


BASH SCRIPTING LOOPS AND CONDITIONS

1. Create a bash script which will take alphabet as input and will check if the input is a consonent or vowel.



```
GNU nano 4.8 alphabets.sh
#!/bin/bash
read -p "Enter a letter: " letter
vowels=("A" "E" "I" "O" "U" "a" "e" "i" "o" "u")
if [[ "${vowels[@]}" =~ "$letter" ]]; then
    echo "It's a vowel."
else
    echo "It's a consonant."
fi
```

Read 13 lines

Get Help Write Out Where Is Cut Text Justify
Exit Read File Replace Paste Text To Spell



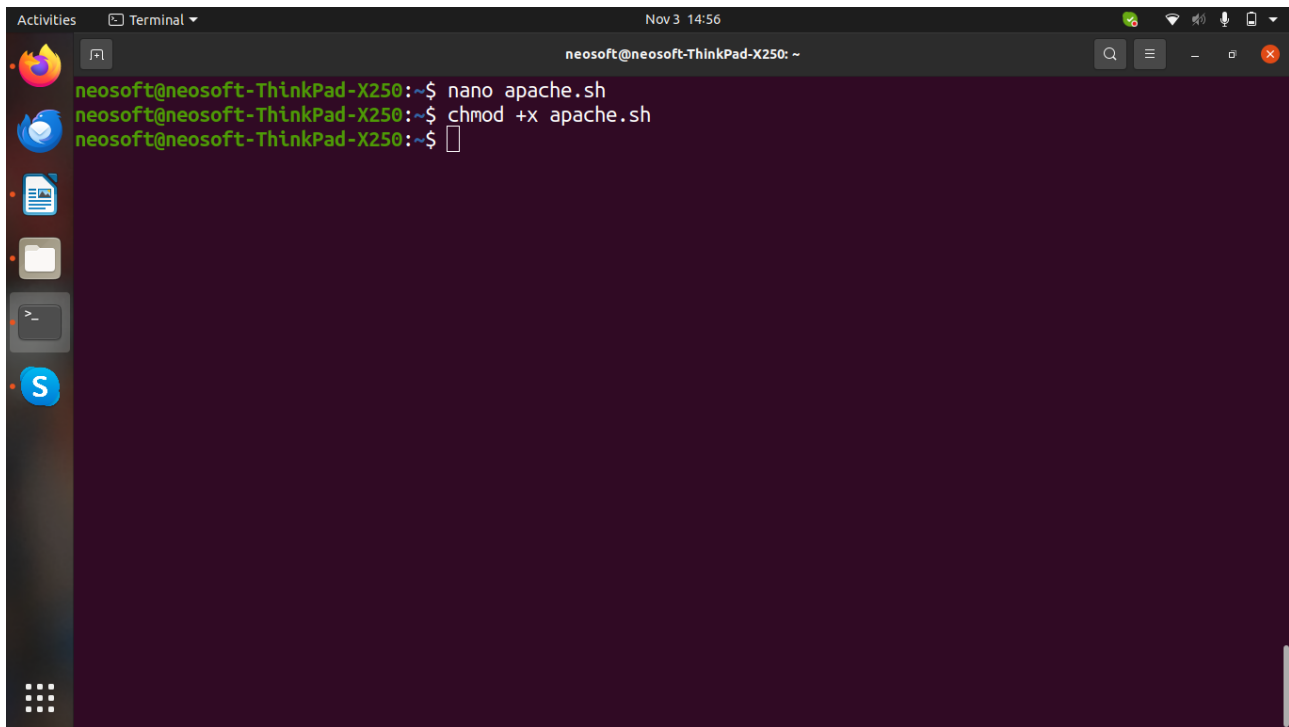
```
neosoft@neosoft-ThinkPad-X250:~$ nano alphabets.sh
neosoft@neosoft-ThinkPad-X250:~$ chmod +x alphabets.sh
neosoft@neosoft-ThinkPad-X250:~$ ./alphabets.sh
Enter a letter: E
It's a vowel.
neosoft@neosoft-ThinkPad-X250:~$ ./alphabets.sh
Enter a letter: b
It's a consonant.
neosoft@neosoft-ThinkPad-X250:~$ ./alphabets.sh
Enter a letter: u
It's a vowel.
```

`[[...]]` is used for conditional tests.

`${vowels[@]}` is used to expand the `vowels` array into a list of its elements.

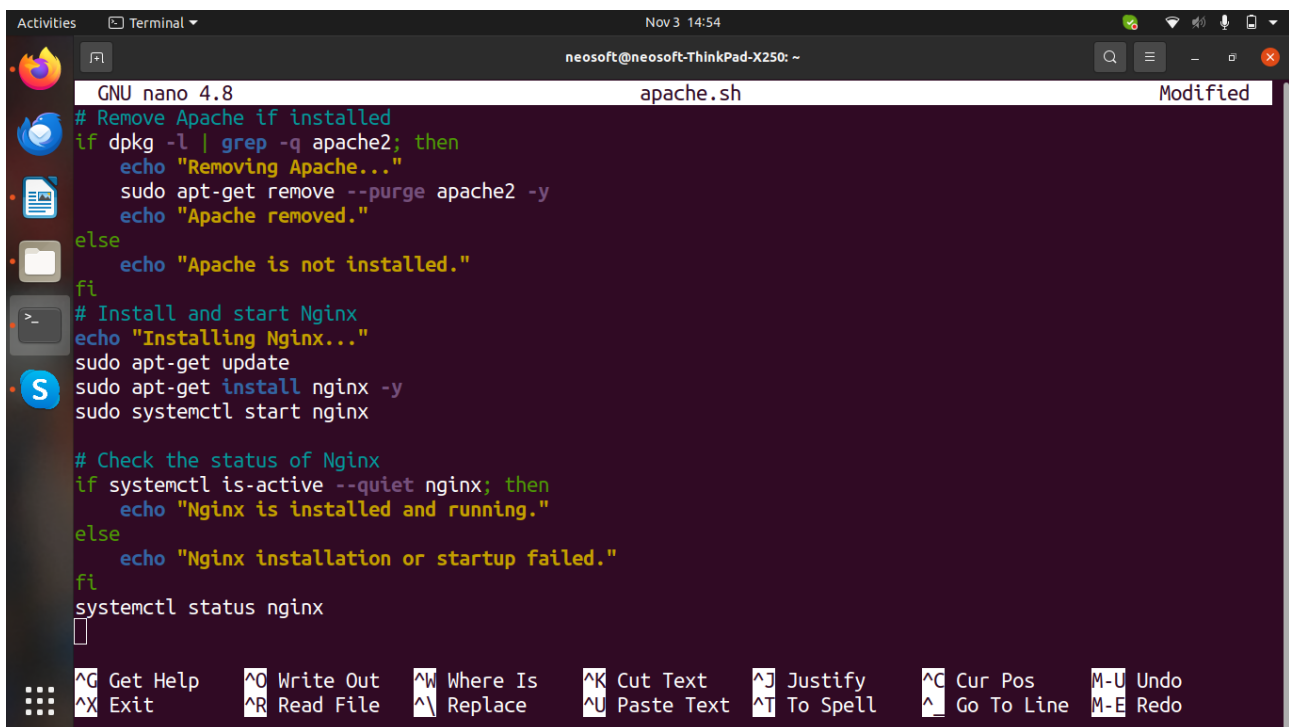
`=~` is a pattern matching operator

2. Create a bash script which will check if the apache is installed; if installed it will remove the apache and will install nginx.



A terminal window titled "Terminal" with the date "Nov 3 14:56" and the user "neosoft@neosoft-ThinkPad-X250: ~". The terminal shows the following commands and output:

```
neosoft@neosoft-ThinkPad-X250:~$ nano apache.sh
neosoft@neosoft-ThinkPad-X250:~$ chmod +x apache.sh
neosoft@neosoft-ThinkPad-X250:~$
```



A terminal window titled "Terminal" with the date "Nov 3 14:54" and the user "neosoft@neosoft-ThinkPad-X250: ~". The terminal shows the contents of the file "apache.sh" using the "nano" editor. The script is as follows:

```
GNU nano 4.8 apache.sh Modified
# Remove Apache if installed
if dpkg -l | grep -q apache2; then
    echo "Removing Apache..."
    sudo apt-get remove --purge apache2 -y
    echo "Apache removed."
else
    echo "Apache is not installed."
fi

# Install and start Nginx
echo "Installing Nginx..."
sudo apt-get update
sudo apt-get install nginx -y
sudo systemctl start nginx

# Check the status of Nginx
if systemctl is-active --quiet nginx; then
    echo "Nginx is installed and running."
else
    echo "Nginx installation or startup failed."
fi
systemctl status nginx
```

At the bottom of the terminal, there is a status bar with various keyboard shortcuts: `^G Get Help`, `^O Write Out`, `^W Where Is`, `^K Cut Text`, `^J Justify`, `^C Cur Pos`, `M-U Undo`, `^X Exit`, `^R Read File`, `^_ Replace`, `^U Paste Text`, `^T To Spell`, `^_ Go To Line`, and `M-E Redo`.

Explaining the script:

- `if dpkg -l | grep -q apache2; then`

this command is used to list all the packages on the system and finding the 'apache2'

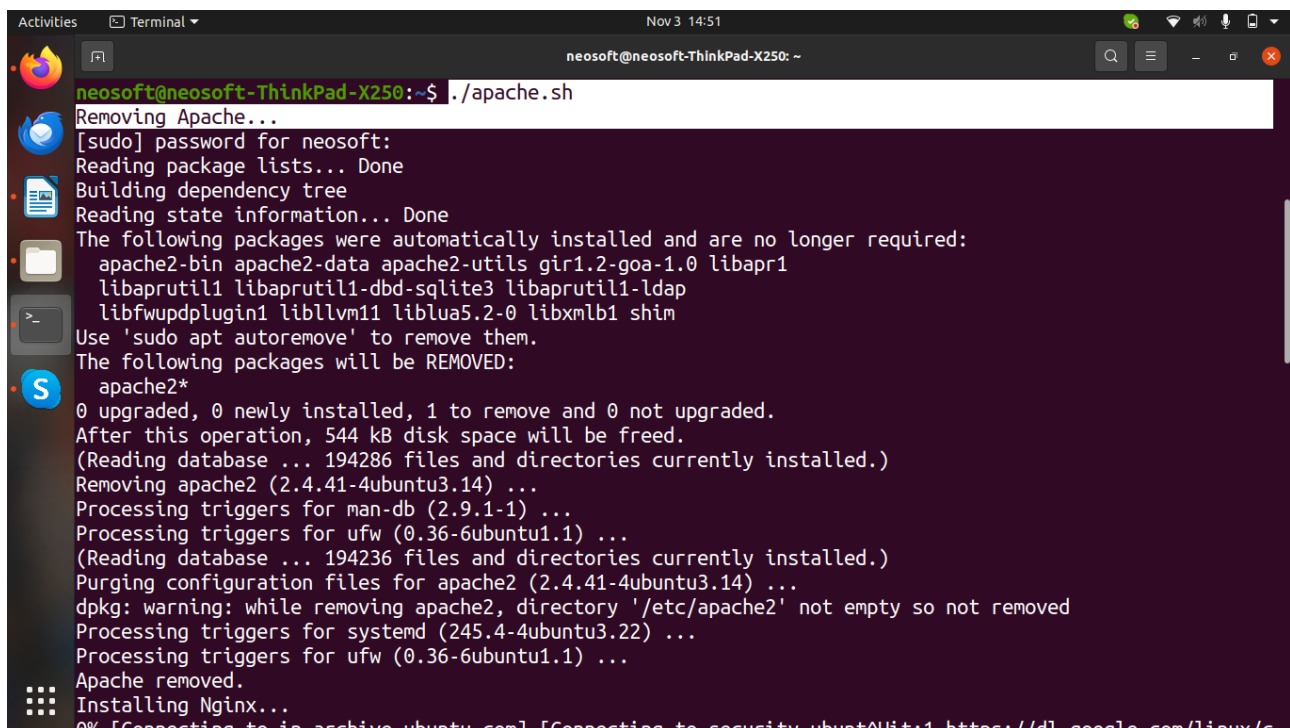
- `sudo apt-get remove --purge apache2 -y:`

if apache package is found then with this command it is removed

- After removing the apache message is displayed that Apache is removed and the nginx is installed by the command:

`sudo apt-get install nginx -y`

`sudo systemctl start nginx`



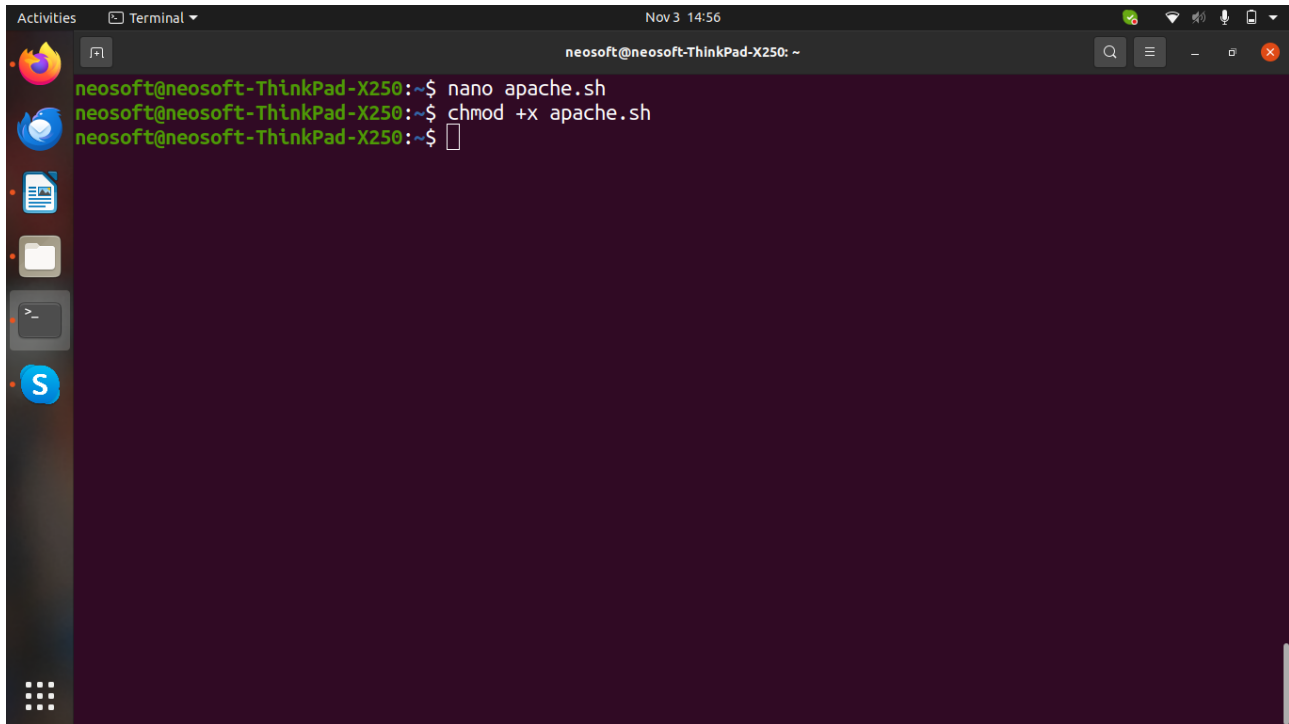
```
neosoftware@neosoftware-ThinkPad-X250: ~$ ./apache.sh
Removing Apache...
[sudo] password for neosoftware:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  apache2-bin apache2-data apache2-utils gir1.2-goa-1.0 libapr1
  libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap
  libfwupdplugin1 libllvm11 liblua5.2-0 libxmlb1 shim
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  apache2*
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 544 kB disk space will be freed.
(Reading database ... 194286 files and directories currently installed.)
Removing apache2 (2.4.41-4ubuntu3.14) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for ufw (0.36-6ubuntu1.1) ...
(Reading database ... 194236 files and directories currently installed.)
Purging configuration files for apache2 (2.4.41-4ubuntu3.14) ...
dpkg: warning: while removing apache2, directory '/etc/apache2' not empty so not removed
Processing triggers for systemd (245.4-4ubuntu3.22) ...
Processing triggers for ufw (0.36-6ubuntu1.1) ...
Apache removed.
Installing Nginx...
0% [Connecting to in.archive.ubuntu.com] [Connecting to security.ubuntu.com] [Hit:1 https://dl.google.com/linux/c
```

```
Activities Terminal Nov 3 14:51
neosoftware@neosoftware-ThinkPad-X250: ~
Apache removed.
Installing Nginx...
0% [Connecting to in.archive.ubuntu.com] [Connecting to security.ubuntu.com] Hit:1 https://dl.google.com/linux/chrome/deb stable InRelease
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:3 http://security.ubuntu.com/ubuntu focal-security/main i386 Packages [672 kB]
Get:4 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [2,564 kB]
Hit:5 http://in.archive.ubuntu.com/ubuntu focal InRelease
Get:6 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu focal-updates/main i386 Packages [906 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2,973 kB]
Get:10 http://security.ubuntu.com/ubuntu focal-security/main amd64 DEP-11 Metadata [59.9 kB]
Get:11 http://security.ubuntu.com/ubuntu focal-security/main amd64 c-n-f Metadata [13.2 kB]
Get:12 http://security.ubuntu.com/ubuntu focal-security/restricted i386 Packages [34.7 kB]
Get:13 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [2,367 kB]
Get:14 http://security.ubuntu.com/ubuntu focal-security/restricted Translation-en [329 kB]
Get:15 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 c-n-f Metadata [552 B]
Get:16 http://security.ubuntu.com/ubuntu focal-security/universe i386 Packages [619 kB]
Get:17 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [899 kB]
Get:18 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 DEP-11 Metadata [275 kB]
Get:19 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [17.2 kB]
Get:20 http://in.archive.ubuntu.com/ubuntu focal-updates/restricted i386 Packages [36.2 kB]
Get:21 http://in.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [2,480 kB]
Get:22 http://security.ubuntu.com/ubuntu focal-security/universe Translation-en [188 kB]
Get:23 http://security.ubuntu.com/ubuntu focal-security/universe amd64 DEP-11 Metadata [96.9 kB]
Get:24 http://security.ubuntu.com/ubuntu focal-security/universe amd64 c-n-f Metadata [19.2 kB]
```

```
Activities Terminal Nov 3 14:52
neosoftware@neosoftware-ThinkPad-X250: ~
nginx is already the newest version (1.18.0-0ubuntu1.4).
The following packages were automatically installed and are no longer required:
apache2-bin apache2-data apache2-utils gir1.2-goa-1.0 libapr1
libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap
libfwupdplugin1 libllvm11 liblua5.2-0 libxmlb1 shim
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
Nginx is installed and running.
neosoftware@neosoftware-ThinkPad-X250:~$ systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
   Loaded: loaded (/lib/systemd/system/nginx.service; disabled; vendor preset: enabled)
   Active: active (running) since Fri 2023-11-03 14:10:01 IST; 42min ago
     Docs: man:nginx(8)
  Main PID: 14610 (nginx)
    Tasks: 5 (limit: 9277)
   Memory: 5.9M
    CGroup: /system.slice/nginx.service
            └─14610 nginx: master process /usr/sbin/nginx -g daemon on; master_process on;
               └─14611 nginx: worker process
                  14612 nginx: worker process
                  14613 nginx: worker process
                  14614 nginx: worker process

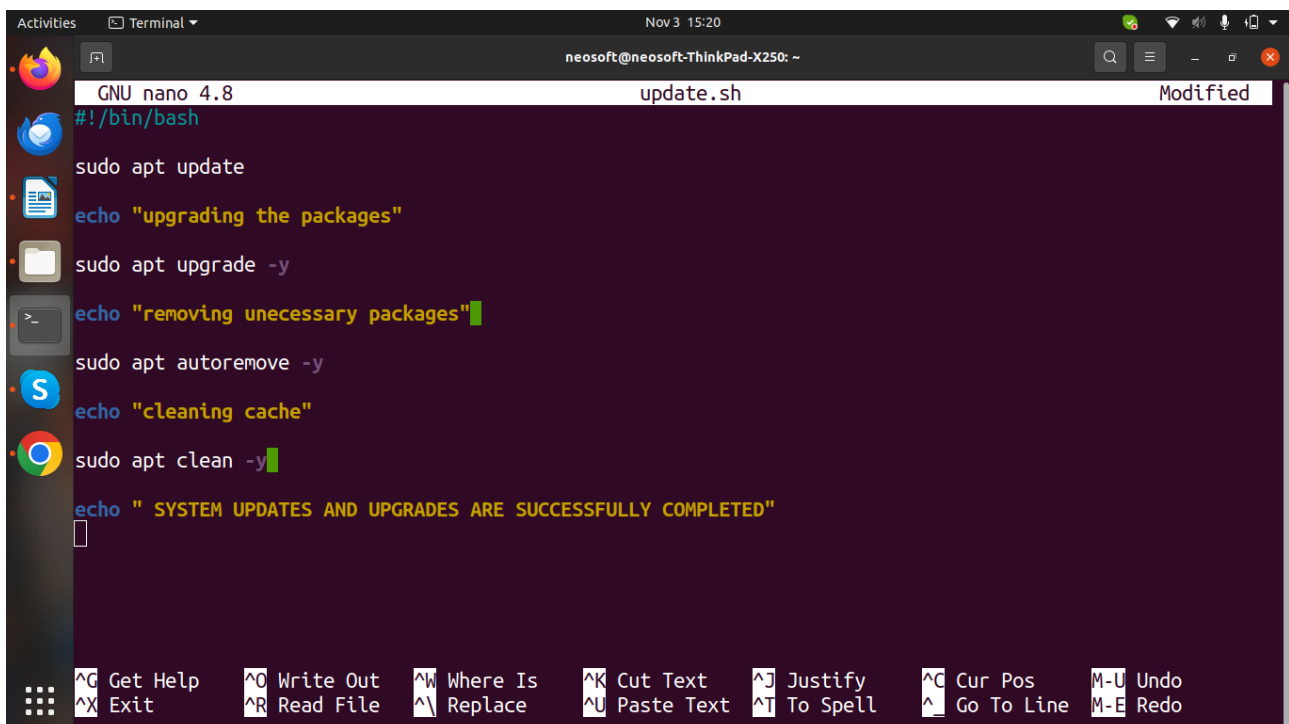
Nov 03 14:10:01 neosoftware-ThinkPad-X250 systemd[1]: Starting A high performance web server and a reverse pr
Nov 03 14:10:01 neosoftware-ThinkPad-X250 systemd[1]: Started A high performance web server and a reverse pr
lines 1-16/16 (END)
```

3. Create a bsah script which will check the linux distribution and will execute update commands for the specific distribution.



A terminal window titled "Terminal" with the date "Nov 3 14:56" and the user "neosoft@neosoft-ThinkPad-X250: ~". The terminal shows the following commands and output:

```
neosoft@neosoft-ThinkPad-X250:~$ nano apache.sh
neosoft@neosoft-ThinkPad-X250:~$ chmod +x apache.sh
neosoft@neosoft-ThinkPad-X250:~$
```



A terminal window titled "Terminal" with the date "Nov 3 15:20" and the user "neosoft@neosoft-ThinkPad-X250: ~". The terminal shows the contents of a script named "update.sh" being edited in nano 4.8. The script contains the following commands:

```
#!/bin/bash
sudo apt update
echo "upgrading the packages"
sudo apt upgrade -y
echo "removing unnecessary packages"
sudo apt autoremove -y
echo "cleaning cache"
sudo apt clean -y
echo " SYSTEM UPDATES AND UPGRADES ARE SUCCESSFULLY COMPLETED"
```

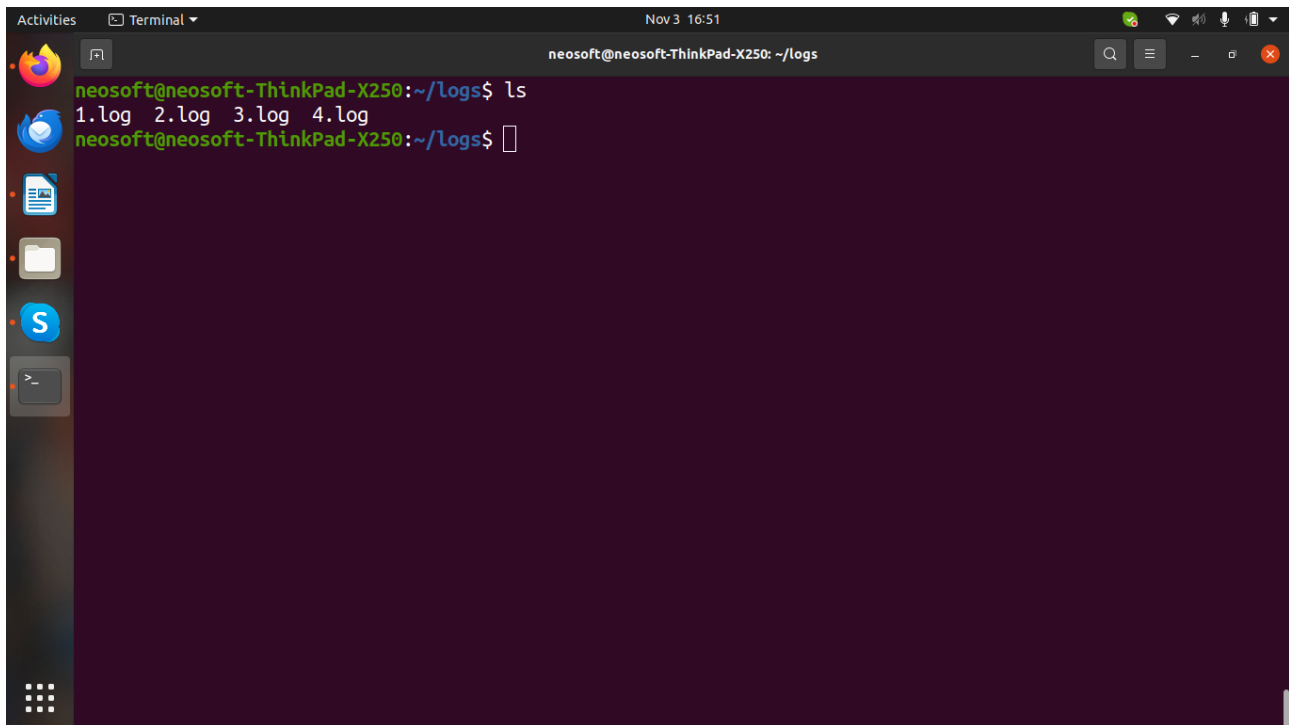
The terminal also shows a list of keyboard shortcuts at the bottom:

```
^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify    ^C Cur Pos   M-U Undo
^X Exit      ^R Read File  ^\ Replace   ^U Paste Text ^T To Spell  ^_ Go To Line M-E Redo
```

```
Activities Terminal Nov 3 15:23
neosoft@neosoft-ThinkPad-X250: ~
neosoft@neosoft-ThinkPad-X250:~$ ./update.sh
[sudo] password for neosoft:
Hit:1 https://dl.google.com/linux/chrome/deb stable InRelease
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:3 http://in.archive.ubuntu.com/ubuntu focal InRelease
Get:4 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 DEP-11 Metadata [59.9 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/universe amd64 DEP-11 Metadata [97.0 kB]
Get:8 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 DEP-11 Metadata [940 B]
Get:9 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 DEP-11 Metadata [274 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-11 Metadata [414 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 DEP-11 Metadata [944 B]
Get:12 http://in.archive.ubuntu.com/ubuntu focal-backports/main amd64 DEP-11 Metadata [7,976 B]
Get:13 http://in.archive.ubuntu.com/ubuntu focal-backports/universe amd64 DEP-11 Metadata [30.5 kB]
Fetched 1,222 kB in 11s (114 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
upgrading the packages
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
  apache2-bin apache2-data apache2-utils gir1.2-goa-1.0 libapr1 libaprutil1 libaprutil1-dbd-sqlite3
  libaprutil1-ldap libfwupdplugin1 liblvm1 liblua5.2-0 libxmlb1 shim
Use 'sudo apt autoremove' to remove them.
#
# Canonical released microcode updates for both Intel (CVE-2022-40982) and AMD
# (CVE-2023-20503). 'Unattended-upgrades' provide security updates by default
```

```
Activities Terminal Nov 3 15:23
neosoft@neosoft-ThinkPad-X250: ~
Unpacking libsndfile1:amd64 (1.0.28-7ubuntu0.2) over (1.0.28-7ubuntu0.1) ...
Setting up libsndfile1:amd64 (1.0.28-7ubuntu0.2) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
removing unnecessary packages
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be REMOVED:
  apache2-bin apache2-data apache2-utils gir1.2-goa-1.0 libapr1 libaprutil1 libaprutil1-dbd-sqlite3
  libaprutil1-ldap libfwupdplugin1 liblvm1 liblua5.2-0 libxmlb1 shim
0 upgraded, 0 newly installed, 13 to remove and 0 not upgraded.
After this operation, 91.3 MB disk space will be freed.
(Reading database ... 194070 files and directories currently installed.)
Removing apache2-bin (2.4.41-4ubuntu3.14) ...
Removing apache2-data (2.4.41-4ubuntu3.14) ...
Removing apache2-utils (2.4.41-4ubuntu3.14) ...
Removing gir1.2-goa-1.0:amd64 (3.36.1-0ubuntu1) ...
Removing libaprutil1-dbd-sqlite3:amd64 (1.6.1-4ubuntu2.2) ...
Removing libaprutil1-ldap:amd64 (1.6.1-4ubuntu2.2) ...
Removing libaprutil1:amd64 (1.6.1-4ubuntu2.2) ...
Removing libapr1:amd64 (1.6.5-1ubuntu1) ...
Removing libfwupdplugin1:amd64 (1.5.11-0ubuntu1~20.04.2) ...
Removing liblvm1:amd64 (1:11.0.0-2-ubuntu20.04.1) ...
Removing liblua5.2-0:amd64 (5.2.4-1.1build3) ...
Removing libxmlb1:amd64 (0.1.15-2ubuntu1~20.04.1) ...
Removing shim (15.7-0ubuntu1) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
cleaning cache
SYSTEM UPDATES AND UPGRADES ARE SUCCESSFULLY COMPLETED
neosoft@neosoft-ThinkPad-X250:~$
```

4. Create a bash script which will compress all the files in a specific directory which have .log as extension. Also add a cronjob which will execute at a certain time.

A screenshot of a Linux terminal window. The window title is "Terminal" and the system clock shows "Nov 3 16:51". The terminal prompt is "neosoftware@neosoftware-ThinkPad-X250: ~/logs". The user has entered the command "ls" and the output is "1.log 2.log 3.log 4.log". The terminal has a dark purple background and a sidebar on the left with application icons.

```
neosoftware@neosoftware-ThinkPad-X250: ~/logs$ ls
1.log 2.log 3.log 4.log
neosoftware@neosoftware-ThinkPad-X250: ~/logs$
```



```
Activities Terminal Nov 3 16:57 neosoft@neosoft-ThinkPad-X250: ~
GNU nano 4.8 compress.sh
#!/bin/bash

# Directory containing log files
log_directory=/home/neosoft/logs/

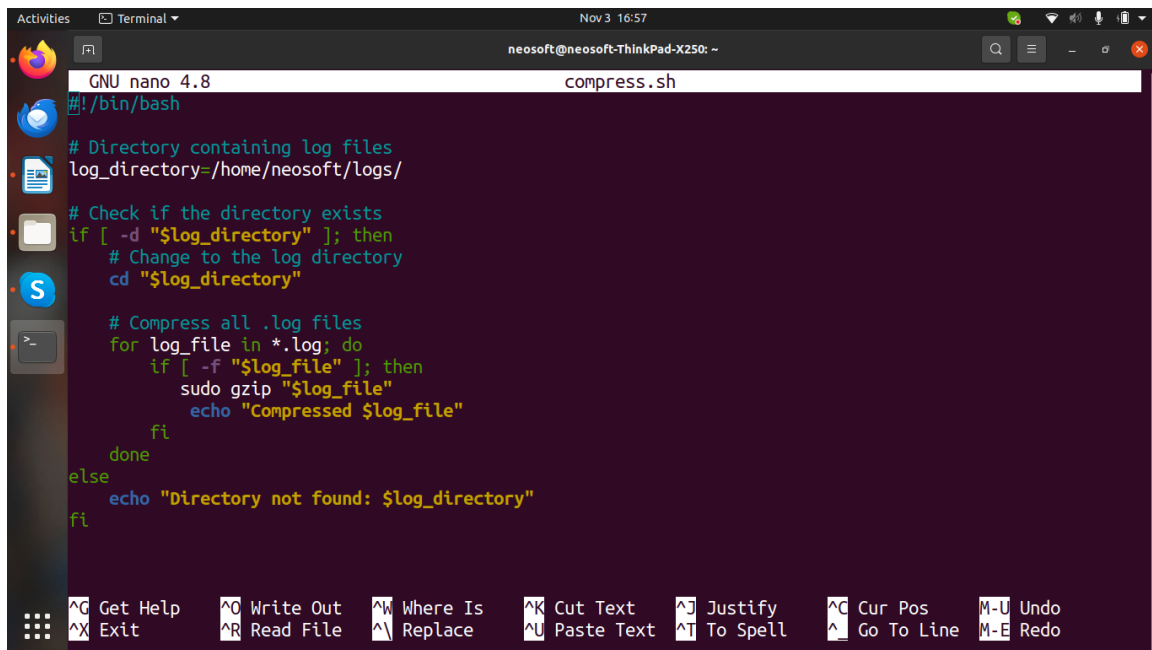
# Check if the directory exists
if [ -d "$log_directory" ]; then
    # Change to the log directory
    cd "$log_directory"

    # Compress all .log files
    for log_file in *.log; do
        if [ -f "$log_file" ]; then
            sudo gzip "$log_file"
            echo "Compressed $log_file"
        fi
    done
else
    echo "Directory not found: $log_directory"
fi

^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify ^C Cur Pos ^M-U Undo
^X Exit ^R Read File ^\ Replace ^U Paste Text ^T To Spell ^_ Go To Line ^M-E Redo
```

```
Activities Terminal Nov 3 17:00 neosoft@neosoft-ThinkPad-X250: ~
GNU nano 4.8 /tmp/crontab.M9XdIP/crontab
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
# m h dom mon dow command
57 16 * * * /home/neosoft/compress.sh
```

Mentioning the time when the script should be executed.



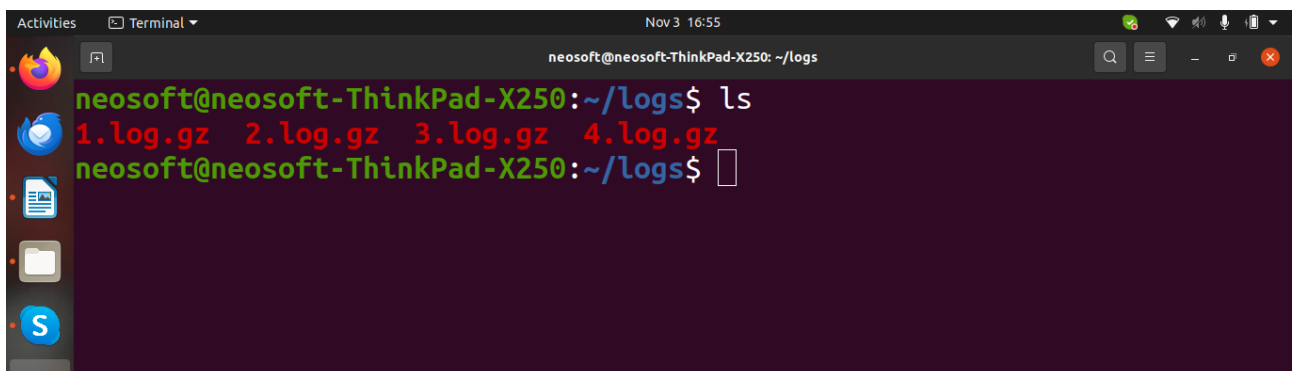
```
GNU nano 4.8 compress.sh
#!/bin/bash

# Directory containing log files
log_directory=/home/neosoft/logs/

# Check if the directory exists
if [ -d "$log_directory" ]; then
    # Change to the log directory
    cd "$log_directory"

    # Compress all .log files
    for log_file in *.log; do
        if [ -f "$log_file" ]; then
            sudo gzip "$log_file"
            echo "Compressed $log_file"
        fi
    done
else
    echo "Directory not found: $log_directory"
fi
```

- Specifying the path where the log files are stored
- Compressing the files ending with .log using gzip



```
neosoftware@neosoftware-ThinkPad-X250:~/logs$ ls
1.log.gz 2.log.gz 3.log.gz 4.log.gz
neosoftware@neosoftware-ThinkPad-X250:~/logs$
```

The files are compressed using the script and executing at specific time with the help of crontab.