Operating Systems

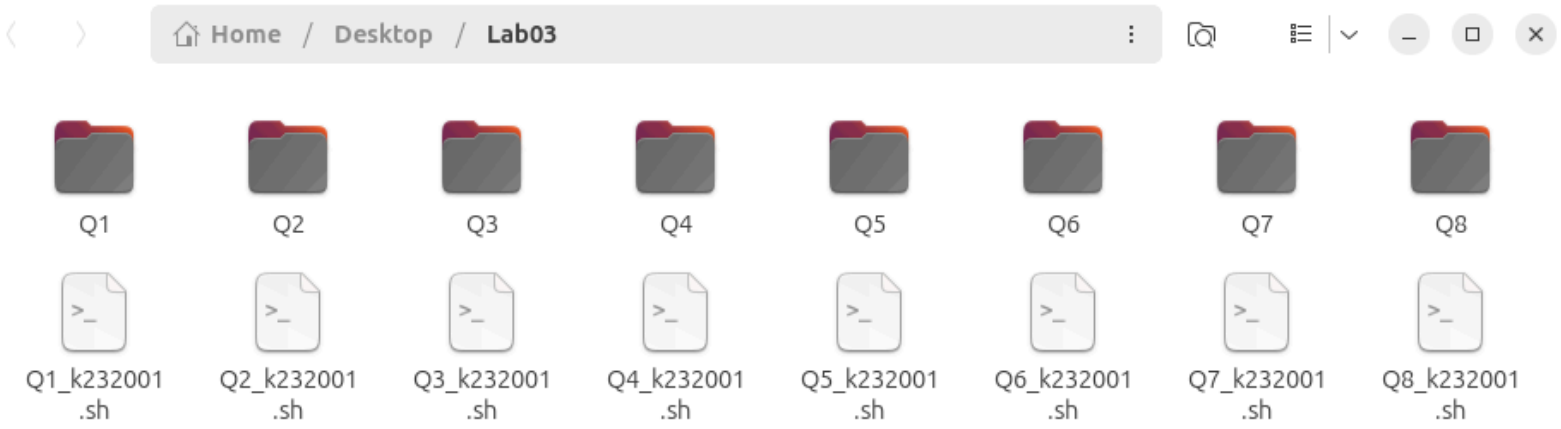
LAB#03

23K-2001

BCS-4J

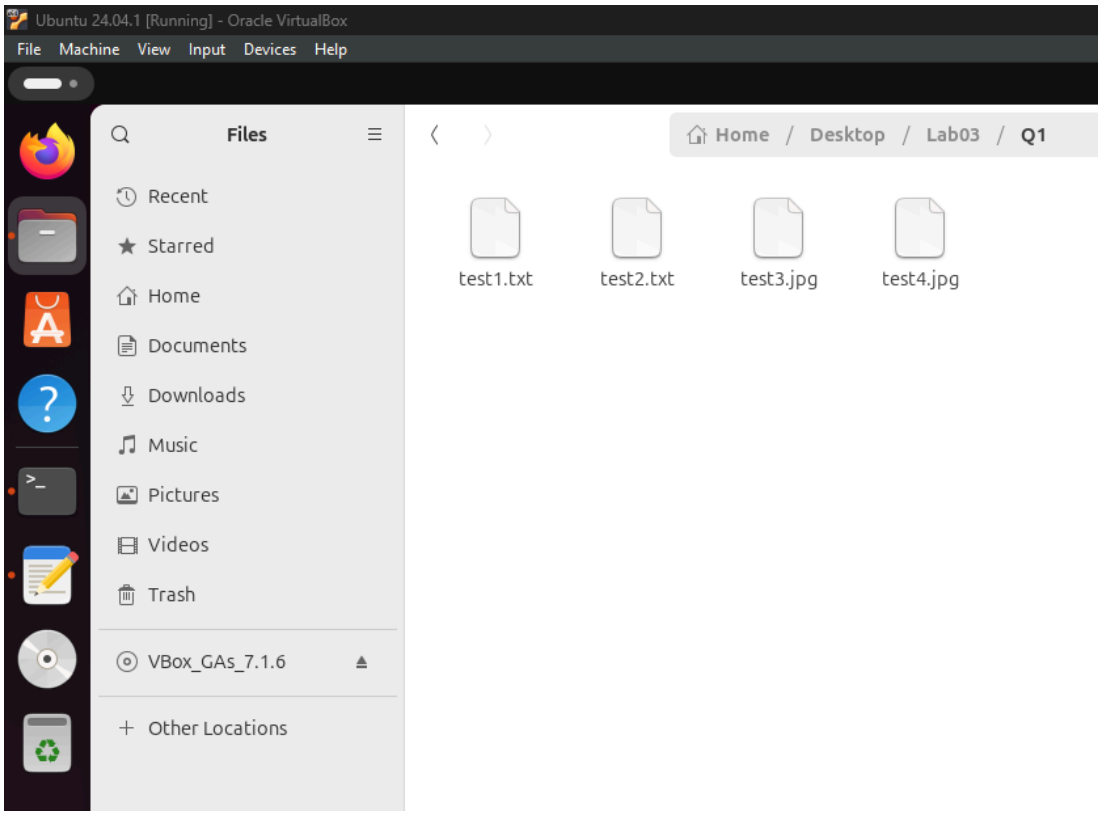
Structure of Tasks:

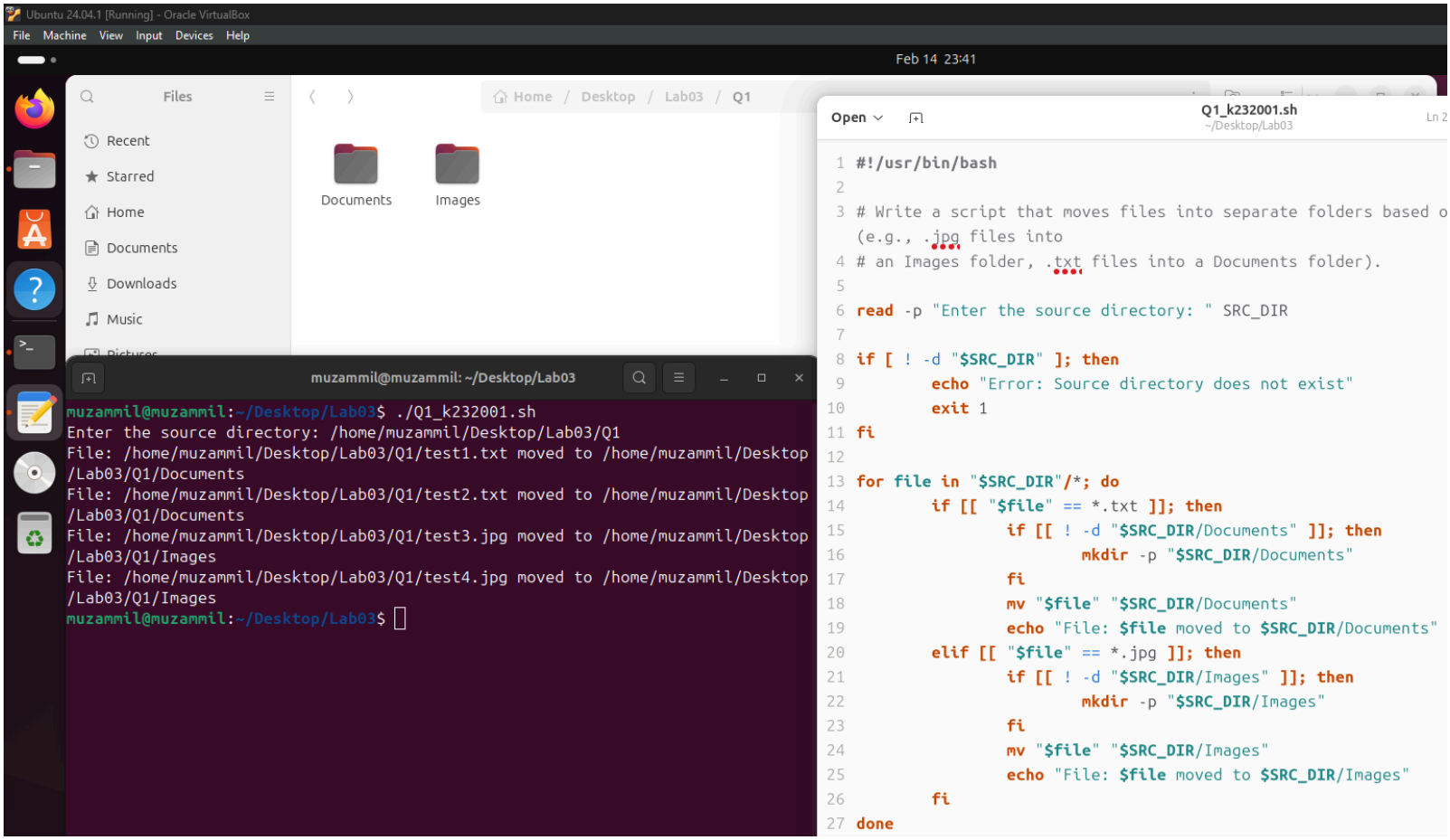
Each question's script operates on the specific folder, inside the main folder (Lab03). E.g: To test the functionality of Q8's script, provide the folder path of Q8 while running Q8_k232001.sh



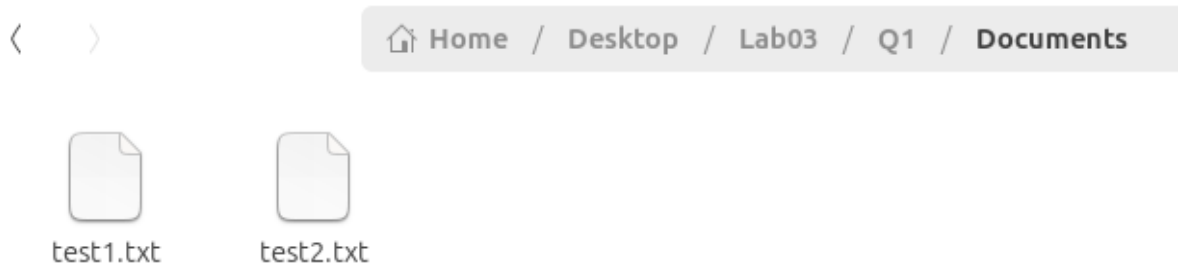
The scripts reside outside their specific question's folder to provide ease & an organized manner to operate those scripts.

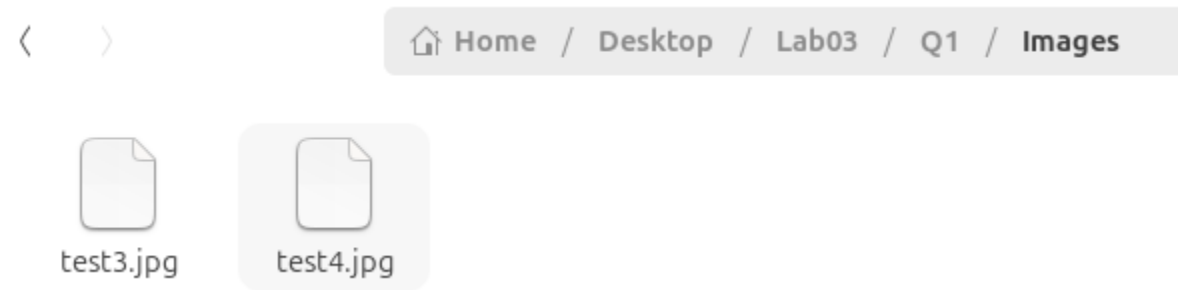
Q1:


Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Files
Recent
Starred
Home
Documents
Downloads
Music
Pictures
Videos
Trash
VBox_GAs_7.1.6
Other Locations
Home / Desktop / Lab03 / Q1
test1.txt
test2.txt
test3.jpg
test4.jpg

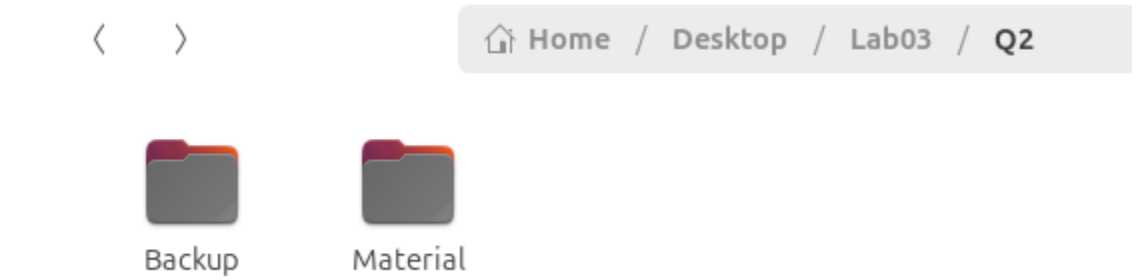

Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Feb 14 23:41
Files
Recent
Starred
Home
Documents
Downloads
Music
Home / Desktop / Lab03 / Q1
Documents
Images
muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ ./Q1_k232001.sh
Enter the source directory: /home/muzammil/Desktop/Lab03/Q1
File: /home/muzammil/Desktop/Lab03/Q1/test1.txt moved to /home/muzammil/Desktop/Lab03/Q1/Documents
File: /home/muzammil/Desktop/Lab03/Q1/test2.txt moved to /home/muzammil/Desktop/Lab03/Q1/Documents
File: /home/muzammil/Desktop/Lab03/Q1/test3.jpg moved to /home/muzammil/Desktop/Lab03/Q1/Images
File: /home/muzammil/Desktop/Lab03/Q1/test4.jpg moved to /home/muzammil/Desktop/Lab03/Q1/Images
muzammil@muzammil:~/Desktop/Lab03$
Open
Q1_k232001.sh
~/Desktop/Lab03
Ln 2
#!/usr/bin/bash
Write a script that moves files into separate folders based o
(e.g., .jpg files into
an Images folder, .txt files into a Documents folder).
read -p "Enter the source directory: " SRC_DIR
if [! -d "$SRC_DIR"]; then
echo "Error: Source directory does not exist"
exit 1
fi
for file in "$SRC_DIR"/*; do
if [["$file" == *.txt]]; then
if [[! -d "$SRC_DIR/Documents"]]; then
mkdir -p "$SRC_DIR/Documents"
fi
mv "$file" "$SRC_DIR/Documents"
echo "File: $file moved to $SRC_DIR/Documents"
elif [["$file" == *.jpg]]; then
if [[! -d "$SRC_DIR/Images"]]; then
mkdir -p "$SRC_DIR/Images"
fi
mv "$file" "$SRC_DIR/Images"
echo "File: $file moved to $SRC_DIR/Images"
fi
done

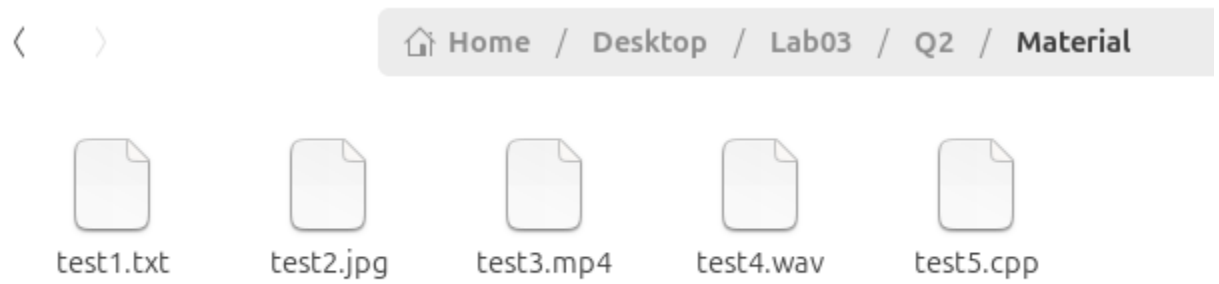
```
#!/usr/bin/bash

# Write a script that moves files into separate folders based on their extensions (e.g., .jpg files
into
# an Images folder, .txt files into a Documents folder).

read -p "Enter the source directory: " SRC_DIR

if [ ! -d "$SRC_DIR" ]; then
        echo "Error: Source directory does not exist"
        exit 1
fi

for file in "$SRC_DIR"/*; do
        if [[ "$file" == *.txt ]]; then
        if [[ ! -d "$SRC_DIR/Documents" ]]; then
        mkdir -p "$SRC_DIR/Documents"
        fi
        mv "$file" "$SRC_DIR/Documents"
        echo "File: $file moved to $SRC_DIR/Documents"
        elif [[ "$file" == *.jpg ]]; then
        if [[ ! -d "$SRC_DIR/Images" ]]; then
        mkdir -p "$SRC_DIR/Images"
        fi
        mv "$file" "$SRC_DIR/Images"
        echo "File: $file moved to $SRC_DIR/Images"
        fi
done
```

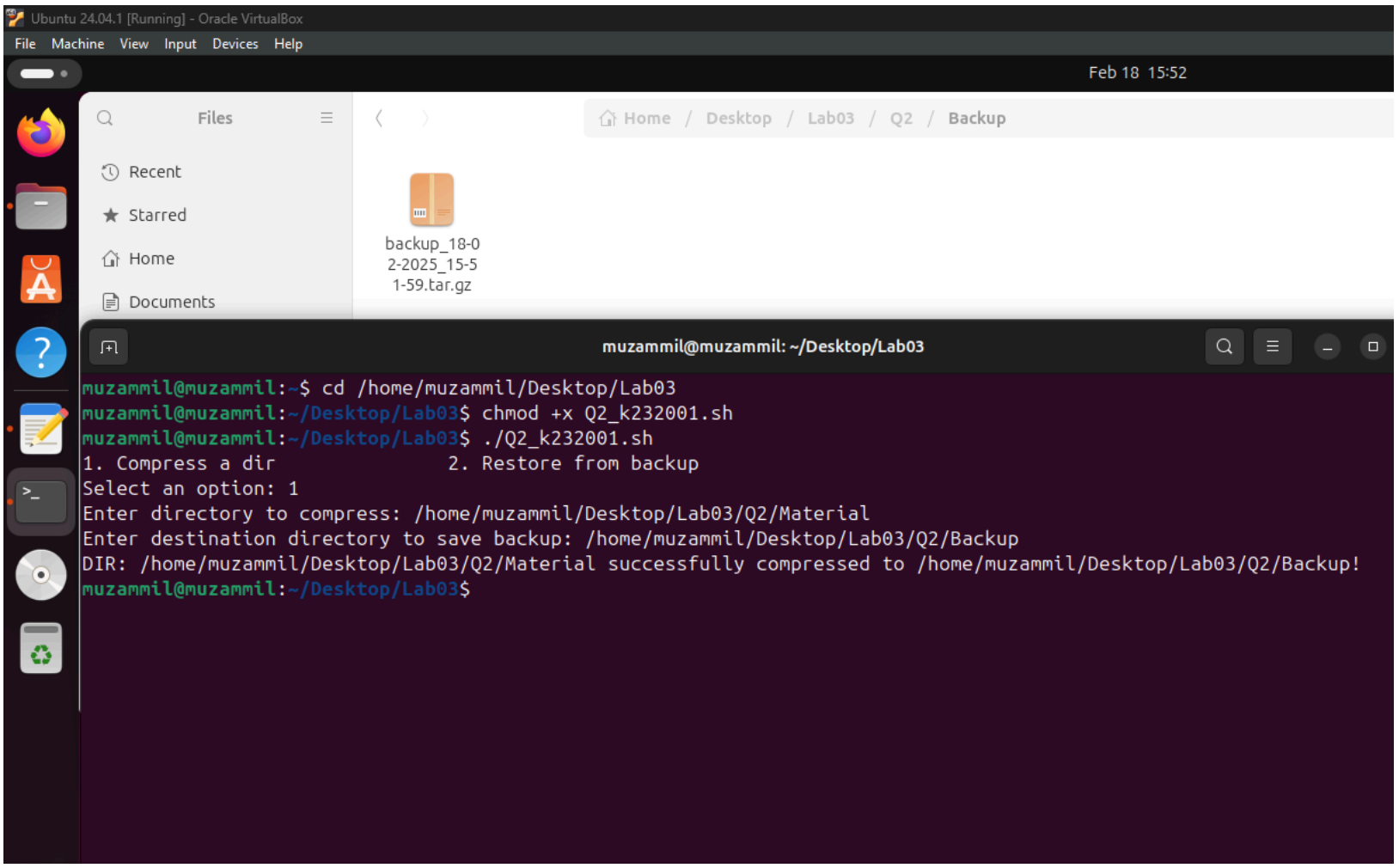


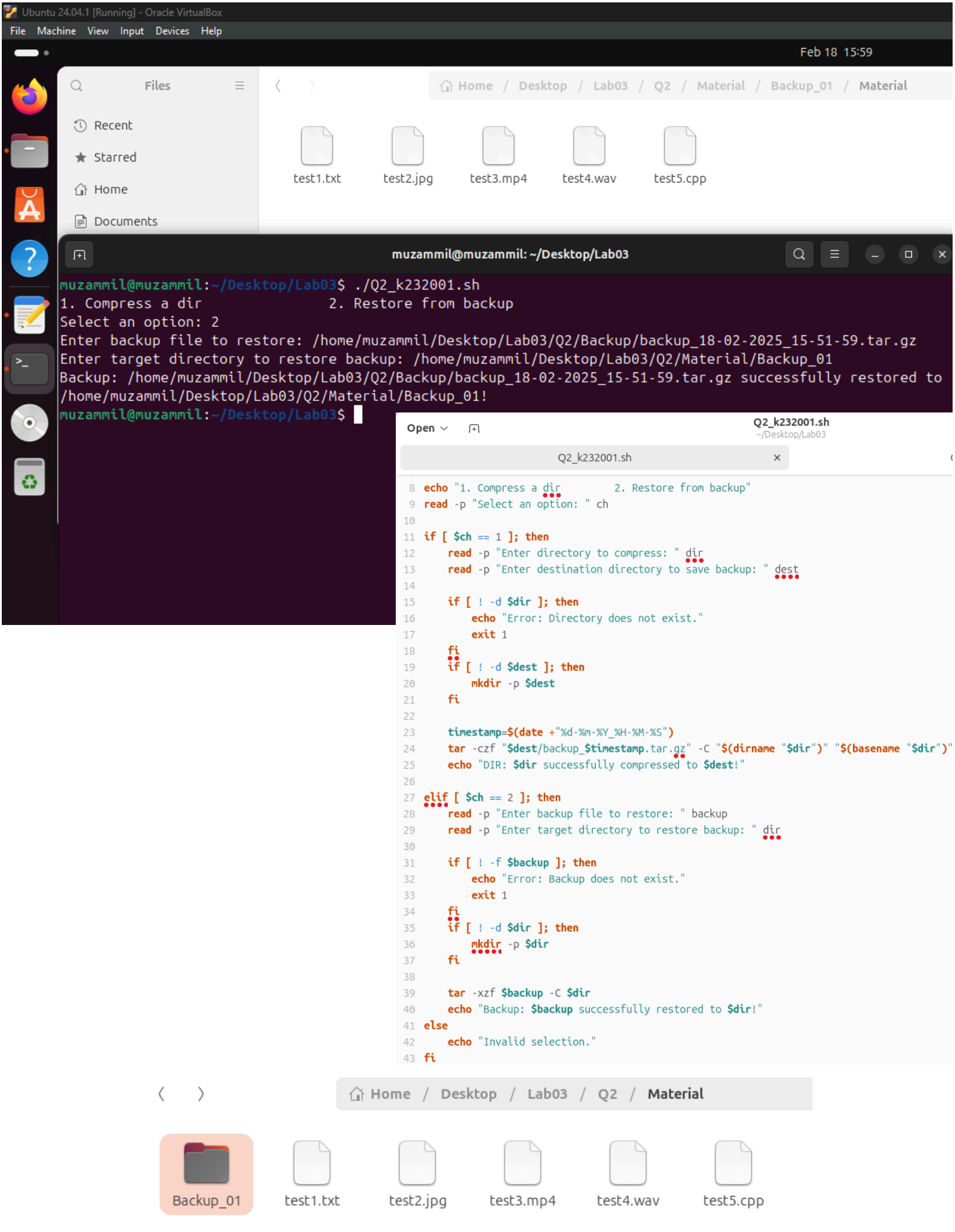


Q2:


Home / Desktop / Lab03 / Q2
Backup
Material

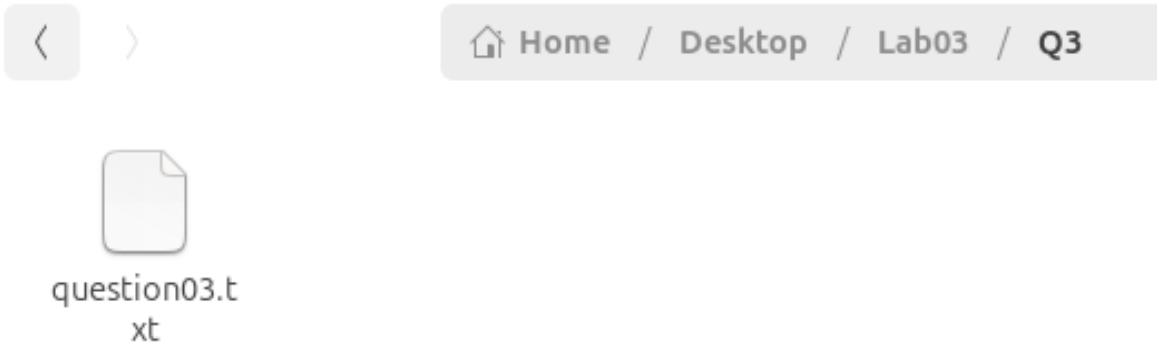

Home / Desktop / Lab03 / Q2 / Material
test1.txt
test2.jpg
test3.mp4
test4.wav
test5.cpp

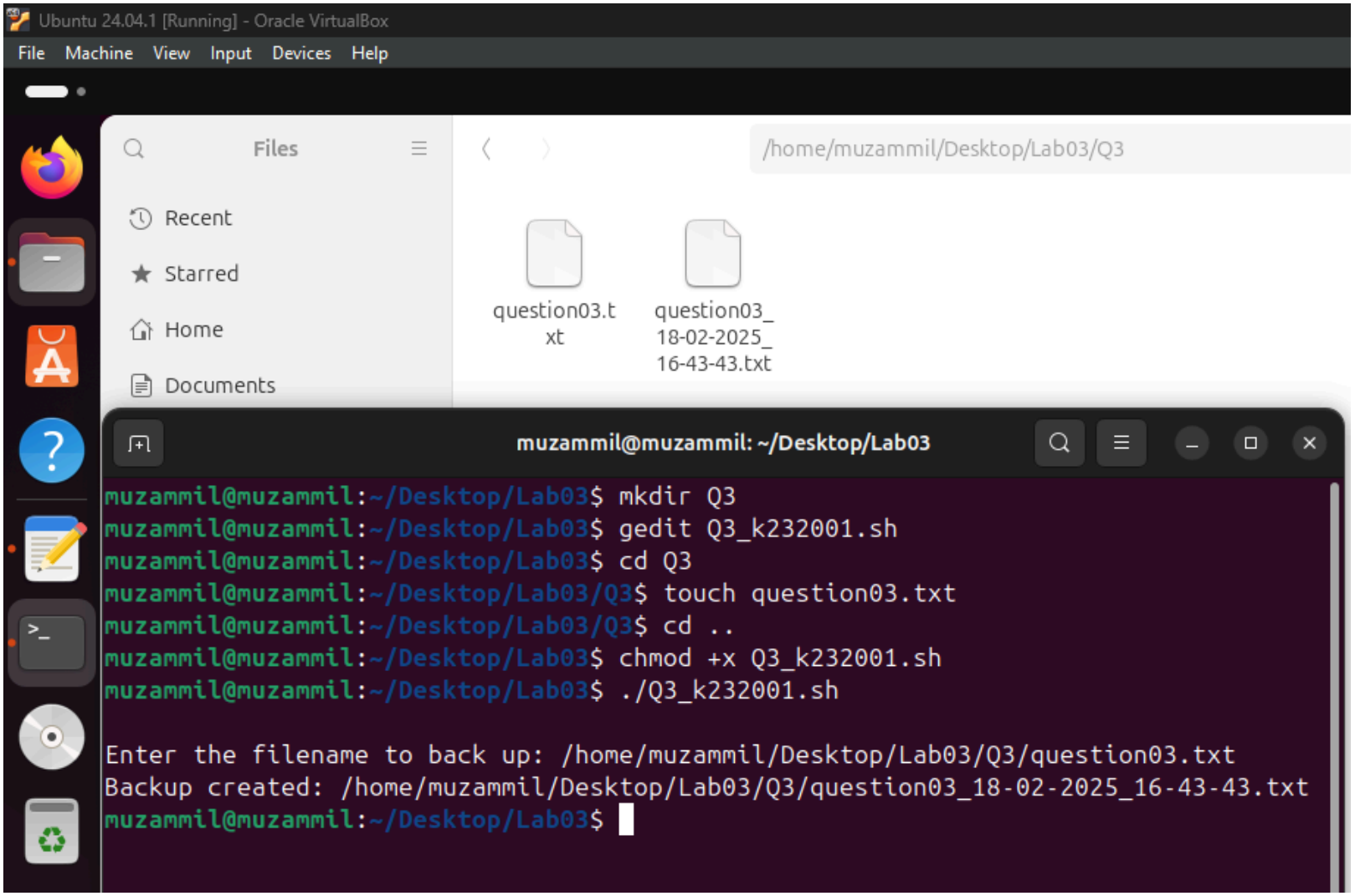

Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Feb 18 15:52
Files
Recent
Starred
Home
Documents
Home / Desktop / Lab03 / Q2 / Backup
backup_18-02-2025_15-51-59.tar.gz
muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~$ cd /home/muzammil/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ chmod +x Q2_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ ./Q2_k232001.sh
1. Compress a dir 2. Restore from backup
Select an option: 1
Enter directory to compress: /home/muzammil/Desktop/Lab03/Q2/Material
Enter destination directory to save backup: /home/muzammil/Desktop/Lab03/Q2/Backup
DIR: /home/muzammil/Desktop/Lab03/Q2/Material successfully compressed to /home/muzammil/Desktop/Lab03/Q2/Backup!
muzammil@muzammil:~/Desktop/Lab03$


Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Feb 18 15:59
Files
Recent
Starred
Home
Documents
Home / Desktop / Lab03 / Q2 / Material / Backup_01 / Material
test1.txt
test2.jpg
test3.mp4
test4.wav
test5.cpp
muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ ./Q2_k232001.sh
1. Compress a dir 2. Restore from backup
Select an option: 2
Enter backup file to restore: /home/muzammil/Desktop/Lab03/Q2/Backup/backup_18-02-2025_15-51-59.tar.gz
Enter target directory to restore backup: /home/muzammil/Desktop/Lab03/Q2/Material/Backup_01
Backup: /home/muzammil/Desktop/Lab03/Q2/Backup/backup_18-02-2025_15-51-59.tar.gz successfully restored to /home/muzammil/Desktop/Lab03/Q2/Material/Backup_01!
muzammil@muzammil:~/Desktop/Lab03$
Open
Q2_k232001.sh
~/Desktop/Lab03
Q2_k232001.sh
8 echo "1. Compress a dir 2. Restore from backup"
9 read -p "Select an option: " ch
10
11 if [$ch == 1]; then
12 read -p "Enter directory to compress: " dir
13 read -p "Enter destination directory to save backup: " dest
14
15 if [! -d $dir]; then
16 echo "Error: Directory does not exist."
17 exit 1
18 fi
19 if [! -d $dest]; then
20 mkdir -p $dest
21 fi
22
23 timestamp=$(date +"%d-%m-%Y_%H-%M-%S")
24 tar -czf "$dest/backup_$timestamp.tar.gz" -C "$(dirname "$dir")" "$(basename "$dir")"
25 echo "DIR: $dir successfully compressed to $dest!"
26
27 elif [$ch == 2]; then
28 read -p "Enter backup file to restore: " backup
29 read -p "Enter target directory to restore backup: " dir
30
31 if [! -f $backup]; then
32 echo "Error: Backup does not exist."
33 exit 1
34 fi
35 if [! -d $dir]; then
36 mkdir -p $dir
37 fi
38
39 tar -xzf $backup -C $dir
40 echo "Backup: $backup successfully restored to $dir!"
41 else
42 echo "Invalid selection."
43 fi
Home / Desktop / Lab03 / Q2 / Material
Backup_01
test1.txt
test2.jpg
test3.mp4
test4.wav
test5.cpp

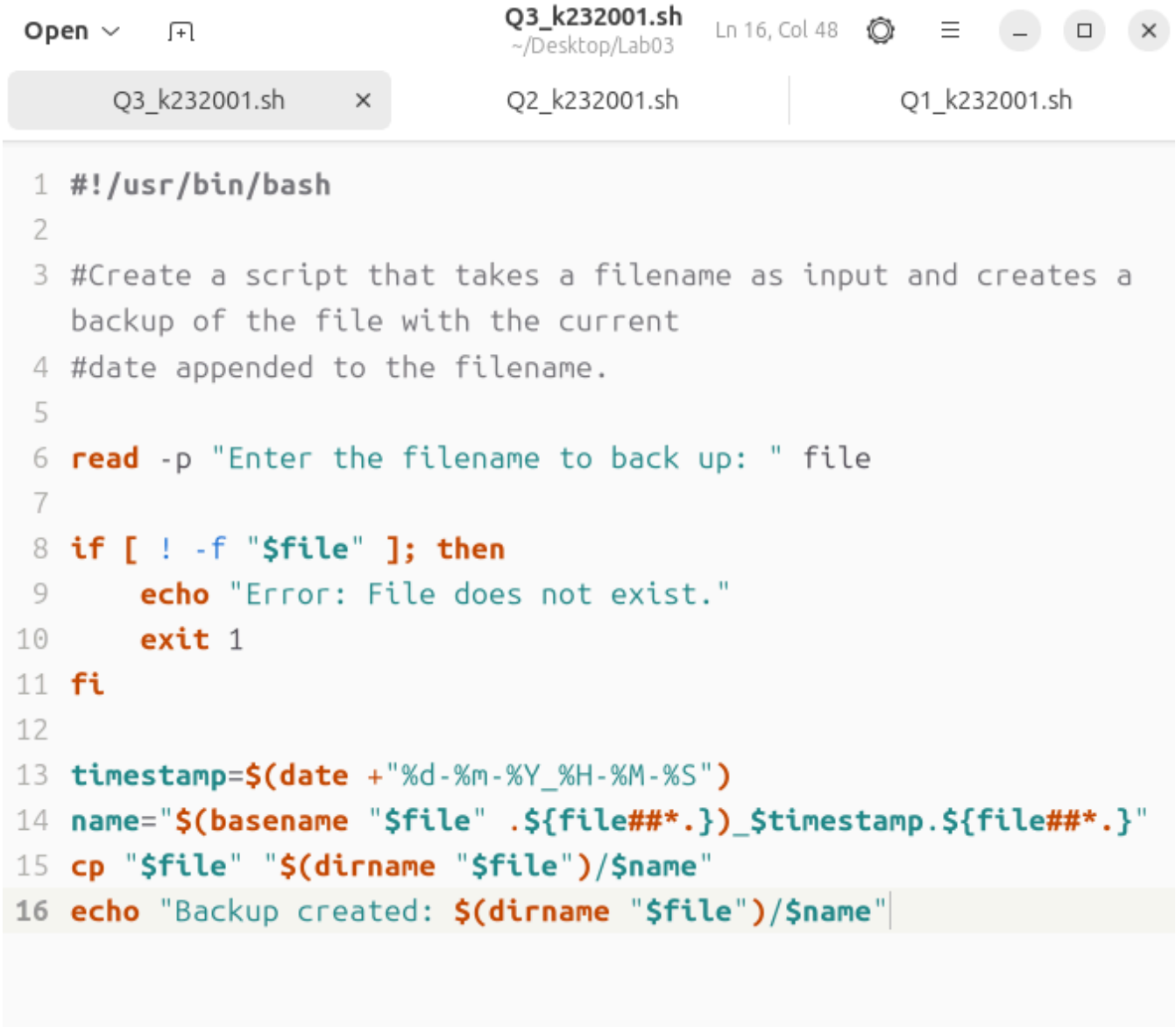
```
#!/usr/bin/bash

# Write a script that compresses a specified directory into a ".tar.gz" archive with a timestamp
# and allows restoring from a backup.

echo "1. Compress a dir        2. Restore from backup"
read -p "Select an option: " ch

if [ $ch == 1 ]; then
        read -p "Enter directory to compress: " dir
        read -p "Enter destination directory to save backup: " dest

        if [ ! -d $dir ]; then
        echo "Error: Directory does not exist."
        exit 1
        fi
        if [ ! -d $dest ]; then
        mkdir -p $dest
        fi

        timestamp=$(date +"%d-%m-%Y_%H-%M-%S")
        tar -czf "$dest/backup_$timestamp.tar.gz" -C "$(dirname "$dir")" "$(basename "$dir")"
        echo "DIR: $dir successfully compressed to $dest!"

elif [ $ch == 2 ]; then
        read -p "Enter backup file to restore: " backup
        read -p "Enter target directory to restore backup: " dir

        if [ ! -f $backup ]; then
        echo "Error: Backup does not exist."
        exit 1
        fi
        if [ ! -d $dir ]; then
        mkdir -p $dir
        fi

        tar -xzf $backup -C $dir
        echo "Backup: $backup successfully restored to $dir!"
else
        echo "Invalid selection."
fi
```

Q3:

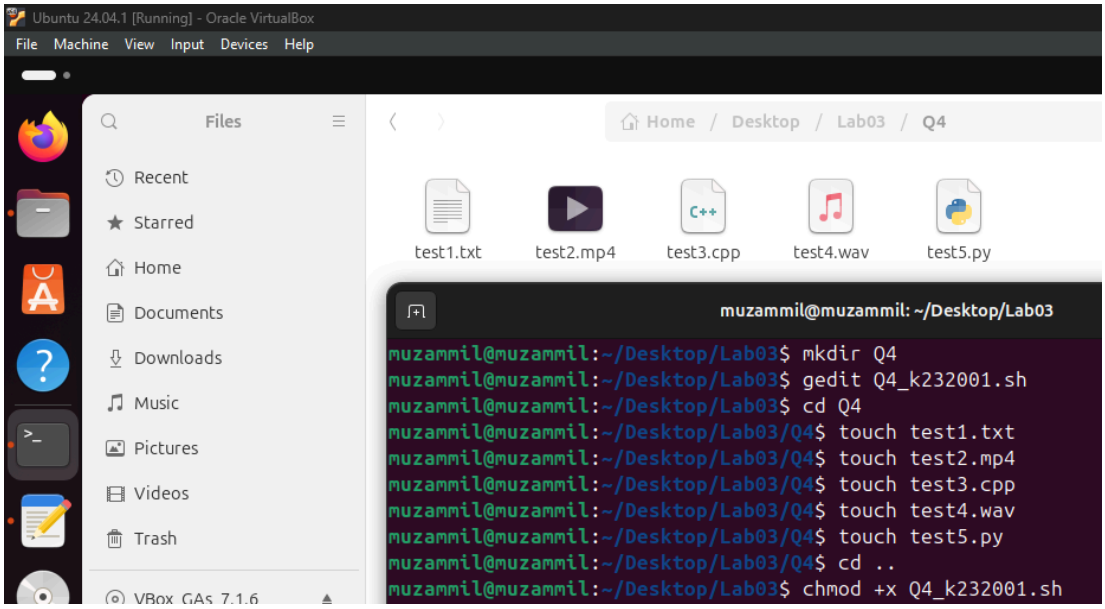

Home / Desktop / Lab03 / Q3
question03.txt

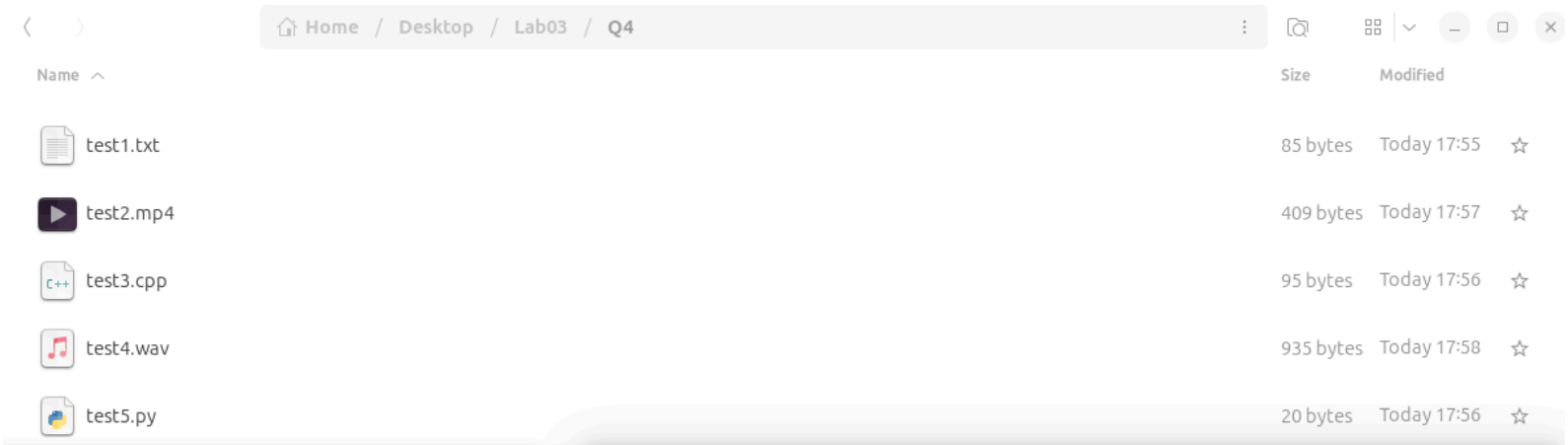

Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Files
Recent
Starred
Home
Documents
/home/muzammil/Desktop/Lab03/Q3
question03.txt
question03_18-02-2025_16-43-43.txt
muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ mkdir Q3
muzammil@muzammil:~/Desktop/Lab03$ gedit Q3_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ cd Q3
muzammil@muzammil:~/Desktop/Lab03/Q3$ touch question03.txt
muzammil@muzammil:~/Desktop/Lab03/Q3$ cd ..
muzammil@muzammil:~/Desktop/Lab03$ chmod +x Q3_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ ./Q3_k232001.sh
Enter the filename to back up: /home/muzammil/Desktop/Lab03/Q3/question03.txt
Backup created: /home/muzammil/Desktop/Lab03/Q3/question03_18-02-2025_16-43-43.txt
muzammil@muzammil:~/Desktop/Lab03$

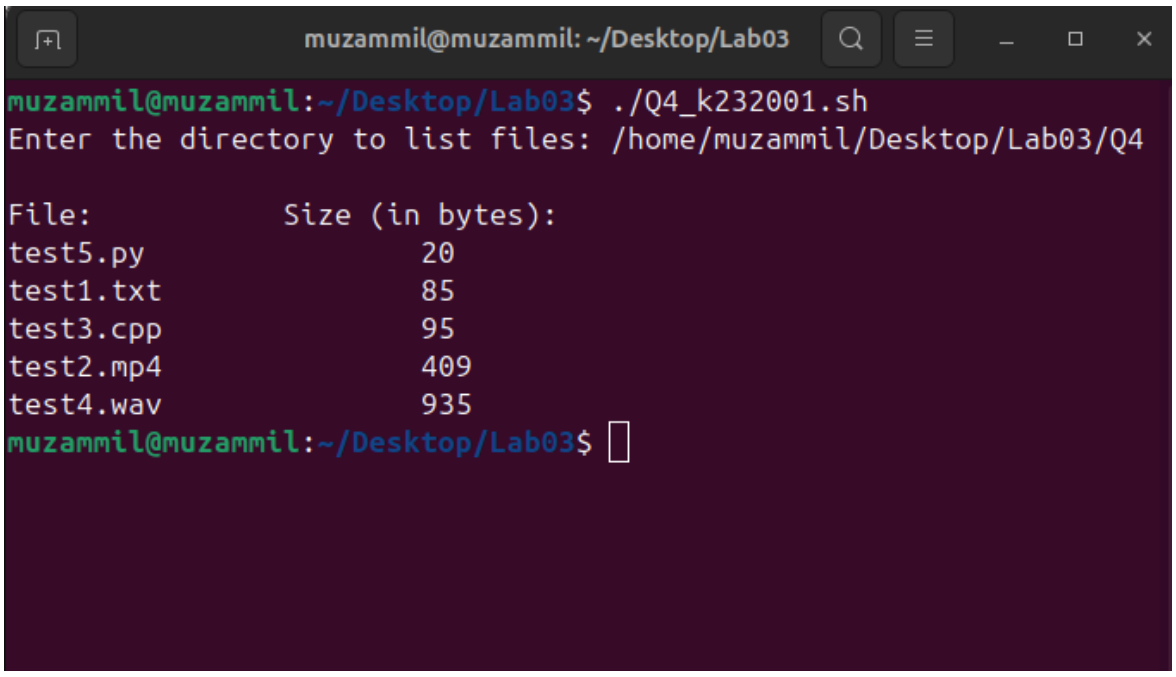
```
#!/usr/bin/bash

#Create a script that takes a filename as input and creates a backup of the file with the current
#date appended to the filename.

read -p "Enter the filename to back up: " file

if [ ! -f "$file" ]; then
        echo "Error: File does not exist."
        exit 1
fi

timestamp=$(date +"%d-%m-%Y_%H-%M-%S")
name="$(basename "$file" .${file##*.})_$timestamp.${file##*.}"
cp "$file" "$(dirname "$file")/$name"
echo "Backup created: $(dirname "$file")/$name"
```



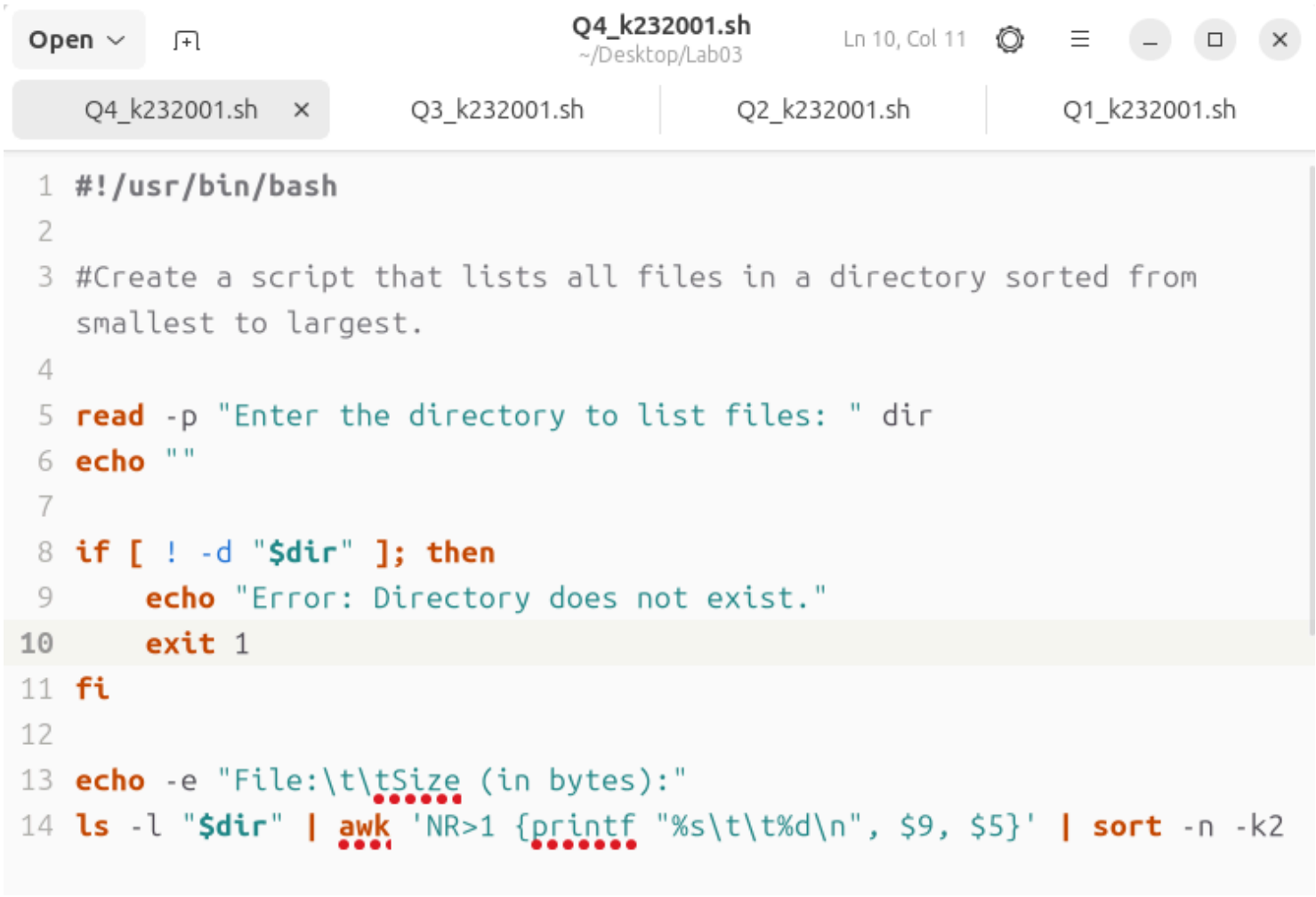
Q4:


Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Files
Recent
Starred
Home
Documents
Downloads
Music
Pictures
Videos
Trash
Home / Desktop / Lab03 / Q4
test1.txt
test2.mp4
test3.cpp
test4.wav
test5.py
muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ mkdir Q4
muzammil@muzammil:~/Desktop/Lab03$ gedit Q4_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ cd Q4
muzammil@muzammil:~/Desktop/Lab03/Q4$ touch test1.txt
muzammil@muzammil:~/Desktop/Lab03/Q4$ touch test2.mp4
muzammil@muzammil:~/Desktop/Lab03/Q4$ touch test3.cpp
muzammil@muzammil:~/Desktop/Lab03/Q4$ touch test4.wav
muzammil@muzammil:~/Desktop/Lab03/Q4$ touch test5.py
muzammil@muzammil:~/Desktop/Lab03/Q4$ cd ..
muzammil@muzammil:~/Desktop/Lab03$ chmod +x Q4_k232001.sh

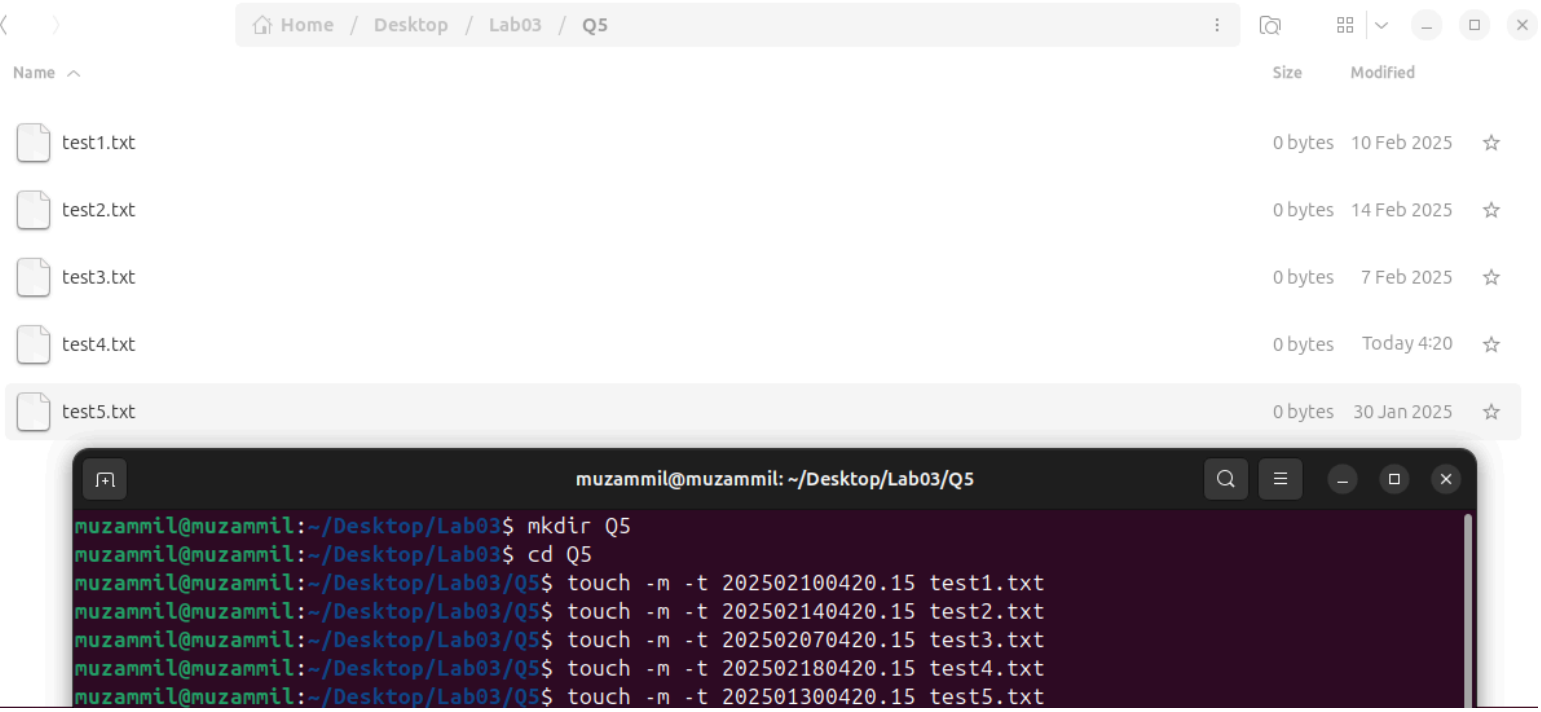

Home / Desktop / Lab03 / Q4
Name
Size
Modified
test1.txt 85 bytes Today 17:55
test2.mp4 409 bytes Today 17:57
test3.cpp 95 bytes Today 17:56
test4.wav 935 bytes Today 17:58
test5.py 20 bytes Today 17:56


muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ ./Q4_k232001.sh
Enter the directory to list files: /home/muzammil/Desktop/Lab03/Q4
File: Size (in bytes):
test5.py 20
test1.txt 85
test3.cpp 95
test2.mp4 409
test4.wav 935
muzammil@muzammil:~/Desktop/Lab03$

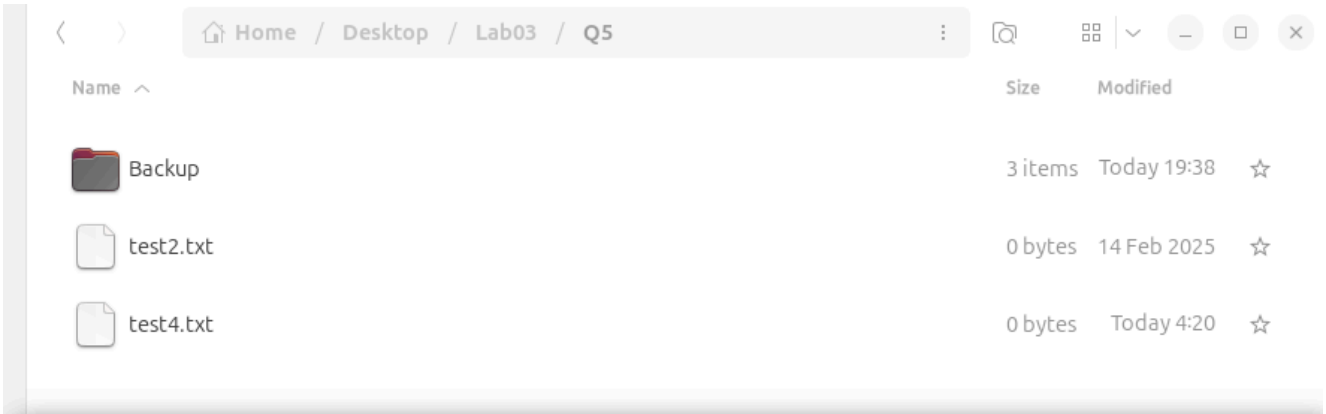
```
#!/usr/bin/bash

#Create a script that lists all files in a directory sorted from smallest to largest.

read -p "Enter the directory to list files: " dir
echo ""

if [ ! -d "$dir" ]; then
        echo "Error: Directory does not exist."
        exit 1
fi

echo -e "File:\t\tSize (in bytes):"
ls -l "$dir" | awk 'NR>1 {printf "%s\t\t%d\n", $9, $5}' | sort -n -k2
```



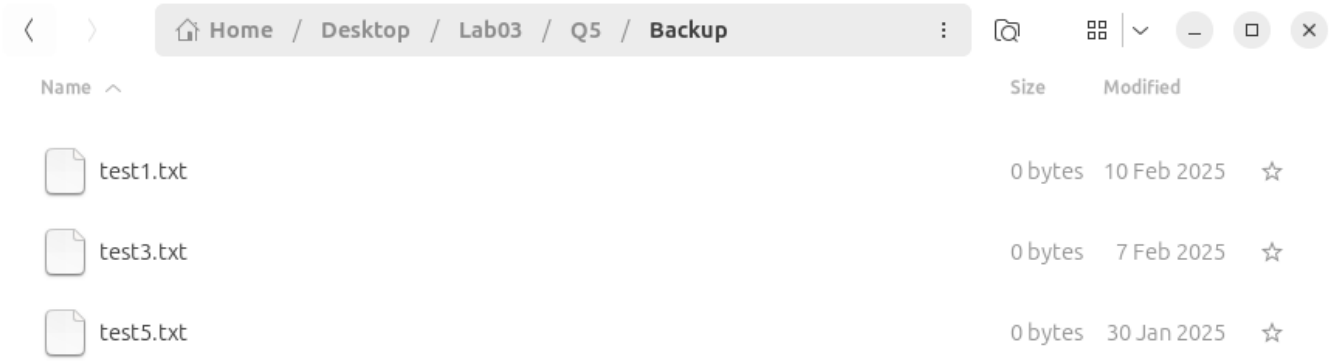
Q5:



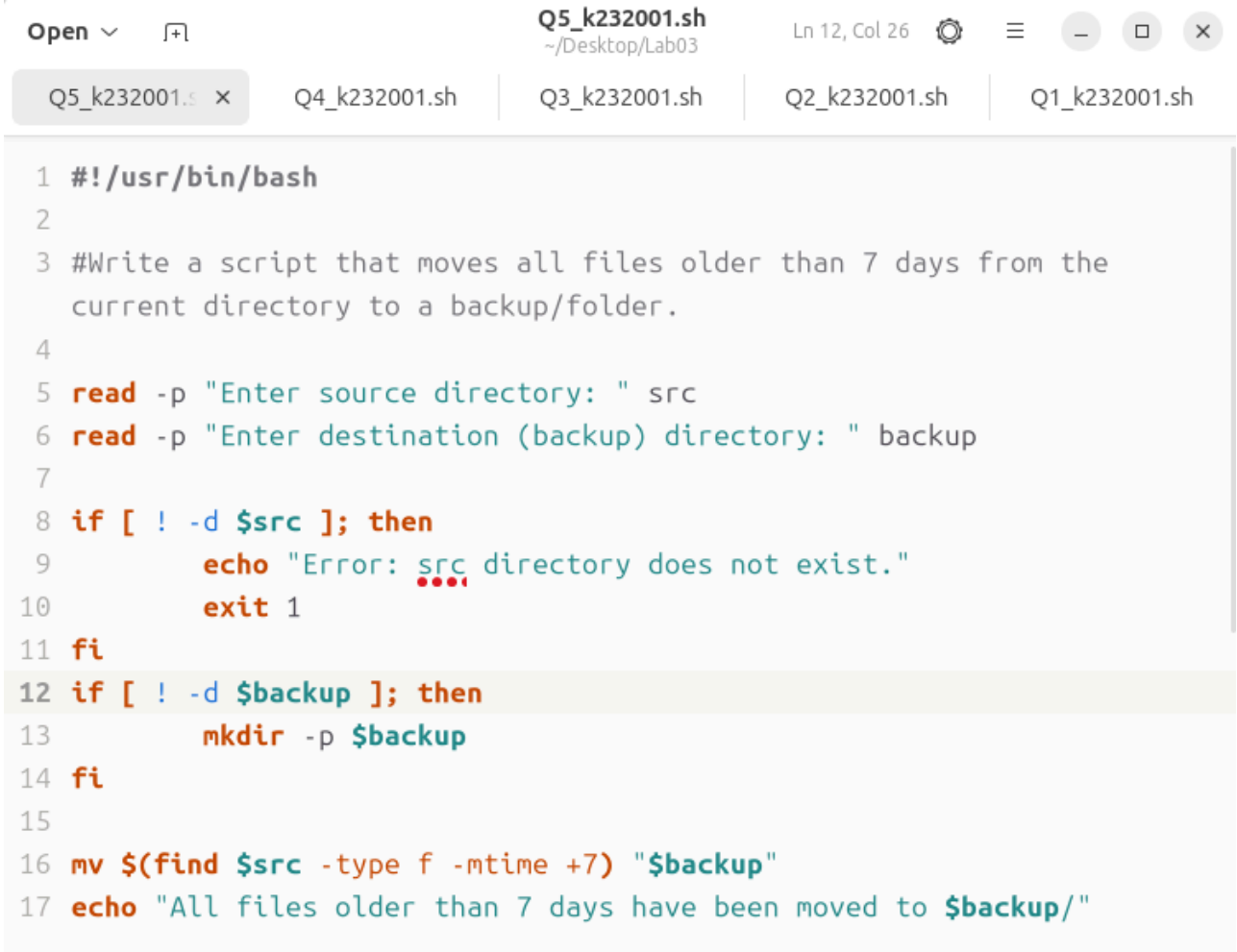

```
muzammil@muzammil: ~/Desktop/Lab03/Q5
muzammil@muzammil:~/Desktop/Lab03$ mkdir Q5
muzammil@muzammil:~/Desktop/Lab03$ cd Q5
muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202502100420.15 test1.txt
muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202502140420.15 test2.txt
muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202502070420.15 test3.txt
muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202502180420.15 test4.txt
muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202501300420.15 test5.txt
```



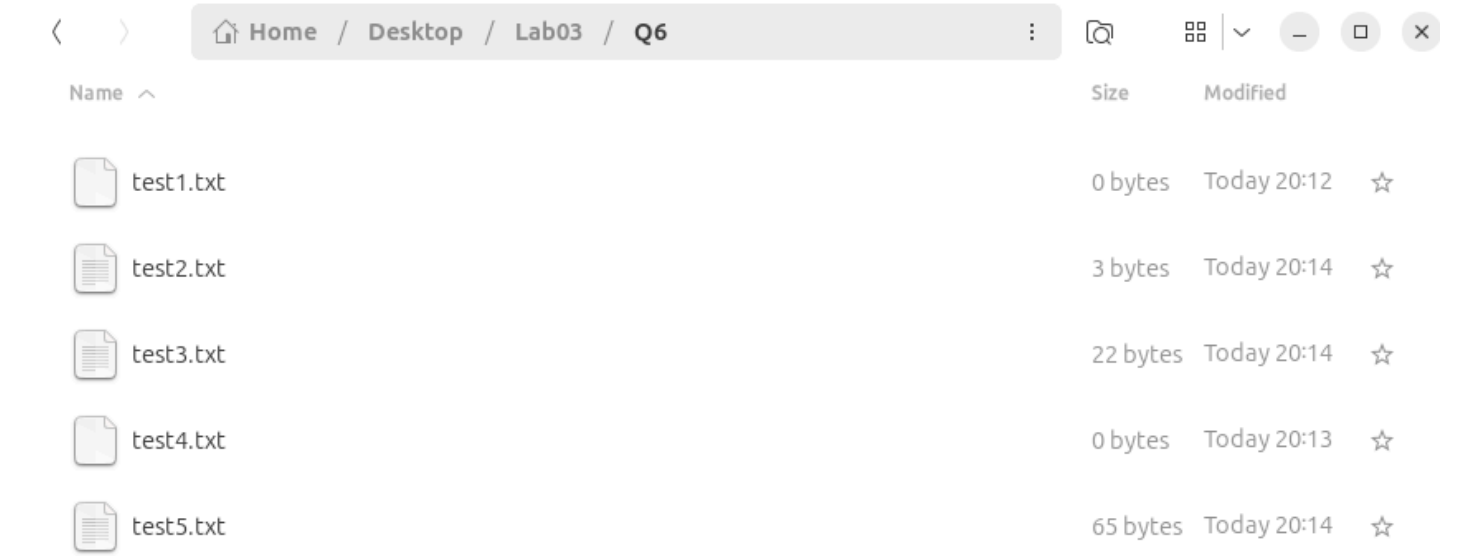

```
muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ mkdir Q5
muzammil@muzammil:~/Desktop/Lab03$ cd Q5
muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202502100420.15 test1.txt
muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202502140420.15 test2.txt

muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202502070420.15 test3.txt

muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202502180420.15 test4.txt

muzammil@muzammil:~/Desktop/Lab03/Q5$ touch -m -t 202501300420.15 test5.txt

muzammil@muzammil:~/Desktop/Lab03/Q5$ cd ..
muzammil@muzammil:~/Desktop/Lab03$ chmod +x Q5_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ ./Q5_k232001.sh
Enter source directory: /home/muzammil/Desktop/Lab03/Q5
Enter destination (backup) directory: /home/muzammil/Desktop/Lab03/Q5/Backup
All files older than 7 days have been moved to /home/muzammil/Desktop/Lab03/Q5/Backup/
muzammil@muzammil:~/Desktop/Lab03$
```

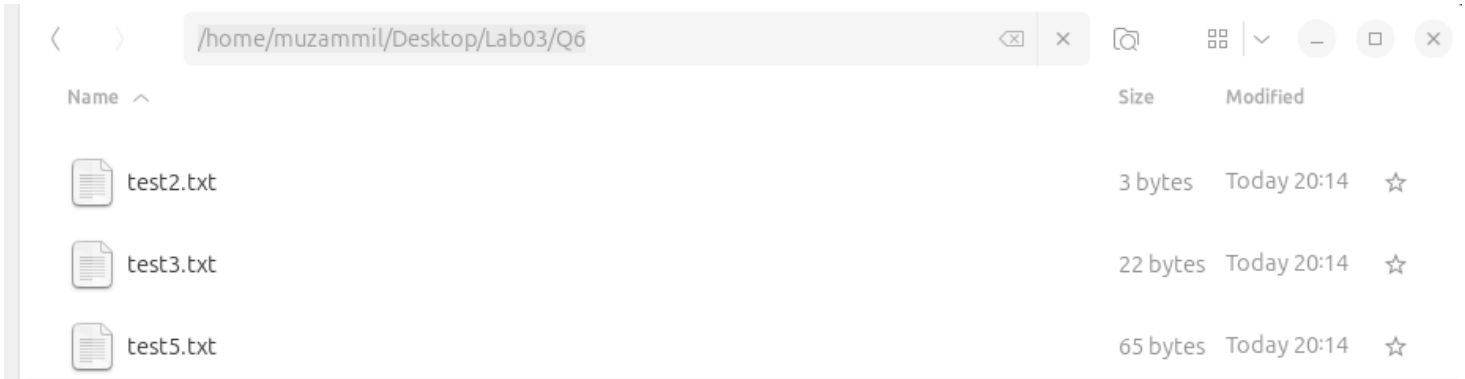



```
#!/usr/bin/bash
#Write a script that moves all files older than 7 days from the current directory to a backup/folder.

read -p "Enter source directory: " src
read -p "Enter destination (backup) directory: " backup

if [ ! -d $src ]; then
        echo "Error: src directory does not exist."
        exit 1
fi
if [ ! -d $backup ]; then
        mkdir -p $backup
fi

mv $(find $src -type f -mtime +7) "$backup"
echo "All files older than 7 days have been moved to $backup/"
```



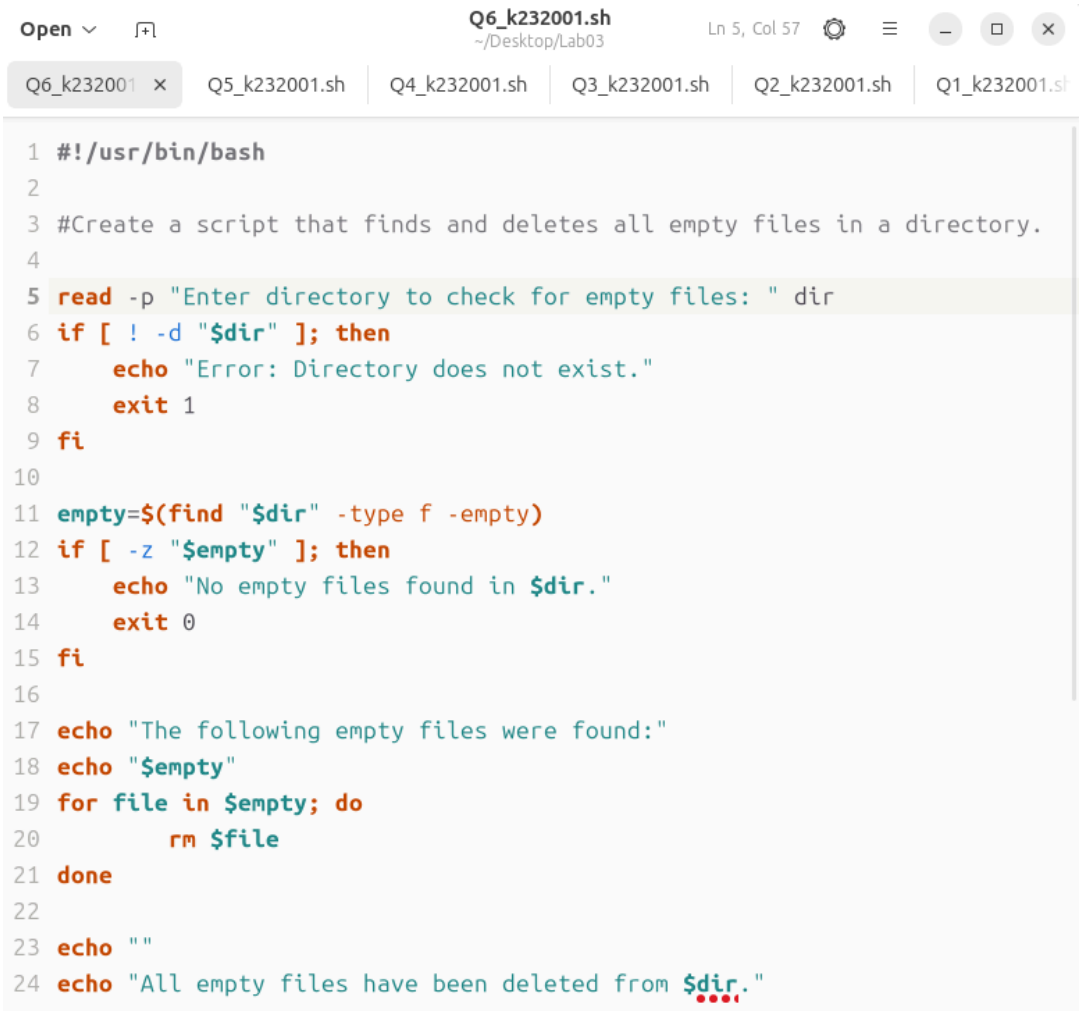
Q6:



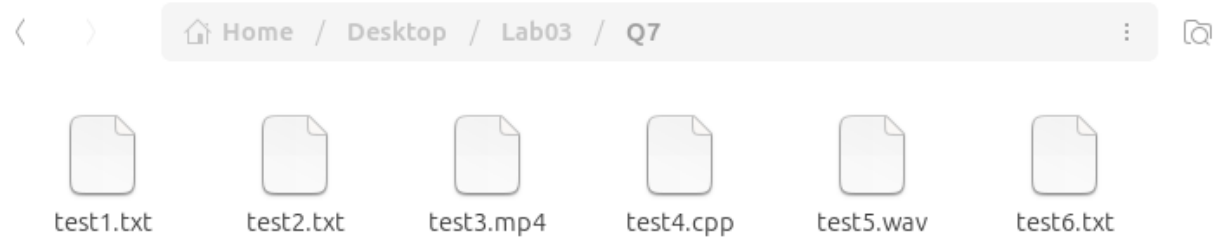


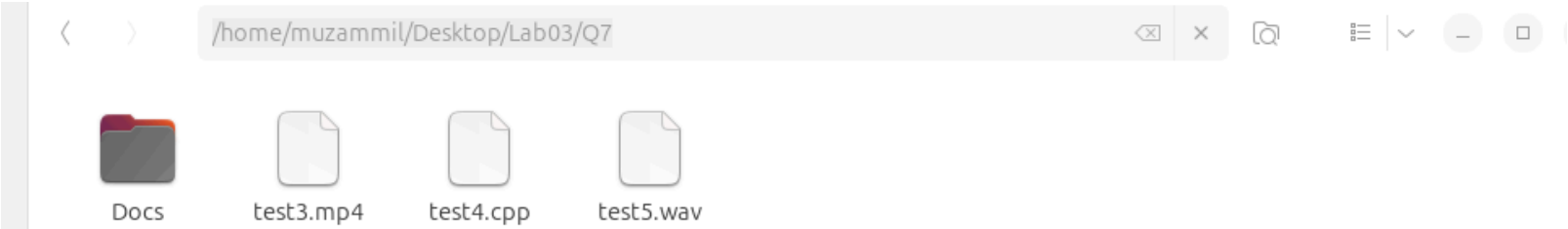

```
muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ mkdir Q6
muzammil@muzammil:~/Desktop/Lab03$ cd Q6
muzammil@muzammil:~/Desktop/Lab03/Q6$ touch test1.txt
muzammil@muzammil:~/Desktop/Lab03/Q6$ touch test2.txt
muzammil@muzammil:~/Desktop/Lab03/Q6$ touch test3.txt
muzammil@muzammil:~/Desktop/Lab03/Q6$ touch test4.txt
muzammil@muzammil:~/Desktop/Lab03/Q6$ touch test5.txt
muzammil@muzammil:~/Desktop/Lab03/Q6$ cd ..
muzammil@muzammil:~/Desktop/Lab03$ gedit Q6_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ chmod +x Q6_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ ./Q6_k232001.sh
Enter directory to check for empty files: /home/muzammil/Desktop/Lab03/Q6
The following empty files were found:
/home/muzammil/Desktop/Lab03/Q6/test1.txt
/home/muzammil/Desktop/Lab03/Q6/test4.txt

All empty files have been deleted from /home/muzammil/Desktop/Lab03/Q6.
muzammil@muzammil:~/Desktop/Lab03$ ./Q6_k232001.sh
Enter directory to check for empty files: /home/muzammil/Desktop/Lab03/Q6
No empty files found in /home/muzammil/Desktop/Lab03/Q6.
muzammil@muzammil:~/Desktop/Lab03$
```

```
#!/usr/bin/bash
#Create a script that finds and deletes all empty files in a directory.

read -p "Enter directory to check for empty files: " dir
if [ ! -d "$dir" ]; then
        echo "Error: Directory does not exist."
        exit 1
fi

empty=$(find "$dir" -type f -empty)
if [ -z "$empty" ]; then
        echo "No empty files found in $dir."
        exit 0
fi

echo "The following empty files were found:"
echo "$empty"
for file in $empty; do
        rm $file
done

echo ""
echo "All empty files have been deleted from $dir."
```

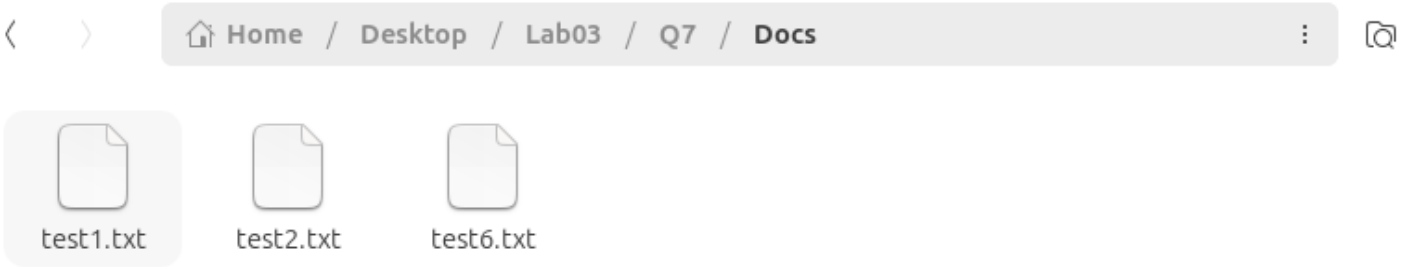


Q7:

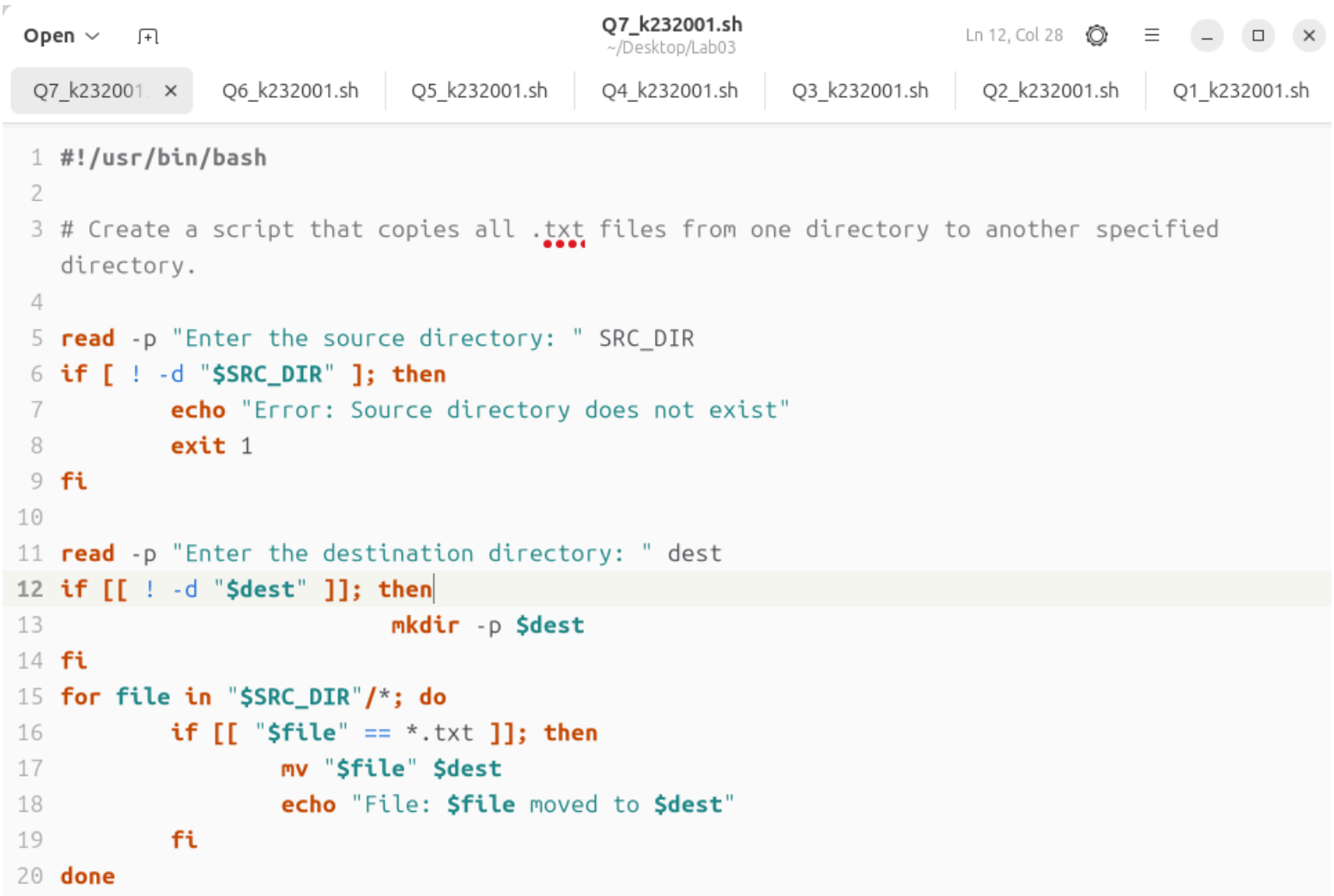




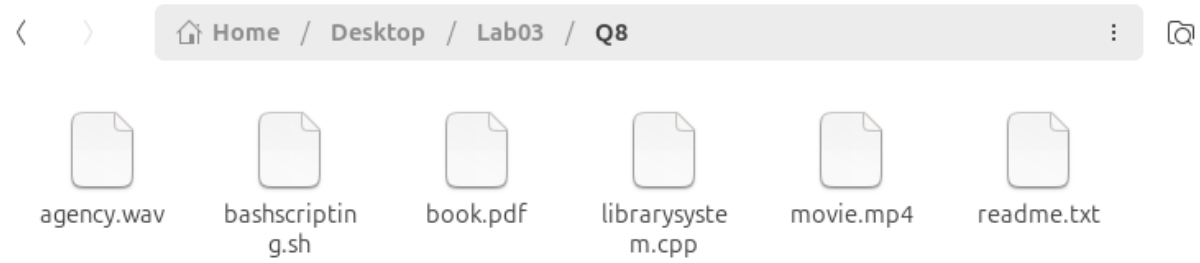

```
muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ mkdir Q7
muzammil@muzammil:~/Desktop/Lab03$ cd Q7
muzammil@muzammil:~/Desktop/Lab03/Q7$ touch test1.txt
muzammil@muzammil:~/Desktop/Lab03/Q7$ touch test2.txt
muzammil@muzammil:~/Desktop/Lab03/Q7$ touch test3.mp4
muzammil@muzammil:~/Desktop/Lab03/Q7$ touch test4.cpp
muzammil@muzammil:~/Desktop/Lab03/Q7$ touch test5.wav
muzammil@muzammil:~/Desktop/Lab03/Q7$ touch test6.txt
muzammil@muzammil:~/Desktop/Lab03/Q7$ cd ..
muzammil@muzammil:~/Desktop/Lab03$ gedit Q7_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ chmod +x Q7_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ ./Q7_k232001.sh
Enter the source directory: /home/muzammil/Desktop/Lab03/Q7
Enter the destination directory: /home/muzammil/Desktop/Lab03/Q7/Docs
File: /home/muzammil/Desktop/Lab03/Q7/test1.txt moved to /home/muzammil/Desktop/Lab03/Q7/Docs
File: /home/muzammil/Desktop/Lab03/Q7/test2.txt moved to /home/muzammil/Desktop/Lab03/Q7/Docs
File: /home/muzammil/Desktop/Lab03/Q7/test6.txt moved to /home/muzammil/Desktop/Lab03/Q7/Docs
muzammil@muzammil:~/Desktop/Lab03$
```

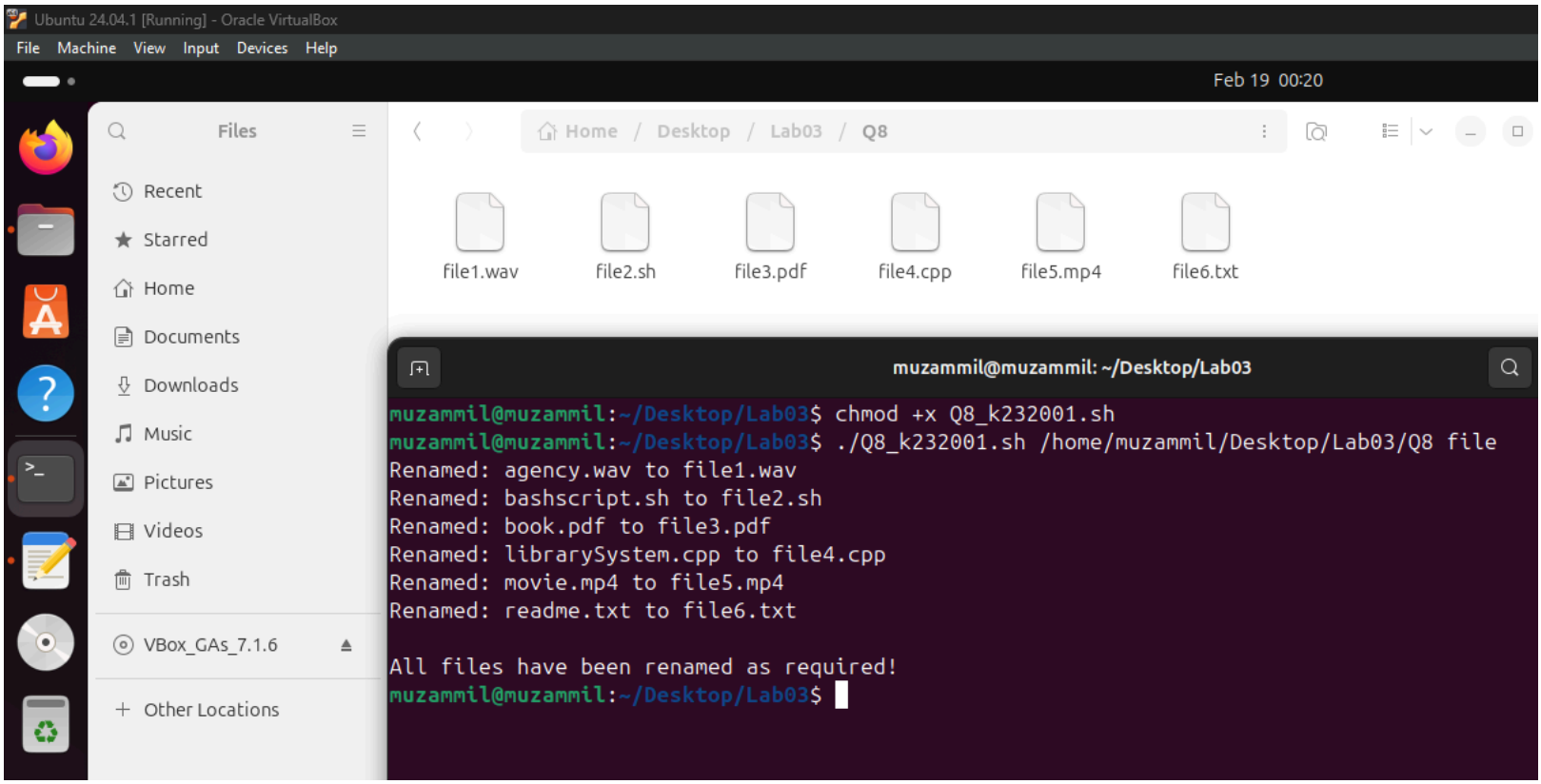
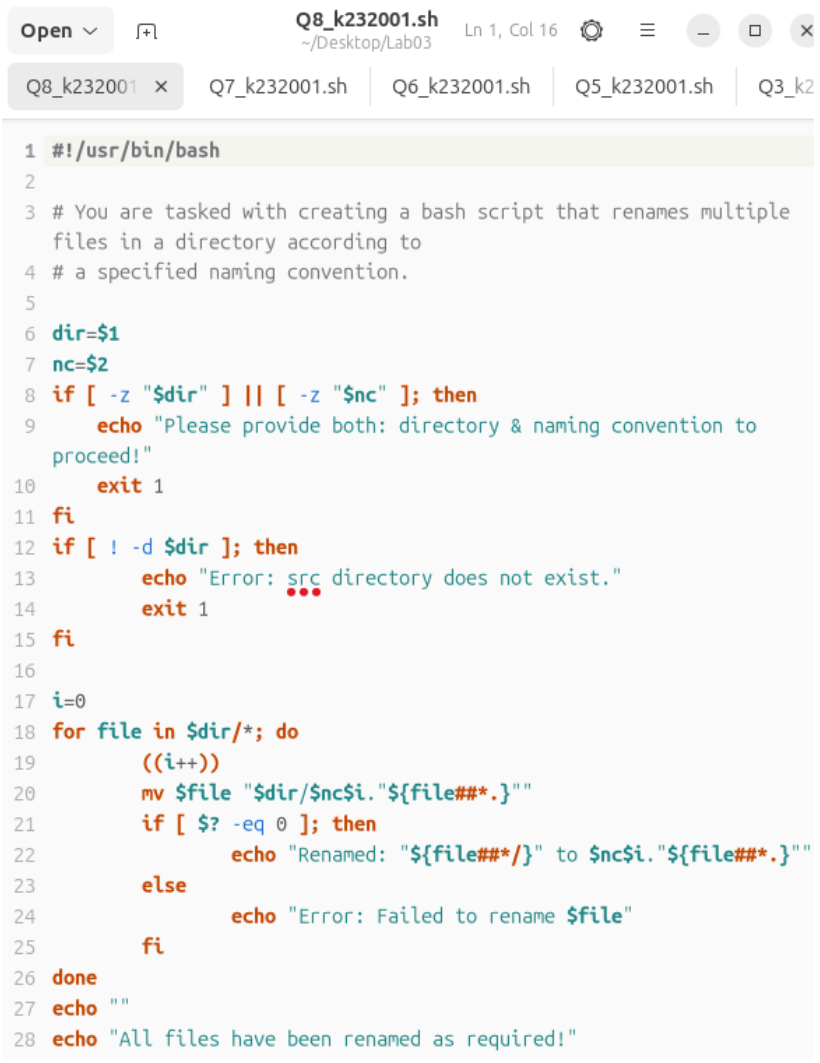


```
#!/usr/bin/bash

# Create a script that copies all .txt files from one directory to another specified directory.

read -p "Enter the source directory: " SRC_DIR
if [ ! -d "$SRC_DIR" ]; then
        echo "Error: Source directory does not exist"
        exit 1
fi

read -p "Enter the destination directory: " dest
if [[ ! -d "$dest" ]]; then
        mkdir -p $dest
fi
for file in "$SRC_DIR"/*; do
        if [[ "$file" == *.txt ]]; then
        mv "$file" $dest
        echo "File: $file moved to $dest"
        fi
done
```



Q8:


Home / Desktop / Lab03 / Q8
agency.wav
bashscripting.sh
book.pdf
librarysystem.cpp
movie.mp4
readme.txt


Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Feb 19 00:20
Files
Recent
Starred
Home
Documents
Downloads
Music
Pictures
Videos
Trash
VBox_GAs_7.1.6
Other Locations
Home / Desktop / Lab03 / Q8
file1.wav
file2.sh
file3.pdf
file4.cpp
file5.mp4
file6.txt
muzammil@muzammil: ~/Desktop/Lab03
muzammil@muzammil:~/Desktop/Lab03$ chmod +x Q8_k232001.sh
muzammil@muzammil:~/Desktop/Lab03$ ./Q8_k232001.sh /home/muzammil/Desktop/Lab03/Q8 file
Renamed: agency.wav to file1.wav
Renamed: bashscript.sh to file2.sh
Renamed: book.pdf to file3.pdf
Renamed: librarySystem.cpp to file4.cpp
Renamed: movie.mp4 to file5.mp4
Renamed: readme.txt to file6.txt
All files have been renamed as required!
muzammil@muzammil:~/Desktop/Lab03$

```
#!/usr/bin/bash

# You are tasked with creating a bash script that renames multiple files in a directory according
to
# a specified naming convention.
dir=$1
nc=$2
if [ -z "$dir" ] || [ -z "$nc" ]; then
        echo "Please provide both: directory & naming convention to proceed!"
        exit 1
fi
if [ ! -d $dir ]; then
        echo "Error: src directory does not exist."
        exit 1
fi
i=0
for file in $dir/*; do
        ((i++))
        mv $file "$dir/$nc$i."${file##*.}""
if [ $? -eq 0 ]; then
   echo "Renamed: "${file##*/}" to $nc$i."${file##*.}""
else
    echo "Error: Failed to rename $file"
        fi
done
echo ""
echo "All files have been renamed as required!"
```