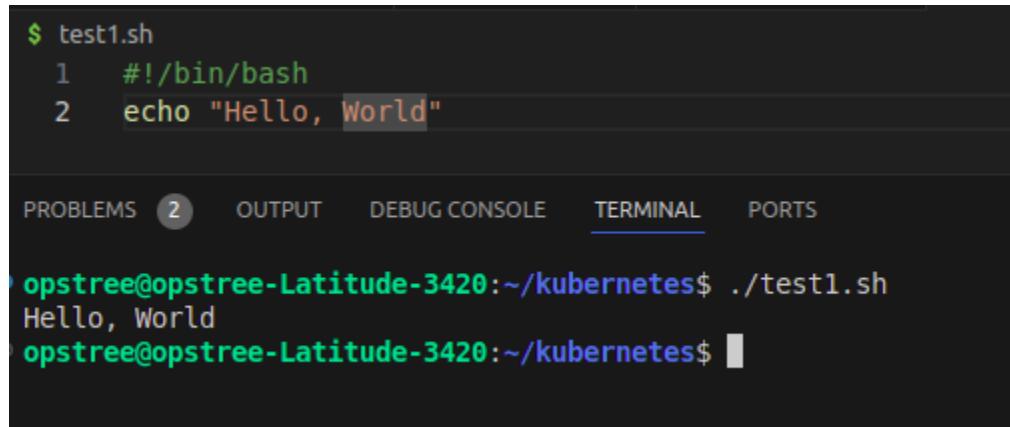


SUNNY KUMAR
18 JULY TASK

LSP

PRINT HELLO WORLD USING SHELL SCRIPT



The screenshot shows a terminal window with the following content:

```
$ test1.sh
1  #!/bin/bash
2  echo "Hello, World"

PROBLEMS 2      OUTPUT      DEBUG CONSOLE      TERMINAL      PORTS

opstree@opstree-Latitude-3420:~/kubernetes$ ./test1.sh
Hello, World
opstree@opstree-Latitude-3420:~/kubernetes$
```

The terminal window has tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL (which is underlined), and PORTS. The output shows the execution of the script and its output.

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`.

```
$ condition.sh
1  #!/bin/bash
2
3  # Loop through numbers 1 to 20
4  for i in {1..20}
5  do
6      echo $i
7      if [ $i -gt 10 ]; then
8          echo "I am big"
9      fi
10
11
12
13
14
15
16
17
18
19
20

opstree@opstree-Latitude-3420:~/kubernetes$ ./condition.sh
1
2
3
4
5
6
7
8
9
10
11
I am big
12
I am big
13
I am big
14
I am big
15
I am big
16
I am big
17
I am big
18
I am big
19
I am big
20
```

Q. Exercise:

Write a shell script that defines a function to create a directory and then change the current working directory to the newly created directory. The function should take one argument, which is the name of the directory to be created. The script should use this function to create a directory specified by the first command-line argument when the script is executed.

The screenshot shows a Visual Studio Code interface. On the left is the Explorer sidebar with a folder named 'RPS' expanded, showing subfolders like '.cache', '.config', '.dotnet', '.gnupg', '.local', '.pki', '.ssh', '.vscode', 'Desktop', 'Documents', 'Downloads', 'linux', 'lsp', 'Music', 'my_folder', 'Pictures', 'Public', 'shell_script', 'sks', 'snap'. Below these are 'OUTLINE' and 'TIMELINE' sections. The main area is a terminal window titled 'fun.sh - rps - Visual Studio Code' with the status bar showing 'Jul 18 12:46'. The terminal content includes:

```
$ test1.sh ● $ num_loop.sh ● $ fun.sh ✘ $ bash.sh
$ fun.sh
1 #!/bin/bash
2 make_and_enter()
3 {
4     mkdir -p "$1"
5     cd "$1"
6 }
7 make_and_enter "$1"

● rps@rps-virtual-machine:~/RPS$ ./fun.sh my_folder
● rps@rps-virtual-machine:~/RPS$ ls
1         fun.sh    hello.o      lsp        Public      Templates  Videos
bash.sh    hello    hello.s    Music      shell_script test      wipro
Desktop   hello.c   history.txt my_folder  sks        test1.sh  wipro_project
Documents hello.cpp  linux     num_loop.sh snap      test.txt
Downloads hello.i   long_text.txt Pictures  temp      version
```

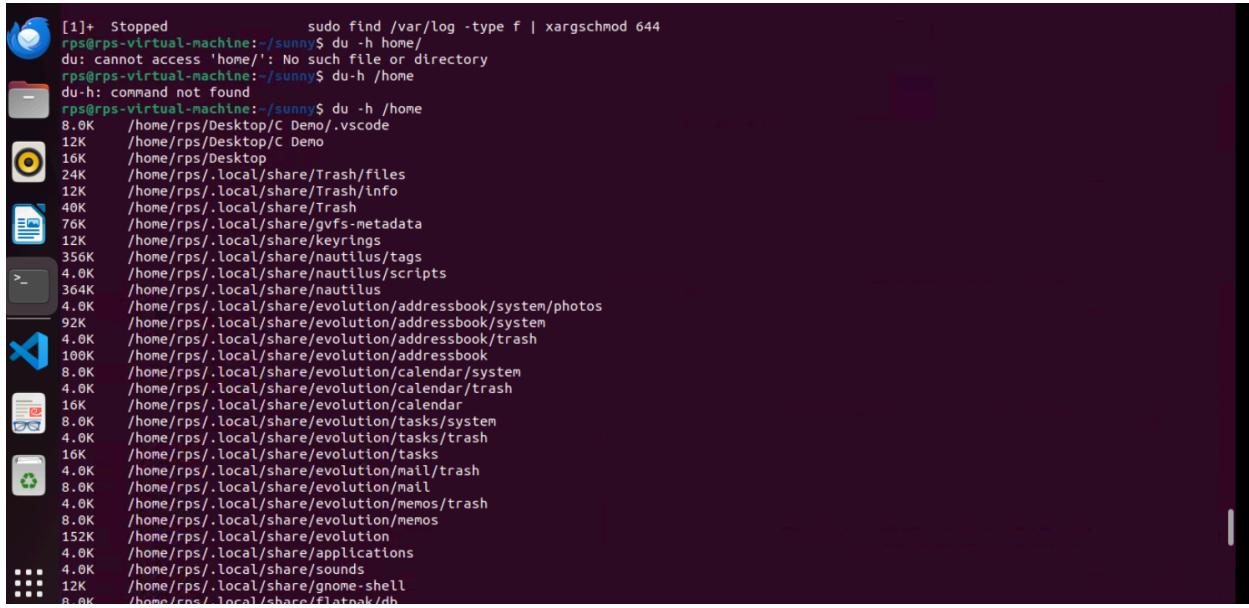
Q. Write a command to find all files with the extension .txt in the /home directory and its subdirectories.

The screenshot shows a terminal window with the status bar showing '106 history'. The command entered was 'find /home -type f -name "*.txt"'. The output of the command is:

```
rps@rps-virtual-machine:~/sunny$ 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/Documents/rename.txt
/home/rps/history.txt
/home/rps/snap/firefox/common/.mozilla/firefox/6oz9udyh.default/siteSecurityServiceState.txt
/home/rps/snap/firefox/common/.mozilla/firefox/6oz9udyh.default/pkcs11.txt
/home/rps/snap/firefox/common/.mozilla/firefox/6oz9udyh.default/serviceworker.txt
/home/rps/.vscode/extensions/twxs.cmake-0.0.17/LICENSE.txt
/home/rps/.vscode/extensions/twxs.cmake-0.0.17/node_modules/opener/LICENSE.txt
/home/rps/.vscode/extensions/twxs.cmake-0.0.17/node_modules/peg-cmake/test/CMakeLists.txt
/home/rps/.vscode/extensions/formulahendry.code-runner-0.12.2/LICENSE.txt
/home/rps/.vscode/extensions/formulahendry.code-runner-0.12.2/node_modules/applicationinsights/License.txt
/home/rps/.vscode/extensions/bbenoist.shell-0.3.0/node_modules/typescript/CopyrightNotice.txt
/home/rps/.vscode/extensions/bbenoist.shell-0.3.0/node_modules/typescript/ThirdPartyNoticeText.txt
/home/rps/.vscode/extensions/bbenoist.shell-0.3.0/node_modules/typescript/LICENSE.txt
/home/rps/.vscode/extensions/bbenoist.shell-0.3.0/node_modules/vscode/thirdpartynotices.txt
/home/rps/.vscode/extensions/ms-vscode.cppTools-extension-pack-1.3.0/LICENSE.txt
/home/rps/.vscode/extensions/ms-vscode.cppTools-themes-2.0.0/LICENSE.txt
/home/rps/.vscode/extensions/ms-vscode.cmake-tools-1.18.43/LICENSE.txt
/home/rps/.vscode/extensions/ms-vscode.cmake-tools-1.18.43/ThirdPartyNotices.txt
/home/rps/.vscode/extensions/ms-vscode.cppTools-1.20.5-linux-x64/LICENSE.txt
/home/rps/.vscode/extensions/ms-vscode.cppTools-1.20.5-linux-x64/ThirdPartyNotices.txt
/home/rps/.vscode/extensions/ms-vscode.cppTools-1.20.5-linux-x64/bin/LICENSE.txt
/home/rps/.config/Code/Service Worker/CacheStorage/2b4d61bdfcf37cef5cf99195f8b34ac60c80a8d1/index.txt
/home/rps/.config/Code/Service Worker/CacheStorage/427ca6b9f671819530034b6d93e85e9a7a4028eb/index.txt
/home/rps/sks/test.txt
/home/rps/long_text.txt
/home/rps/test.txt
rps@rps-virtual-machine:~/sunny$
```

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

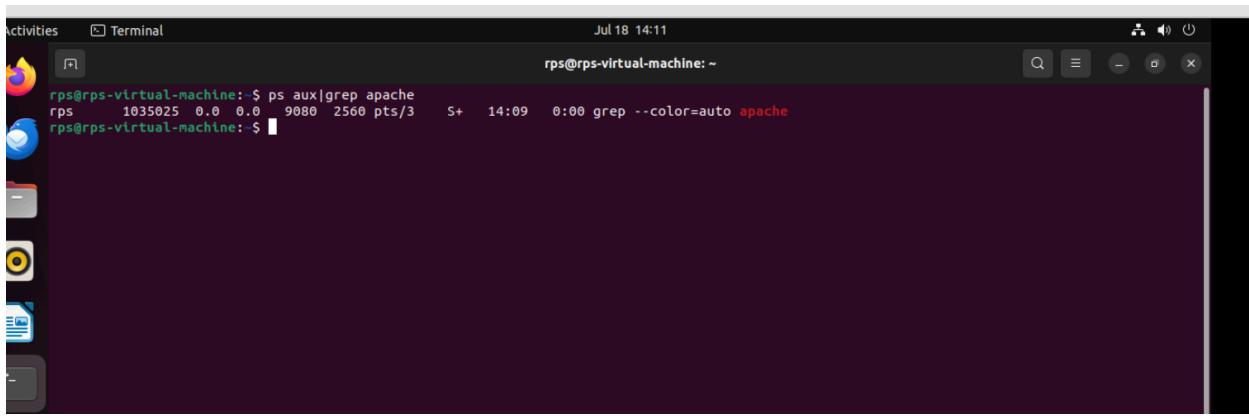
Q. Write a command to display the disk usage of all directories in the /home directory in a human-readable format.



```
[1]+ Stopped sudo find /var/log -type f | xargschmod 644
rps@rps-virtual-machine:~/sunny$ du -h /home/
du: cannot access '/home/': No such file or directory
rps@rps-virtual-machine:~/sunny$ du -h /home
du-h: command not found
rps@rps-virtual-machine:~/sunny$ du -h /home
8.0K  /home/rps/Desktop/C Demo/.vscode
12K   /home/rps/Desktop/C Demo
16K   /home/rps/Desktop
24K   /home/rps/.local/share/Trash/files
12K   /home/rps/.local/share/Trash/info
40K   /home/rps/.local/share/Trash
76K   /home/rps/.local/share/gvfs-metadata
12K   /home/rps/.local/share/keyrings
356K  /home/rps/.local/share/nautilus/tags
4.0K   /home/rps/.local/share/nautilus/scripts
364K  /home/rps/.local/share/nautilus
4.0K   /home/rps/.local/share/evolution/addressbook/system/photos
92K   /home/rps/.local/share/evolution/addressbook/system
4.0K   /home/rps/.local/share/evolution/addressbook/trash
100K  /home/rps/.local/share/evolution/addressbook
8.0K   /home/rps/.local/share/evolution/calendar/system
4.0K   /home/rps/.local/share/evolution/calendar/trash
16K   /home/rps/.local/share/evolution/calendar
8.0K   /home/rps/.local/share/evolution/tasks/system
4.0K   /home/rps/.local/share/evolution/tasks/trash
16K   /home/rps/.local/share/evolution/tasks
4.0K   /home/rps/.local/share/evolution/mail/trash
8.0K   /home/rps/.local/share/evolution/mail
4.0K   /home/rps/.local/share/evolution/memos/trash
8.0K   /home/rps/.local/share/evolution/memos
152K  /home/rps/.local/share/evolution
4.0K   /home/rps/.local/share/applications
4.0K   /home/rps/.local/share/sounds
12K   /home/rps/.local/share/gnome-shell
8.0K   /home/rps/.local/share/flatpak/db
```

Q. Process Management:

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



```
Activities Terminal Jul 18 14:11
rps@rps-virtual-machine: ~
rps@rps-virtual-machine: $ ps aux|grep apache
rps  1035025  0.0  0.0  9080 2560 pts/3    S+   14:09   0:00 grep --color=auto apache
rps@rps-virtual-machine: $
```

Text Processing:

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

```
rps@rps-virtual-machine:~$ wc -l error.log
wc: error.log: No such file or directory
rps@rps-virtual-machine:~$ wc -l hello.cpp
9 hello.cpp
rps@rps-virtual-machine:~$
```

Network Configuration:

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

```
rps@rps-virtual-machine:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 scope host lo
            valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: ens192: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:50:56:92:54:8c brd ff:ff:ff:ff:ff:ff
        altname enp11s0
        inet 172.20.0.24/24 brd 172.20.0.255 scope global dynamic noprefixroute ens192
            valid_lft 5060sec preferred_lft 5060sec
        inet6 fe80::fad0:a849:47ce:9dc3/64 scope link noprefixroute
            valid_lft forever preferred_lft forever
rps@rps-virtual-machine:~$ ifconfig
ens192: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 172.20.0.24 netmask 255.255.255.0 broadcast 172.20.0.255
        inet6 fe80::fad0:a849:47ce:9dc3/64 scopeid 0x20<link>
            ether 00:50:56:92:54:8c txqueuelen 1000 (Ethernet)
            RX packets 4232504 bytes 3503830929 (3.5 GB)
            RX errors 0 dropped 3804 overruns 0 frame 0
            TX packets 2301948 bytes 525617603 (525.6 MB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1/128 scope host
            valid_lft 1000 (Local Loopback)
            RX packets 378737 bytes 35277607 (35.2 MB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 378737 bytes 35277607 (35.2 MB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
rps@rps-virtual-machine:~$
```

Package Management:

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

```
rps@rps-virtual-machine:~$ sudo apt install htop
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 liblolv13 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 33 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 (67.7 kB/s)
Selecting previously unselected package htop.
(Reading database ... 213989 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.

```
0 upgraded, 1 newly installed, 0 to remove and 33 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 (67.7 kB/s)
Selecting previously unselected package htop.
(Reading database ... 213989 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:~$ sudo useradd developer
rps@rps-virtual-machine:~$
```

File Compression:

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

```
rps@rps-virtual-machine:~$ mkdir backup
rps@rps-virtual-machine:~$ cd backup/
rps@rps-virtual-machine:~/backup$ touch ski.txt
rps@rps-virtual-machine:~/backup$ cd ..
rps@rps-virtual-machine:~$ tar -czvf backup.tar.gz backup/
backup/
backup/ski.txt
rps@rps-virtual-machine:~$
```

System Monitoring:

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

The screenshot shows a terminal window titled "Terminal" with the command "rps@rps-virtual-machine: ~". The window displays system status and a detailed list of running processes.

System Status:

- CPU Usage: 5.1% (Tasks: 149, 688 thr; 1 running)
- Memory Usage: 2.76G/15.6G (Uptime: 32 days, 19:12:08)
- Swap Usage: 256K/2.00G

Process List (PID, USER, PRI, NI, VIRT, RES, SHR, S, CPU%, %MEM, TIME+, Command):

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	%MEM	TIME+	Command
1036824	rps	20	0	12136	5760	3584	R	3.2	0.6	0:00.94	htop
5527	rps	20	0	4991M	519M	156M	S	1.9	3.3	50:43.40	/usr/bin/gnome-shell
395	systemd-o	20	0	14836	6784	6016	S	0.6	0.6	52:00.29	/lib/systemd/systemd-oomd
5541	rps	20	0	4991M	519M	156M	S	0.6	3.3	7:53.73	/usr/bin/gnome-shell
5783	rps	20	0	66320	36976	28784	S	0.6	0.2	1h17:29	/usr/bin/vttoolsd -n vmusr --blockFd 3 --unblockFd 4
1	root	20	0	164M	12980	8116	S	0.0	0.1	0:45.55	/sbin/init splash
244	root	19	-1	64652	25472	24320	S	0.0	0.2	0:40.74	/lib/systemd/systemd-journald
267	root	20	0	148M	1292	1152	S	0.0	0.0	0:00.00	vmware-vmblock-fuse /run/vmblock-fuse -o rw,subtype=vmware-vmblock,default_p
268	root	20	0	148M	1292	1152	S	0.0	0.0	0:00.00	vmware-vmblock-fuse /run/vmblock-fuse -o rw,subtype=vmware-vmblock,default_p
269	root	20	0	148M	1292	1152	S	0.0	0.0	0:00.00	vmware-vmblock-fuse /run/vmblock-fuse -o rw,subtype=vmware-vmblock,default_p
303	root	20	0	27084	6968	4604	S	0.0	0.0	0:03.91	/lib/systemd/systemd-udevd
399	systemd-r	20	0	26200	14176	9344	S	0.0	0.1	1:05.93	/lib/systemd/systemd-resolved
401	systemd-t	20	0	89388	7296	6528	S	0.0	0.0	0:04.45	/lib/systemd/systemd-timesyncd
431	root	20	0	53744	11984	9856	S	0.0	0.1	0:00.02	/usr/bin/VGAuthService
434	root	20	0	310M	9472	7808	S	0.0	0.1	49:59.05	/usr/bin/vttoolsd
467	systemd-t	20	0	89388	7296	6528	S	0.0	0.0	0:00.00	/lib/systemd/systemd-timesyncd
519	root	20	0	310M	9472	7808	S	0.0	0.1	1:40.25	/usr/bin/vttoolsd
520	root	20	0	310M	9472	7808	S	0.0	0.1	0:00.00	/usr/bin/vttoolsd
524	root	20	0	310M	9472	7808	S	0.0	0.1	0:00.00	/usr/bin/vttoolsd
641	root	20	0	234M	7980	7604	S	0.0	0.0	0:39.84	/usr/libexec/accounts-daemon
642	root	20	0	2816	1920	1792	S	0.0	0.0	0:00.79	/usr/sbin/acpid
648	avahi	20	0	7628	4096	3712	S	0.0	0.0	0:21.61	avahi-daemon: running [rps-virtual-machine-7.local]
649	root	20	0	9496	2816	2688	S	0.0	0.0	0:05.26	/usr/sbin/cron -f -P
652	messagebu	20	0	11140	6656	3968	S	0.0	0.0	1:00.91	@dbus-daemon -system --address=/systemd: --nofork --nopidfile --systemd-acti
655	root	20	0	254M	19036	15836	S	0.0	0.1	1:19.76	/usr/sbin/NetworkManager --no-daemon
663	root	20	0	82804	3968	3584	S	0.0	0.0	2:48.10	/usr/sbin/lrqbalance --foreground
665	root	20	0	41036	20864	11648	S	0.0	0.1	0:00.10	/usr/bin/python3 /usr/bin/networkd-dispatcher --run-startup-triggers
667	root	20	0	237M	11352	7276	S	0.0	0.1	0:12.05	/usr/libexec/polkitd --no-debug

Bottom of the terminal window shows function key bindings:

- F1 Help
- F2 Setup
- F3 Search
- F4 Filter
- F5 Tree
- F6 Sort By
- F7 File
- F8 File
- F9 Kill
- F10 Exit

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.

Log Rotation:

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

The screenshot shows a Linux desktop environment with a terminal window open in Visual Studio Code. The terminal window title is "log.sh - rps - Visual Studio Code". The date and time at the top of the window are "Jul 18 16:28". The terminal content shows a shell script named "log.sh" being run. The script contains the following code:

```
$ log.sh
1  #!/bin/bash
2  log="/var/log"
3  find "$log" -type f -name "*.log" -mtime +7 -exec rm -f {} \;
4  echo "log rotation completed"
```

After running the script, the terminal shows numerous permission denied errors for removing log files from various system directories like /var/log/ and /var/log/vmware-.log. It also shows an error message about "echolog rotation completed: command not found". The command prompt at the bottom is "rps@rps-virtual-machine:~\$".

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`.