

Lab 4 Submission

Question 1

```

1/1 v + [ ] [ ]
Tilix: student@portablevm: ~
1: student@portablevm: ~ v
student@portablevm:~$ apt search "tetris clone"
bastet/stable,now 0.43.2-2 amd64 [installed]
  ncurses Tetris clone with a bastard algorithm

ltris/stable 2.0.3-1 amd64
  very polished Tetris clone with CPU opponents

tint/stable 0.07 amd64
  Tetris clone for text based terminal

student@portablevm:~$

3: student@portablevm: ~ v
student@portablevm:~$ apt search --names-only "tetris"
games-tetris/stable 5 all
  Debian's tetris-like games

vitetris/stable 0.59.1-3 amd64
  Virtual terminal *tris clone

student@portablevm:~$

2: student@portablevm: ~ v
bastet/stable,now 0.43.2-2 amd64 [installed]
  ncurses Tetris clone with a bastard algorithm

blockattack/stable 2.9.0-1+b1 amd64
  puzzle game inspired by Tetris

blockout2/stable,now 2.5+dfsg1-2 amd64 [installed]
  Tetris like game (3D-tetris)

blocks-of-the-undead/stable 1.0-7 amd64
  Tetris Attack clone with spooky undertones

blocks-of-the-undead-data/stable 1.0-7 all
  Tetris Attack clone with spooky undertones - data files
lines 1-14

```

```

1/1 v + [ ] [ ]
Tilix: student@portablevm: ~
1: student@portablevm: ~ v
student@portablevm:~$ sudo apt install blockout2+ cuyo+ blockattack-
[sudo] password for student:
The following packages were automatically installed and are no longer required:
  libfmt10      libphysfs1      libSDL2-mixer-2.0-0  libxmp4
  libopusfile0 libSDL2-image-2.0-0 libSDL2-ttf-2.0-0
Use 'sudo apt autoremove' to remove them.

Installing:
  blockout2  cuyo

REMOVING:
  blockattack

Summary:
  Upgrading: 0, Installing: 2, Removing: 1, Not Upgrading: 13
  Download size: 4,403 kB
  Freed space: 2,446 kB

Continue? [Y/n] y
Get:1 http://deb.debian.org/debian trixie/main amd64 blockout2 amd64 2.5+dfsg1-2 [4,228 kB]
Get:2 http://deb.debian.org/debian trixie/main amd64 cuyo amd64 2.1.0-1 [175 kB]
Fetched 4,403 kB in 0s (29.4 MB/s)
(Reading database ... 194922 files and directories currently installed.)
Removing blockattack (2.9.0-1+b1) ...
Selecting previously unselected package blockout2.
(Reading database ... 194895 files and directories currently installed.)
Preparing to unpack .../blockout2_2.5+dfsg1-2_amd64.deb ...
Unpacking blockout2 (2.5+dfsg1-2) ...

```

```
Selecting previously unselected package cuyo.  
Preparing to unpack .../cuyo_2.1.0-1_amd64.deb ...  
Unpacking cuyo (2.1.0-1) ...  
Setting up blockout2 (2.5+dfsg1-2) ...  
Setting up cuyo (2.1.0-1) ...  
Processing triggers for desktop-file-utils (0.28-1) ...  
Processing triggers for hicolor-icon-theme (0.18-2) ...  
Processing triggers for gnome-menus (3.36.0-3) ...  
Processing triggers for man-db (2.13.1-1) ...  
Processing triggers for mailcap (3.74) ...  
student@portablevm:~$
```

```
1/1 v + [ ] [ ] Tili: student@portablevm: ~
1: student@portablevm: ~ v
student@portablevm:~$ sudo apt remove cuyo
The following packages were automatically installed and are no longer required:
  cuyo-data libopusfile0 libsdl2-image-2.0-0 libsdl2-ttf-2.0-0
  libfmt10 libphysfs1 libsdl2-mixer-2.0-0 libxmp4
Use 'sudo apt autoremove' to remove them.

REMOVING:
  cuyo

Summary:
  Upgrading: 0, Installing: 0, Removing: 1, Not Upgrading: 13
  Freed space: 489 kB

Continue? [Y/n]
(Reading database ... 194947 files and directories currently installed.)
Removing cuyo (2.1.0-1) ...
Processing triggers for hicolor-icon-theme (0.18-2) ...
Processing triggers for gnome-menus (3.36.0-3) ...
Processing triggers for mailcap (3.74) ...
Processing triggers for desktop-file-utils (0.28-1) ...
student@portablevm:~$ sudo apt purge cuyo
The following packages were automatically installed and are no longer required:
  cuyo-data libopusfile0 libsdl2-image-2.0-0 libsdl2-ttf-2.0-0
  libfmt10 libphysfs1 libsdl2-mixer-2.0-0 libxmp4
Use 'sudo apt autoremove' to remove them.

REMOVING:
  cuyo*

Summary:
  Upgrading: 0, Installing: 0, Removing: 1, Not Upgrading: 13
  Space needed: 0 B / 12.4 GB available

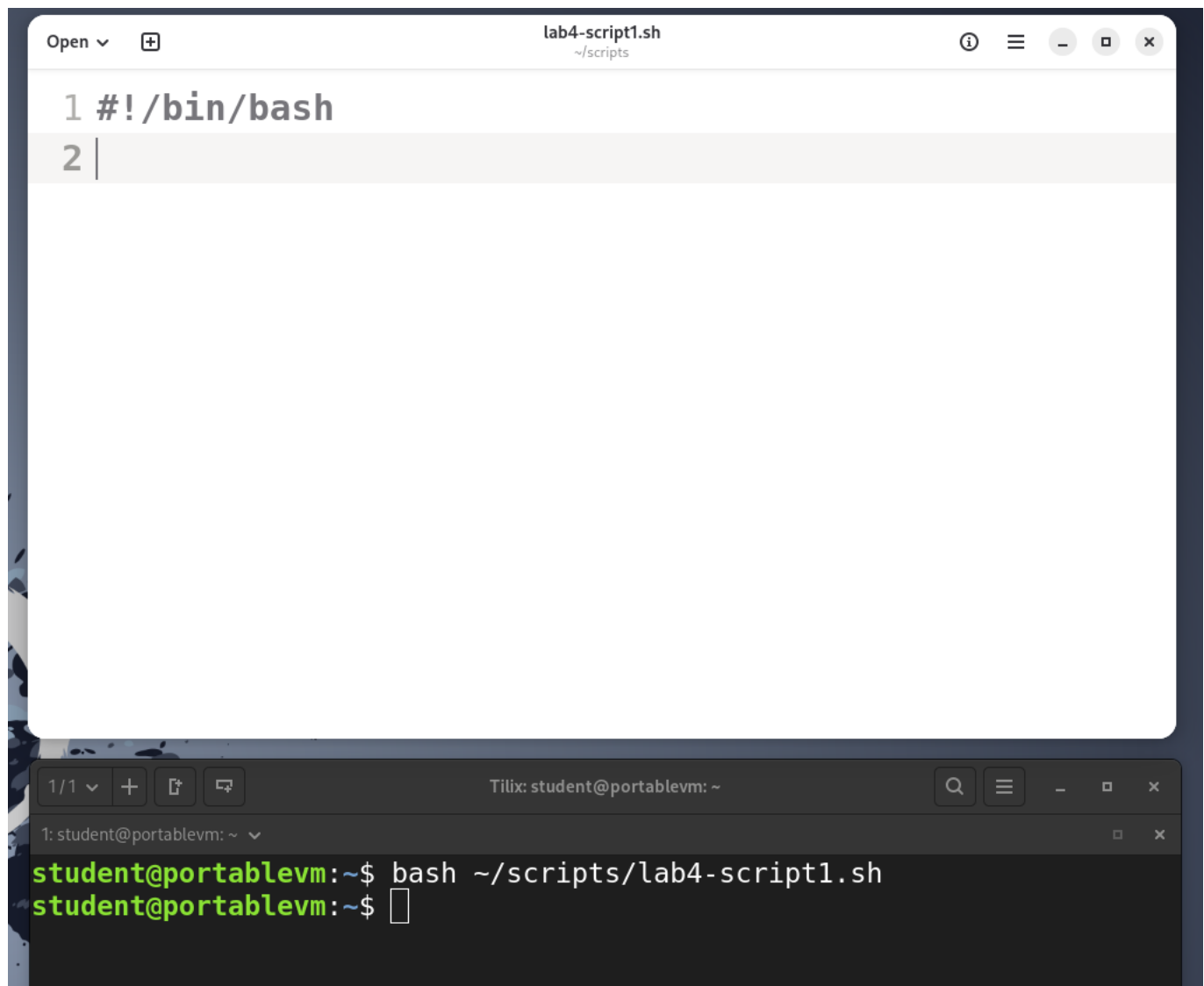
Continue? [Y/n] y
(Reading database ... 194939 files and directories currently installed.)
Purging configuration files for cuyo (2.1.0-1) ...
student@portablevm:~$
```

```
1/1 v + [ ] [ ]
Tilix: student@portablevm: ~
1: student@portablevm: ~ v
student@portablevm:~$ sudo apt clean && sudo apt autoclean && sudo apt autoremove &&
sudo apt autopurge
REMOVING:
  cuyo-data  libopusfile0  libsdl2-image-2.0-0  libsdl2-ttf-2.0-0
  libfmt10   libphysfs1    libsdl2-mixer-2.0-0  libxmp4

Summary:
  Upgrading: 0, Installing: 0, Removing: 8, Not Upgrading: 13
  Freed space: 7,495 kB

Continue? [Y/n] y
(Reading database ... 194939 files and directories currently installed.)
Removing cuyo-data (2.1.0-1) ...
Removing libfmt10:amd64 (10.1.1+ds1-4) ...
Removing libsdl2-mixer-2.0-0:amd64 (2.8.1+dfsg-2) ...
Removing libopusfile0:amd64 (0.12-4+b3) ...
Removing libphysfs1:amd64 (3.0.2-6+b2) ...
Removing libsdl2-image-2.0-0:amd64 (2.8.8+dfsg-1) ...
Removing libsdl2-ttf-2.0-0:amd64 (2.24.0+dfsg-2) ...
Removing libxmp4:amd64 (4.6.2-2) ...
Processing triggers for man-db (2.13.1-1) ...
Processing triggers for libc-bin (2.41-12) ...
Summary:
  Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 13
student@portablevm:~$
```

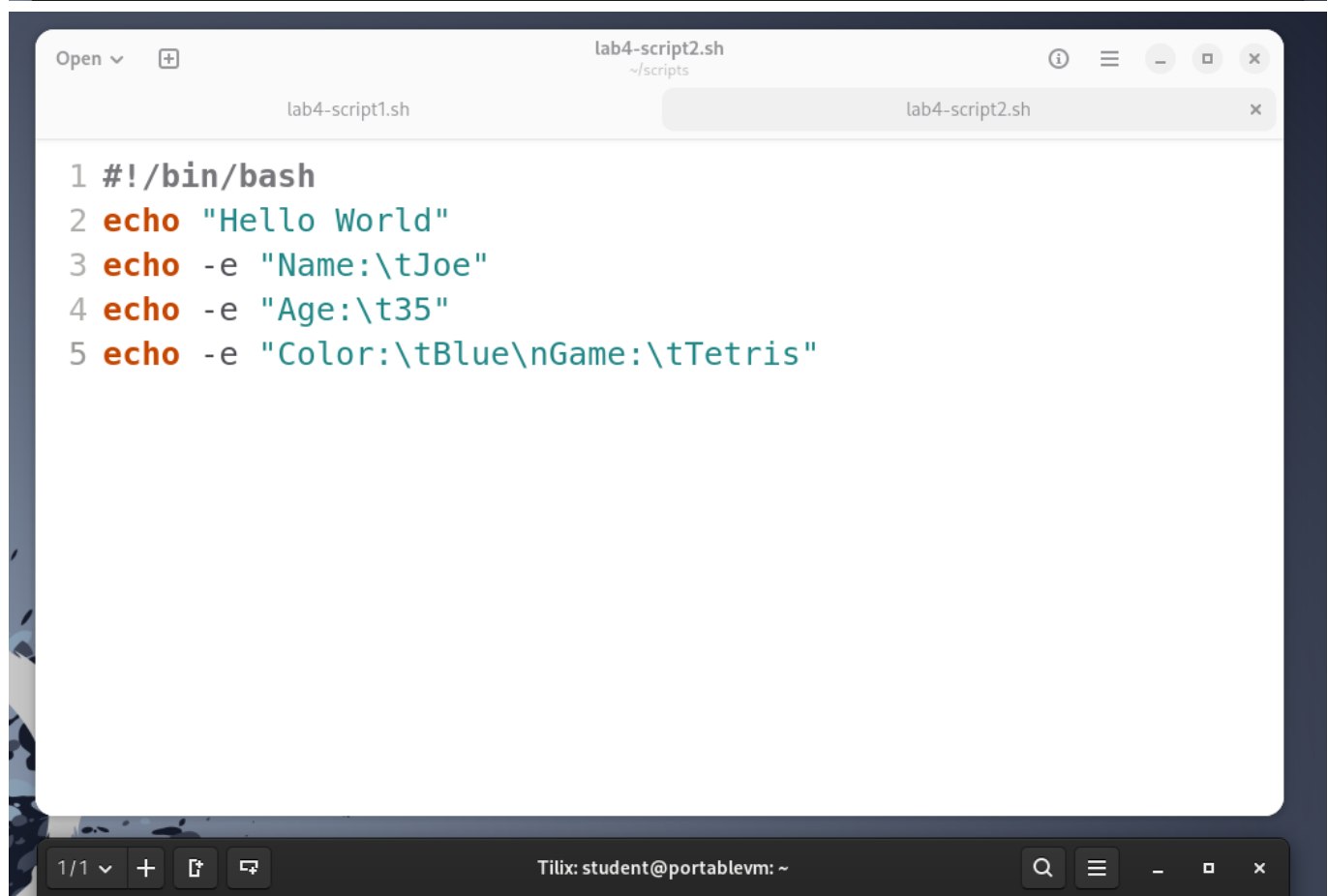
Question 2



The top part of the image shows a code editor window titled "lab4-script1.sh" with the file path "~/scripts". It contains two lines of code: `1 #!/bin/bash` and `2 |`. The bottom part shows a terminal window titled "Tilix: student@portablevm: ~". The terminal displays the command `bash ~/scripts/lab4-script1.sh` being executed, followed by a new prompt `student@portablevm:~$` and a cursor.

```
1 #!/bin/bash
2 |
```

```
1/1 + [ ] [ ] Tilix: student@portablevm: ~
1: student@portablevm: ~
student@portablevm:~$ bash ~/scripts/lab4-script1.sh
student@portablevm:~$
```

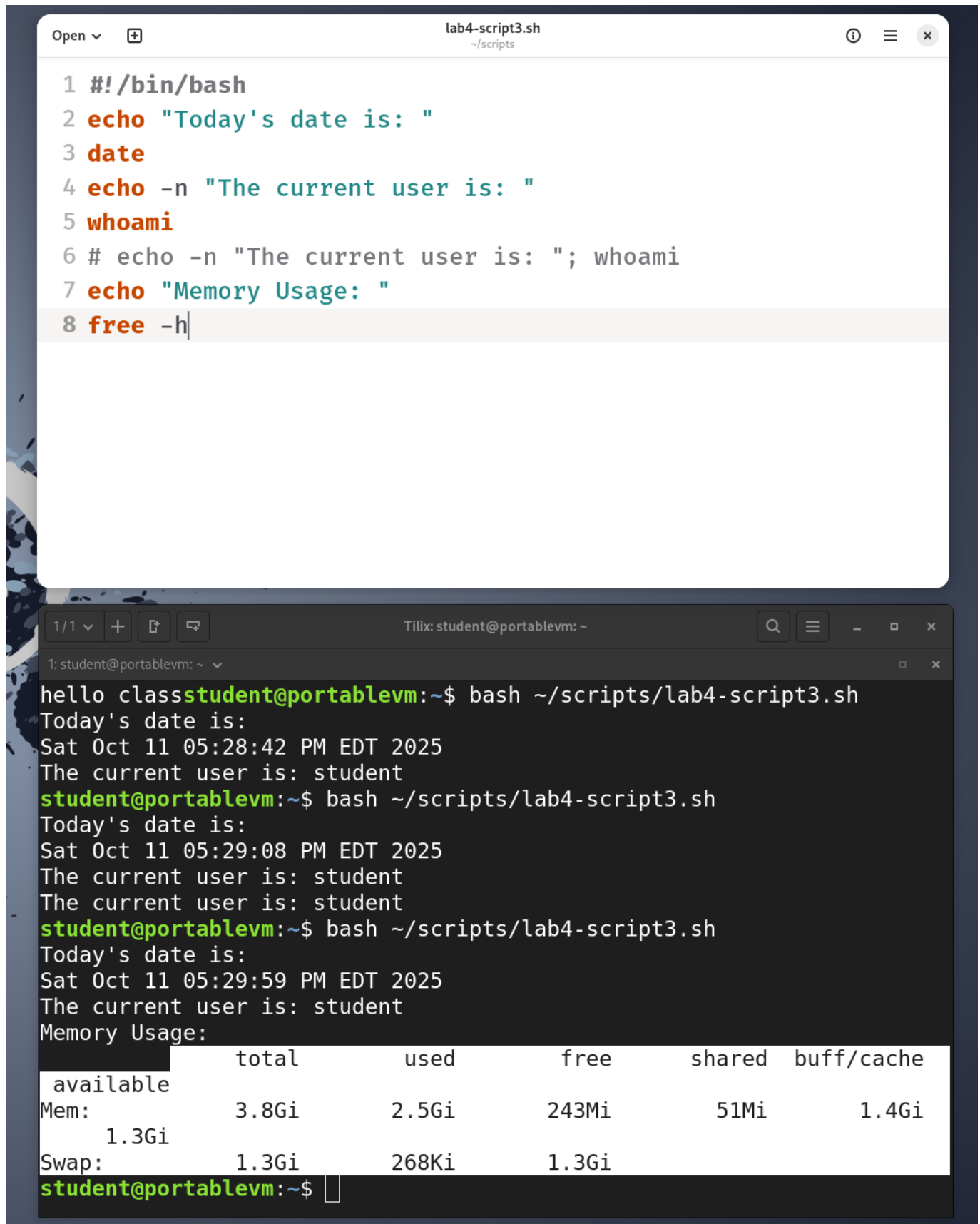


The bottom part of the image shows a code editor window titled "lab4-script2.sh" with the file path "~/scripts". It contains five lines of code: `1 #!/bin/bash`, `2 echo "Hello World"`, `3 echo -e "Name:\tJoe"`, `4 echo -e "Age:\t35"`, and `5 echo -e "Color:\tBlue\nGame:\tTetris"`. The terminal window below shows the command `bash ~/scripts/lab4-script2.sh` being executed, followed by a new prompt `student@portablevm:~$` and a cursor.

```
1 #!/bin/bash
2 echo "Hello World"
3 echo -e "Name:\tJoe"
4 echo -e "Age:\t35"
5 echo -e "Color:\tBlue\nGame:\tTetris"
```

```
1/1 + [ ] [ ] Tilix: student@portablevm: ~
1: student@portablevm: ~
student@portablevm:~$ bash ~/scripts/lab4-script2.sh
student@portablevm:~$
```

```
1: student@portablevm: ~  
student@portablevm:~$ man echo  
student@portablevm:~$ bash ~/scripts/lab4-script2.sh  
Hello World  
student@portablevm:~$ man echo  
student@portablevm:~$ bash ~/scripts/lab4-script2.sh  
Hello World  
Name:   Joe  
Age:    35  
student@portablevm:~$ bash ~/scripts/lab4-script2.sh  
Hello World  
Name:   Joe  
Age:    35  
Color:  Blue  
Game:   Tetris  
student@portablevm:~$
```

The image shows a code editor window at the top and a terminal window below it. The code editor displays a shell script named `lab4-script3.sh` with the following content:

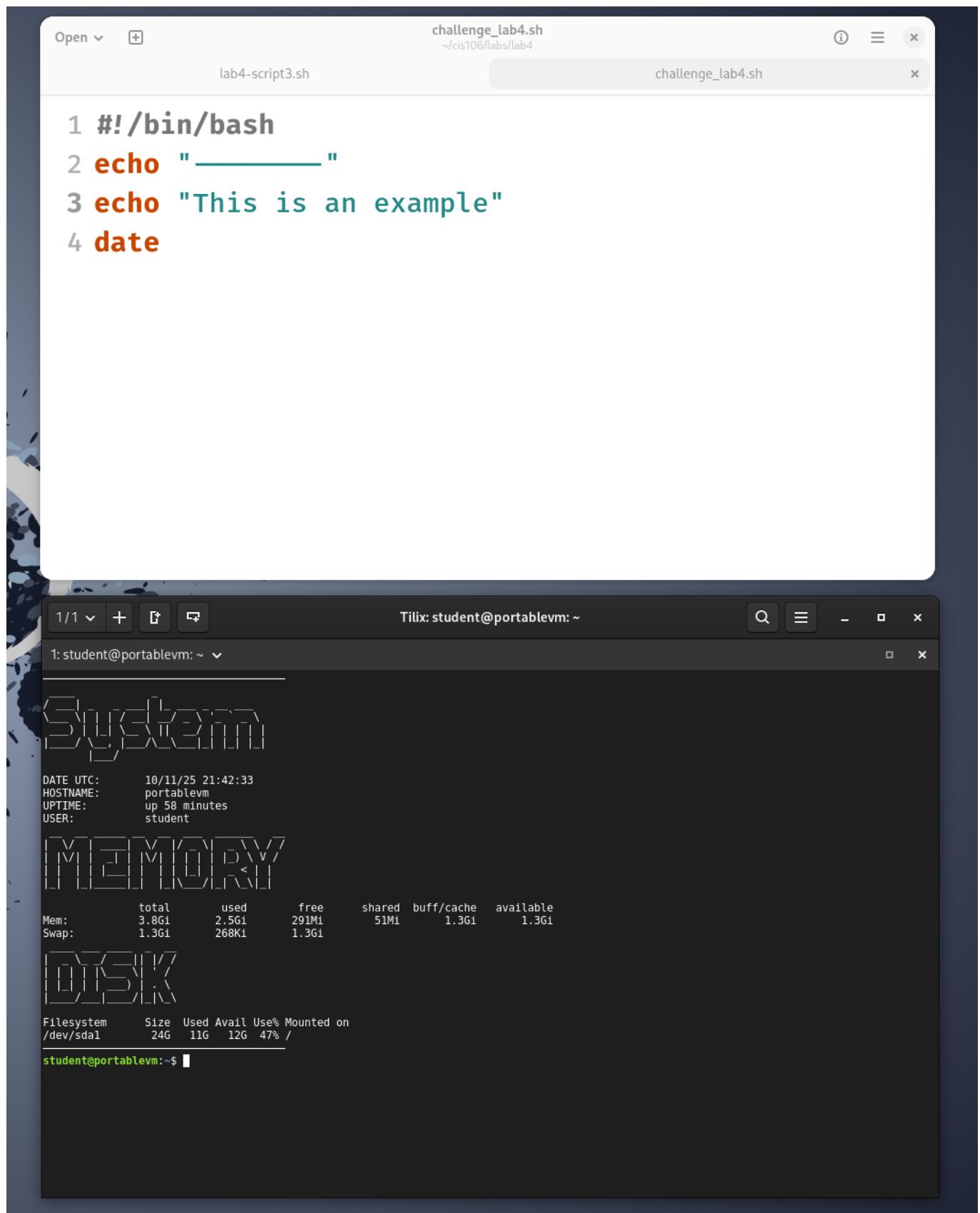
```
1 #!/bin/bash
2 echo "Today's date is: "
3 date
4 echo -n "The current user is: "
5 whoami
6 # echo -n "The current user is: "; whoami
7 echo "Memory Usage: "
8 free -h|
```

The terminal window shows the execution of this script three times. Each time, it prints the current date, the current user (student), and the memory usage. The output of the `free -h` command is displayed in a table format:

	total	used	free	shared	buff/cache
Mem:	3.8Gi	2.5Gi	243Mi	51Mi	1.4Gi
Swap:	1.3Gi	268Ki	1.3Gi		

The terminal window also shows the prompt `student@portablevm:~$` and the command `bash ~/scripts/lab4-script3.sh` being executed multiple times.

Question 3



The image shows a terminal window with a dark background. At the top, there's a header bar with 'Open' and a plus icon on the left, and 'challenge_lab4.sh' with a tilde and path '~/.cis106/labs/lab4' in the center. Below this, there's a tab bar with 'lab4-script3.sh' and 'challenge_lab4.sh'. The main content area displays a script with four lines: 1 `#!/bin/bash`, 2 `echo "_____"`, 3 `echo "This is an example"`, and 4 `date`. Below the script, there's a section titled 'SYSTEM' in a large, stylized font. Under 'SYSTEM', there's a table of system information: DATE UTC: 10/11/25 21:42:33, HOSTNAME: portablevm, UPTIME: up 58 minutes, USER: student. Below this, there's a section titled 'MEMORY' in a large, stylized font. Under 'MEMORY', there's a table of memory usage: Mem: total 3.8Gi, used 2.5Gi, free 291Mi, shared 51Mi, buff/cache 1.3Gi, available 1.3Gi; Swap: total 1.3Gi, used 268Ki, free 1.3Gi. Below this, there's a section titled 'DISK' in a large, stylized font. Under 'DISK', there's a table of disk usage: Filesystem /dev/sda1, Size 24G, Used 11G, Avail 12G, Use% 47%, Mounted on /. At the bottom, the prompt 'student@portablevm:~\$' is shown.

```
1 #!/bin/bash
2 echo "_____ "
3 echo "This is an example"
4 date
```

SYSTEM

DATE UTC: 10/11/25 21:42:33
HOSTNAME: portablevm
UPTIME: up 58 minutes
USER: student

MEMORY

	total	used	free	shared	buff/cache	available
Mem:	3.8Gi	2.5Gi	291Mi	51Mi	1.3Gi	1.3Gi
Swap:	1.3Gi	268Ki	1.3Gi			

DISK

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/sda1	24G	11G	12G	47%	/

student@portablevm:~\$

script