

Concepts of Operating System

Assignment 1

Problem 1: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

a) Navigate and List:

a. Start by navigating to your home directory and list its contents. Then, move into a directory named "LinuxAssignment" if it exists; otherwise, create it

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~$ cd
cdac@DESKTOP-PC892RC:~$ ls
Day-1 abc.txt file1.txt file2.txt
cdac@DESKTOP-PC892RC:~$ mkdir LinuxAssignment
cdac@DESKTOP-PC892RC:~$ cd LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

b) File Management:

a. Inside the "LinuxAssignment" directory, create a new file named "file1.txt". Display its contents

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat file1.txt
Hello
This is Linux Assignment
All the best!
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

c) Directory Management:

a. Create a new directory named "docs" inside the "LinuxAssignment" directory

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:47 docs
-rw-r--r-- 1 cdac cdac 45 Aug 28 18:43 file1.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

d) Copy and Move Files:

- a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt"

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat file1.txt
Hello
This is Linux Assignment
All the best!
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat file1.txt > file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat file2.txt
Hello
This is Linux Assignment
All the best!
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

e) Permissions and Ownership:

- a. Change the permissions of "file2.txt" to allow read, write, and execute permissions for the owner and only read permissions for others. Then, change the owner of "file2.txt" to the current user

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls -l
total 12
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:47 docs
-rw-r--r-- 1 cdac cdac 45 Aug 28 18:43 file1.txt
-rwxr--r-- 1 cdac cdac 45 Aug 28 18:50 file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ chmod u+rwx file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ chmod o+r file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls -l
total 12
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:47 docs
-rw-r--r-- 1 cdac cdac 45 Aug 28 18:43 file1.txt
-rwxr--r-- 1 cdac cdac 45 Aug 28 18:50 file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ whoami
cdac
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ chown cdac file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 45 Aug 28 18:50 file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

f) Final Checklist:

a. Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly

```
cdac@DESKTOP-PC892RC: ~  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls -l  
total 12  
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:47 docs  
-rw-r--r-- 1 cdac cdac 45 Aug 28 18:43 file1.txt  
-rwxr--r-- 1 cdac cdac 45 Aug 28 18:50 file2.txt  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cd  
cdac@DESKTOP-PC892RC:~$ ls -l  
total 12  
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:20 Day-1  
drwxr-xr-x 3 cdac cdac 4096 Aug 28 18:49 LinuxAssignment  
-rw-r--r-- 1 cdac cdac 41 Aug 28 17:45 abc.txt  
-rwxr--r-- 1 cdac cdac 0 Aug 28 17:41 file1.txt  
-rwxrwxr-- 1 cdac cdac 0 Aug 28 17:42 file2.txt  
cdac@DESKTOP-PC892RC:~$
```

g) **File Searching:**

a. Search for all files with the extension ".txt" in the current directory and its subdirectories.

```
cdac@DESKTOP-PC892RC: ~  
cdac@DESKTOP-PC892RC:~$ find . -type f -name "*.txt"  
./LinuxAssignment/file2.txt  
./LinuxAssignment/file1.txt  
./file2.txt  
./abc.txt  
./Day-1/abc.txt  
./file1.txt  
cdac@DESKTOP-PC892RC:~$
```

b. Display lines containing a specific word in a file (provide a file name and the specific word to search)

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment  
cdac@DESKTOP-PC892RC:~$ grep "best" file1.txt  
cdac@DESKTOP-PC892RC:~$ cd LinuxAssignment  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ grep "best" file1.txt  
All the best!  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

System Information:

- Display the current system date and time

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ date  
Wed Aug 28 19:24:42 IST 2024  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

i) Networking:

- Display the IP address of the system.

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ hostname -i  
127.0.1.1  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

- Ping a remote server to check connectivity (provide a remote server address to ping).

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ hostname -i  
127.0.1.1  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ hostname -a  
DESKTOP-PC892RC  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ping 8.8.8.8  
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data:  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=116 time=24.6 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=116 time=38.2 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=116 time=29.0 ms  
64 bytes from 8.8.8.8: icmp_seq=4 ttl=116 time=26.1 ms  
64 bytes from 8.8.8.8: icmp_seq=5 ttl=116 time=25.4 ms  
64 bytes from 8.8.8.8: icmp_seq=6 ttl=116 time=25.1 ms  
64 bytes from 8.8.8.8: icmp_seq=7 ttl=116 time=31.8 ms  
64 bytes from 8.8.8.8: icmp_seq=8 ttl=116 time=24.4 ms  
^C  
--- 8.8.8.8 ping statistics ---  
8 packets transmitted, 8 received, 0% packet loss, time 7012ms  
rtt min/avg/max/mdev = 24.391/28.063/38.170/4.503 ms  
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

File Compression:

a. Compress the "docs" directory into a zip file.

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ zip -r docs docs/
Command 'zip' not found, but can be installed with:
sudo apt install zip
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ sudo apt install zip
[sudo] password for cdac:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  unzip
The following NEW packages will be installed:
  unzip zip
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 350 kB of archives.
After this operation, 929 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 unzip amd64 6.0-26ubuntu3.1 [174 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 zip amd64 3.0-12build2 [176 kB]
Fetched 350 kB in 3s (127 kB/s)
Selecting previously unselected package unzip.
(Reading database ... 24208 files and directories currently installed.)
Preparing to unpack .../unzip_6.0-26ubuntu3.1_amd64.deb ...
Unpacking unzip (6.0-26ubuntu3.1) ...
Selecting previously unselected package zip.
Preparing to unpack .../zip_3.0-12build2_amd64.deb ...
Unpacking zip (3.0-12build2) ...
Setting up unzip (6.0-26ubuntu3.1) ...
Setting up zip (3.0-12build2) ...
Processing triggers for man-db (2.10.2-1) ...
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt  file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

b. Extract the contents of the zip file into a new directory.

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt  file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ unzip docs.zip -d docs1
Archive:  docs.zip
  creating: docs1/docs/
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls
docs  docs.zip  docs1  file1.txt  file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

k) **File Editing:**

a. Open the "file1.txt" file in a text editor and add some text to it.

Select cdac@DESKTOP-PC892RC: ~/LinuxAssignment

GNU nano 6.2

```
Hello
This is Linux Assignment
All the best!
It's great to join the CDAC
```

cdac@DESKTOP-PC892RC: ~/LinuxAssignment

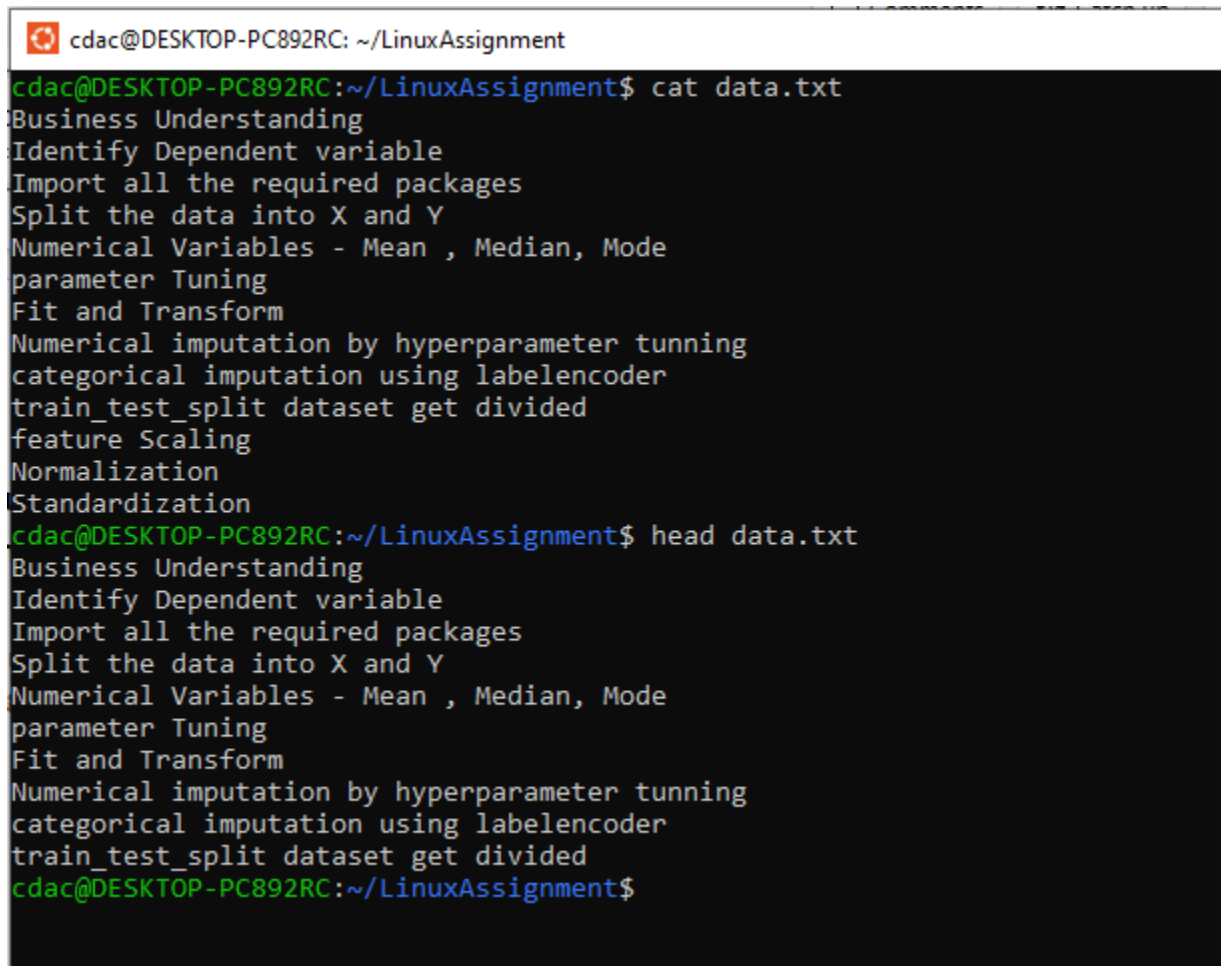
```
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls
docs  docs.zip  docs1  file1.txt  file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat file1.txt
Hello
This is Linux Assignment
All the best!
It's great to join the CDAC
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

b. Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with)

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ ls
docs docs.zip docs1 file1.txt file2.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat file1.txt
Hello
This is Linux Assignment
All the best!
It's great to join the CDAC
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ sed 's/Assignment/Assignment-1/g' file1.txt
Hello
This is Linux Assignment-1
All the best!
It's great to join the CDAC
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ grep -l 'Hello' file1.txt | sed 's/Hello/Welcome/g'
file1.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat file1.txt
Hello
This is Linux Assignment
All the best!
It's great to join the CDAC
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ grep -l 'Hello' file1.txt | sed -i 's/Hello/Welcome/g'
sed: no input files
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ grep -l 'Hello' file1.txt | sed 's/Hello/Welcome/g' file1.txt
Welcome
This is Linux Assignment
All the best!
It's great to join the CDAC
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```


Problem 2: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

a. Suppose you have a file named "data.txt" containing important information. Display the first 10 lines of this file to quickly glance at its contents using a command

A terminal window with a dark background and light-colored text. The window title bar shows a red icon and the text 'cdac@DESKTOP-PC892RC: ~/LinuxAssignment'. The terminal shows two commands being executed. The first command is 'cat data.txt', which displays 10 lines of text: 'Business Understanding', 'Identify Dependent variable', 'Import all the required packages', 'Split the data into X and Y', 'Numerical Variables - Mean , Median, Mode', 'parameter Tuning', 'Fit and Transform', 'Numerical imputation by hyperparameter tuning', 'categorical imputation using labelencoder', and 'train_test_split dataset get divided'. The second command is 'head data.txt', which displays the same 10 lines of text. The prompt 'cdac@DESKTOP-PC892RC:~/LinuxAssignment\$' is visible at the end of the second command.

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat data.txt
Business Understanding
Identify Dependent variable
Import all the required packages
Split the data into X and Y
Numerical Variables - Mean , Median, Mode
parameter Tuning
Fit and Transform
Numerical imputation by hyperparameter tuning
categorical imputation using labelencoder
train_test_split dataset get divided
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ head data.txt
Business Understanding
Identify Dependent variable
Import all the required packages
Split the data into X and Y
Numerical Variables - Mean , Median, Mode
parameter Tuning
Fit and Transform
Numerical imputation by hyperparameter tuning
categorical imputation using labelencoder
train_test_split dataset get divided
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

b. Now, to check the end of the file for any recent additions, display the last 5 lines of "data.txt" using another command



cdac@DESKTOP-PC892RC: ~/LinuxAssignment

```
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat data.txt
Business Understanding
Identify Dependent variable
Import all the required packages
Split the data into X and Y
Numerical Variables - Mean , Median, Mode
parameter Tuning
Fit and Transform
Numerical imputation by hyperparameter tuning
categorical imputation using labelencoder
train_test_split dataset get divided
feature Scaling
Normalization
Standardization
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ head data.txt
Business Understanding
Identify Dependent variable
Import all the required packages
Split the data into X and Y
Numerical Variables - Mean , Median, Mode
parameter Tuning
Fit and Transform
Numerical imputation by hyperparameter tuning
categorical imputation using labelencoder
train_test_split dataset get divided
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ nano data.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ tail -5 data.txt
feature Scaling
Normalization
Standardization
Simple Linear regression
Multiple Linear Regression
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

c. In a file named "numbers.txt," there are a series of numbers. Display the first 15 lines of this file to analyze the initial data set.

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ nano numbers.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

d. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt"

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ tail -3 numbers.txt
18
19
20
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

e. Imagine you have a file named "input.txt" with text content. Use a command to translate all lowercase letters to uppercase in "input.txt" and save the modified text in a new file named "output.txt."

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ nano input.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat input.txt
This is the text file to translate lowercase text to uppercase
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ tr '[:lower:]' '[:upper:]' <input.txt> output.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ input.txt
input.txt: command not found
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat input.txt
This is the text file to translate lowercase text to uppercase
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat output.txt
THIS IS THE TEXT FILE TO TRANSLATE LOWERCASE TEXT TO UPPERCASE
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

f. In a file named "duplicate.txt," there are several lines of text, some of which are duplicates. Use a command to display only the unique lines from "duplicate.txt."

```
cdac@DESKTOP-PC892RC: ~/LinuxAssignment
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ cat duplicate.txt
This is a unique line
This is duplicate line
This is duplicate line
You are invited at 10 am for CDAC inauguration function
Kindly be on time
This is duplicate line

cdac@DESKTOP-PC892RC:~/LinuxAssignment$ sort duplicate.txt | uniq

Kindly be on time
This is a unique line
This is duplicate line
You are invited at 10 am for CDAC inauguration function
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ uniq -u duplicate.txt
This is a unique line
You are invited at 10 am for CDAC inauguration function
Kindly be on time
This is duplicate line

cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```

g. In a file named "fruit.txt," there is a list of fruits, but some fruits are repeated. Use a command to display each unique fruit along with the count of its occurrences in "fruit.txt."

 cdac@DESKTOP-PC892RC: ~/LinuxAssignment

```
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ nano fruit.txt
cdac@DESKTOP-PC892RC:~/LinuxAssignment$ sort fruit.txt | uniq -c
  1 Apple
  2 Banana
  1 Blue Bery
  1 Grapes
  1 Kivi
  2 Lichi
  2 Mango
  1 Orange
  2 Pineapple
  1 Watermelon
cdac@DESKTOP-PC892RC:~/LinuxAssignment$
```