PRINT TESTS (1,2):-

```
rps@rps-virtual-machine:~$ echo "hello world"
hello world
rps@rps-virtual-machine:~$ vim test.sh
rps@rps-virtual-machine:~$ sh test.sh
hello world
rps@rps-virtual-machine:~$ cat test.sh
#/bin/bin/env bash
echo "hello world"
rps@rps-virtual-machine:~$ cp test.sh test1.sh
rps@rps-virtual-machine:~$ vim test1.sh
rps@rps-virtual-machine:~$ sh test1.sh
hello world
rps@rps-virtual-machine:~$ cat test1.sh
#/bin/bin/env bash
message="hello world"
echo $message
rps@rps-virtual-machine:~$ cp test1.sh test2.sh
rps@rps-virtual-machine:~$ vim test2.sh
rps@rps-virtual-machine:~$ sh test2.sh
test2.sh: 6: Syntax error: "fi" unexpected (expecting "then")
rps@rps-virtual-machine:~$ cat test2.sh
#/bin/bin/env bash
num=100
if [ $num -gt 50 ]
        message="hello world"
        echo $message
fi

rps@rps-virtual-machine:~$
```

```
rps@rps-virtual-machine:~$ cat test.sh
#/bin/bin/env bash
echo "hello world"
rps@rps-virtual-machine:~$ cat test1.sh
#/bin/bin/env bash
message="hello world"
echo $message
rps@rps-virtual-machine:~$ cat test2.sh
#/bin/bin/env bash
num=100
if [ $num -gt 50 ]
        message="hello world"
        echo $message
fi
```

PRINT TESTS(3,4)

```
rps@rps-virtual-machine:~$ cp test2.sh test3.sh
rps@rps-virtual-machine:~$ vim test3.sh
rps@rps-virtual-machine:~$ sh test3.sh
hello world
rps@rps-virtual-machine:~$ cat test3.sh
#/bin/bin/env bash
for x in {1..10}
do
        message="hello world"
        echo $message
done

rps@rps-virtual-machine:~$ vim test3.sh
rps@rps-virtual-machine:~$ sh test3.sh
test3.sh: 3: Syntax error: Bad for loop variable
rps@rps-virtual-machine:~$ cat test3.sh
#/bin/bin/env bash
num=0
for (( i=1; i<=5; i++));
do
        message="hello world"
        echo $message
        num=$((num+1))
        echo $num
done

rps@rps-virtual-machine:~$ cp test3.sh test4.sh
rps@rps-virtual-machine:~$ vim test4.sh
rps@rps-virtual-machine:~$ sh test4.sh
```

search

```
rps@rps-virtual-machine:~$ cat test3.sh
#/bin/bin/env bash
num=0
for (( i=1; i<=5; i++));
do
        message="hello world"
        echo $message
        num=$((num+1))
        echo $num
done

rps@rps-virtual-machine:~$ cp test3.sh test4.sh
rps@rps-virtual-machine:~$ vim test4.sh
rps@rps-virtual-machine:~$ sh test4.sh
I like to eat apple
I like to eat babana
I like to eat cherry
test4.sh: 8: Syntax error: Bad for loop variable
rps@rps-virtual-machine:~$ cat test4.sh
#/bin/bash
#looping through a list of elements
for item in apple babana cherry; do
        echo "I like to eat $item"
done

#Looping through a list of elements
for (( i=1; i<=5; i++ )); do
        echo "Current number: $i"
done
rps@rps-virtual-machine:~$ █
```

TEST - 4 :-

```
rps@rps-virtual-machine:~$ vim test4.sh
rps@rps-virtual-machine:~$ bash test4.sh
hello world
1
hello world
2
hello world
3
hello world
4
hello world
5
hello world
6
hello world
7
hello world
8
hello world
9
hello world
10
rps@rps-virtual-machine:~$ cat test4.sh
#/bin/bash/env bash
num=0
for i in {1..10}
do
        message="hello world"
        echo $message
        num=$((num + 1))
        echo $num
done
rps@rps-virtual-machine:~$
```

Bash Scripting: Exercise

Exercise 1: Write a shell script called num_loop.sh that loops through every number 1 through 20 and prints each number to standard output. The script should also conditionally print I'm big! for every number larger than 10.

```
rps@rps-virtual-machine:~$ vim num_loop.sh
rps@rps-virtual-machine:~$ ./num_loop.sh
bash: ./num_loop.sh: Permission denied
rps@rps-virtual-machine:~$ cat num_loop.sh
#!/bin/bash
for i in {1..20}
do
        echo $i
        if [$i -gt 10] then
                echo "i am big"
        fi
done
rps@rps-virtual-machine:~$
```

Bash Scripting: Functions

We can also define functions!

```
adrazen@ayelet-computer ~ % sh mcd.sh my_folder

#!/usr/bin/env bash

make_and_enter() {
    mkdir -p "$1"
    cd "$1"
}

make_and_enter $1
```

```
done
rps@rps-virtual-machine:~$ vim function.sh
rps@rps-virtual-machine:~$ bash function.sh
mkdir: cannot create directory '': No such file or directory
rps@rps-virtual-machine:~$ cat function.sh
#!/use/bin/env bash
make_and_enter() {
        mkdir -p "$1"
        cd "$1"
}
make_and_enter $1
rps@rps-virtual-machine:~$
```

```
rps@rps-virtual-machine: $ ls
assignment  df          exercises   file5.txt        history.txt     message.txt  num_loop.sh  Public     test1      test.sh
basename    Documents   file1.txt   file6.txt        linux           Music        password     README.md  test1.sh   type
book        dognames    file2.txt   file.txt         long_text.txt   mv           Pictures     snap       test2.sh   Videos
dem.txt     Downloads   file3.txt   function.sh      ls              mydir        projects     Templates  test3.sh
Desktop     du          file4.txt   historyfile.txt  manbasename     mydirectory  Projects     test       test4.sh
rps@rps-virtual-machine: $
```

Bash Scripting: Exercise

Exercise 2: Write a shell script called `my_folder.sh` that takes in two arguments: your name (e.g. `ayelet`) and your name with the `.txt` ending (e.g. `ayelet.txt`). The script should call a function that creates a folder by the name of the first argument (e.g. `ayelet`) and then create a file inside by the name of the second argument (e.g. `ayelet.txt`).

For my name, my function would create a folder named `ayelet` and a file named `ayelet.txt` inside of `ayelet`.

```
rps@rps-virtual-machine:~$ mkdir ayelet
rps@rps-virtual-machine:~$ cd ayelet
rps@rps-virtual-machine:~/ayelet$ ayelet.txt
ayelet.txt: command not found
rps@rps-virtual-machine:~/ayelet$ cat > ayelet.txt
This is a ayelet file
rps@rps-virtual-machine:~/ayelet$ cat  ayelet.txt
This is a ayelet file
```

File Search:

Write a command to find all files with the extension .txt in the /home directory and its subdirectories.

A: find /home -type f -name "*.txt"

find: The command used to search for files and directories.

- /home: The directory where the search begins.

- -type f: This option tells find to look for files only (not directories).

- -name "*.txt": This option specifies the pattern to match for file names, in this case, files ending with .txt.

```
rps@rps-virtual-machine:~$ find /home -type f -name "*.txt"
/home/rps/.local/share/CMakeTools/log.txt
/home/rps/.pki/nssdb/pkcs11.txt
/home/rps/.cache/tracker3/files/last-crawl.txt
/home/rps/.cache/tracker3/files/locale-for-miner-apps.txt
/home/rps/.cache/tracker3/files/first-index.txt
/home/rps/commands/newfile.txt
/home/rps/ayelet/ayelet.txt
/home/rps/Documents/file1.txt
/home/rps/Documents/data.txt
/home/rps/Documents/test.txt
/home/rps/snap/firefox/common/.mozilla/firefox/6oz9udyh.default/SiteSecurityServiceState.tx
/home/rps/snap/firefox/common/.mozilla/firefox/6oz9udyh.default/pkcs11.txt
/home/rps/snap/firefox/common/.mozilla/firefox/6oz9udyh.default/serviceworker.txt
/home/rps/snap/firefox/common/.mozilla/firefox/6oz9udyh.default/AlternateServices.txt
/home/rps/file.txt
/home/rps/desktop/example1.txt
/home/rps/message.txt
/home/rps/sample.txt
```

File Permissions:

Write a command to change the permissions of all files in the /var/log directory to 644.

A: **find /var/log -type f -exec chmod 644 {} \;**

- find: The command used to search for files and directories.

- /var/log: The directory where the search begins.

- -type f: This option tells find to look for files only (not directories).

- -exec: This option allows you to execute a command on each file found by find.

- -exec: This option allows you to execute a command on each file found by find.

- chmod 644 {}: The command to change the file permissions to 644, where {} is a placeholder for each file found.

- \;: This indicates the end of the -exec command.

```
rps@rps-virtual-machine:-$ find /var/log -type f -exec chmod 644 {} \;
chmod: changing permissions of '/var/log/vmware-network.1.log': Operation not permitted
chmod: changing permissions of '/var/log/alternatives.log.1': Operation not permitted
chmod: changing permissions of '/var/log/cups/access_log.5.gz': Operation not permitted
chmod: changing permissions of '/var/log/cups/access_log.3.gz': Operation not permitted
chmod: changing permissions of '/var/log/cups/access_log.1': Operation not permitted
chmod: changing permissions of '/var/log/cups/access_log.2.gz': Operation not permitted
chmod: changing permissions of '/var/log/cups/access_log': Operation not permitted
chmod: changing permissions of '/var/log/cups/access_log.4.gz': Operation not permitted
chmod: changing permissions of '/var/log/cups/access_log.7.gz': Operation not permitted
chmod: changing permissions of '/var/log/cups/access_log.6.gz': Operation not permitted
chmod: changing permissions of '/var/log/boot.log': Operation not permitted
chmod: changing permissions of '/var/log/dmesg.2.gz': Operation not permitted
chmod: changing permissions of '/var/log/vmware-vmusr-rps.log': Operation not permitted
chmod: changing permissions of '/var/log/vmware-network.4.log': Operation not permitted
chmod: changing permissions of '/var/log/vmware-vmtoolsd-rps.log': Operation not permitted
chmod: changing permissions of '/var/log/vmware-network.8.log': Operation not permitted
chmod: changing permissions of '/var/log/auth.log.4.gz': Operation not permitted
chmod: changing permissions of '/var/log/kern.log.1': Operation not permitted
chmod: changing permissions of '/var/log/alternatives.log.3.gz': Operation not permitted
chmod: changing permissions of '/var/log/vmware-network.7.log': Operation not permitted
chmod: changing permissions of '/var/log/wtmp': Operation not permitted
chmod: changing permissions of '/var/log/kern.log.2.gz': Operation not permitted
chmod: changing permissions of '/var/log/syslog.4.gz': Operation not permitted
chmod: changing permissions of '/var/log/syslog.1': Operation not permitted
chmod: changing permissions of '/var/log/syslog': Operation not permitted
chmod: changing permissions of '/var/log/dpkg.log.1': Operation not permitted
find: '/var/log/gdm3': Permission denied
chmod: changing permissions of '/var/log/vmware-vmsvc-root.1.log': Operation not permitted
chmod: changing permissions of '/var/log/dmesg.4.gz': Operation not permitted
chmod: changing permissions of '/var/log/journal/20e4fcbd122f4fb0b036e74c4f6d9b44/user-1000@f8beab58a53d4bf6a65a8a0d9f396dfb-0000000000000630
-0006186625ef95a4.journal': Operation not permitted
chmod: changing permissions of '/var/log/journal/20e4fcbd122f4fb0b036e74c4f6d9b44/user-1000@70984ea93b30447a8e3927d5d03ae4c1-000000000000144c
-0006133d3922ec0a.journal': Operation not permitted
chmod: changing permissions of '/var/log/journal/20e4fcbd122f4fb0b036e74c4f6d9b44/system@954f87e3a771428c9ada25eede39891a-00000000000011a2-00
```

Process Management:

Write a command to list all running processes that contain the name "apache" in their command line.

ps -ef | grep apache

- ps stands for "process status".

- e stands for "all" and shows all running processes.

- f stands for "full" and shows the full command line.

- grep apache searches for the pattern "apache" in the output of the ps command.

```
rps@rps-virtual-machine:~$ ps -ef|grep apache
rps         28071   27534  0 15:24 pts/0    00:00:00 grep --color=auto apache
```

Text Processing:

Write a command to count the number of lines in a file named error.log.

Text Processing:
Write a command to count the number of lines in a file named error.log.

wc -l error.log

```
rps@rps-virtual-machine:~$ ls
add       data_archive  Documents  exercises  fil2.sh  hello.cpp  loop.cpp  Pictures  snap  swap.cpp  test3.sh   test5.sh  tst1.sh  tst.sh
add.cpp   Desktop       Downloads  fil1.sh    hello    loop       Music     Public    swap  Templates  test4.bash  test_sh   tst2.sh  Videos
rps@rps-virtual-machine:~$ wc -l test3.sh
9 test3.sh
rps@rps-virtual-machine:~$
```

Network Configuration:

Write a command to display the IP address of all network interfaces on the system.

ipaddr show | grep "inet "

```
rps@rps-virtual-machine:~$ ip addr show | grep "inet"
    inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
    inet 172.20.0.45/24 brd 172.20.0.255 scope global dynamic noprefixroute ens192
    inet6 fe80::3b17:ba42:3eba:359e/64 scope link noprefixroute
rps@rps-virtual-machine:~$
```

Package Management:

Write a command to install a package named htop using the package manager.

sudo apt-get install htop

```
rps@rps-virtual-machine:~$ sudo apt-get install htop
[sudo] password for rps:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libflashrom1 libftdi1-2 libllvm13 libwpe-1.0-1 libwpebackend-fdo-1.0-1
Use 'sudo apt autoremove' to remove them.
Suggested packages:
  lm-sensors
The following NEW packages will be installed:
  htop
0 upgraded, 1 newly installed, 0 to remove and 5 not upgraded.
Need to get 128 kB of archives.
After this operation, 342 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 htop amd64 3.0.5-7build2 [128 kB]
Fetched 128 kB in 2s (71.2 kB/s)
Selecting previously unselected package htop.
(Reading database ... 214001 files and directories currently installed.)
Preparing to unpack .../htop_3.0.5-7build2_amd64.deb ...
Unpacking htop (3.0.5-7build2) ...
Setting up htop (3.0.5-7build2) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for man-db (2.10.2-1) ...
rps@rps-virtual-machine:~$ 
```

User Management:

Write a command to add a new user named developer to the system.

Sudo useradd   developer

File Compression:

Write a command to compress a directory named backup into a .tar.gz file.

tar -czvf backup.tar.gz backup

System Monitoring:

Write a command to display real-time system resource usage, including CPU, memory, and disk I/O.

Top

```
top - 10:01:48 up 23 days, 19:53,  1 user,  load average: 3.10, 1.49, 0.62
Tasks: 264 total,   2 running, 261 sleeping,   0 stopped,   1 zombie
%Cpu(s): 14.7 us, 48.3 sy,  0.0 ni, 36.6 id,  0.0 wa,  0.0 hi,  0.5 si,  0.0 st
MiB Mem :  15984.7 total,   9510.2 free,   2559.6 used,   3914.9 buff/cache
MiB Swap:   2048.0 total,   2048.0 free,      0.0 used.  13020.9 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
 527723 rps       20   0    2776   1280   1280 S  88.8   0.0   2:18.79 hello
 502814 rps       20   0  566504  56072  42052 R  71.4   0.3   2:23.94 gnome-terminal-
 527181 root      20   0       0      0      0 I  29.9   0.0   0:29.15 kworker/u8:2-events_unbound
 527099 root      20   0       0      0      0 I  18.8   0.0   0:19.53 kworker/u8:3-events_unbound
 527724 root      20   0       0      0      0 I  11.5   0.0   0:26.58 kworker/u8:1-events_unbound
 527746 root      20   0       0      0      0 I   6.9   0.0   0:13.20 kworker/u8:5-events_unbound
 527614 root      20   0       0      0      0 I   5.6   0.0   0:29.53 kworker/u8:0-ext4-rsv-conversion
   1472 rps       20   0 5579500 457888 175436 S   2.0   2.8   1879:44 gnome-shell
   1329 rps        9 -11 1870728  23740  19388 S   1.3   0.1 699:43.99 pulseaudio
 527794 rps       20   0   13228   4224   3328 R   1.0   0.0   0:00.13 top
    413 systemd+  20   0   14836   6784   6016 S   0.3   0.0  72:33.54 systemd-oomd
 504221 root      20   0       0      0      0 I   0.3   0.0   0:09.32 kworker/0:0-events
      1 root      20   0  168096  12876   8140 S   0.0   0.1   0:54.63 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.30 kthreadd
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 slub_flushwq
      6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns
      8 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
     11 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
     12 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_kthread
     13 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_rude_kthread
     14 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_trace_kthread
     15 root      20   0       0      0      0 S   0.0   0.0   0:02.18 ksoftirqd/0
     16 root      20   0       0      0      0 I   0.0   0.0  10:26.71 rcu_preempt
     17 root      rt   0       0      0      0 S   0.0   0.0   0:12.15 migration/0
     18 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle_inject/0
     19 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
     20 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/1
```

Shell Scripts

Backup Script:

Write a shell script to back up a directory named /data to /backup with the current date appended to the backup file name.

```
     33 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle_inject/3
rps@rps-virtual-machine:~$ vim backup_script.sh
rps@rps-virtual-machine:~$ chmod +x backuo_script.sh
chmod: cannot access 'backuo_script.sh': No such file or directory
rps@rps-virtual-machine:~$ chmod +x backup_script.sh
rps@rps-virtual-machine:~$ ./backup_script.sh
mkdir: cannot create directory '/backup': Permission denied
date: extra operand '%Y-%m-%d'
Try 'date --help' for more information.
tar: Removing leading `/' from member names
tar: /data: Cannot stattar (child): /backup/data_backup_.tar.gz: Cannot open: No such file or directory
: No such file or directory
tar (child): Error is not recoverable: exiting now
tar: Child returned status 2
tar: Error is not recoverable: exiting now
Backup failed
rps@rps-virtual-machine:~$
```

Log Rotation:

Write a shell script to rotate log files in the /var/log directory, keeping only the last 7 days of logs.

```
rps@rps-virtual-machine:-$ vim log_r.sh
rps@rps-virtual-machine:-$ chmod +x log_r.sh
rps@rps-virtual-machine:-$ ./log_r.sh
date: extra operand '%Y-%m-%d'
Try 'date --help' for more information.
cp: cannot create regular file '/var/log/alternatives_.log': Permission denied
truncate: cannot open '/var/log/alternatives.log' for writing: Permission denied
date: extra operand '%Y-%m-%d'
Try 'date --help' for more information.
cp: cannot create regular file '/var/log/apport_.log': Permission denied
truncate: cannot open '/var/log/apport.log' for writing: Permission denied
date: extra operand '%Y-%m-%d'
Try 'date --help' for more information.
cp: cannot create regular file '/var/log/auth_.log': Permission denied
truncate: cannot open '/var/log/auth.log' for writing: Permission denied
date: extra operand '%Y-%m-%d'
Try 'date --help' for more information.
cp: cannot create regular file '/var/log/boot_.log': Permission denied
truncate: cannot open '/var/log/boot.log' for writing: Permission denied
date: extra operand '%Y-%m-%d'
Try 'date --help' for more information.
cp: cannot create regular file '/var/log/bootstrap_.log': Permission denied
truncate: cannot open '/var/log/bootstrap.log' for writing: Permission denied
date: extra operand '%Y-%m-%d'
Try 'date --help' for more information.
cp: cannot create regular file '/var/log/dpkg_.log': Permission denied
truncate: cannot open '/var/log/dpkg.log' for writing: Permission denied
date: extra operand '%Y-%m-%d'
```

User Report:

Write a shell script to generate a report of all users currently logged into the system and save it to a file named user_report.txt.

```
echo "Log rotation completed.
rps@rps-virtual-machine:~$ nano user_report.sh
rps@rps-virtual-machine:~$ chmod +x user_report.sh
rps@rps-virtual-machine:~$ ./user_report.sh
User report generated successfully. Check user_report.txt
rps@rps-virtual-machine:~$ cat user_report.sh
#!/bin/bash
# Store the current date and time
DATE=$(date +"%Y-%m-%d %H:%M:%S")

# Output header for the report
echo "User Report - Generated on $DATE"> user_report.txt
echo "==================================" >> user_report.txt
echo >> user_report.txt

# List all logged-in users and append to the report file
who >> user_report.txt

# Print completion message

echo "User report generated successfully. Check user_report.txt"
rps@rps-virtual-machine:~$
```

Disk Space Alert:

Write a shell script to check the disk usage of the /home directory and send an email alert if the usage exceeds 80%.

```
Try: sudo apt install <deb name>
rps@rps-virtual-machine:~$ nano disk_space_alert.sh
rps@rps-virtual-machine:~$ chmod +x disk_space_alert.sh
rps@rps-virtual-machine:~$ crontab -e
no crontab for rps - using an empty one

Select an editor.  To change later, run 'select-editor'.
  1. /bin/nano        <---- easiest
  2. /usr/bin/vim.basic
  3. /usr/bin/vim.tiny
  4. /usr/bin/code
  5. /bin/ed
```

```
THRESHOLD=80

# Get current disk usage percentage for /home directory
DISK_USAGE=$(df -h /home | awk 'NR==2 {print $5}' | sed 's/%//')

# Compare disk usage with the threshold
if [ "$DISK_USAGE" _GT "$THRESHOLD" ]; then

# Disk usage is above threshold, send an email alret
SUBJECT="Disk Space Alret on $(hostname)"
EMAIL="your-email@example.com
MESSAGE="/temp/disk_usgae_message.txt"

echo "Disk usgae in /home is above ${THRESHOLD}%" > "$MESSAGE"
echo >> "$MESSAGE"
df -h /home >> "$MESSAGE"

#Send email
mail -s "$SUBJECT" "$EMAIL" < "$MESSAGE"

# Clean up temporary message file
rm "$MESSAGE"
fi
```

Service Monitor:

Write a shell script to check if the nginx service is running and restart it if it is not.

Write a shell script to check if the nginx service is running and restart it if it is not.

```
# 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
```

```
rps@rps-virtual-machine:~$ nano check_nginx.sh
rps@rps-virtual-machine:~$ chmod +x check_nginx.sh
rps@rps-virtual-machine:~$ ./check_nginx.sh
nginx service is not running.
Restarting nginx service...
[sudo] password for rps:
Failed to restart nginx.service: Unit nginx.service not found.
Failed to restart nginx service.
rps@rps-virtual-machine:~$ sudo ./check_ngninx.sh
sudo: ./check_ngninx.sh: command not found
rps@rps-virtual-machine:~$ sudo ./check_nginx.sh
nginx service is not running.
Restarting nginx service...
Failed to restart nginx.service: Unit nginx.service not found.
Failed to restart nginx service.
rps@rps-virtual-machine:~$ crontab -e
no crontab for rps - using an empty one

Select an editor.  To change later, run 'select-editor'.
  1. /bin/nano        <---- easiest
  2. /usr/bin/vim.basic
  3. /usr/bin/vim.tiny
  4. /usr/bin/code
  5. /bin/ed

Choose 1-5 [1]: 1
No modification made
rps@rps-virtual-machine:~$
```

File Cleanup:

Write a shell script to delete all files older than 30 days in the /tmp directory.

```
rps@rps-virtual-machine:-$ nano cleanup_tmp.sh
rps@rps-virtual-machine:-$ chmod +x cleanup_tmp.sh
rps@rps-virtual-machine:-$ ./cleanup_tmp.sh
find: '/tmp/systemd-private-561770c9483244fca7157c8716063e16-systemd-logind.service-dFNZKu': Permission denied
find: '/tmp/systemd-private-561770c9483244fca7157c8716063e16-colord.service-wzcFB0': Permission denied
rm: cannot remove '/tmp/.X1025-lock': Operation not permitted
find: '/tmp/snap-private-tmp': Permission denied
rm: cannot remove '/tmp/.X1024-lock': Operation not permitted
find: '/tmp/systemd-private-561770c9483244fca7157c8716063e16-systemd-timesyncd.service-a4JbOA': Permission denied
find: '/tmp/systemd-private-561770c9483244fca7157c8716063e16-systemd-oomd.service-9y7eVP': Permission denied
find: '/tmp/vmware-root_455-2092382727': Permission denied
find: '/tmp/systemd-private-561770c9483244fca7157c8716063e16-switcheroo-control.service-ipCrjA': Permission denied
find: '/tmp/systemd-private-561770c9483244fca7157c8716063e16-power-profiles-daemon.service-1BIehN': Permission denied
find: '/tmp/systemd-private-561770c9483244fca7157c8716063e16-ModemManager.service-1UPu1v': Permission denied
find: '/tmp/systemd-private-561770c9483244fca7157c8716063e16-systemd-resolved.service-HweBE4': Permission denied
find: '/tmp/systemd-private-561770c9483244fca7157c8716063e16-upower.service-iFF3Rq': Permission denied
./cleanup_tmp.sh: line 14: /var/log/cleanup_tmp.log: Permission denied
rps@rps-virtual-machine:-$ cat cleanup_tmp.sh
#!/bin/bash

# Directory to clean up
directory="/tmp"

# Number of days to retain files
retention_days=30

# Find and delete files older than retention_days
find "$directory" -type f -mtime +$retention_days -exec rm -f {} \;

# Optional: Add a log entry for each cleanup
log_file="/var/log/cleanup_tmp.log"
echo "$(date +'%Y-%m-%d %H:%M:%S') - Deleted files older than $retention_days days in $directory" >> "$log_file"
rps@rps-virtual-machine:-$
```

Automated Updates:

Write a shell script to automatically update all installed packages on the system.

```
cleanup-completed
rps@rps-virtual-machine:-$ cd ~
rps@rps-virtual-machine:-$ vim update_packages.sh
rps@rps-virtual-machine:-$ chmod +x update_packages.sh
rps@rps-virtual-machine:-$ ./update_packages.sh
[sudo] password for rps:
Hit:1 https://packages.microsoft.com/repos/code stable InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Hit:5 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:6 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1,107 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe i386 Packages [722 kB]
Fetched 2,085 kB in 4s (502 kB/s)
```

Database Backup:

Write a shell script to back up a MySQL database named sales to a file named sales_backup.sql.

```
Package update completed.
rps@rps-virtual-machine:~$ cd ~
rps@rps-virtual-machine:~$ vim backup_sales_db.sh
rps@rps-virtual-machine:~$ chmod +x backup_sales_db.sh
rps@rps-virtual-machine:~$ ./backup_sales_db.sh
./backup_sales_db.sh: line 12: : No such file or directory
Database backup completed:
rps@rps-virtual-machine:~$ crontab -e
crontab: installing new crontab
rps@rps-virtual-machine:~$ cat backup_sales_db.sh
#!/bin/bash

# MySQL database credentials
DB_USER="your_username"
DB_PASS="your_password"
DB_NAME="sales"

# Backup file name and location
BACKUP_FILES="/path/to/sales_backup.sql"

# Dump the database to the backup file
mysqldump -u"$DB_USER" -p"$DB_PASS" "$DB_NAME" > "$BACKUP_FILE"

echo "Database backup completed: $BACKUP_FILE"
rps@rps-virtual-machine:~$
```

System Information:

Write a shell script to display system information, including hostname, OS version, and kernel version.

```
rps@rps-virtual-machine:~$ cd ~
rps@rps-virtual-machine:~$ nano system_info.sh
rps@rps-virtual-machine:~$ chmod +x system_info.sh
rps@rps-virtual-machine:~$ ./system_info.sh
Hostname: rps-virtual-machine
OS Version: Ubuntu 22.04.4 LTS
Kernel Version: 6.5.0-35-generic
rps@rps-virtual-machine:~$ cat system_info.sh
#!/bin/bash
 # Get hostname
HOSTNAME=$(hostname)

# Get OS version
OS_VERSION=$(lsb_release -d | awk -F"\t" '{print $2}')

# Get kernal version
KERNEL_VERSION=$(uname -r)

# Print system information
echo "Hostname: $HOSTNAME"
echo "OS Version: $OS_VERSION"
echo "Kernel Version: $KERNEL_VERSION"
rps@rps-virtual-machine:~$ 
```

Cron Job:

Write a shell script to schedule a cron job that runs a specific command every day at midnight.

```
rps@rps-virtual-machine:~$ cd ~
rps@rps-virtual-machine:~$ nano daily_task.sh
rps@rps-virtual-machine:~$ chmod +x daily_task.sh
rps@rps-virtual-machine:~$ crontab -e
crontab: installing new crontab
rps@rps-virtual-machine:~$ ./daily_task.sh
```