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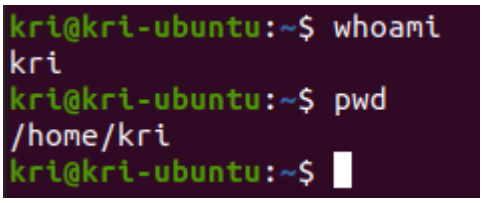
Assignment 1 – Basic Commands

Simple commands:

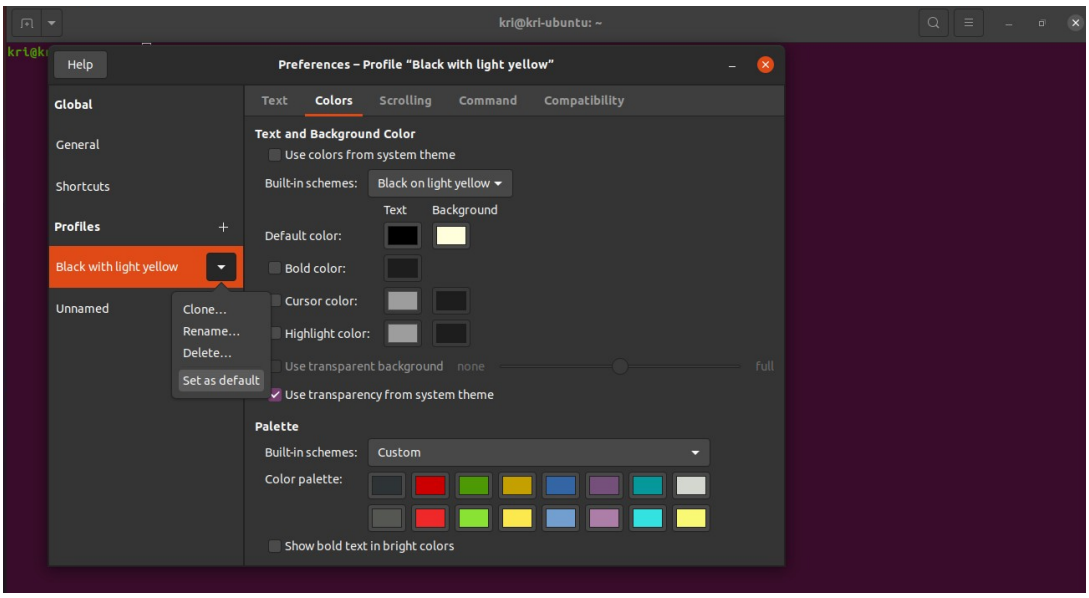
1&2. Login to the system and launch the terminal.

The prompt gives us the *name of the user* as well as the *name of the system*. The command prompt at any instance of time gives us an indication of our present working directory.



For example, here, *kri* is the name of the current user and *kri-ubuntu* is the name of the system. The prompt also shows us that we are currently in the home folder of the current user, indicated by the ~ symbol before the $ sign at the end of the prompt.

3. Launch a terminal maximize the window. Define a profile with the color built-in scheme "Black on light yellow". Set your new profile as the default profile.



Name: Krithika Swaminathan
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4. Try these commands and give your interpretation of them.

a. echo

Command: echo [option] [string]

i. echo string

kri@kri-ubuntu:~$ echo string
string

(The argument "string" is displayed as it is.)
Interpretation: The echo command displays the line or text passed as the argument exactly how it has been entered.

ii. echo *

kri@kri-ubuntu:~$ echo *
Desktop Documents Downloads files Music Pictures Public simple_commands.txt snap Templates Videos workspace

(A list of all the contents of the present working directory is displayed.)
Interpretation: The echo command displays the relevant files and directories present in the present working directory when wildcard characters are present in the argument. For example, * represents a variable number of any character, ? represents any one character and [...] represents a set of given characters.

iii. echo

kri@kri-ubuntu:~$ echo
//<blank line>
(A blank line is printed.)
Interpretation: The echo command displays an empty line when no argument is passed.

b. date

Command: date [option] [+format]

i. Print date in dd-mm-yyyy format. Refer to the man page for date to find out the option for this format.

kri@kri-ubuntu:~$ date +%d-%m-%Y
22-09-2021

(The date is printed in the specified format.)
Interpretation: The date command can be formatted to print the date and time in specific formats using the format specifiers. Here, %d represents the date of the month, %m represents the month number and %Y represents the year in the 4-digit format.

kri@kri-ubuntu:~$ man date
(The manual page for the date command is displayed, which includes the syntax and description of the different options available for the command.)
Interpetation: The man command is used to diplay the user manual of any command that the user can run on the linux terminal.

Name: Krithika Swaminathan
Roll No.: 205001057

ii. Print time in hh-mm-ss format, hh is 0-24 hours.

```
kri@kri-ubuntu:~$ date +%T
22:26:44
```

(The time is displayed in the specified format.)
Interpretation: The date command can be formatted to print the date and time in specific formats using the format specifiers. Here, %T represents the hh-mm-ss format in the 24-hour format.

iv. Print the date in the following formats Thursday, 20/08/2020.

```
kri@kri-ubuntu:~$ date +%A,%d/%m/%Y
Wednesday,22/09/2021
```

(The date is displayed in the specified format.)
Interpretation: The date command can be formatted to print the date and time in specific formats using the format specifiers. Here, %A represents the day of the week (full name of the day). It is combined with the date in the dd-mm-yyyy format which is as discussed in 1.b.i.

c. cal

Command: cal [[month] year]

i. Print the calendar for the current month.

```
kri@kri-ubuntu:~$ cal
   September 2021
Su Mo Tu We Th Fr Sa
          1  2  3  4
 5  6  7  8  9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30
```

(The calendar for the current month is displayed.)
Interpretation: The cal command displays the calendar for the current month when no argument is specified.

ii. Print the calendar for year 2020.

```
kri@kri-ubuntu:~$ cal 2020
                              2020
      January               February                March
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
                1  2  3  4                     1   1  2  3  4  5  6  7
 5  6  7  8  9 10 11   2  3  4  5  6  7  8   8  9 10 11 12 13 14
12 13 14 15 16 17 18   9 10 11 12 13 14 15  15 16 17 18 19 20 21
19 20 21 22 23 24 25  16 17 18 19 20 21 22  22 23 24 25 26 27 28
26 27 28 29 30 31     23 24 25 26 27 28 29  29 30 31

      April                 May                   June
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
          1  2  3  4            1  2               1  2  3  4  5  6
 5  6  7  8  9 10 11   3  4  5  6  7  8  9   7  8  9 10 11 12 13
12 13 14 15 16 17 18  10 11 12 13 14 15 16  14 15 16 17 18 19 20
19 20 21 22 23 24 25  17 18 19 20 21 22 23  21 22 23 24 25 26 27
```

```
26 27 28 29 30                  24 25 26 27 28 29 30            28 29 30
                                31

      July                      August                          September
Su Mo Tu We Th Fr Sa            Su Mo Tu We Th Fr Sa            Su Mo Tu We Th Fr Sa
          1  2  3  4                                  1                  1  2  3  4  5
 5  6  7  8  9 10 11             2  3  4  5  6  7  8             6  7  8  9 10 11 12
12 13 14 15 16 17 18            9 10 11 12 13 14 15             13 14 15 16 17 18 19
19 20 21 22 23 24 25            16 17 18 19 20 21 22            20 21 22 23 24 25 26
26 27 28 29 30 31               23 24 25 26 27 28 29            27 28 29 30
                                30 31

     October                    November                        December
Su Mo Tu We Th Fr Sa            Su Mo Tu We Th Fr Sa            Su Mo Tu We Th Fr Sa
             1  2  3             1  2  3  4  5  6  7                  1  2  3  4  5
 4  5  6  7  8  9 10             8  9 10 11 12 13 14             6  7  8  9 10 11 12
11 12 13 14 15 16 17            15 16 17 18 19 20 21            13 14 15 16 17 18 19
18 19 20 21 22 23 24            22 23 24 25 26 27 28            20 21 22 23 24 25 26
25 26 27 28 29 30 31            29 30                           27 28 29 30 31
```

(The calendar for the year 2020 is displayed.)
Interpretation: If only one argument is entered, the cal command assumes that the argument is a year and displays the calendar for that entire year.

iii. Print the calendar for August 2020.

```
kri@kri-ubuntu:~$ cal aug 2020
   August 2020
Su Mo Tu We Th Fr Sa
                   1
 2  3  4  5  6  7  8
 9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31
```

(The calendar for the month Aug 2020 is displayed.)
Interpretation: If both a month and a year are entered as arguments, the cal command displays only the calendar for the specified month of the specified year.

d. who and whoami

Command: who [option] [args]

```
kri@kri-ubuntu:~$ who
kri      :0           2021-09-22 21:26 (:0)
```

(A list of the current users of the system is displayed along with their login details.)
Interpretation: The who command prints information about all the users who are currently logged into the system. The options provide specific information about each user. For example, -b displays time of the last system boot, -l displays system login processes, etc.

Command: whoami [option]

```
kri@kri-ubuntu:~$ whoami
kri
```

(The effective user alone is displayed.)
Interpretation: The whoami command prints the user name of the effective user ID.

e. uname with options -a, -s, -r, -sr

Command: uname [option]

```
kri@kri-ubuntu:~$ uname -a
Linux kri-ubuntu 5.11.0-34-generic #36~20.04.1-Ubuntu SMP Fri Aug 27 08:06:32 UTC 2021 x86_64 x86_64 x86_64 GNU/Linux
```

(All known information about the system is displayed.)
Interpretation: The uname command displays certain system information. It prints all the known system information when used with the option -a.

```
kri@kri-ubuntu:~$ uname -s
Linux
```

(The kernel name is displayed.)
Interpretation: The uname command displays certain system information. It prints the kernel name when used with the option -s.

```
kri@kri-ubuntu:~$ uname -r
5.11.0-34-generic
```

(The kernel release is displayed.)
Interpretation: The uname command displays certain system information. It prints the kernel release when used with the option -r.

```
kri@kri-ubuntu:~$ uname -sr
Linux 5.11.0-34-generic
```

(The kernel name and the kernel release are displayed.)
Interpretation: The uname command displays certain system information. It prints the kernel name and kernel release when used with the option -sr.

f. df -h

Command: df [option] [file]

```
kri@kri-ubuntu:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            3.9G     0  3.9G   0% /dev
tmpfs           788M  2.0M  786M   1% /run
/dev/sda7        79G   13G   62G  17% /
tmpfs           3.9G     0  3.9G   0% /dev/shm
tmpfs           5.0M  4.0K  5.0M   1% /run/lock
```

```
tmpfs           3.9G     0  3.9G   0% /sys/fs/cgroup
/dev/loop1      100M  100M     0 100% /snap/core/11606
/dev/loop0      188M  188M     0 100% /snap/audacity/857
/dev/loop3       62M   62M     0 100% /snap/core20/1081
/dev/loop4       17M   17M     0 100% /snap/foliate/1167
/dev/loop5      277M  277M     0 100% /snap/gimp/372
/dev/loop2       56M   56M     0 100% /snap/core18/2128
/dev/loop6      165M  165M     0 100% /snap/gnome-3-28-1804/161
/dev/loop7      219M  219M     0 100% /snap/gnome-3-34-1804/72
/dev/loop9      256K  256K     0 100% /snap/gtk2-common-themes/13
/dev/loop8       66M   66M     0 100% /snap/gtk-common-themes/1515
/dev/loop11     363M  363M     0 100% /snap/kdenlive/39
/dev/loop10     319M  319M     0 100% /snap/kde-frameworks-5-qt-5-15-3-core20/5
/dev/loop12      33M   33M     0 100% /snap/snapd/12883
/dev/loop14      51M   51M     0 100% /snap/snap-store/547
/dev/loop15     296M  296M     0 100% /snap/vlc/2344
/dev/sda1       256M   85M  172M  33% /boot/efi
/dev/loop16      33M   33M     0 100% /snap/snapd/13170
tmpfs           788M   48K  788M   1% /run/user/1000
```

(The amount of disk space available on all currently mounted file systems is shown.)
Interpretation: The df command displays the amount of disk space available on the file system containing each file name argument. When no argument is given, it displays the amount of disk space available on all currently mounted file systems. The option -h displays the sizes in powers of 1024.

g. history

Command: history

```
kri@kri-ubuntu:~$ history
  131  clear
  132  whoami
  133  pwd
  134  clear
  135  echo
  136  clear
  137  script simple_commands.txt
  138  cat simple_commands.txt
  139  clear
  140  script simple_commands.txt
  141  history
```

(The command history is displayed.)
Interpretation: The history command displays the command history of the user which is stored in the history library.

h. clear

Command: clear

Name: Krithika Swaminathan
Roll No.: 205001057

kri@kri-ubuntu:~$ clear
(The termianl screen is cleared.)
Interpretation: The clear command clears the terminal screen.

Files:

5. cat

Command: cat [option] [file]

Create a file lockdown_story.txt and type the lines on the stdin (standard input). Print (display) the contents of lockdown_story.txt on stdout (standard output).

```
kri@kri-ubuntu:~$ cat>lockdownstory.txt
Lockdowns were imposed throughout the world due to the rapid spread of the Covid-19 corona virus.
This resulted in a major shift to digital systems world-wide.
kri@kri-ubuntu:~$ cat lockdownstory.txt
Lockdowns were imposed throughout the world due to the rapid spread of the Covid-19 corona virus.
This resulted in a major shift to digital systems world-wide.
```

(A file “lockdownstory.txt” is created and content is entered into the file. Then, the content is displayed.)
Interpretation: The cat> command creates a new file in the specified directory and simultaneously opens the file for entering content into it. The cat command displays the contents of the file specified in the argument.

6. ls

Command: ls [option] [file]

List the contents of your home directory.

```
kri@kri-ubuntu:~$ ls
Desktop    files           Pictures          snap      workspace
Documents  lockdownstory.txt  Public          Templates
Downloads  Music           simple_commands.txt  Videos
```

(A list of all the files present in the home directory is displayed.)

List the contents of your home directory with
i. long format

```
kri@kri-ubuntu:~$ ls -l
total 60
drwxr-xr-x 2 kri kri 4096 Sep 16 20:09 Desktop
drwxr-xr-x 2 kri kri 4096 Sep 16 18:05 Documents
drwxr-xr-x 3 kri kri 4096 Sep 26 13:32 Downloads
drwxrwxr-x 3 kri kri 4096 Sep 26 16:52 files
-rw-rw-r-- 1 kri kri  160 Sep 22 22:39 lockdownstory.txt
drwxr-xr-x 2 kri kri 4096 Sep 16 18:05 Music
```

```
drwxr-xr-x 2 kri kri 4096 Sep 22 21:49 Pictures
drwxr-xr-x 2 kri kri 4096 Sep 16 18:05 Public
-rw-rw-r-- 1 kri kri 8187 Sep 22 22:29 simple_commands.txt
drwxr-xr-x 3 kri kri 4096 Sep 16 18:15 snap
drwxr-xr-x 2 kri kri 4096 Sep 16 18:05 Templates
drwxr-xr-x 2 kri kri 4096 Sep 16 18:05 Videos
drwxrwx--- 2 kri kri 4096 Sep 21 13:51 workspace
```

(A list of all the files present in the home directory is displayed along with details of each file, i.e., long format.)

ii. hidden files

```
kri@kri-ubuntu:~$ ls -Ad .*
.              .bash_logout  .config  .mozilla  .ssh
..             .bashrc       .gnupg   .pki      .sudo_as_admin_successful
.bash_history  .cache        .local   .profile  .thunderbird
```

(Only the hidden files are listed.)

```
kri@kri-ubuntu:~$ ls -a
.              files              simple_commands.txt
..             .gnupg             snap
.bash_history  .local             .ssh
.bash_logout   lockdownstory.txt  .sudo_as_admin_successful
.bashrc        .mozilla           Templates
.cache         Music              .thunderbird
.config        Pictures           Videos
Desktop        .pki               workspace
Documents      .profile
Downloads      Public
```

(All files, including the hidden files, are listed.)

iii. recursive list

```
kri@kri-ubuntu:~$ ls -R
.:
Desktop    files            Pictures            snap       workspace
Documents  lockdownstory.txt  Public              Templates
Downloads  Music            simple_commands.txt  Videos

./Desktop:

./Documents:

./Downloads:
'Assignment1 - Basic Commands.pdf'        python-assignment-01-KriS862-main.zip
 google-chrome-stable_current_amd64.deb   Pythonlearn-09-Dictionaries.pptx
 python-assignment-01-KriS862-main
```

```
./Downloads/python-assignment-01-KriS862-main:
py_a1.ipynb  README.md

./files:
usp_assignment1.odt

./Music:

./Pictures:

./Public:

./snap:
snap-store

./snap/snap-store:
547  common  current

./snap/snap-store/547:

./snap/snap-store/common:

./Templates:

./Videos:

./workspace:
a.out          EBbill.java      IntOperations.class  StudentGrades.java
arrayngement.c  Employee.class   IntOperations.java   Tutorial1_057.docx
Consumer.class  EmpSalary.class  Student.class        Tutorial1_057.odt
EBbill.class    EmpSalary.java   StudentGrades.class
```

(The directories, subdirectories and files are listed recursively.)

iv. modified time order

```
kri@kri-ubuntu:~$ ls -t
files            simple_commands.txt  Desktop    Music      Videos
Downloads        Pictures             snap       Public
lockdownstory.txt  workspace          Documents  Templates
```

(The files are listed by order of last modified.)

Interpretation: The ls command lists the contents of the given directory. The command has various options associated with it. The -l option lists all the files with their details in the long format. The -a option lists all the files including the hidden files. The -d option lists directories themselves and not their contents. The -A option does not list implied . and .. files. The -R option lists all the subdirectories recursively. The -t option lists all the files by order of last modified. When used with wildcard characters in the argument, the command lists all the relevant files.

Name: Krithika Swaminathan
Roll No.: 205001057

Filesystem:

7. Directory structure

Commands: cd [destination path] //path can be absolute or relative
mkdir [new directory] //can also be [path/directory]
touch [new file] //can also be [path/file]

a. Move to your root directory.

```
kri@kri-ubuntu:/home$ cd /
```

(The root directory is represented by the / symbol.)

b. Check the system files present in the root directory.

```
kri@kri-ubuntu:/$ ls
bin   dev  lib   libx32      mnt   root  snap      sys  var
boot  etc  lib32 lost+found  opt   run   srv       tmp
cdrom home lib64 media       proc  sbin  swapfile  usr
```

(The ls command is used to list the system files present in the root directory.)

c. Display your home directory.

The home directory is present in the root directory. This home directory contains the home for every user on the system.

```
kri@kri-ubuntu:/$ ls home
kri
```

(The contents of the home directory are displayed, which includes the users present on the system. In this case, the only user present is *kri* and the *kri* directory is the home for that user.)

d. Move to your home directory.

```
kri@kri-ubuntu:/$ cd ~
```

(The home directory is represented by the ~ symbol.)

```
kri@kri-ubuntu:~$ ls        //displaying contents of home
Desktop    files            Pictures          snap       workspace
Documents  lockdownstory.txt Public           Templates
Downloads  Music            simple_commands.txt Videos
```

e. Create a directory myfolder in your home.

```
kri@kri-ubuntu:~$ mkdir myfolder
```

(A new directory “myfolder” is created in home.)

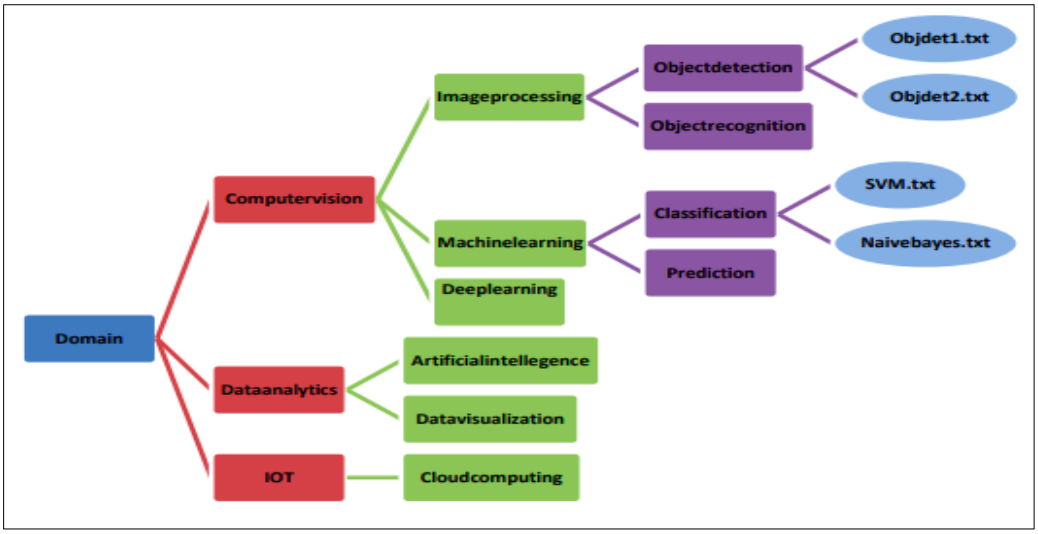
f. Move to myfolder.

```
kri@kri-ubuntu:~$ cd myfolder
```

(The working directory is changed from home to myfolder.)

Name: Krithika Swaminathan
Roll No.: 205001057

g. In myfolder, create the following directory structure.



kri@kri-ubuntu:~/myfolder$ mkdir Domain
kri@kri-ubuntu:~/myfolder$ cd Domain

kri@kri-ubuntu:~/myfolder/Domain$ mkdir ComputerVision DataAnalytics IOT

kri@kri-ubuntu:~/myfolder/Domain$ mkdir IOT/CloudComputing

kri@kri-ubuntu:~/myfolder/Domain$ cd DataAnalytics
kri@kri-ubuntu:~/myfolder/Domain/DataAnalytics$ mkdir ArtificialIntelligence DataVisualisation

kri@kri-ubuntu:~/myfolder/Domain/DataAnalytics$ cd ../ComputerVision
kri@kri-ubuntu:~/myfolder/Domain/ComputerVision$ mkdir ImageProcessing MachineLearning DeepLearning

kri@kri-ubuntu:~/myfolder/Domain/ComputerVision$ cd ImageProcessing
kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/ImageProcessing$ mkdir ObjectDetection ObjectRecognition
kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/ImageProcessing$ cd ObjectDetection
kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/ImageProcessing/ObjectDetection$ touch Object1.txt Object2.txt

kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/ImageProcessing/ObjectDetection$ cd ../../MachineLearning
kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/MachineLearning$ mkdir Classification Prediction

kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/MachineLearning$ cd Classification
kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/MachineLearning/Classification$ touch SVM.txt Naivebayes.txt

kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/MachineLearning/Classification$ cd ~

i. Move to Classification directory using absolute path.

kri@kri-ubuntu:~$ cd /home/kri/myfolder/Domain/ComputerVision/MachineLearning/Classification

Description: The absolute path begins from either the root or the home directory.

ii. Move to Prediction directory using relative path.

kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/MachineLearning/Classification$ cd ../Prediction

Description: The absolute path begins from the current directory and starts with a . or the name.

iii. Move to myfolder.

kri@kri-ubuntu:~/myfolder/Domain/ComputerVision/MachineLearning/Prediction$ cd ~/myfolder

Interpretation: The cd command is used to change the working directory. The mkdir command is used to create a new directory. It is also possible to create multiple directories at once using the mkdir command. The touch command is used to create a file in the specified directory without entering into the file.

8. rmdir

Command: rm [option] [file]

a. Create a file cloud1.txt in CloudComputing

kri@kri-ubuntu:~/myfolder$ cd Domain/IOT/CloudComputing
kri@kri-ubuntu:~/myfolder/Domain/IOT/CloudComputing$ touch cloud1.txt

(A file “cloud1.txt” is created in the CloudComputing directory.)

b. Remove directory CloudComputing

kri@kri-ubuntu:~/myfolder/Domain/IOT/CloudComputing$ cd ..
kri@kri-ubuntu:~/myfolder/Domain/IOT$ rm -d CloudComputing
rm: cannot remove 'CloudComputing': Directory not empty

(The directory CloudComputing could not be removed.)

c. Cannot remove? Why? - The directory is not empty and hence, cannot be removed using the command rm -d or rmdir.

d. What should you do to remove the CloudComputing directory? - The command rm -r should be used to remove non–empty directories.

kri@kri-ubuntu:~/myfolder/Domain/IOT$ rm -r CloudComputing
kri@kri-ubuntu:~/myfolder/Domain/IOT$ ls
//<blank line>

(The IOT directory is now empty, which implies that the CloudComputing directory was successfully removed.)

Interpretation: The rm command is used to delete the required files and directories. The -d option can be used to remove empty directories. The -r option is used to remove directories and their contents recursively.

Name: Krithika Swaminathan
Roll No.: 205001057

9. cp

Command: cp [option] [source path] [destination path]

i. Copy the directory Classification along with its files into the DataAnalytics directory.

```
kri@kri-ubuntu:~/myfolder/Domain/IOT$ cp -r
/home/kri/myfolder/Domain/ComputerVision/MachineLearning/Classification
/home/kri/myfolder/Domain/DataAnalytics
```

(The Classification directory is copied into the DataAnalytics directory.)

ii. List the contents of SVM.txt present in the DataAnalytics directory.

```
kri@kri-ubuntu:~/myfolder/Domain/IOT$ cd ../DataAnalytics/Classification
kri@kri-ubuntu:~/myfolder/Domain/DataAnalytics/Classification$ cat>>SVM.txt  (write in file)
content of svm.txt
that's it
kri@kri-ubuntu:~/myfolder/Domain/DataAnalytics/Classification$ cat SVM.txt (display content)
content of svm.txt
that's it
```

iii. List the content of the directory Domain using the recursive list option.

```
kri@kri-ubuntu:~/myfolder/Domain/DataAnalytics/Classification$ cd ../..
kri@kri-ubuntu:~/myfolder/Domain$ ls -R
.:
ComputerVision  DataAnalytics  IOT

./ComputerVision:
DeepLearning  ImageProcessing  MachineLearning

./ComputerVision/DeepLearning:

./ComputerVision/ImageProcessing:
ObjectDetection  ObjectRecognition

./ComputerVision/ImageProcessing/ObjectDetection:
Object1.txt  Object2.txt

./ComputerVision/ImageProcessing/ObjectRecognition:

./ComputerVision/MachineLearning:
Classification  Prediction

./ComputerVision/MachineLearning/Classification:
Naivebayes.txt  SVM.txt

./ComputerVision/MachineLearning/Prediction:

./DataAnalytics:
ArtificialIntelligence  Classification  DataVisualisation
```

./DataAnalytics/ArtificialIntelligence:

./DataAnalytics/Classification:
Naivebayes.txt SVM.txt

./DataAnalytics/DataVisualisation:

./IOT:

(It is verified that Classification was copied to DataAnalytics.)

Interpretation: The cp command is used to copy the required files from the specified source to the destination. The -r option is used to copy directories and their contents recursively.

10. mv

Command: mv [option] [source] [destination] //relative paths are allowed

a. Rename ComputerVision to CV, and DataAnalytics to DA.

```
kri@kri-ubuntu:~/myfolder/Domain$ mv /home/kri/myfolder/Domain/ComputerVision CV
kri@kri-ubuntu:~/myfolder/Domain$ ls
CV  DataAnalytics  IOT
kri@kri-ubuntu:~/myfolder/Domain$ mv DataAnalytics DA
kri@kri-ubuntu:~/myfolder/Domain$ ls
CV  DA  IOT
```

(The directories were renamed as specified.)

b. Move the available two files of ObjectDetection directory to ObjectRecognition.

```
kri@kri-ubuntu:~/myfolder/Domain$ mv
/home/kri/myfolder/Domain/CV/ImageProcessing/ObjectDetection/*
/home/kri/myfolder/Domain/CV/ImageProcessing/ObjectRecognition
kri@kri-ubuntu:~/myfolder/Domain$ cd CV/ImageProcessing/ObjectRecognition
kri@kri-ubuntu:~/myfolder/Domain/CV/ImageProcessing/ObjectRecognition$ ls
Object1.txt  Object2.txt
```

(The files were moved as specified.)

Interpretation: The mv command is used to move the required files from the specified source to the destination. A file can be renamed be moving it from its current directory to the current directory itself while replacing the old name with the new name in the destination path.

11. rm

Command: rm [option] [files]

a. Remove the files from Classification directory available in DataAnalytics.

```
kri@kri-ubuntu:~/myfolder/Domain/CV/ImageProcessing/ObjectRecognition$ cd
~/myfolder/Domain/DA
kri@kri-ubuntu:~/myfolder/Domain/DA$ rm -r Classification/*
kri@kri-ubuntu:~/myfolder/Domain/DA$ cd Classification
```

kri@kri-ubuntu:~/myfolder/Domain/DA/Classification$ ls
//<blank line>

Interpretation: The rm command can be used to delete multiple files at once using relevant wildcard characters.

12. ln

Commands: ln [filename] [linkname] (hard link)
ln -s [filename] [linkname] (soft link)

kri@kri-ubuntu:~/myfolder/Domain/DA/Classification$ cd ~/myfolder/Domain/CV/MachineLearning/Classification
kri@kri-ubuntu:~/myfolder/Domain/CV/MachineLearning/Classification$ cat>>SVM.txt
written inside svm text file

a. Create a hard link for the file SVM.txt.
kri@kri-ubuntu:~/myfolder/Domain/CV/MachineLearning/Classification$ ln SVM.txt hard.txt

b. Show the inode number for both the original file and the hard link.
kri@kri-ubuntu:~/myfolder/Domain/CV/MachineLearning/Classification$ ls -li SVM.txt hard.txt
5122364 -rw-rw-r-- 2 kri kri 29 Sep 26 15:04 hard.txt
5122364 -rw-rw-r-- 2 kri kri 29 Sep 26 15:04 SVM.txt

c. Remove the file and check if the link is deleted.
kri@kri-ubuntu:~/myfolder/Domain/CV/MachineLearning/Classification$ rm SVM.txt
kri@kri-ubuntu:~/myfolder/Domain/CV/MachineLearning/Classification$ ls
hard.txt Naivebayes.txt
kri@kri-ubuntu:~/myfolder/Domain/CV/MachineLearning/Classification$ ls -li SVM.txt hard.txt
ls: cannot access 'SVM.txt': No such file or directory
5122364 -rw-rw-r-- 1 kri kri 29 Sep 26 15:04 hard.txt
kri@kri-ubuntu:~/myfolder/Domain/CV/MachineLearning/Classification$ cat hard.txt
written inside svm text file

Interpretation: The ln command can be used to create a hard link to a file. The same inode numbers are displayed for all the files. A hard link contains a copy of the contents of the original file. When the original file is deleted, the hard link still contains the contents of the file.

d. Create a hard link for the directory DA.
kri@kri-ubuntu:~/myfolder/Domain/CV/MachineLearning/Classification$ cd ../../..
kri@kri-ubuntu:~/myfolder/Domain$ ln DA hardlink
ln: DA: hard link not allowed for directory

e. Cannot create hard link? Why? - Allowing hard links for directories would break the file-system strucure and hence, hard links are not allowed for directories.

Interpretation: Hard links are not allowed for directories, but soft links are allowed.

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f. Create a soft link for the directory DA.

```
kri@kri-ubuntu:~/myfolder/Domain$ ln -s DA soft
```

g. Show the inode number for both the original file and the shortcut.

```
kri@kri-ubuntu:~/myfolder/Domain$ ls -li DA soft
5122371 lrwxrwxrwx 1 kri kri    2 Sep 26 15:18 soft -> DA

DA:
total 12
5122350 drwxrwxr-x 2 kri kri 4096 Sep 26 15:17 ArtificialIntelligence
5122351 drwxrwxr-x 2 kri kri 4096 Sep 26 15:17 Classification
5122352 drwxrwxr-x 2 kri kri 4096 Sep 26 15:17 DataVisualisation
```

h&i. Remove the directory DA and check that the shortcut has become a dangling link.

```
kri@kri-ubuntu:~/myfolder/Domain$ ls DA
ArtificialIntelligence  Classification  DataVisualisation
kri@kri-ubuntu:~/myfolder/Domain$ ls soft
ArtificialIntelligence  Classification  DataVisualisation
kri@kri-ubuntu:~/myfolder/Domain$ rm -r DA
kri@kri-ubuntu:~/myfolder/Domain$ ls -li DA soft
ls: cannot access 'DA': No such file or directory
5122371 lrwxrwxrwx 1 kri kri 2 Sep 26 15:18 soft -> DA
kri@kri-ubuntu:~/myfolder/Domain$ ls soft
soft
```

Interpretation: The ln -s command can be used to create a soft link to a file. Different inode numbers are displayed for the original file and each link. A soft link only contains a reference to the original file. It does not contain a copy of the contents of the original file. If the original file is deleted, the soft link becomes a dangling link.
