software updates. To install a PPA, the syntax is sudo add-apt-repository ppa:<name of repository/ppa name>. The official one stores packages for software distribution. The syntax is sudo apt-add-repository followed by the repository URL.

4.) Before we install any program, we should update our system, using the **_sudo apt update_** command.

(Screenshot of the update: October 22, 2024)


```
aconcepcion@Alina:~$ sudo apt update
[sudo] password for aconcepcion:
Hit:1 http://us.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [597 kB]
Get:6 http://us.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [146 kB]
Get:7 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [114 kB]
Get:8 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [10.2 kB]
Get:9 http://us.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [388 kB]
Get:10 http://us.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [74.8 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [431 kB]
Get:12 http://us.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:13 http://us.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [705 kB]
Get:14 http://us.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [209 kB]
Get:15 http://us.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [305 kB]
Get:16 http://us.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [19.8 kB]
Get:17 http://us.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [14.7 kB]
Get:18 http://us.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:19 http://us.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B]
Get:20 http://us.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:21 http://us.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [21.1 kB]
Get:22 http://us.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:23 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [92.7 kB]
Get:24 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [7,184 B]
Get:25 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [5,788 B]
Get:26 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [388 kB]
Get:27 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [74.8 kB]
Get:28 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:29 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [553 kB]
Get:30 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [51.9 kB]
Get:31 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [13.5 kB]
Get:32 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Fetched 4,605 kB in 2s (2,189 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
49 packages can be upgraded. Run 'apt list --upgradable' to see them.
aconcepcion@Alina:~$ _
```
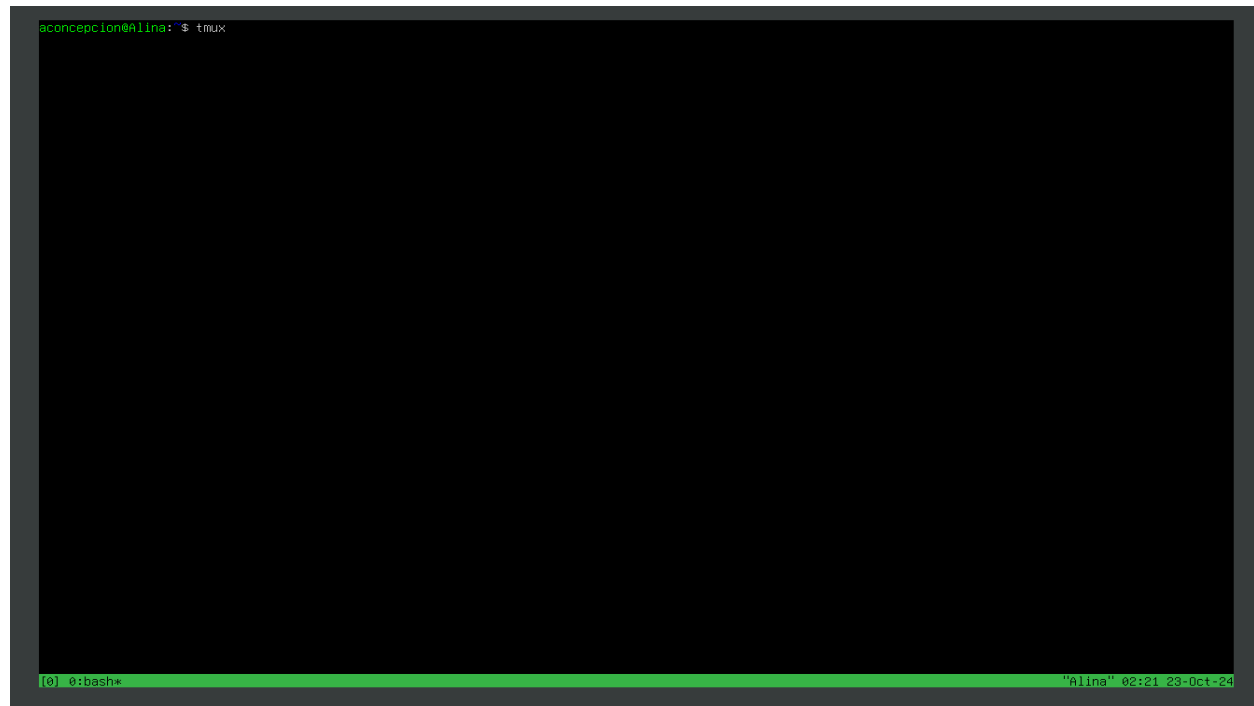
The first program I will be installing is **Tmux** which stands for Terminal multiplexer. It allows users to manage multiple terminal sessions within a single terminal window. The benefits are that you can switch between sessions, rename sessions, create multiple sessions, keep tasks running and much more. You can install tmux on the command line using ***sudo apt install tmux.***
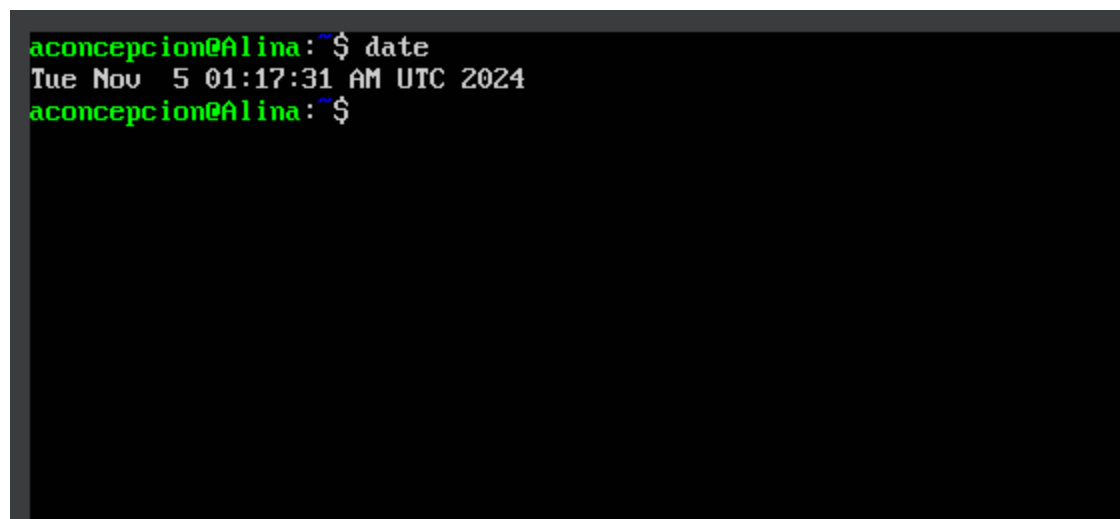
Tmux installation

```
aconcepcion@Alina:~$ sudo apt install tmux
[sudo] password for aconcepcion:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
tmux is already the newest version (3.4-1ubuntu0.1).
tmux set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 48 not upgraded.
aconcepcion@Alina:~$ date
Tue Nov  5 01:15:26 AM UTC 2024
aconcepcion@Alina:~$ _
```

To open Tmux, you type tmux on the command line. This will open the server and create a default session(0).


```
aconcepcion@Alina: $ tmux
```

```
[0] 0:bash*                                                                "Alina" 02:21 23-Oct-24
```



```
aconcepcion@Alina:~$ date
Tue Nov  5 01:17:31 AM UTC 2024
aconcepcion@Alina:~$
```

To close tmux, you must click _**Ctrl + B and D.**_

```
[exited]
aconcepcion@Alina:~$ _
```

To find out the location of your tmux file, you must use the _**whereis tmux**_ command.

```
aconcepcion@Alina:~$ whereis tmux
tmux: /usr/bin/tmux /usr/share/man/man1/tmux.1.gz
aconcepcion@Alina:~$ date
Tue Nov  5 01:09:49 AM UTC 2024
aconcepcion@Alina:~$ _
```

Emacs is a text editor. It can be used as a word processor for writing text files or for more advanced tasks like writing Python, C, or Java code. To install emac , we use _**sudo apt**_ install emacs.

```
aconcepcion@Alina:~$ sudo apt install emacs
[sudo] password for aconcepcion:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
emacs is already the newest version (1:29.3+1-1ubuntu2).
0 upgraded, 0 newly installed, 0 to remove and 48 not upgraded.
aconcepcion@Alina:~$ date
Tue Nov  5 01:19:26 AM UTC 2024
aconcepcion@Alina:~$ _
```

Screenshots of Emac Installation:

```
Selecting previously unselected package ssl-cert.
(Reading database ... 84826 files and directories currently installed.)
Preparing to unpack .../000-ssl-cert_1.1.2ubuntu1_all.deb ...
Unpacking ssl-cert (1.1.2ubuntu1) ...
Selecting previously unselected package libnsl2:amd64.
Preparing to unpack .../001-libnsl2_1.3.0-3build3_amd64.deb ...
Unpacking libnsl2:amd64 (1.3.0-3build3) ...
Selecting previously unselected package postfix.
Preparing to unpack .../002-postfix_3.8.6-1build2_amd64.deb ...
Unpacking postfix (3.8.6-1build2) ...
Selecting previously unselected package libgdk-pixbuf2.0-common.
Preparing to unpack .../003-libgdk-pixbuf2.0-common_2.42.10+dfsg-3ubuntu3.1_all.deb ...
Unpacking libgdk-pixbuf2.0-common (2.42.10+dfsg-3ubuntu3.1) ...
Selecting previously unselected package libgdk-pixbuf-2.0-0:amd64.
Preparing to unpack .../004-libgdk-pixbuf-2.0-0_2.42.10+dfsg-3ubuntu3.1_amd64.deb ...
Unpacking libgdk-pixbuf-2.0-0:amd64 (2.42.10+dfsg-3ubuntu3.1) ...
Selecting previously unselected package gtk-update-icon-cache.
Preparing to unpack .../005-gtk-update-icon-cache_3.24.41-4ubuntu1.2_amd64.deb ...
Unpacking gtk-update-icon-cache (3.24.41-4ubuntu1.2) ...
Selecting previously unselected package hicolor-icon-theme.
Preparing to unpack .../006-hicolor-icon-theme_0.17-2_all.deb ...
Unpacking hicolor-icon-theme (0.17-2) ...
Selecting previously unselected package humanity-icon-theme.
Preparing to unpack .../007-humanity-icon-theme_0.6.16_all.deb ...
Unpacking humanity-icon-theme (0.6.16) ...
Selecting previously unselected package ubuntu-mono.
Preparing to unpack .../008-ubuntu-mono_24.04-0ubuntu1_all.deb ...
Unpacking ubuntu-mono (24.04-0ubuntu1) ...

Progress: [  3%] [####.......................................................................]
```

```
Setting up libpango-1.0-0:amd64 (1.52.1+ds-1build1) ...
Setting up binutils (2.42-4ubuntu2.3) ...
Setting up libxt6t64:amd64 (1:1.2.1-1.2build1) ...
Setting up libpangoft2-1.0-0:amd64 (1.52.1+ds-1build1) ...
Setting up libgccjit0:amd64 (14.2.0-4ubuntu2~24.04) ...
Setting up libgtk-3-common (3.24.41-4ubuntu1.2) ...
Setting up libpangocairo-1.0-0:amd64 (1.52.1+ds-1build1) ...
Setting up gsettings-desktop-schemas (46.1-0ubuntu1) ...
Setting up libm17n-0:amd64 (1.8.4-1build2) ...
Setting up librsvg2-2:amd64 (2.58.0+dfsg-1build1) ...
Setting up librsvg2-common:amd64 (2.58.0+dfsg-1build1) ...
Setting up adwaita-icon-theme (46.0-1) ...
update-alternatives: using /usr/share/icons/Adwaita/cursor.theme to provide /usr/share/icons/default/index.theme (x-cursor-theme) in auto mode
Setting up emacs-el (1:29.3+1-1ubuntu2) ...
Setting up emacs-common (1:29.3+1-1ubuntu2) ...
Setting up humanity-icon-theme (0.6.16) ...
Setting up ubuntu-mono (24.04-0ubuntu1) ...
Processing triggers for rsyslog (8.2312.0-3ubuntu9) ...
Processing triggers for ufw (0.36.2-6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libglib2.0-0t64:amd64 (2.80.0-6ubuntu3.1) ...
Setting up libgtk-3-0t64:amd64 (3.24.41-4ubuntu1.2) ...
Setting up at-spi2-core (2.52.0-1build1) ...
Setting up emacs-bin-common (1:29.3+1-1ubuntu2) ...
update-alternatives: using /usr/bin/ctags.emacs to provide /usr/bin/ctags (ctags) in auto mode
update-alternatives: using /usr/bin/ebrowse.emacs to provide /usr/bin/ebrowse (ebrowse) in auto mode
update-alternatives: using /usr/bin/etags.emacs to provide /usr/bin/etags (etags) in auto mode
Processing triggers for install-info (7.1-3build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
Setting up libgtk-3-bin (3.24.41-4ubuntu1.2) ...
Setting up emacs-gtk (1:29.3+1-1ubuntu2) ...
update-alternatives: using /usr/bin/emacs-gtk to provide /usr/bin/emacs (emacs) in auto mode
update-alternatives: using /usr/bin/emacsclient.emacs to provide /usr/bin/emacsclient (emacsclient) in auto mode
Install emacsen-common for emacs
emacsen-common: Handling install of emacsen flavor emacs
Setting up emacs (1:29.3+1-1ubuntu2) ...
Processing triggers for libgdk-pixbuf-2.0-0:amd64 (2.42.10+dfsg-3ubuntu3.1) ...
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.
aconcepcion@Alina:~$
```
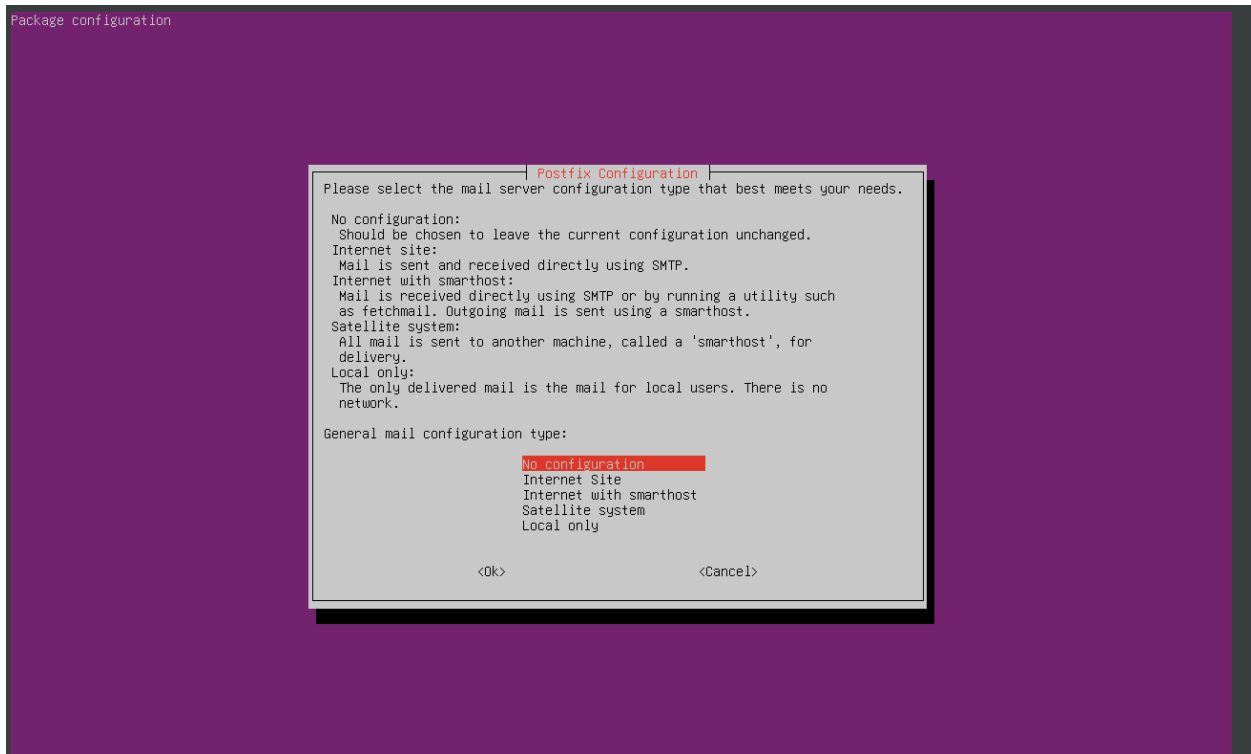
During the installation, this prompt required me to select a configuration which I chose "No Configuration".

To locate emacs, you use the ***whereis*** command and type emacs after.

To open emacs, type emacs, this will prompt the emacs menu to appear on the screen and will prompt you with choices like visiting a new file, open home directory, emacs tutorial, etc.

To exit emacs, you press ctrl , x and c on your keyboard.

I opened emacs again and chose to create a new file by selecting "Visit New File" and clicking enter and typing "new file" and started typing what I wanted in the file. After exiting the file using ctrl, x and c it prompted me to select y(yes) or n(no) if i wanted to save the file, I chose "Y" for yes.

```
File Edit Options Buffers Tools Help
hi this is me alina and i'm writing a new file. the dat is 11/4/2024 and the time is 8:29 pm













-UUU:**-  F1   new file     All  L1    (Fundamental) -----------------------------------------------
```

I used ls to confirm the creation of the file and cat to confirm the contents of the file.

```
aconcepcion@Alina:~$ ls
ascript.awk    foo        knock_knock.py    labs            ' new file'    script.awk    'script.txt script.awk'    SedLab10.sed    took.awk
'awk -f.txt'    GrepLab    knock.txt          labscript.awk    output.txt     script.sed    sed                         Sh.txt          tooktotalscript.awk
AwkLab.data    hi         lab4.awk           myscript.awk     root           script.sh     SedLab                      test
aconcepcion@Alina:~$ cat ' new file'
hi this is me alina and i'm writing a new file. the dat is 11/4/2024 and the time is 8:29 pmaconcepcion@Alina:~$ date
Tue Nov  5 01:36:49 AM UTC 2024
aconcepcion@Alina:~$
```

Next, I will install Fail2ban. **Fail2ban** is a program that is used to secure a Linux system against malicious links. To install Fail2ban, you type ***sudo apt install fail2ban*** in the command line.

```
Selecting previously unselected package fail2ban.
Preparing to unpack .../fail2ban_1.0.2-3ubuntu0.1_all.deb ...
Unpacking fail2ban (1.0.2-3ubuntu0.1) ...
Selecting previously unselected package python3-pyinotify.
Preparing to unpack .../python3-pyinotify_0.9.6-2ubuntu1_all.deb ...
Unpacking python3-pyinotify (0.9.6-2ubuntu1) ...
Selecting previously unselected package whois.
Preparing to unpack .../whois_5.5.22_amd64.deb ...
Unpacking whois (5.5.22) ...
Setting up whois (5.5.22) ...
Setting up python3-pyasyncore (1.0.2-2) ...
Setting up fail2ban (1.0.2-3ubuntu0.1) ...
/usr/lib/python3/dist-packages/fail2ban/tests/fail2banregextestcase.py:224: SyntaxWarning: invalid escape sequence '\s'
   "1490349000 test failed.dns.ch", "^\s*test <F-ID>\S+</F-ID>"
/usr/lib/python3/dist-packages/fail2ban/tests/fail2banregextestcase.py:435: SyntaxWarning: invalid escape sequence '\S'
   '^'+prefix+'<F-ID>User <F-USER>\S+</F-USER></F-ID> not allowed\n'
/usr/lib/python3/dist-packages/fail2ban/tests/fail2banregextestcase.py:443: SyntaxWarning: invalid escape sequence '\S'
   '^'+prefix+'User <F-USER>\S+</F-USER> not allowed\n'
/usr/lib/python3/dist-packages/fail2ban/tests/fail2banregextestcase.py:444: SyntaxWarning: invalid escape sequence '\d'
   '^'+prefix+'Received disconnect from <F-ID><ADDR> port \d+</F-ID>'
/usr/lib/python3/dist-packages/fail2ban/tests/fail2banregextestcase.py:451: SyntaxWarning: invalid escape sequence '\s'
   _test_variants('common', prefix="\s*\S+ sshd\[<F-MLFID>\d+</F-MLFID>\]:\s+")
/usr/lib/python3/dist-packages/fail2ban/tests/fail2banregextestcase.py:537: SyntaxWarning: invalid escape sequence '\['
   'common[prefregex="^svc\[<F-MLFID>\d+</F-MLFID>\] connect <F-CONTENT>.+</F-CONTENT>$"'
/usr/lib/python3/dist-packages/fail2ban/tests/servertestcase.py:1375: SyntaxWarning: invalid escape sequence '\s'
   "`{ nft -a list chain inet f2b-table f2b-chain | grep -oP '@addr-set-j-w-nft-mp\s+.*\s+\Khandle\s+(\d+)$'; } | while read -r hdl; do`",
/usr/lib/python3/dist-packages/fail2ban/tests/servertestcase.py:1378: SyntaxWarning: invalid escape sequence '\s'
   "`{ nft -a list chain inet f2b-table f2b-chain | grep -oP '@addr6-set-j-w-nft-mp\s+.*\s+\Khandle\s+(\d+)$'; } | while read -r hdl; do`",
/usr/lib/python3/dist-packages/fail2ban/tests/servertestcase.py:1421: SyntaxWarning: invalid escape sequence '\s'
   "`{ nft -a list chain inet f2b-table f2b-chain | grep -oP '@addr-set-j-w-nft-ap\s+.*\s+\Khandle\s+(\d+)$'; } | while read -r hdl; do`",
/usr/lib/python3/dist-packages/fail2ban/tests/servertestcase.py:1424: SyntaxWarning: invalid escape sequence '\s'
   "`{ nft -a list chain inet f2b-table f2b-chain | grep -oP '@addr6-set-j-w-nft-ap\s+.*\s+\Khandle\s+(\d+)$'; } | while read -r hdl; do`",
Created symlink /etc/systemd/system/multi-user.target.wants/fail2ban.service → /usr/lib/systemd/system/fail2ban.service.
Setting up python3-pyinotify (0.9.6-2ubuntu1) ...
Processing triggers for man-db (2.12.0-4build2) ...
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.
aconcepcion@Alina:~$ date
Tue Nov  5 02:00:39 AM UTC 2024
aconcepcion@Alina:~$
```

In order to start fail2ban, you use the command **_systemctl start fail2ban_**. When the program starts, it will require you to authenticate by entering your password.

To enable fail2ban, you enter **_systemctl enable fail2ban_** which will require you to authenticate and enter your password numerous times.

Fail2ban has two configuration files, fail2ban.conf and jail.conf. The fail2ban.conf file manages the operational settings like how the daemon logs info and the sockets for the pid file it will use. The jail.conf is a standard configuration file that can be used as a starting point where a user can customize configuration settings.

To locate fail2ban, I used whereis fail2ban and then changed into that directory using cd and listed everything inside the directory, which you can see the jail.conf and the fail2ban.conf file.

```
aconcepcion@Alina:~$ whereis fail2ban
fail2ban: /etc/fail2ban /usr/share/man/man1/fail2ban.1.gz
aconcepcion@Alina:~$  cd /etc/fail2ban
aconcepcion@Alina:/etc/fail2ban$ ls -l
total 64
drwxr-xr-x 2 root root  4096 Nov  5 02:00 action.d
-rw-r--r-- 1 root root  3017 Nov  9  2022 fail2ban.conf
drwxr-xr-x 2 root root  4096 Jun 10 21:27 fail2ban.d
drwxr-xr-x 3 root root  4096 Nov  5 02:00 filter.d
-rw-r--r-- 1 root root 25607 Nov  9  2022 jail.conf
drwxr-xr-x 2 root root  4096 Nov  5 02:00 jail.d
-rw-r--r-- 1 root root   645 Nov  9  2022 paths-arch.conf
-rw-r--r-- 1 root root  2728 Nov  9  2022 paths-common.conf
-rw-r--r-- 1 root root   627 Nov  9  2022 paths-debian.conf
-rw-r--r-- 1 root root   738 Nov  9  2022 paths-opensuse.conf
aconcepcion@Alina:/etc/fail2ban$ _
```

To view the contents of the files, you can use the cat commands. In this case, to view the first 40 lies of the jail.conf file, I used **_cat jail.conf | head -40._** The head is for the beginning of the file and the 40 represents how many lines I want to view, I can also view the last 40 by using tail -40.

```
aconcepcion@Alina:/etc/fail2ban$ cat jail.conf | head -40
#
# WARNING: heavily refactored in 0.9.0 release.  Please review and
#          customize settings for your setup.
#
# Changes:  in most of the cases you should not modify this
#           file, but provide customizations in jail.local file,
#           or separate .conf files under jail.d/ directory, e.g.:
#
# HOW TO ACTIVATE JAILS:
#
# YOU SHOULD NOT MODIFY THIS FILE.
#
# It will probably be overwritten or improved in a distribution update.
#
# Provide customizations in a jail.local file or a jail.d/customisation.local.
# For example to change the default bantime for all jails and to enable the
# ssh-iptables jail the following (uncommented) would appear in the .local file.
# See man 5 jail.conf for details.
#
# [DEFAULT]
# bantime = 1h
#
# [sshd]
# enabled = true
#
# See jail.conf(5) man page for more information


# Comments: use '#' for comment lines and ';' (following a space) for inline comments


[INCLUDES]

#before = paths-distro.conf
before = paths-debian.conf

# The DEFAULT allows a global definition of the options. They can be overridden
# in each jail afterwards.

aconcepcion@Alina:/etc/fail2ban$ _
```

I used cat to view the contents of the fail2ban.conf file.

```
# Notes.: Set the socket file. This is used to communicate with the daemon. Do
#         not remove this file when Fail2ban runs. It will not be possible to
#         communicate with the server afterwards.
# Values: [ FILE ]  Default: /var/run/fail2ban/fail2ban.sock
#
socket = /var/run/fail2ban/fail2ban.sock

# Option: pidfile
# Notes.: Set the PID file. This is used to store the process ID of the
#         fail2ban server.
# Values: [ FILE ]  Default: /var/run/fail2ban/fail2ban.pid
#
pidfile = /var/run/fail2ban/fail2ban.pid

# Option: allowipv6
# Notes.: Allows IPv6 interface:
#         Default: auto
# Values: [ auto yes (on, true, 1) no (off, false, 0) ] Default: auto
#allowipv6 = auto

# Options: dbfile
# Notes.: Set the file for the fail2ban persistent data to be stored.
#         A value of ":memory:" means database is only stored in memory
#         and data is lost when fail2ban is stopped.
#         A value of "None" disables the database.
# Values: [ None :memory: FILE ] Default: /var/lib/fail2ban/fail2ban.sqlite3
dbfile = /var/lib/fail2ban/fail2ban.sqlite3

# Options: dbpurgeage
# Notes.: Sets age at which bans should be purged from the database
# Values: [ SECONDS ] Default: 86400 (24hours)
dbpurgeage = 1d

# Options: dbmaxmatches
# Notes.: Number of matches stored in database per ticket (resolvable via
#         tags <ipmatches>/<ipjailmatches> in actions)
# Values: [ INT ] Default: 10
dbmaxmatches = 10

[Definition]


[Thread]

# Options: stacksize
# Notes.: Specifies the stack size (in KiB) to be used for subsequently created threads,
#         and must be 0 or a positive integer value of at least 32.
# Values: [ SIZE ] Default: 0 (use platform or configured default)
#stacksize = 0
aconcepcion@Alina:/etc/fail2ban$ _
```

Cowsay

Cowsay is a tool that displays a cow in the terminal along with a message.

To install cowsay, you use ***sudo apt install cowsay***

```
aconcepcion@Alina:~$ sudo apt install cowsay
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  filters cowsay-off
The following NEW packages will be installed:
  cowsay
0 upgraded, 1 newly installed, 0 to remove and 54 not upgraded.
Need to get 18.6 kB of archives.
After this operation, 93.2 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu noble/universe amd64 cowsay all 3.03+dfsg2-8 [18.6 kB]
Fetched 18.6 kB in 1s (31.7 kB/s)
Selecting previously unselected package cowsay.
(Reading database ... 105989 files and directories currently installed.)
Preparing to unpack .../cowsay_3.03+dfsg2-8_all.deb ...
Unpacking cowsay (3.03+dfsg2-8) ...
Setting up cowsay (3.03+dfsg2-8) ...
Processing triggers for man-db (2.12.0-4build2) ...
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.
aconcepcion@Alina:~$ date
Tue Nov  5 03:40:38 AM UTC 2024
aconcepcion@Alina:~$
```

In order to use cowsay, you type the command cowsay along with any text you want the cow to say. I typed cowsay moo.

```
aconcepcion@Alina:~$ cowsay moo
 _____
< moo >
 -----
        \   ^__^
         \  (oo)_____
            (__)\       )\/\
                ||----w |
                ||     ||
aconcepcion@Alina:~$
```

Also, there are options you can use with cowsay. You can use a -g option which will display a cow with dollar signs for eyes. I typed cowsay -g feed me more!

```
aconcepcion@Alina:~$ cowsay -g feed me more!
 _____
< feed me more! >
 --------------
        \   ^__^
         \  ($$)_____
            (__)\       )\/\
                ||----w |
                ||     ||
aconcepcion@Alina:~$ _
```

To locate cowsay, you use the whereis command (whereis cowsay).

```
aconcepcion@Alina:~$ whereis cowsay
cowsay: /usr/games/cowsay /usr/share/cowsay /usr/share/man/man6/cowsay.6.gz
aconcepcion@Alina:~$ date
Tue Nov  5 03:45:32 AM UTC 2024
aconcepcion@Alina:~$ _
```

lolcat

Lolcat is a program that is used to add colors to the terminal. It can also be used to read files along with other commands in the terminal.

To install lolcat, you use the sudo apt install lolcat command.

```
aconcepcion@Alina:~$ sudo apt install lolcat
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  fonts-lato javascript-common libjs-jquery libruby libruby3.2 rake ruby ruby-net-telnet ruby-optimist ruby-paint ruby-rubygems ruby-sdbm ruby-webrick
  ruby-xmlrpc ruby3.2 rubygems-integration unzip zip
Suggested packages:
  apache2 | lighttpd | httpd ri ruby-dev bundler
The following NEW packages will be installed:
  fonts-lato javascript-common libjs-jquery libruby libruby3.2 lolcat rake ruby ruby-net-telnet ruby-optimist ruby-paint ruby-rubygems ruby-sdbm ruby-webrick
  ruby-xmlrpc ruby3.2 rubygems-integration unzip zip
0 upgraded, 19 newly installed, 0 to remove and 54 not upgraded.
Need to get 9,311 kB of archives.
After this operation, 42.2 MB of additional disk space will be used.
Do you want to continue? [Y/n] y_
```

To locate I used the whereis lolcat command. Also, I used lolcat -h to display the help menu, along with the example of what the color appearance should look like if successfully installed.

```
aconcepcion@Alina:~$ lolcat -h

Usage: lolcat [OPTION]... [FILE]...

Concatenate FILE(s), or standard input, to standard output.
With no FILE, or when FILE is -, read standard input.

  -p, --spread=<f>        Rainbow spread (default: 3.0)
  -F, --freq=<f>          Rainbow frequency (default: 0.1)
  -S, --seed=<i>          Rainbow seed, 0 = random (default: 0)
  -a, --animate           Enable psychedelics
  -d, --duration=<i>      Animation duration (default: 12)
  -s, --speed=<f>         Animation speed (default: 20.0)
  -i, --invert            Invert fg and bg
  -t, --truecolor         24-bit (truecolor)
  -f, --force             Force color even when stdout is not a tty
  -v, --version           Print version and exit
  -h, --help              Show this message

Examples:
  lolcat f - g       Output f's contents, then stdin, then g's contents.
  lolcat             Copy standard input to standard output.
  fortune | lolcat   Display a rainbow cookie.

Report lolcat bugs to <https://github.com/busyloop/lolcat/issues>
lolcat home page: <https://github.com/busyloop/lolcat/>
Report lolcat translation bugs to <http://speaklolcat.com/>

aconcepcion@Alina:~$ whereis lolcat
lolcat: /usr/games/lolcat /usr/share/man/man6/lolcat.6.gz
aconcepcion@Alina:~$ date
Tue Nov  5 03:50:21 AM UTC 2024
aconcepcion@Alina:~$
```

To use lolcat, you must add the "condition" first: for example date, then you separate it with a pipe | then lolcat . date | lolcat ,
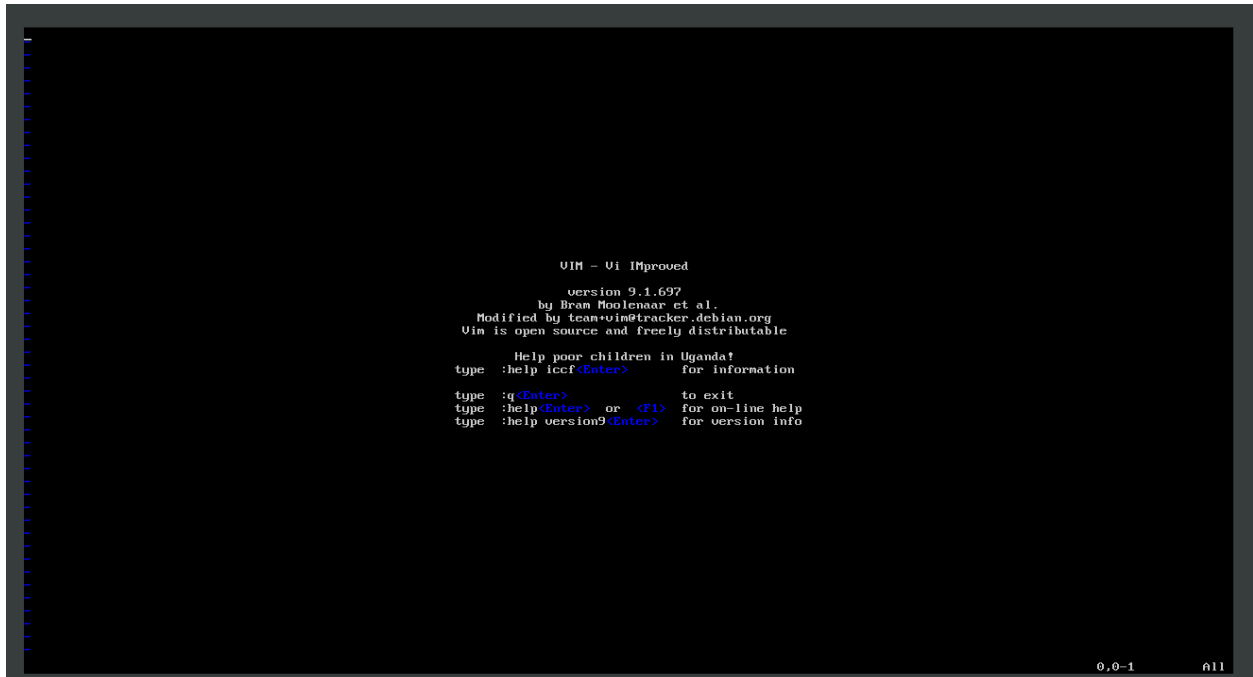

<u>Vim</u>
Vim is a preinstalled text editor that can be used to search and replace, supports other programming languages and can even integrate other tools as well.

I already have it installed but, if you did not have it installed you type sudo apt install vim
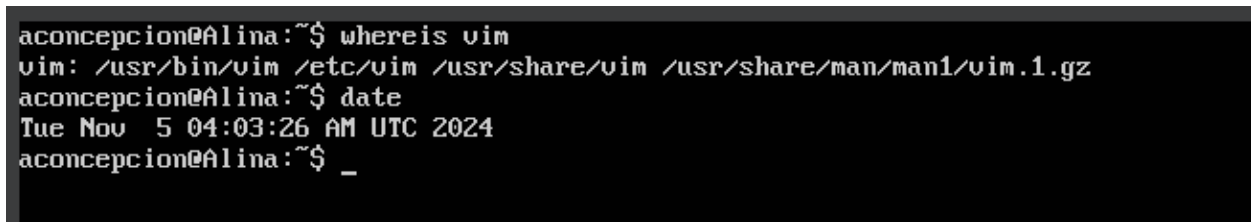
To open Vim you type "vim" in the terminal.
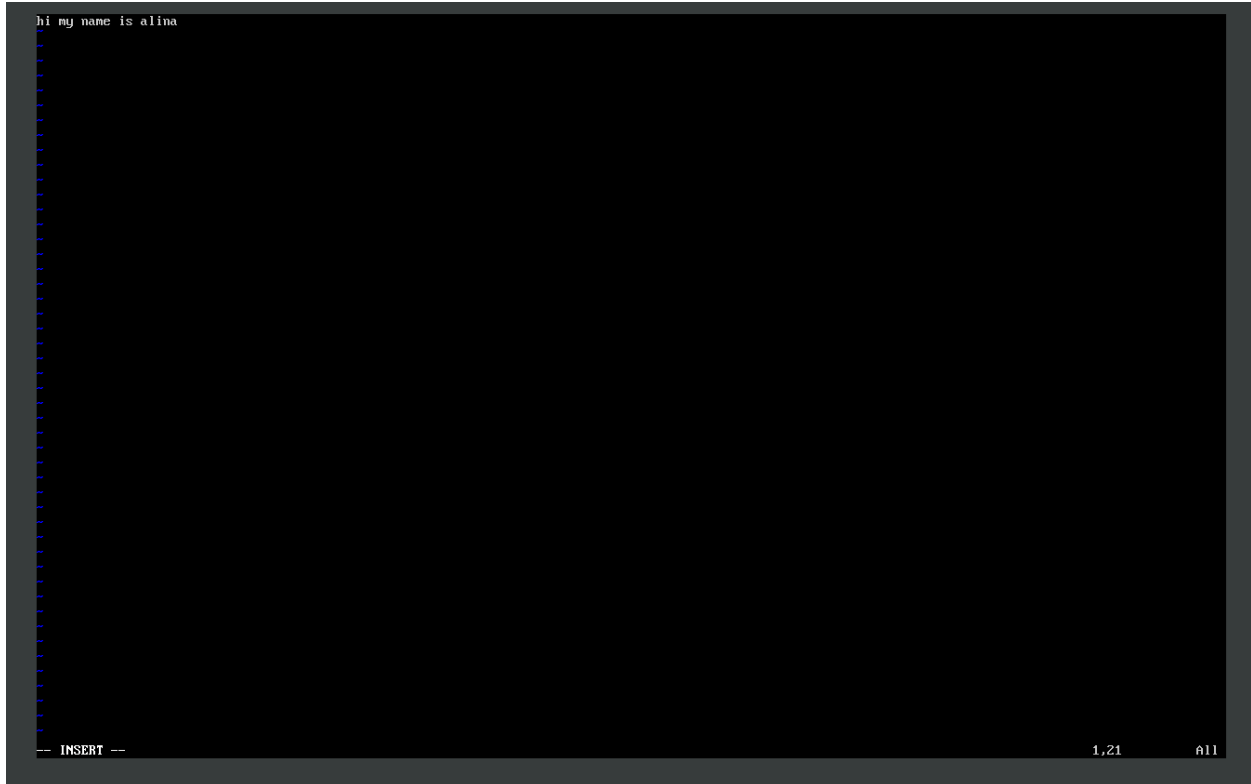
To create a file, you type :i to go to insert mode. Here's an example of text that I texted into vim using insert mode:

To exit vim, you type :q.

To locate the vim files, you use whereis vim command.

As an example, I used vim (file name), in this case I wanted to name the vim file cool file. I wrote some text in the file, then used escape, :w to save the file.

```
hi this file is cool
~
~
~
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~
aconcepcion@Alina:~$
```

To ensure that the file exists, I used ls which lists all of my files and directories. You can see the file that I made (coolfile), then I used cat to view the contents of the file.

```
aconcepcion@Alina:~$ ls
 ascript.awk    coolfile   hi            lab4.awk        myscript.awk   root        script.sh             SedLab          test
'awk -f.txt'    foo        knock_knock.py  labs          ' new file'    script.awk  'script.txt script.awk'  SedLab10.sed    took.awk
 AwkLab.data    GrepLab    knock.txt      labscript.awk   output.txt     script.sed  sed                   Sh.txt          tooktotalscript.awk
aconcepcion@Alina:~$ cat coolfile
hi this file is cool

aconcepcion@Alina:~$ date
Tue Nov  5 04:13:13 AM UTC 2024
aconcepcion@Alina:~$ _
```

https://jumpcloud.com/blog/how-to-manage-apt-repositories-debian-ubuntu

https://opensource.com/article/18/8/how-install-software-linux-command-line

https://www.networkworld.com/article/966370/how-to-list-repositories-on-linux.html

https://ubuntu.com/landscape/docs/explanation-repositories
https://serverspace.us/support/help/configure-repositories-on-ubuntu-20-04/

https://linuxize.com/post/how-to-add-apt-repository-in-ubuntu/

https://askubuntu.com/questions/217179/how-to-add-ppa-repositories

https://askubuntu.com/questions/4983/what-are-ppas-and-how-do-i-use-them/4990#4990

https://www.digitalocean.com/community/tutorials/how-fail2ban-works-to-protect-services-on-a-linux-server

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https://snapcraft.io/install/lolcat-rs/rhel

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