1. Write down some different kinds of cloud computing applications that are not in Google.

Answer: Aside from Google Cloud applications there are many cloud application out there in our current world. Here the some applications except Google Cloud applications:

1. **Amazon Web Services (AWS) Lambda**: A serverless computing service that runs code in response to events, without requiring server management. It's widely used for event-driven applications, such as real-time file processing or automated data updates.

2. **Microsoft Azure Virtual Desktop:** A serverless computing service that runs code in response to events, without requiring server management. It's widely used for event-driven applications, such as real-time file processing or automated data updates.

3. **Dropbox:** A cloud storage and collaboration platform similar to Google Drive but focuses more on business users and advanced file-sharing features. It integrates with numerous other platforms and is known for its cross-device syncing capabilities.

4. **Zoom Cloud Meetings**: A video-conferencing application that leverages the cloud to provide virtual meetings, webinars, and collaboration tools. While Google has Google Meet, Zoom specializes in video communication and has extensive features for event hosting.

5. **iCloud by Apple**: A cloud storage and synchronization service integrated with Apple's ecosystem, allowing users to store photos, documents, and app data across Apple devices.

6. **IBM Watson Health:** A healthcare-focused AI and cloud service platform that supports medical research, diagnostics, and patient data analysis.

7. **Salesforce CRM**: A cloud-based customer relationship management (CRM) platform that helps businesses manage customer interactions, sales pipelines, and marketing efforts. Salesforce integrates heavily with third-party applications, making it a popular choice for customer engagement.

8. **Microsoft OneDrive:** OneDrive is Microsoft's cloud storage service that allows users to store files, documents, photos, and videos securely in the cloud. It enables users to access their files from any device with internet connectivity, sync files across multiple devices, and share documents with others for collaborative work.

9. **GitHub:** GitHub, owned by Microsoft, operates as a cloud-based platform that allows developers to store, manage, and collaborate on code repositories. It enables version

control, collaboration, and project management for software development, all powered by cloud servers, so developers can access and work on their code from anywhere.

2. Answer: I installed Virtualbox and installed Ubuntu in it. Set the Username and hostname accordingly as instructed. Here are some commands of Ubuntu:

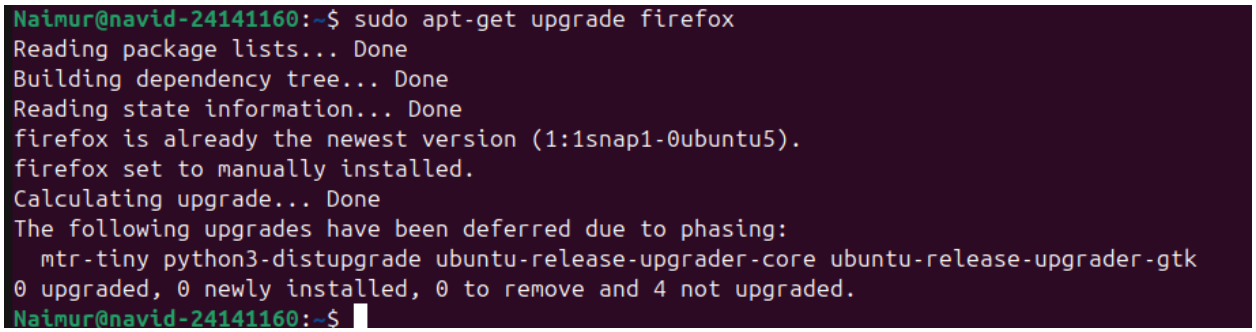
1. **sudo: sudo** (SuperUser DO) Linux command allows us to run programs or other commands with administrative privileges, just like "Run as administrator" in Windows. This is useful when, for example, we need to modify files in a directory that our user wouldn't normally have access to.

```
Naimur@navid-24141160:~$ sudo
usage: sudo -h | -K | -k | -V
usage: sudo -v [-ABkNnS] [-g group] [-h host] [-p prompt] [-u user]
usage: sudo -l [-ABkNnS] [-g group] [-h host] [-p prompt] [-U user]
            [-u user] [command [arg ...]]
usage: sudo [-ABbEHkNnPS] [-r role] [-t type] [-C num] [-D directory]
            [-g group] [-h host] [-p prompt] [-R directory] [-T timeout]
            [-u user] [VAR=value] [-i | -s] [command [arg ...]]
usage: sudo -e [-ABkNnS] [-r role] [-t type] [-C num] [-D directory]
            [-g group] [-h host] [-p prompt] [-R directory] [-T timeout]
            [-u user] file ...
```

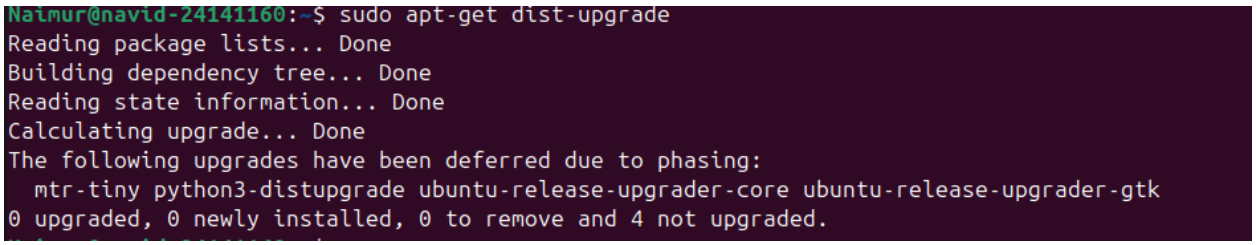
2. **sudo apt-get update:** apt-get update with superuser privileges is the first command we need to run in any Linux system after a fresh install. This command updates the database and lets our system know if there are newer packages available or not. This sudo apt-get update command will fetch the package information from all configured sources and update the local package index.

```
Naimur@navid-24141160:~$ sudo apt-get update
[sudo] password for naimur-islam-navid:
Warning: The unit file, source configuration file or drop-ins of apt-news.service changed on disk. Run 'systemctl daemon
-reload' to reload units.
Warning: The unit file, source configuration file or drop-ins of esm-cache.service changed on disk. Run 'systemctl daemo
n-reload' to reload units.
Hit:1 http://bd.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:3 http://bd.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [456 kB]
Get:5 http://bd.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:6 http://bd.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [623 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [97.2 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [7,232 B]
Get:9 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [425 kB]
Get:10 http://bd.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [151 kB]
Get:11 http://bd.archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [114 kB]
Get:12 http://bd.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [428 kB]
Get:13 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [82.2 kB]
Get:14 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [208 B]
```

3. **sudo apt-get upgrade:** After updating the package database, the next step is to upgrade the installed packages. For upgrading all the packages with available updates, we can use this command. This command will also upgrade all currently installed packages that have newer versions available in the repositories. And if we like to upgrade a particular package, we should tweak the above command a little and use '*apt-get upgrade <package-name>*' here I used firefox.



4. **sudo apt-get dist-upgrade:** This command tries to intelligently handle the dependencies of the upgraded packages, even if it means removing certain packages. This command will upgrade packages, and it will also handle changing dependencies with new versions of packages.



5. **sudo apt-get install firefox thunderbird:** This command will install both the Firefox and Thunderbird packages.

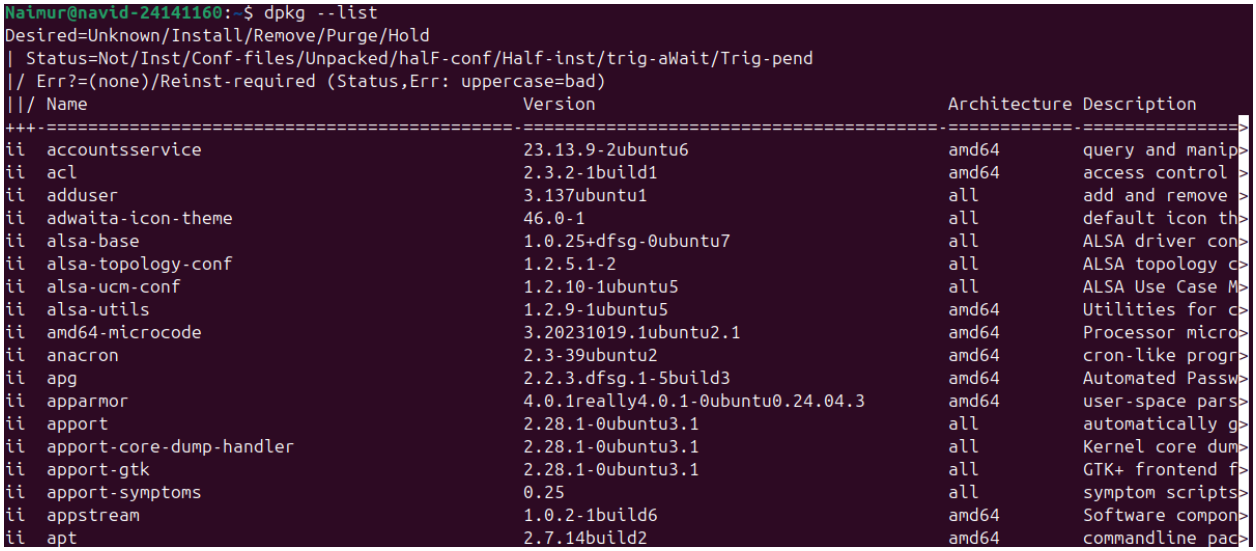
```
Naimur@navid-24141160:~$ sudo apt-get install firefox thunderbird
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
firefox is already the newest version (1:1snap1-0ubuntu5).
The following NEW packages will be installed:
  thunderbird
0 upgraded, 1 newly installed, 0 to remove and 4 not upgraded.
Need to get 25.5 kB of archives.
After this operation, 72.7 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://bd.archive.ubuntu.com/ubuntu noble/main amd64 thunderbird amd64 2:1snap1-0ubuntu3 [25.5 kB]
Fetched 25.5 kB in 1s (17.2 kB/s)
Preconfiguring packages ...
Selecting previously unselected package thunderbird.
(Reading database ... 148059 files and directories currently installed.)
Preparing to unpack .../thunderbird_2%3a1snap1-0ubuntu3_amd64.deb ...
=> Installing the thunderbird snap
==> Checking connectivity with the snap store
==> Installing the thunderbird snap


exit
thunderbird 128.4.1esr-1 from Canonical✓ installed
=> Snap installation complete
Unpacking thunderbird (2:1snap1-0ubuntu3) ...
Setting up thunderbird (2:1snap1-0ubuntu3) ...
Processing triggers for gnome-menus (3.36.0-1.1ubuntu3) ...
Processing triggers for desktop-file-utils (0.27-2build1) ...
W: Operation was interrupted before it could finish
```

6. **sudo apt-get remove firefox thunderbird:** When it comes to removing the installed program ‘apt-get remove‘ command is needed. We only have to know the exact package name of the software we want to uninstall. Here this command will remove the Firefox Thunderbird package but leave behind any configuration files.

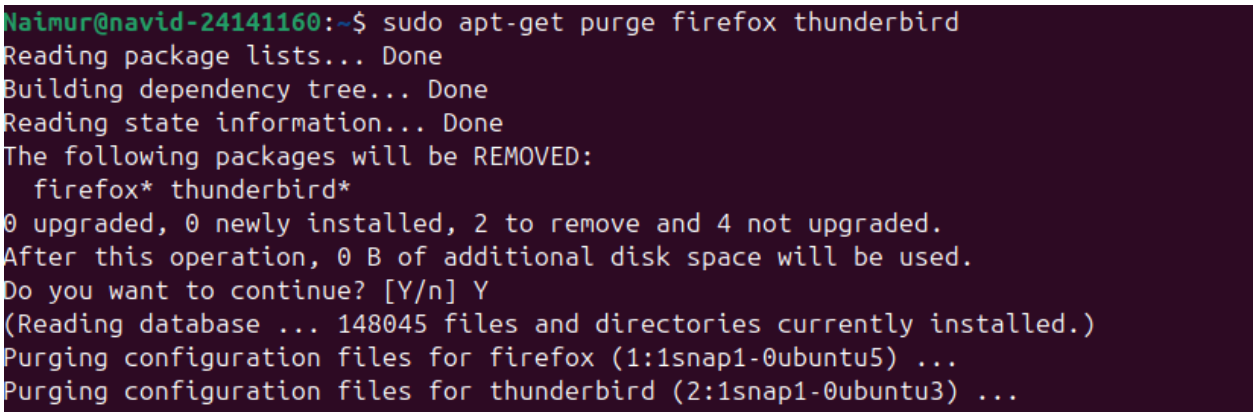
```
Naimur@navid-24141160:~$ sudo apt-get remove firefox thunderbird
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  firefox thunderbird
0 upgraded, 0 newly installed, 2 to remove and 4 not upgraded.
After this operation, 197 kB disk space will be freed.
Do you want to continue? [Y/n] Y
(Reading database ... 148065 files and directories currently installed.)
Removing firefox (1:1snap1-0ubuntu5) ...
Removing thunderbird (2:1snap1-0ubuntu3) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1.1ubuntu3) ...
Processing triggers for desktop-file-utils (0.27-2build1) ...
Naimur@navid-24141160:~$
```

7. **dpkg --list:** If we don't know about the package name, we use this Ubuntu basic command to list all the packages installed on our system and then copy the package name from the list.



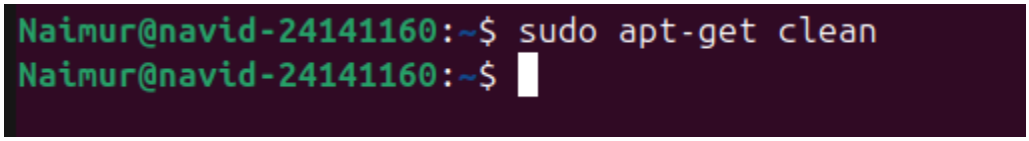
```
Naimur@navid-24141160:~$ dpkg --list
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Inst/Conf-files/Unpacked/halF-conf/Half-inst/trig-aWait/Trig-pend
|/ Err?=(none)/Reinst-required (Status,Err: uppercase=bad)
||/ Name                                    Version                                 Architecture Description
+++-=======================================-=======================================-============-==============>
ii  accountsservice                         23.13.9-2ubuntu6                        amd64        query and manip>
ii  acl                                     2.3.2-1build1                           amd64        access control >
ii  adduser                                 3.137ubuntu1                            all          add and remove >
ii  adwaita-icon-theme                      46.0-1                                  all          default icon th>
ii  alsa-base                               1.0.25+dfsg-0ubuntu7                    all          ALSA driver con>
ii  alsa-topology-conf                      1.2.5.1-2                               all          ALSA topology c>
ii  alsa-ucm-conf                           1.2.10-1ubuntu5                         all          ALSA Use Case M>
ii  alsa-utils                              1.2.9-1ubuntu5                          amd64        Utilities for c>
ii  amd64-microcode                         3.20231019.1ubuntu2.1                   amd64        Processor micro>
ii  anacron                                 2.3-39ubuntu2                           amd64        cron-like progr>
ii  apg                                     2.2.3.dfsg.1-5build3                    amd64        Automated Passw>
ii  apparmor                                4.0.1really4.0.1-0ubuntu0.24.04.3       amd64        user-space pars>
ii  apport                                  2.28.1-0ubuntu3.1                       all          automatically g>
ii  apport-core-dump-handler                2.28.1-0ubuntu3.1                       all          Kernel core dum>
ii  apport-gtk                              2.28.1-0ubuntu3.1                       all          GTK+ frontend f>
ii  apport-symptoms                         0.25                                    all          symptom scripts>
ii  appstream                               1.0.2-1build6                           amd64        Software compon>
ii  apt                                     2.7.14build2                            amd64        commandline pac>
```

8. **sudo apt-get purge firefox thunderbird:** apt-get purge command is used when we want to remove software completely from our system with its configuration or data files so that no longer personalized settings will be available during reinstallation. This command will remove the Firefox Thunderbird package and its configuration files.



```
Naimur@navid-24141160:~$ sudo apt-get purge firefox thunderbird
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  firefox* thunderbird*
0 upgraded, 0 newly installed, 2 to remove and 4 not upgraded.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] Y
(Reading database ... 148045 files and directories currently installed.)
Purging configuration files for firefox (1:1snap1-0ubuntu5) ...
Purging configuration files for thunderbird (2:1snap1-0ubuntu3) ...
```

9. **sudo apt-get clean:** This command clears out the local repository of retrieved package files, freeing up disk space. It will remove all stored archive files from our cache.



```
Naimur@navid-24141160:~$ sudo apt-get clean
Naimur@navid-24141160:~$
```

10. **sudo apt-get autoclean:** apt-get autoclean command removes package files that can no longer be downloaded and are largely useless, helping to keep your system clean. sudo

apt-get autoclean command will remove only those cache files that can no longer be downloaded from their sources.

```
Naimur@navid-24141160:~$ sudo apt-get autoclean
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Naimur@navid-24141160:~$
```

11. **sudo apt-get autoremove:** apt-get autoremove command is used to remove any unnecessary packages. Unnecessary means whenever we install an application, the system will also install the software that this application depends on. It is common in Ubuntu that applications share the same libraries. When we remove the application, the dependency will stay on your system. So we run apt-get autoremove as sudo after uninstalling a package to remove unwanted software dependencies.

```
Naimur@navid-24141160:~$ sudo apt-get autoremove
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
```

12. **date:** This command displays the current date and time, including the day of the week, month, time, time zone, and year.

```
Naimur@navid-24141160:~$ date
Thu Nov  7 10:08:45 PM +06 2024
```

13. **df:** df (display filesystem) command displays information about the disk space usage of all mounted filesystems.

```
Naimur@navid-24141160:~$ df
Filesystem     1K-blocks    Used Available Use% Mounted on
tmpfs             251312    1756    249556   1% /run
/dev/sda3       14276488 8224304   5305176  61% /
tmpfs            1256560       4   1256556   1% /dev/shm
tmpfs               5120       8      5112   1% /run/lock
tmpfs             251312    2568    248744   2% /run/user/1000
/dev/sda2       11243712 4552224   6095164  43% /media/naimur-islam-navid/ec63b8a5-7465-47d9-a168-27da6e5d14fb
Naimur@navid-24141160:~$
```

14. **du:** du (directory usage) command displays the size of a directory and all of its subdirectories. By default, the du command displays the sizes of all directories and files in bytes. However, we can use different options to change the output format. For example, the “-h” option is used to display the sizes in a human-readable format, such as

KB, MB, or GB. The “-s” option is used to display only the total size of a directory or file. The “-c” option can be used to display the total size of all the directories and files that are being analyzed.

```
Naimur@navid-24141160:~$ du
4       ./Public
4       ./Desktop
8       ./.config/tiling-assistant
8       ./.config/gtk-3.0
4       ./.config/update-notifier
8       ./.config/pulse
8       ./.config/evolution/sources
12      ./.config/evolution
4       ./.config/gtk-4.0
12      ./.config/dconf
12      ./.config/ibus/bus
16      ./.config/ibus
4       ./.config/enchant
4       ./.config/nautilus
4       ./.config/goa-1.0
112     ./.config
8       ./.local/state/wireplumber
12      ./.local/state
4       ./.local/share/ibus-table
4       ./.local/share/sounds
8       ./.local/share/gnome-shell
12      ./.local/share/keyrings
76      ./.local/share/gvfs-metadata
4       ./.local/share/gnome-settings-daemon
4       ./.local/share/flatpak/db
8       ./.local/share/flatpak
8       ./.local/share/evolution/tasks/system
4       ./.local/share/evolution/tasks/trash
16      ./.local/share/evolution/tasks
```

15. **free:** Displays the amount of free space available on the system.

```
Naimur@navid-24141160:~$ free
               total        used        free      shared  buff/cache   available
Mem:         2513120     1551672      105844       48136     1079328      961448
Swap:        2311164      986316     1324848
Naimur@navid-24141160:~$
```

16. **uname -a:** uname -a Provides a wide range of basic information about the system.

```
Naimur@navid-24141160:~$ uname -a
Linux navid-24141160 6.8.0-48-generic #48-Ubuntu SMP PREEMPT_DYNAMIC Fri Sep 27 14:04:52 UTC 2024 x86_64 x86_64 x86_64
NU/Linux
Naimur@navid-24141160:~$
```

17. **ps:** This command provides information about the currently running processes.

```
Naimur@navid-24141160:~$ ps
    PID TTY          TIME CMD
   3834 pts/0    00:00:00 bash
  17811 pts/0    00:00:00 ps
```

18. **uptime:** This command provides information about how long the system has been running.

```
Naimur@navid-24141160:~$ uptime
 22:13:07 up  1:43,  1 user,  load average: 1.31, 0.59, 0.47
Naimur@navid-24141160:~$
```

19. **pwd:** pwd (print working directory) Ubuntu command displays the full pathname of the current working directory. When we execute the pwd command, the shell returns the absolute pathname of the current directory. This is the directory in which we are currently working.

```
Naimur@navid-24141160:~$ pwd
/home/naimur-islam-navid
Naimur@navid-24141160:~$
```

20. **ls -l:** s (list) command in Ubuntu is used to list the contents of a directory. When we run the ls command in a terminal window, it displays the files and directories in the current working directory. “ls -l”: Displays the contents of the directory in a long format, including details like permissions, ownership, and file size.

```
Naimur@navid-24141160:~$ ls -l
total 36
drwxr-xr-x 2 naimur-islam-navid naimur-islam-navid 4096 Nov  5 18:37 Desktop
drwxr-xr-x 2 naimur-islam-navid naimur-islam-navid 4096 Nov  5 18:37 Documents
drwxr-xr-x 2 naimur-islam-navid naimur-islam-navid 4096 Nov  5 18:37 Downloads
drwxr-xr-x 2 naimur-islam-navid naimur-islam-navid 4096 Nov  5 18:37 Music
drwxr-xr-x 2 naimur-islam-navid naimur-islam-navid 4096 Nov  5 18:37 Pictures
drwxr-xr-x 2 naimur-islam-navid naimur-islam-navid 4096 Nov  5 18:37 Public
drwx------ 5 naimur-islam-navid naimur-islam-navid 4096 Nov  7 21:00 snap
drwxr-xr-x 2 naimur-islam-navid naimur-islam-navid 4096 Nov  5 18:37 Templates
drwxr-xr-x 2 naimur-islam-navid naimur-islam-navid 4096 Nov  5 18:37 Videos
```

21. **history:** history command works by displaying a list of the previously executed commands, along with a unique number assigned to each command. By default, the history command displays the last 500 commands that were executed in the current shell session.

```
Naimur@navid-24141160:~$ history
    1  sudo
    2  apt-get update
    3  sudo apt-get update
    4  sudo apt -get update
    5  sudo apt-get update
    6  clear
    7  sudo apt-get upgrade
    8  sudo apt-get firefox
    9  sudo apr-get upgrade firefox
   10  sudo apt-get upgrade firefox
   11  sudo apt-get dist -upgrade
   12  sudo apt-get dist-upgrade
   13  sudo apt-get install firefox thunderbird
   14  dpkg --list
   15  clear
   16  sudo apt-get remove firefox thunderbird
   17  sudo apt-get purge gimp
   18  sudo apt-get purge firefoc thunderbird
   19  clear
   20  sudo apt-get purge firefox thunderbird
   21  sudo apt-get clean
   22  clear
   23  sudo apt-get autoclean
   24  sudo apt-get clean
   25  sudo apt-get autoremover
   26  cleart
   27  clear
   28  sudo apt-get autoremove
   29  date
   30  df
```

22. **clear:** This command is used to clear the terminal screen. Simply typing clear in the terminal will clear the screen.

```
Naimur@navid-24141160:~$ clear
```