Task 5: Pipes and Filters in Bash

Objective:
To understand the use of pipes and filters in Bash scripting. This task demonstrates how the output of one command can be passed as input to another command using a pipe (|).

1. Concept Overview

In Linux, pipes allow the output of one command to be used as the input of another. Filters like grep and sort process text streams. The grep command searches for patterns in files, while sort arranges output alphabetically.

2. Bash Script Code

```bash
#!/bin/bash

# Check if filename and word are provided
if [ $# -ne 2 ]; then
        echo "Usage: $0 <filename> <word>"
        exit 1
fi

file=$1
word=$2

# Use grep and pipe output to sort
grep "$word" "$file" | sort
```

3. Script Explanation

1. The script expects two command-line arguments: filename and search word.
2. grep searches for all lines containing the specified word in the file.
3. The pipe (|) sends grep output to the sort command.
4. sort arranges the matching lines alphabetically.

4. Execution Steps

1. Create a sample text file with repeated words.
2. Save the script as task5.sh
3. Give execute permission using chmod.
4. Run the script with filename and word as arguments.

5. Sample Output

```
student@student-virtual-machine:~/25SUB4508_LSP/25SUB4508_56133/Assignments/day23$ ll
total 36
drwxrwxr-x  2 student student 4096 Jan 16 00:05 ./
drwxrwxr-x 26 student student 4096 Jan 15 23:49 ../
-rw-rw-r--  1 student student   11 Jan 15 23:59 file1.txt
-rw-rw-r--  1 student student   35 Jan 15 23:59 file2.txt
-rw-rw-r--  1 student student   46 Jan 16 00:00 file3.txt
-rw-rw-r--  1 student student   91 Jan 15 23:49 sample.txt
-rwxrwxr-x  1 student student  216 Jan 15 23:49 task3.sh*
-rwxrwxr-x  1 student student  378 Jan 15 23:49 task4.sh*
-rw-rw-r--  1 student student  185 Jan 16 00:05 task5.sh
student@student-virtual-machine:~/25SUB4508_LSP/25SUB4508_56133/Assignments/day23$ chmod +x task5.sh
student@student-virtual-machine:~/25SUB4508_LSP/25SUB4508_56133/Assignments/day23$ ./task5.sh
Usage: ./task5.sh <filename> <word>
student@student-virtual-machine:~/25SUB4508_LSP/25SUB4508_56133/Assignments/day23$ ./task5.sh sample.txt apple
apple is a fruit
apple pie is tasty
apple tree grows well
student@student-virtual-machine:~/25SUB4508_LSP/25SUB4508_56133/Assignments/day23$
```

6. Observations

• Pipes allow command chaining.
• grep filters text based on patterns.
• sort organizes output alphabetically.

7. Conclusion

This task demonstrates how pipes and filters work together in Bash. Such techniques are fundamental in Linux for text processing, log analysis, and automation.