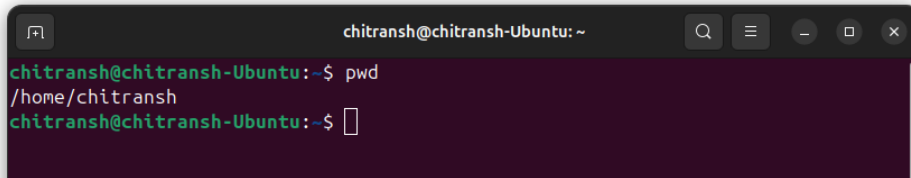


# 4ITRC2 Operating System Lab

## Lab Assignment 2

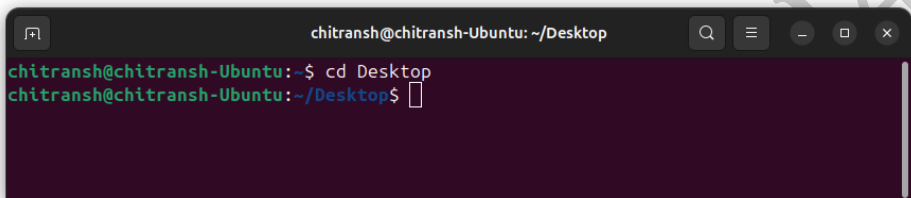
### Part 1: Command Outputs

1. **pwd** - Prints the current working directory.

A terminal window titled 'chitransh@chitransh-Ubuntu: ~' showing the command 'pwd' being executed. The output is '/home/chitransh'.

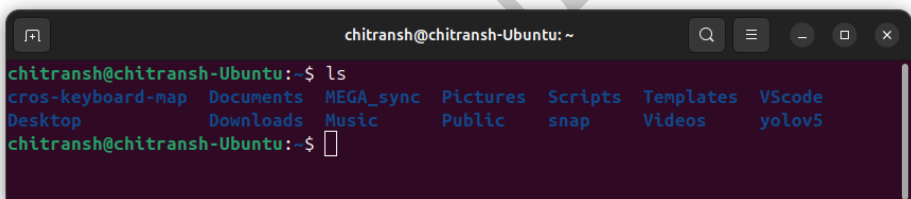
```
chitransh@chitransh-Ubuntu: ~  
chitransh@chitransh-Ubuntu:~$ pwd  
/home/chitransh  
chitransh@chitransh-Ubuntu:~$
```

2. **cd** - Changes the current directory.

A terminal window titled 'chitransh@chitransh-Ubuntu: ~/Desktop' showing the command 'cd Desktop' being executed. The output is 'chitransh@chitransh-Ubuntu:~/Desktop\$'.

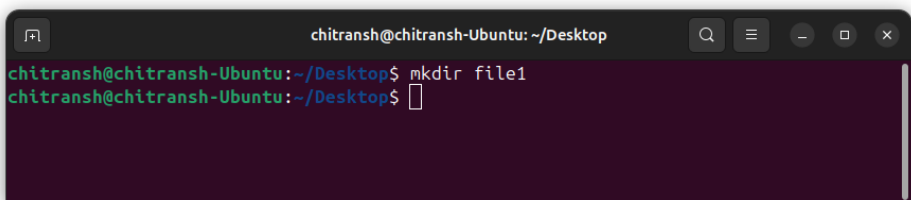
```
chitransh@chitransh-Ubuntu: ~/Desktop  
chitransh@chitransh-Ubuntu:~$ cd Desktop  
chitransh@chitransh-Ubuntu:~/Desktop$
```

3. **ls** - Lists files and directories.

A terminal window titled 'chitransh@chitransh-Ubuntu: ~' showing the command 'ls' being executed. The output lists various directories and files in two rows.

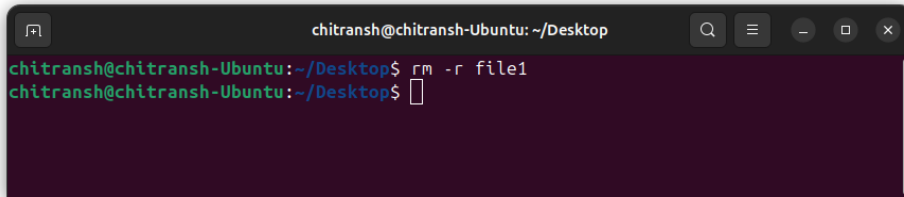
```
chitransh@chitransh-Ubuntu: ~  
chitransh@chitransh-Ubuntu:~$ ls  
cros-keyboard-map  Documents  MEGA_sync  Pictures  Scripts  Templates  VScode  
Desktop            Downloads  Music      Public    snap     Videos    yolov5  
chitransh@chitransh-Ubuntu:~$
```

4. **mkdir** - Creates a new directory.

A terminal window titled 'chitransh@chitransh-Ubuntu: ~/Desktop' showing the command 'mkdir file1' being executed. The output is 'chitransh@chitransh-Ubuntu:~/Desktop\$'.

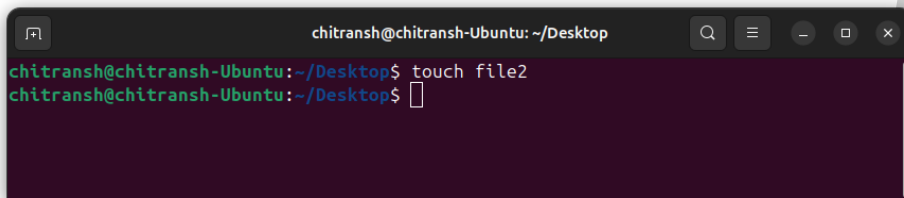
```
chitransh@chitransh-Ubuntu: ~/Desktop  
chitransh@chitransh-Ubuntu:~/Desktop$ mkdir file1  
chitransh@chitransh-Ubuntu:~/Desktop$
```

5. **rm** - Removes files or directories.



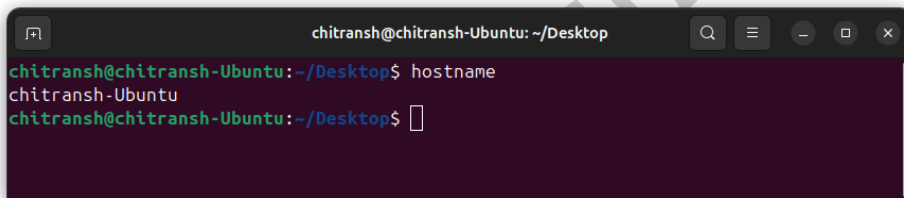
```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ rm -r file1
chitransh@chitransh-Ubuntu:~/Desktop$
```

6. **touch** - Creates an empty file.



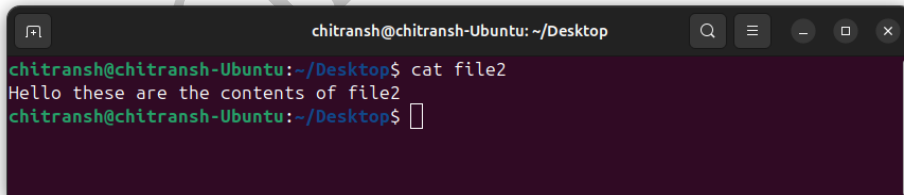
```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ touch file2
chitransh@chitransh-Ubuntu:~/Desktop$
```

7. **hostname** - Displays the system's hostname.



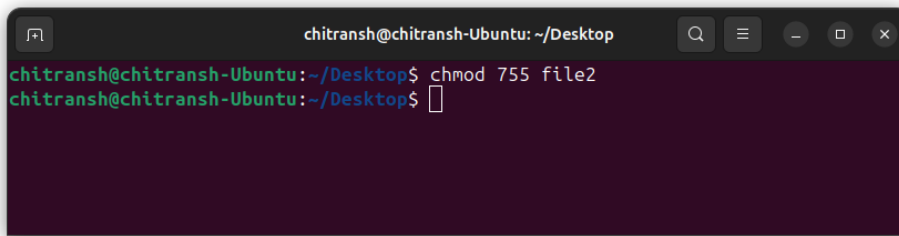
```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ hostname
chitransh-Ubuntu
chitransh@chitransh-Ubuntu:~/Desktop$
```

8. **cat** - Displays the content of a file.



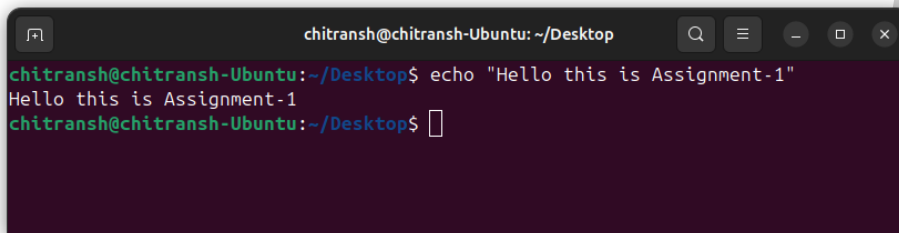
```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ cat file2
Hello these are the contents of file2
chitransh@chitransh-Ubuntu:~/Desktop$
```

9. **chmod** - Changes file permissions.



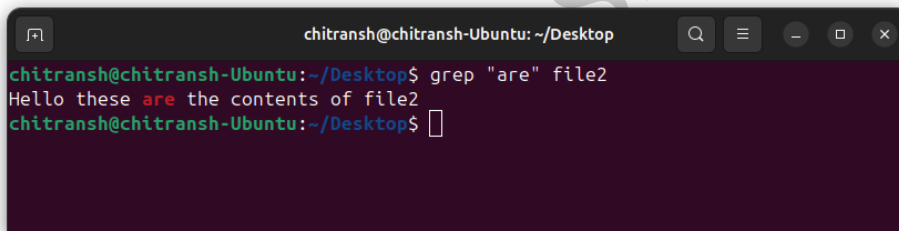
```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ chmod 755 file2
chitransh@chitransh-Ubuntu:~/Desktop$
```

10. **echo** - Prints text to the terminal.



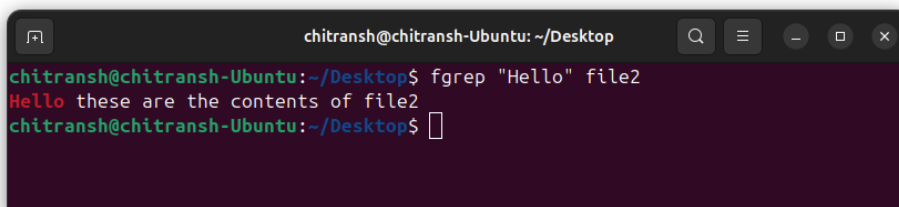
```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ echo "Hello this is Assignment-1"
Hello this is Assignment-1
chitransh@chitransh-Ubuntu:~/Desktop$
```

11. **grep** - Searches for a pattern in files.



```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ grep "are" file2
Hello these are the contents of file2
chitransh@chitransh-Ubuntu:~/Desktop$
```

12. **fgrep** - Searches for fixed strings.



```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ fgrep "Hello" file2
Hello these are the contents of file2
chitransh@chitransh-Ubuntu:~/Desktop$
```

13. **mv** - Moves or renames files.

```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ mv file2 banana
chitransh@chitransh-Ubuntu:~/Desktop$
```

14. **cp** - Copies files or directories.

```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ cp file2.txt /home/chitransh/Documents
chitransh@chitransh-Ubuntu:~/Desktop$
```

15. **more** - Displays content one page at a time.

```
chitransh@chitransh-Ubuntu: ~/Downloads
%PDF-1.7
%␣␣␣␣
1 0 obj
<</Type/Catalog/Pages 2 0 R/Lang(en-IN) /StructTreeRoot 1448 0 R/Outlines 887 0
R/MarkInfo<<Marked true>>/Metadata 8001 0 R/ViewerPreferences 8002 0 R>>
endobj
2 0 obj
<</Type/Pages/Count 135/Kids[ 3 0 R 23 0 R 39 0 R 42 0 R 43 0 R 44 0 R 45 0 R 46
0 R 47 0 R 54 0 R 59 0 R 67 0 R 74 0 R 76 0 R 79 0 R 81 0 R 87 0 R 93 0 R 95 0
R 97 0 R 98 0 R 101 0 R 110 0 R 113 0 R 115 0 R 116 0 R 117 0 R 118 0 R 119 0 R
120 0 R 121 0 R 122 0 R 123 0 R 124 0 R 125 0 R 126 0 R 127 0 R 128 0 R 129 0 R
130 0 R 135 0 R 137 0 R 141 0 R 142 0 R 143 0 R 144 0 R 145 0 R 146 0 R 147 0 R
148 0 R 150 0 R 153 0 R 154 0 R 157 0 R 160 0 R 162 0 R 165 0 R 167 0 R 168 0 R
175 0 R 178 0 R 181 0 R 184 0 R 185 0 R 189 0 R 192 0 R 194 0 R 195 0 R 199 0 R
203 0 R 205 0 R 206 0 R 212 0 R 219 0 R 220 0 R 221 0 R 223 0 R 227 0 R 232 0 R
233 0 R 237 0 R 241 0 R 248 0 R 254 0 R 257 0 R 260 0 R 265 0 R 269 0 R 272 0 R
273 0 R 277 0 R 279 0 R 280 0 R 282 0 R 287 0 R 289 0 R 293 0 R 298 0 R 302 0 R
304 0 R 309 0 R 314 0 R 320 0 R 327 0 R 332 0 R 335 0 R 340 0 R 344 0 R 349 0 R
353 0 R 354 0 R 356 0 R 362 0 R 375 0 R 383 0 R 393 0 R 403 0 R 405 0 R 411 0 R
412 0 R 413 0 R 414 0 R 415 0 R 417 0 R 418 0 R 419 0 R 420 0 R 421 0 R 422 0 R
423 0 R 424 0 R 425 0 R 428 0 R 430 0 R 432 0 R] >>
endobj
3 0 obj
--More-- (0%)
```

16. **less** - Similar to more, but with more features. Allows backward scrolling.

```
chitransh@chitransh-Ubuntu: ~/Downloads
AUTONOMOUS
BAJA(aBAJA)
SAEINDIA 2024

2024 Collegiate Design Series

Baja SAEINDIA®Rules
DRAFT, 28 May 2023
Applicable for aBAJA event being conducted in 2024

Note: For any clarification on rules/articles mentioned in this draft rulebook, please wait till the release of Final Rulebook on BAJA SAEINDIA Forum.
Foreword

Welcome to aBAJA SAEINDIA 2024

The BAJA SAEINDIA® Rulebook Committee has come up with a new Rulebook for aBAJA for the 2024 season. BAJA SAEINDIA has introduced a new event from the 2024 season which will include building an autonomous vehicle capable of self-driving without a physical driver being present. This competition will witness the teams implementing autonomous driving technologies - including but not limited to pattern recognition, sensing, advanced computation methods, synchronization of sensor data and pattern recognition with software
```

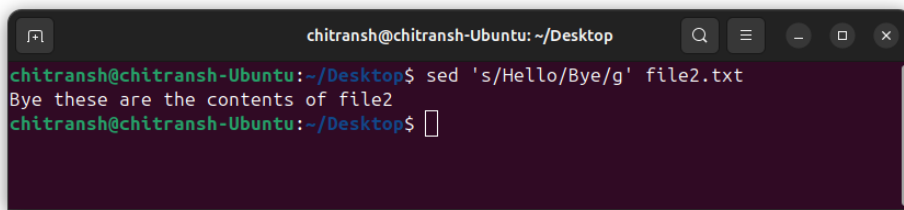
17. **wc** - Counts lines, words, and characters in a file.

```
chitransh@chitransh-Ubuntu: ~/Downloads
chitransh@chitransh-Ubuntu:~/Downloads$ wc SAE.pdf
36055 158399 5204455 SAE.pdf
chitransh@chitransh-Ubuntu:~/Downloads$
```

18. **awk** - Pattern scanning and processing.

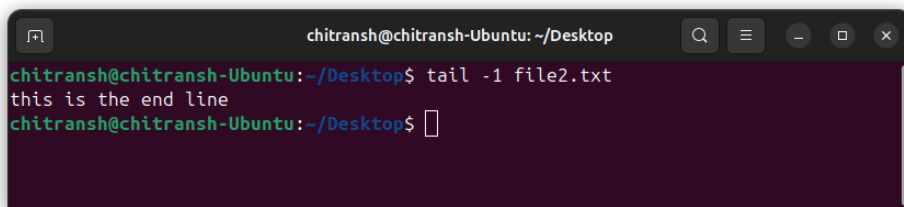
```
chitransh@chitransh-Ubuntu: ~/Downloads
/StemV
/CapHeight
/ItalicAngle
/FontBBox
/FontFile2
endobj
86
<</Type
/FontDescriptor
/BaseFont
/Subtype
/CIDToGIDMap
/CIDSystemInfo
/Ordering
/Supplement
/W
/DW
endobj
87
<</Filter
/Length
x]R
endstream
```

19. **sed** - Stream editor for text manipulation.



```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ sed 's/Hello/Bye/g' file2.txt
Bye these are the contents of file2
chitransh@chitransh-Ubuntu:~/Desktop$
```

20. **tail** - Displays the last few lines of a file.



```
chitransh@chitransh-Ubuntu: ~/Desktop
chitransh@chitransh-Ubuntu:~/Desktop$ tail -1 file2.txt
this is the end line
chitransh@chitransh-Ubuntu:~/Desktop$
```

## Part 2

1. **How to navigate to a Specific Directory?**  
Use: `cd /path/to/directory`
2. **How to see detailed information about files and directories using ls?**  
Use: `ls -l`
3. **How to create multiple directories in Linux using mkdir command?**  
Use: `mkdir dir1 dir2 dir3`
4. **How to remove multiple files at once with rm?**  
Use: `rm file1 file2 file3`
5. **Can rm be used to delete directories?**  
Yes, use: `rm -r directory`
6. **How Do You Copy Files and Directories in Linux?**  
Use: `cp file1 destination/` or `cp -r dir1 destination/`

7. **How to Rename a file in Linux Using mv Command?**

Use: `mv oldfile newfile`

8. **How to Move Multiple files in Linux Using mv Command?**

Use: `mv file1 file2 file3 destination/`

9. **How to Create Multiple Empty Files by Using Touch Command in Linux?**

Use: `touch file1 file2 file3`

10. **How to View the Content of Multiple Files in Linux?**

Use: `cat file1 file2`

11. **How to Create a file and add content in Linux Using cat Command?**

Use: `cat > filename` and type content, then press Ctrl+D

12. **How to Append the Contents of One File to the End of Another File using cat command?**

Use: `cat file1 >> file2`

13. **How to use cat command if the file has a lot of content and can't fit in the terminal?**

Use: `cat filename | less`

14. **How to Merge Contents of Multiple Files Using cat Command?**

Use: `cat file1 file2 > mergedfile`

15. **How to use cat Command to Append to an Existing File?**

Use: `cat >> filename` and type content, then press Ctrl+D

16. **What is “chmod 777”, “chmod 755” and “chmod +x” or “chmod a+x”?**

- `chmod 777` (gives full permissions (read, write, execute) to everyone.)
- `chmod 755` (allows the owner full permissions but only read and execute for others.)
- `chmod +x` or `chmod a+x` (makes a file executable.)

17. **How to find the number of lines that match the given string/pattern?**

Use: `grep -c 'pattern' filename`

18. **How to display the files that contain the given string/pattern?**

Use: `grep -l 'pattern' *`

19. **How to show the line number of a file with the line matched?**

Use: `grep -n 'pattern' filename`

20. **How to match the lines that start with a string using grep?**

Use: `grep '^pattern' filename`

21. **Can the ‘sort’ command be used to sort files in descending order by default?**

No, use `sort -r` for descending order.

22. **How can I sort a file based on a specific column using the ‘sort’ command?**

Use: `sort -k column_number filename`

Chitransh 2314126