Piping in Unix or Linux

A pipe is a form of redirection (transfer of standard output to some other destination) that is used in Linux and other Unix-like operating systems to send the output of one command/program/process to another command/program/process for further processing. The Unix/Linux systems allow stdout of a command to be connected to stdin of another command. You can make it do so by using the pipe character '|'.

Pipe is used to combine two or more commands, and in this, the output of one command acts as input to another command, and this command's output may act as input to the next command and so on. It can also be visualized as a temporary connection between two or more commands/ programs/ processes. The command line programs that do the further processing are referred to as filters.

This direct connection between commands/ programs/ processes allows them to operate simultaneously and permits data to be transferred between them continuously rather than having to pass it through temporary text files or through the display screen.
Pipes are unidirectional **i.e data flows from left to right through the pipeline.**

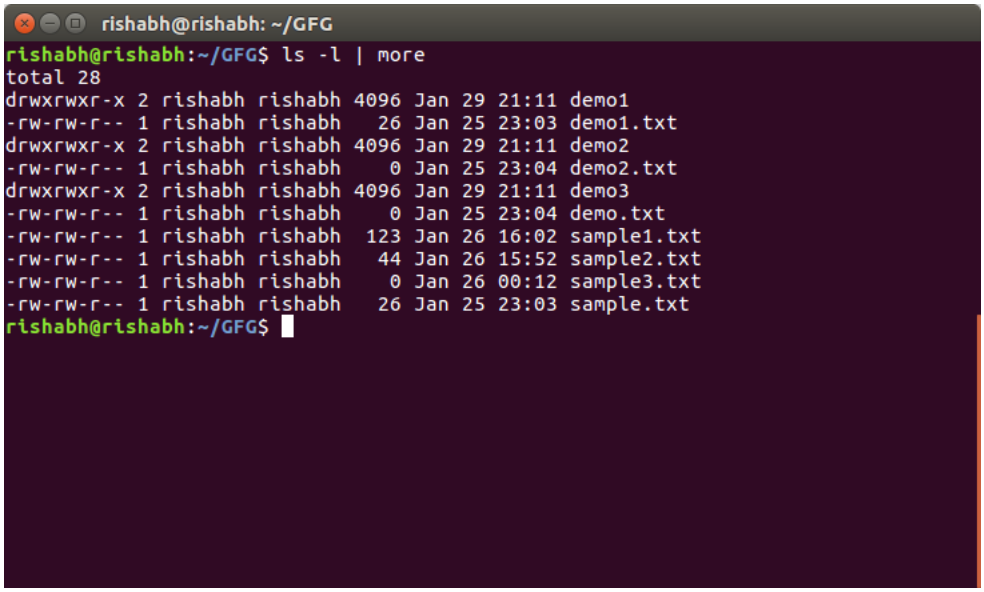
Syntax :

```
command_1 | command_2 | command_3 | .... | command_N
```

Example :
1. Listing all files and directories and give it as input to more command.

```
$ ls -l | more
```

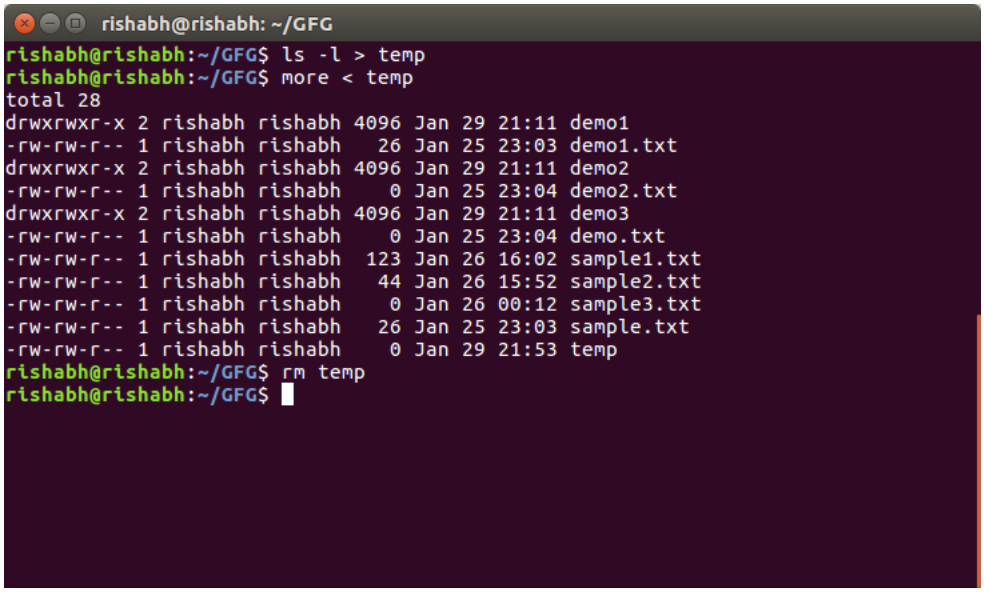
Output :



The more command takes the output of $ ls -l as its input. The net effect of this command is that the output of ls -l is displayed one screen at a time. The pipe acts as a container which takes the output of ls -l and gives it to more as input. This command does not use a disk to connect standard output of ls -l to the standard input of more because pipe is implemented in the main memory.
In terms of I/O redirection operators, the above command is equivalent to the following command sequence.

```
$ ls -l -> temp
more -> temp (or more temp)
[contents of temp]
rm temp
```

Output :



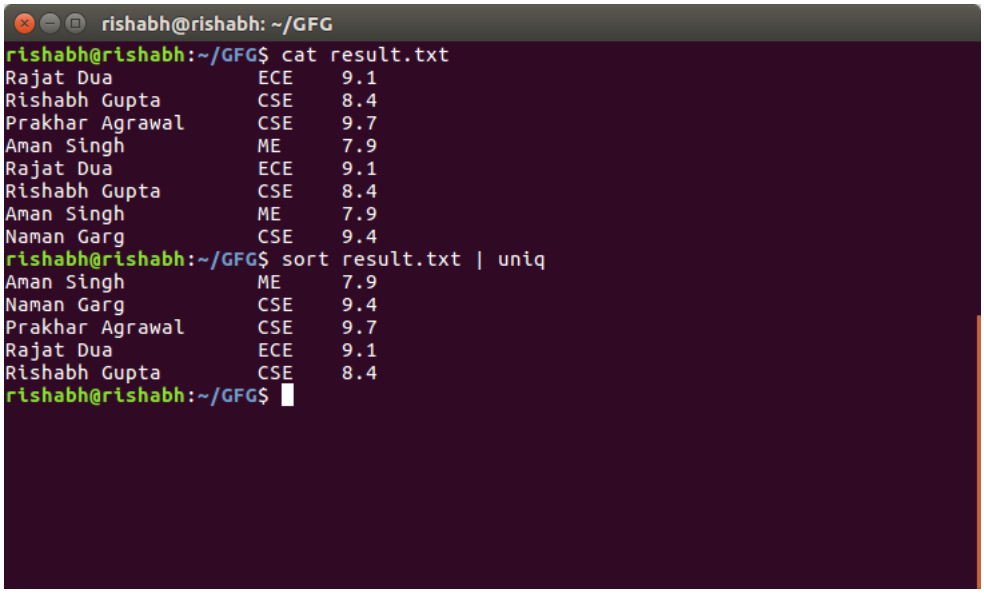
Output of the above two commands is same.

2. Use sort and uniq command to sort a file and print unique values.

```
$ sort record.txt | uniq
```

This will sort the given file and print the unique values only.

Output :

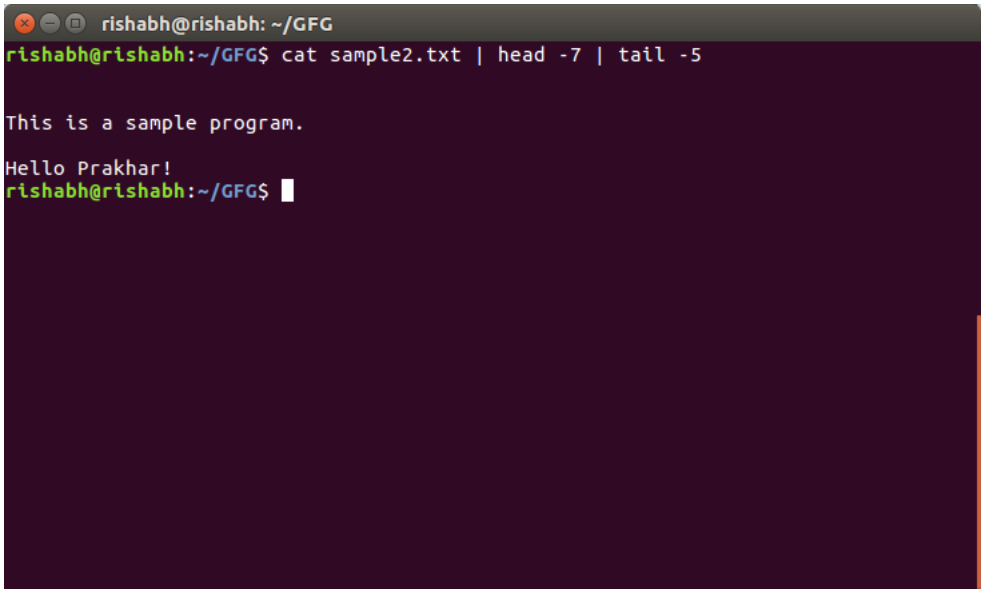


3. Use head and tail to print lines in a particular range in a file.

```
$ cat sample2.txt | head -7 | tail -5
```

This command select first 7 lines and last 5 lines from the file and print those lines which are common to both of them.

Output :

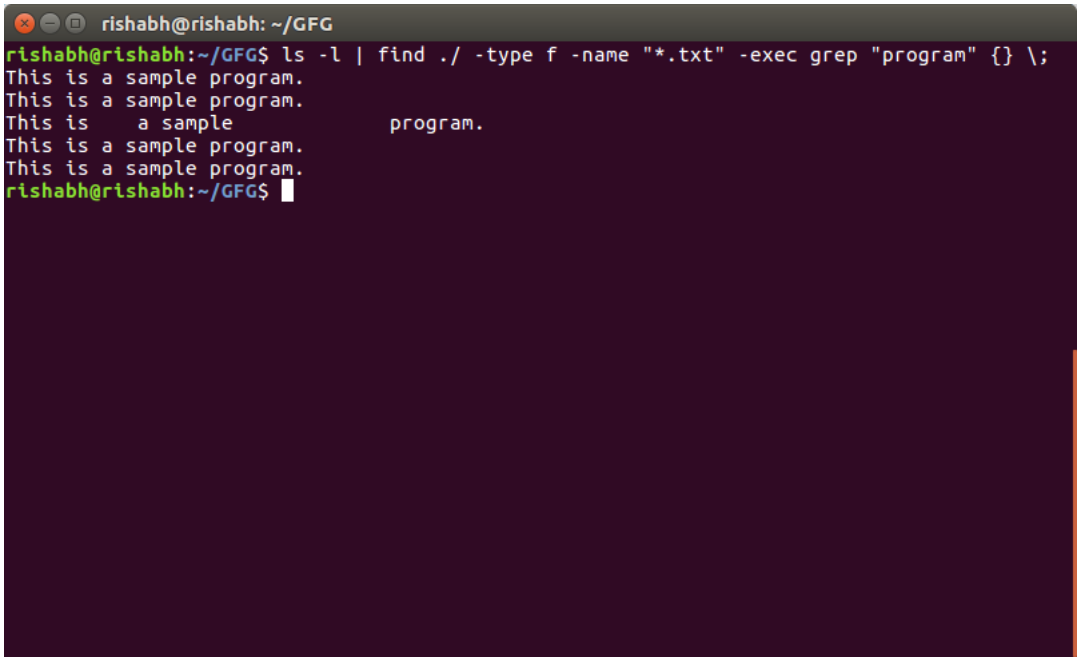


4. Use ls and find to list and print all lines matching a particular pattern in matching files.

```
$ ls -l | find ./ -type f -name "*.txt" -exec grep "program" {} \;
```

This command select files with **.txt** extension in the given directory and search for pattern like “program” in the above example and print those ine which have program in them.

Output :

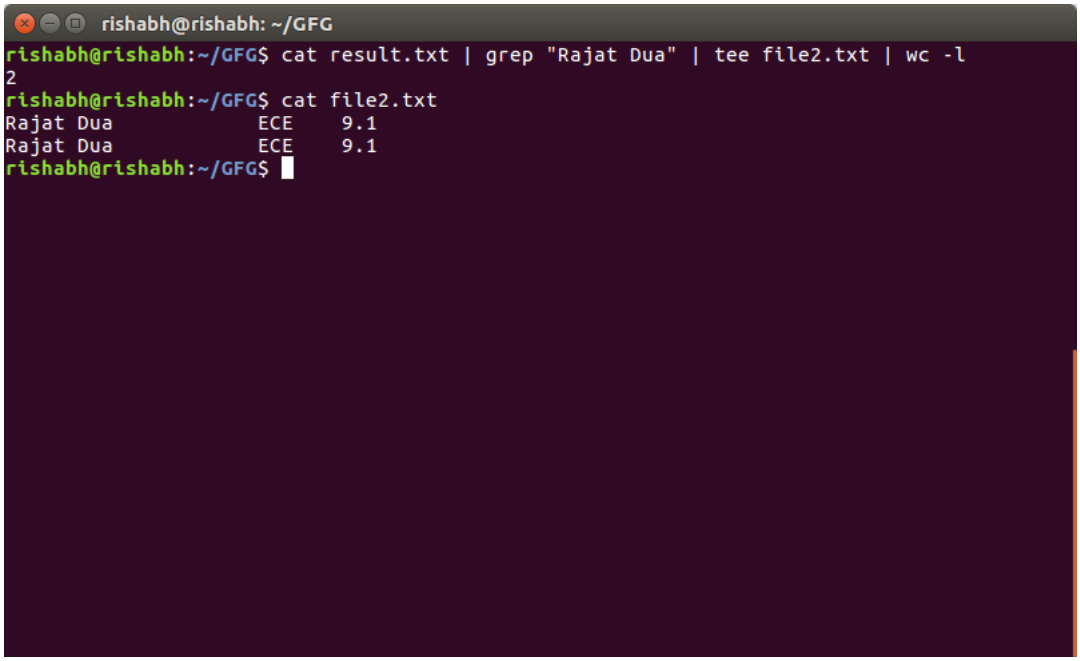


5. Use cat, grep, tee and wc command to read the particular entry from user and store in a file and print line count.

```
$ cat result.txt | grep "Rajat Dua" | tee file2.txt | wc -l
```

This command select **Rajat Dua** and store them in file2.txt and print total number of lines matching **Rajat Dua**

Output :



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