

# Linux Environment Quizzes

## Exercise

The directory /home/user contains the following files, which were derived from the output of the command `ls -l`.

```
-rw-r--r-- 1 scanzio root 0 mag 17 11:31 abXcx.txt
-rw-r--r-- 1 root scanzio 0 mag 17 11:38 a.py
-rw-r--r-- 1 scanzio root 0 mag 17 11:33 axcXab.txt
-rw-r-xr-- 1 scanzio root 0 mag 17 11:36 w.py
-rw-r--r-- 1 scanzio root 0 mag 17 11:33 Xcxab.txt
-rw-r--r-- 1 scanzio root 0 mag 17 11:33 x.py
-rw-r--r-- 1 scanzio root 3464324 mag 17 11:34 y.py
drwxr-xr-x 2 scanzio root 4096 mag 17 11:35 z.py
```

What are the files selected by the find command that follows:

```
find /home/user -type f \ ( -name "*.cpp" -o -name "*.py" -o -name "X?x*.txt" \) -
group root -s size -1M ! -perm 654
```

Choose one or more options:

1. ☐ z.py
2. ☐ y.py
3. ☐ x.py
4. ☐ Xcxab.txt
5. ☐ w.py
6. ☐ abXcx.txt
7. ☐ a.py
8. ☐ axcXab.txt

Correct answers: 2, 4

## Exercise

Given the following bash command:

```
egrep -e "^[1-9]\ \" -e "^1[0-9]\ |^2[0-1]\ \" input.txt | egrep -e "[1-9][0-9]*\.[0-9]" | egrep "X$" | c ut -d \" \" -f 2,4
```

Report which lines are printed in output from the previous command, when it is cuted on the file input.txt, which is reported at the end of the question.

Content of the file input.txt

```
20 Stefano 12.5 X
22 Gabriele 13.9 Y
20 Giulia 7.4 X
15 Lodovica 17.3 A
16 Saverio 24.2 Y
21 Anna 12.3 X
2 Giorgio 14 X
```

Choose one or more options:

1. ☐ Lodovica 17.3 A
2. ☐ Giulia X
3. ☐ Gabriele 13.9 Y
4. ☐ Gabriele Y
5. ☐ Lodovica A
6. ☐ Anna X

7. ☐ Anna 12.3 X
8. ☐ Stefano X
9. ☐ Stefano 12.5 X

Correct answers: 2, 6, 8

## Exercise

Given the execution in sequence of the following commands:

```
touch f1
ln -s f1 f2
ln f1 f3
ln f1 f4
echo "hello" > f3
rm f1
```

Indicate which (one or more) of the following outputs is (are) possible.

Choose one or more options:

1. ☐ After the command:  
# cat f4  
no output is obtained
2. ☐ After the command:  
# ls -l  
the following output is obtained:  
lrwxrwxrwx 1 scanzio scanzio 2 ago 13 16:03 f2 -> f1  
-rw-r--r-- 2 scanzio scanzio 6 ago 13 16:04 f3  
-rw-r--r-- 2 scanzio scanzio 6 ago 13 16:04 f4
3. ☐ After the command:  
# cat f4  
the following output is obtained:  
hello
4. ☐ After the command:  
# cat f2  
following output is obtained:  
hello
5. ☐ After the command:  
# echo "pippo" > f2  
# ls -l  
the following output is obtained:  
-rw-r--r-- 1 scanzio scanzio 6 ago 13 16:19 f1  
lrwxrwxrwx 1 scanzio scanzio 2 ago 13 16:03 f2 -> f1  
-rw-r--r-- 2 scanzio scanzio 6 ago 13 16:04 f3  
-rw-r--r-- 2 scanzio scanzio 6 ago 13 16:04 f4

Correct answers: 2, 3, 5

## Exercise

Indicate which of the following statements related to the following sequence of shell commands are correct.

Note that wrong answers imply a penalty in the final score.

```
find / -name "a?b.c" -Execiseec cat \{} \; | tail -80 | head > /tmp/x
cat /tmp/x | sort -r | tr "e-g" "E-G"
```

Choose one or more options:

1. ☐ The command "sort -r" takes in input the content of the file /tmp/x, and it generates in output the same content but ordered in reverse alphabetical order
2. ☐ The file /tmp/x contains the first 10 rows of the files selected by the find command
3. ☐ The find command searches all the files which name starts with the letter "a", finishes with letters "b.c", and it is composed of any number of characters
4. ☐ The command tr "e-g" "E-G" substitutes the lowercase letters e, g with the corresponding uppercase letters (i.e., E, G)
5. ☐ The find command searches the files in the home directory
6. ☐ The find command searches all the files which name starts with the letter "a", finishes with letters "b.c", and it is composed of 5 characters

Correct answers: 1, 5, 6

## Exercise

Assume that the following script is included in the file named script.sh:

```
#!/bin/bash echo "Number: $# " for x in $* do echo -n $x " " done
```

Also suppose it is invoked with the following command:

```
./script.sh "questa frase - $0 : " ha w parole e '$1' x
```

Indicate which of the following statements are correct. Note that wrong answers imply a penalty in the final score.

Choose one or more options:

1. ☐ L'output contains the string "\$0"
2. ☐ The output has a length of more than 2 lines
3. ☐ The output contains the string "\$1"
4. ☐ The output contains the string "Number: 6"
5. ☐ The output contains the string "Number: 7"
6. ☐ The output has a length of 2 lines
7. ☐ The value \$1 is substituted with 0

Correct answers: 3, 5, 6

## Exercise

Given the following bash command:

```
egrep -e "^202101(2[7-8]|3[01])" input.txt | egrep -e "[1-9][0-9]*\.[0-9]" | egrep -e "13\.[127]" | cut -d " " -f 2-4
```

Report which lines are displayed when the previous command is Execiseecuted on the file input.txt reported at the end of the question.

Note that incorrect answers imply a penalty in the final score.

Content of the file input.txt

```
20210127 12.5 Stefano AXY
20210128 13.1 Giulia AXY
20210129 13.2 Gabriele AXY
20210130 13.3 Manuele AXY
20210131 13.7 Sara AXY
20210201 14.3 Enrico AXY
20210202 15.5 Pietro AXY
```

Choose one or more options:

1. ☐ 13.3 AXY

2. ☐ 13.7 Sara AXY
3. ☐ 13.1 AXY
4. ☐ 13.7 AXY
5. ☐ 13.3 Manuele AXY
6. ☐ 13.2 AXY
7. ☐ 13.1 Giulia AXY
8. ☐ 13.2 Gabriele AXY

Correct answers: 2, 7

## Exercise

Using shell commands only, do the following:

1. Extract the 50-th row of a given file name.
2. save in a file named "list.txt" the names of all the files with extension ".h", which are contained in the root "/home/foo" directory tree and contain the string "define" or the string "include".
3. sort alphabetically in ascending order all lines in the file named "bar.txt", delete the duplicate lines, and pick only the second string of each line. Store the result in the file "/home/tmp/list.txt".

Indicate 3 separate commands using pipes or redirection operations.

Answer:

1.

```
cat "file.txt" | head -n 50 | tail -n 1
head -n 50 "file.txt" | tail -n 1
```

2.

```
find "/home/foo" -type f -name "*.h" -exec grep -l -E "(define)|(include)" \{} \; > "list.txt"
find "/home/foo" -type f -name "*.h" -exec grep -l -e "define" -e "include" \{} \; > "list.txt"
find "/home/foo" -type f -name "*.h" -exec grep -H -e "define" -e "include" \{} \; | cut -d ":" -f 1 > "list.txt"
grep -l -E "(define)|(include)" $(find "/home/foo" -name "*.h" -type f)
```

3.

```
cat "bar.txt" | sort | uniq | cut -d " " -f 2 > "/home/tmp/list.txt"
sort "bar.txt" | uniq | cut -d " " -f 2 > "/home/tmp/list.txt"
sort -u "bar.txt" | cut -d " " -f 2 > "/home/tmp/list.txt"
```

## Exercise

In relation to the following shell command:

```
foo | bar 1> A 2> B
```

which of the following statements are correct:

Choose one or more options:

1. ☐ If you do not want to recover standard error, you can send it to /dev/null.
2. ☐ The foo command receives its input from the bar command and sends its standard output on file B and its standard error on A.
3. ☐ The bar command receives its input from the foo command and sends its standard output on file A and its standard error on file B.
4. ☐ The command would be identical if the symbol "|" were replaced with the character ";".
5. ☐ The command is incorrect and the symbol "|" should be replaced with the character ";".

6. ☐ The bar command receives its input from the foo command and sends its standard output on file B and its standard error on A.

Correct answers: 3

### Exercise

Given the following shell command, indicate which of the following statements are correct. Note that incorrect answers imply a penalty in the final score.

```
find . -type f -regExercisetype posix-Exercisetended -regExercise  
".*/((XXXXXX(XX)*)|((BB|CCC){2,4}))([8-9][0-9]|1[0-4][0-9]|15[0-7])?.txt" -  
Exerciseec cat \{} \; | sort -k1,1nr| uniq
```

Choose one or more options:

1. ☐ The regular file ./BBCCCB.txt is selected by the find command.
2. ☐ The regular Exercisepression coded in the find command can match only files located in the current working directory.
3. ☐ The regular file ./BBCCBBBB148.txt is selected by the find command.
4. ☐ The regular file ./XXXXBBBB85.txt is selected by the find command.
5. ☐ For EACH selected file the find command performs a numerical sorting of its lines from the biggest to the smallest number, and if there are equal lines it deletes them.

Correct answers: 1, 3

### Exercise

Given the following list of commands, indicate which of the following statements are correct after Exerciseecuting them. Note that incorrect answers imply a penalty in the final score.

```
touch f1  
ln f1 f2  
ln f1 f3  
ln -s f1 f4  
rm f1  
echo "hello" > f4  
echo "_world" >> f2
```

Choose one or more options:

1. ☐ File f1 was removed, and therefore it is not present in the directory.
2. ☐ Files f2 and f3 have the same content.
3. ☐ The dimension of file f4 is 2 bytes.
4. ☐ The number of hard links of file f2 is 2.
5. ☐ File f2 contains the string "hello\_world".

Correct answers: 1, 2, 3, 4, 5

### Exercise

Given the following Makefile, indicate which of the following statements are correct. Note that incorrect answers imply a penalty in the final score.

```
CC = gcc  
FLAGS = -Wall -g
```

```

LIB = -lm
.PHONY: clean distclean

mainVet.o: mainVet.c my.h
    $(CC) $(FLAGS) -c mainVet.c $(LIB)

inVet.o: inVet.c my.h
    $(CC) $(FLAGS) -c inVet.c $(LIB)

target: mainVet.o inVet.o
    $(CC) $(FLAGS) -o myExe mainVet.o inVet.o $(LIB)

distclean: clean1 clean2
    rm -f distclean

clean1: clean3
    rm -f clean1

clean2:
    rm -f clean2

clean3:
    rm -f clean3 rm -f clean3b

```

Choose one or more options:

1. ☐ Executing "make distclean" the sequence of commands that is executed is "rm -f distclean; rm -f clean2; rm -f clean1; rm -f clean3; rm -f clean3b".
2. ☐ Executing the command "make", the default target that is named "target" is executed.
3. ☐ Executing two times in sequence "make target", the command that is executed is "gcc -Wall -g -o myExe mainVet.o inVet.o -lm".
4. ☐ Target listed after the keyword ".PHONY" are executed regardless the existence of a file with the same name that has been edited more recently than the dependencies

Correct answers: 3, 4