PUNJAB ENGINEERING COLLEGE
(DEEMED TO BE UNIVERSITY)
CHANDIGARH

Assignment 1

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Q1. Perform following command in Linux based OS:

a) cat

The `cat` command in Linux is used to display the contents of a file, concatenate files, or create a new file.

Create a new file:

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ ls
charts       cosmoc-deploy-0.1.0.tgz       README.md  values.yaml
Chart.yaml   cosmocloud-deploy-0.1.0.tgz   templates
sugam-arora@sugam-arora:~/cosmocloud-deploy$ cat > test.yaml
```

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ ls
charts       cosmoc-deploy-0.1.0.tgz       README.md  test.yaml
Chart.yaml   cosmocloud-deploy-0.1.0.tgz   templates  values.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy$
```

Display file contents

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ cat Chart.yaml
apiVersion: v2
name: cosmocloud-deploy
description: A Helm chart for deploying backend, frontend, and Redis
type: application
version: 0.1.0
appVersion: "1.0.0"
```

b) chmod

The `chmod` command in Linux is used to change the file permissions of a file or directory. Permissions control who can read, write, or execute a file.

Grant full permissions to the owner, and read and execute to others:

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ chmod 755 test.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy$
```

Grant read and write to everyone:

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ chmod 666 test.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy$
```

c) cd

The `cd` command in Linux is used to change the current directory in the terminal. It allows you to navigate through the filesystem.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ cd charts/
sugam-arora@sugam-arora:~/cosmocloud-deploy/charts$
```

d) cp

The `cp` command in Linux is used to copy files and directories. It allows you to duplicate files, move them to a different location, or create backups.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ cp values.yaml test.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy$
```

e) date

The `date` command in Linux is used to display or set the system date and time. By default, it shows the current date and time in a human-readable format.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ date
Sun Jan 26 05:44:56 PM IST 2025
```

f) echo

The `echo` command in Linux is used to display a line of text or a string passed as an argument to the command. It is commonly used in scripts to display information to the user or to output text to files.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ echo "Sugam Arora"
Sugam Arora
```

g) ftp

The `ftp` command in Linux is used to transfer files between systems using the File Transfer Protocol (FTP). It allows users to connect to an FTP server, upload, download, or manage files interactively.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ ftp www.gmail.com
Trying [2404:6800:4009:827::2005]:21 ...
```

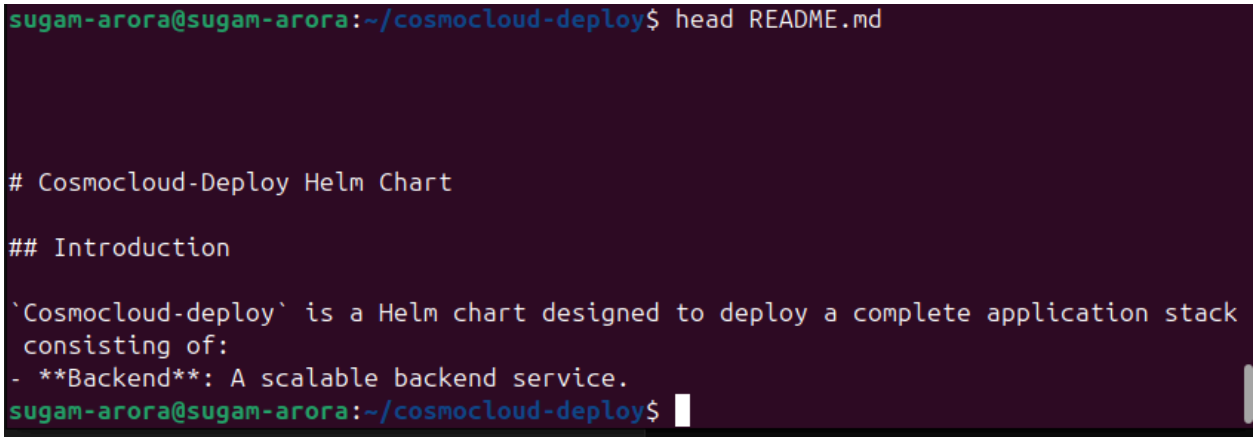
h) grep

The `grep` command in Linux is used to search for patterns within text or files. It scans files line by line and outputs lines that match a specified pattern, making it a powerful tool for text processing and filtering.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ grep "helm" README.md
helm lint .
helm package .
helm install testapp . --atomic --timeout 30s
helm install testapp . -f custom-values.yaml
- **Chart Errors:** Run `helm lint .` to validate your chart.
helm uninstall testapp
```

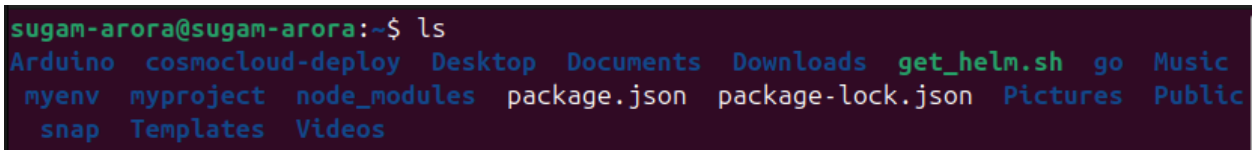
i) head

The `head` command in Linux is used to display the first few lines of a file or data from standard input. By default, it shows the first 10 lines, but this can be customized using options.



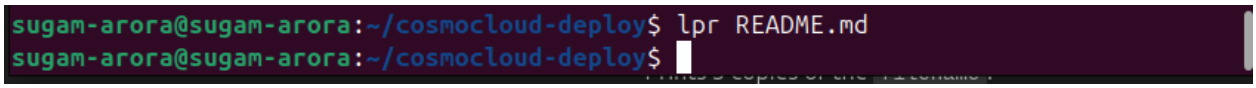
j) ls

The `ls` command in Linux is used to list directory contents. It shows the files and directories in the current directory or the specified path. It is one of the most frequently used commands for navigating and inspecting files in the system.



k) lpr

The `lpr` command in Linux is used to send files to the printer. It stands for "line printer," and it is typically used to send text files or other document formats to the printing queue. It allows you to print documents directly from the command line without needing to open them in a graphical application.



l) more

The `more` command in Linux is used to view the contents of a file one screen at a time. It is a pager utility, meaning it allows you to navigate large files that don't fit on one screen, making it easier to read through them interactively. It is often used in combination with other commands to display output in a more manageable format.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ more README.md
```

```
# Cosmocloud-Deploy Helm Chart

## Introduction

`Cosmocloud-deploy` is a Helm chart designed to deploy a complete application stack
 consisting of:
- **Backend**: A scalable backend service.
- **Frontend**: A user-friendly frontend service.
- **Redis**: A fast in-memory database for caching and data storage.

This chart is structured for simplicity, scalability, and modularity, leveraging Ku
bernetes and Helm to manage deployments efficiently.

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## Features
1. **Applications Deployed:**
   - Backend: Containerized service exposing REST APIs.
   - Frontend: Web application interacting with the backend.
--More--(15%)
```

m) mkdir

The `mkdir` command in Linux is used to create directories. It allows you to make new directories (folders) in the file system, enabling you to organize files and data.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ ls
charts       cosmoc-deploy-0.1.0.tgz       README.md  test.yaml
Chart.yaml   cosmocloud-deploy-0.1.0.tgz   templates  values.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy$ mkdir deploy
sugam-arora@sugam-arora:~/cosmocloud-deploy$ ls
charts       cosmoc-deploy-0.1.0.tgz       deploy     templates  values.yaml
Chart.yaml   cosmocloud-deploy-0.1.0.tgz   README.md  test.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy$
```

n) mv

The `mv` command in Linux is used to move or rename files and directories. It allows you to move a file from one location to another or rename a file or directory in the same location.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ ls
charts       cosmoc-deploy-0.1.0.tgz       deploy     templates  values.yaml
Chart.yaml   cosmocloud-deploy-0.1.0.tgz   README.md  test.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy$ mv test.yaml deploy/
sugam-arora@sugam-arora:~/cosmocloud-deploy$ ls
charts       cosmoc-deploy-0.1.0.tgz       deploy     templates
Chart.yaml   cosmocloud-deploy-0.1.0.tgz   README.md  values.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy$ cd deploy/
sugam-arora@sugam-arora:~/cosmocloud-deploy/deploy$ ls
test.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy/deploy$
```

o) ncftp

`ncftp` is a command-line FTP client that provides a more feature-rich and user-friendly alternative to the basic `ftp` command. It stands for "New Client FTP" and is designed for advanced file transfer operations. It has a number of additional features compared to traditional FTP clients, such as the ability to resume interrupted transfers, support for background transfers, and easier management of FTP sites.`ncftp` includes several commands to simplify FTP tasks, and its interactive mode makes file transfer operations smoother and more efficient.

```
sugam-arora@sugam-arora:~$ ncftp
NcFTP 3.2.6 (Dec 04, 2016) by Mike Gleason (http://www.NcFTP.com/contact/).

Copyright (c) 1992-2016 by Mike Gleason.
All rights reserved.

ncftp>
```

p) print

The `print` command is not typically a native Linux shell command, but it is often used in programming languages (such as Python, C, and many others) to output or display information to the screen.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ print README.md
```

q) pwd

The `pwd` command in Linux stands for "print working directory." It is used to display the current directory or folder you are working in, i.e., the absolute path of the directory you're currently located in.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ pwd
/home/sugam-arora/cosmocloud-deploy
```

r) rm

The `rm` command in Linux stands for "remove" and is used to delete files and directories.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy/deploy$ ls
test.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy/deploy$ rm test.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy/deploy$ ls
sugam-arora@sugam-arora:~/cosmocloud-deploy/deploy$
```

s) rmdir

The `rmdir` command in Linux is used to remove empty directories**.**

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ ls
charts       cosmoc-deploy-0.1.0.tgz      deploy     templates
Chart.yaml   cosmocloud-deploy-0.1.0.tgz  README.md  values.yaml
sugam-arora@sugam-arora:~/cosmocloud-deploy$ rmdir deploy/
sugam-arora@sugam-arora:~/cosmocloud-deploy$ ls
charts       cosmoc-deploy-0.1.0.tgz      README.md  values.yaml
Chart.yaml   cosmocloud-deploy-0.1.0.tgz  templates
sugam-arora@sugam-arora:~/cosmocloud-deploy$
```

t) rsh

The `rsh` (Remote Shell) command in Linux is used to execute commands on a remote machine over a network. It allows a user to run shell commands on another machine without having to log into it manually.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ rsh sugam-arora
```

u) setenv

The `setenv` command in Linux is used to set an environment variable in the shell. It is typically used in C-shell (`csh`) or TCSH shells. In the Bash shell, an equivalent command would be `export`.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ setenv PATH /usr/local/bin:$PATH
```

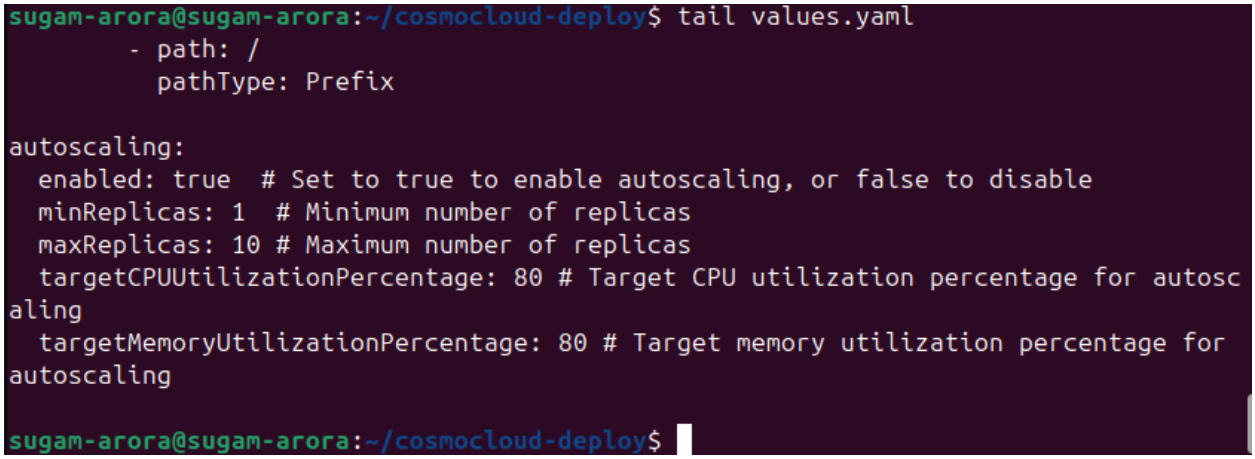
v) sort

The `sort` command in Linux is used to sort lines of text files or input in a specified order. It can be used to sort data in ascending or descending order based on various criteria.

```
sugam-arora@sugam-arora:~/cosmocloud-deploy$ sort values.yaml
  annotations: {}  # Add any annotations if needed, else it can remain empty
  annotations: {}  # Optional, add any annotations you need
  automount: true  # Default to true to allow automounting of service account token
autoscaling:
backend:
    BACKEND_URL: http://{{ .Values.backend.service.type }}:{{ .Values.backend.servi
ce.port }}
  className: ""    # Optional, set a className for ingress controller
  create: true  # Set to true to create the service account, or false if you want t
o skip it
  enabled: true  # Set to true to enable autoscaling, or false to disable
  enabled: true  # Set to true to enable ingress, or false to disable
```

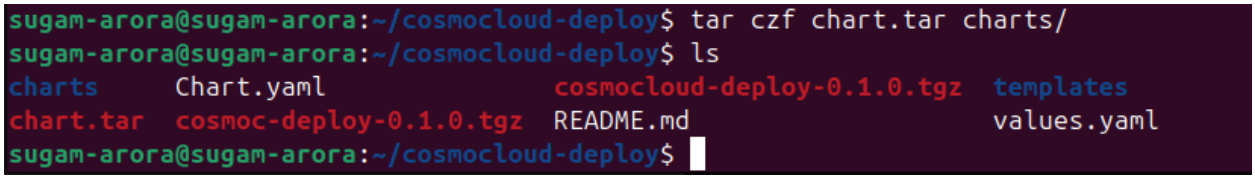
w) tail

The `tail` command in Linux is used to display the last part (usually 10 lines by default) of a file or output. It is particularly useful for viewing the end of large files, such as log files or monitoring the output of a running process.



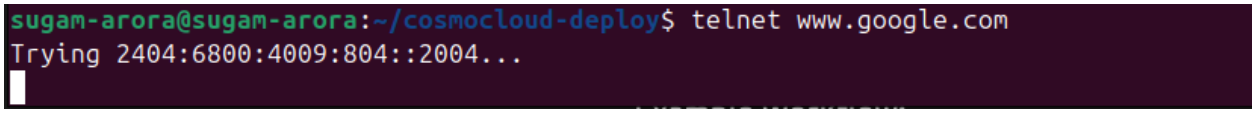
x) tar

The `tar` command in Linux is used to archive files and directories into a single file (tarball) for easier storage or transfer. It can also be used to extract archived files.



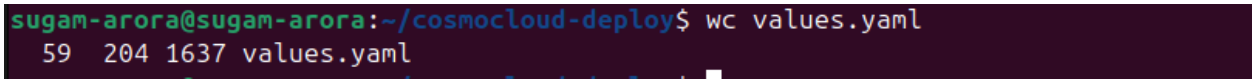
y) telnet

The `telnet` command in Linux is used to connect to remote systems over a network, typically using the Telnet protocol (TCP port 23). It allows you to access and manage remote servers or devices in a text-based interface. However, Telnet is considered insecure because it transmits data, including passwords, in plain text. Therefore, it is often replaced by more secure alternatives like SSH.



z) wc

The `wc` (word count) command in Linux is used to count the number of lines, words, and characters in a file or input from standard input (stdin). It is commonly used for analyzing files and outputs the count of various elements in the file.



Q2. Write a Shell program to check the given number is even or odd

```
#!/bin/bash

# Prompt the user to enter a number
echo "Enter a number:"
read number

# Check if the number is even or odd
if [ $((number % 2)) -eq 0 ]; then
    echo "$number is even."
else
    echo "$number is odd."
fi
```

```
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ chmod +x Q2.sh
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ ./Q2.sh
Enter a number:
22
22 is even.
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ ./Q2.sh
Enter a number:
43
43 is odd.
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$
```

Q3. Write a Shell program to check the given year is leap year or not

```
#!/bin/bash

# Prompt the user to enter a year
echo "Enter a year:"
read year

# Check if the year is a leap year
if [ $((year % 4)) -eq 0 ]; then
    if [ $((year % 100)) -ne 0 ] || [ $((year % 400)) -eq 0 ]; then
        echo "$year is a leap year."
    else
        echo "$year is not a leap year."
    fi
else
    echo "$year is not a leap year."
fi
```

```
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ chmod +x Q3.sh
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ ./Q3.sh
Enter a year:
2024
2024 is a leap year.
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ ./Q3.sh
Enter a year:
2025
2025 is not a leap year.
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$
```

Q4. Write a Shell program to swap the two integers

```
#!/bin/bash

# Prompt the user to enter two integers
echo "Enter the first integer:"
read a
echo "Enter the second integer:"
read b

echo "Before swapping: a = $a, b = $b"

# Swap the integers
temp=$a
a=$b
b=$temp

echo "After swapping: a = $a, b = $b"
```

```
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ chmod +x Q4.sh
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ ./Q4.sh
Enter the first integer:
17
Enter the second integer:
32
Before swapping: a = 17, b = 32
After swapping: a = 32, b = 17
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$
```

Q5. To calculate the sum of digits using shell programming.

```
#!/bin/bash

# Prompt the user to enter a number
echo "Enter a number:"
read number

# Initialize sum to 0
sum=0

# Calculate the sum of digits
while [ $number -gt 0 ]; do
    digit=$((number % 10))  # Extract the last digit
    sum=$((sum + digit))    # Add the digit to the sum
    number=$((number / 10)) # Remove the last digit
done

# Display the result
echo "The sum of the digits is: $sum"
```

```
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ chmod +x Q5.sh
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ ./Q5.sh
Enter a number:
45
The sum of the digits is: 9
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$ ./Q5.sh
Enter a number:
94576
The sum of the digits is: 31
sugam-arora@sugam-arora:~/Documents/GitHub/Operating-System/Assignment 1$
```