Department of Computer Science & Engineering

Course Title : Operating Systems Lab

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Report Name : Basic Ubuntu Operations

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Problem Statement :

The problem focuses on performing various basic command-line operations in an Ubuntu terminal. These commands are essential for managing files and directories, and interacting with the shell environment effectively. The task involves applying the commands mkdir, cd, touch, ls, rm, nano, cat, less, head, tail, echo, wc -w, cd .., and rmdir to simulate a series of file system manipulations. The goal is to understand how these commands are used to create, navigate, modify, and inspect files and directories, as well as perform other related tasks in the terminal environment.

CLASS TASK:

Case Scenario:

You are a student working on a group project. You decide to organize your research notes, drafts, and summaries using the Ubuntu terminal. Your goal is to create a structured directory with relevant files, write content into them, review the content, get word counts, and eventually clean up unnecessary files.

- Create directories and files
- Write and editing text files
- View and manage file content
- Count words
- Print files
- Delete files and directories

Class Work:

```
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~> mkdir atik
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~> cd atik/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> touch utils.py
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> touch index.html
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> touch test.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> ls
index.html  test.txt  utils.py
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> rm test.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> ls
index.html  utils.py
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> touch new.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> nano new.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> cat new.txt
Hello from Atik.
I am practicing Operating System Linux command from OS lab.
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> less new.txt
fish: Job 1, 'less new.txt' has stopped
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> nano new.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> nano new.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> head new.txt
Hello from Atik.
I am practicing Operating System Linux command from OS lab.

l1
l2
l3
l4
l5
l6
l7
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> tail new.txt
l7
l8
l9
l10
l11
l12
l13
l14
l15
l16
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> touch echo.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> echo "Hello From Terminal" >echo.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> cat echo.txt
Hello From Terminal
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik> wc -w file.txt
wc: file.txt: No such file or directory
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik [1]> wc -w new.txt
29 new.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/atik>
```

Class Task:

```
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~> mkdir osLab
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~> cd osLab/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> mkdir research-notes
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> mkdir drafts
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> mkdir summary
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> ls
drafts/  research-notes/  summary/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> cd research-notes/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> touch note1.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> nano note1.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> cat note1.txt
Our research note.
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> nano note1.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> less note1.txt
fish: Job 2, 'less note1.txt' has stopped
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> head note1.txt
Our research note.
Line1
Line2
Line3
Line4
Line5
Line6
L7
L8
L9
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> tail note1.txt
Line1
Line2
Line3
Line4
Line5
Line6
L7
L8
L9
L10
```

Class Task:

```
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> wc -w note1.txt
13 note1.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> wc -l note1.txt
11 note1.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/research-notes> cd ..
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> ls
drafts/  research-notes/  summary/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> cd dra
cd: The directory 'dra' does not exist
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab [1]> cd drafts/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/drafts> echo "Drafts text" >draftFile.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/drafts> cat draftFile.txt
Drafts text
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/drafts> cd ..
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> ls
drafts/  research-notes/  summary/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> cd summary/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/summary> touch summary1.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/summary> echo "Our first research summary" >summary1.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/summary> cat summary1.txt
Our first research summary
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/summary> touch demoSummary.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/summary> echo "demo summary" > demoSummary.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/summary> cat demoSummary.txt
demo summary
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/summary> rm demoSummary.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/summary> cd  ..
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> ls
drafts/  research-notes/  summary/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> mkdir newDemoDir
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> ls
drafts/  newDemoDir/  research-notes/  summary/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> cd newDemoDir/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/newDemoDir> touch n.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/newDemoDir> ls
n.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/newDemoDir> rm n.txt
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/newDemoDir> ls
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/o/newDemoDir> cd ..
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> ls
drafts/  newDemoDir/  research-notes/  summary/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> rm -d newDemoDir/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab> ls
drafts/  research-notes/  summary/
lab-1-ubontu@lab-1-ubontu-VMware-Virtual-Platform ~/osLab>
```

Linux Command Guide with Expected Output and Explanations

1. `mkdir` – Create a Directory

- Command: `mkdir test_directory`
- Expected Output: *No output (directory is created successfully)*
- Explanation: Creates a new directory named `test_directory`.

2. `cd` – Change Directory

- Command: `cd test_directory`
- Expected Output: *No output (terminal changes to specified directory)*
- Explanation: Navigates into the `test_directory`.

3. `touch` – Create a New File

- Command: `touch test_file.txt`
- Expected Output: *No output (file is created)*
- Explanation: Creates an empty file named `test_file.txt`.

4. `ls` – List Directory Contents

- Command: `ls`
- Expected Output: `test_file.txt`
- Explanation: Lists contents of the current directory.

5. `rm` – Remove a File

- Command: `rm test_file.txt`
- Expected Output: *No output (file is deleted)*
- Explanation: Deletes the `test_file.txt` file.

6. `nano` – Open a File in Nano Editor

- Command: `nano test_file.txt`
- Expected Output: *Opens `test_file.txt` in the Nano editor*
- Explanation: Opens the file for editing. If it doesn't exist, Nano creates a new file.

7. `cat` – Display File Content

- Command: `cat test_file.txt`
- Expected Output: *Displays content of `test_file.txt`*
- Explanation: Outputs file content to the terminal.

8. `less` – View File Content Interactively

- Command: `less test_file.txt`
- Expected Output: *Scrollable file content view*
- Explanation: Opens file in a scrollable viewer for easy navigation.

9. `head` – View First Lines of a File

- Command: `head test_file.txt`
- Expected Output: *Displays first 10 lines of the file*
- Explanation: Shows the top portion of the file.

10. `tail` – View Last Lines of a File

- Command: `tail test_file.txt`
- Expected Output: *Displays last 10 lines of the file*
- Explanation: Shows the bottom portion of the file.

11. `echo` – Display Message or Redirect to File

- Command: `echo "Hello, World!"`
- Expected Output: `Hello, World!`
- Explanation: Prints the specified string to the terminal.

12. `wc -w` – Count Words in a File

- Command: `wc -w test_file.txt`
- Expected Output: *Number of words in the file (e.g., `5 test_file.txt`)*
- Explanation: Counts and displays the number of words in the file.

13. `cd ..` – Go to Parent Directory

- Command: `cd ..`
- Expected Output: *No output (moves to parent directory)*
- Explanation: Navigates one level up in the directory tree.

14. `rmdir` – Remove Empty Directory

- Command: `rmdir test_directory`
- Expected Output: *No output (directory is deleted if empty)*
- Explanation: Removes `test_directory` only if it contains no files or subdirectory

Conclusion :

The exercises performed using basic Ubuntu terminal commands provide valuable insights into essential file and directory management tasks. These operations form the foundation for more advanced shell scripting and system administration tasks. By gaining familiarity with commands like mkdir, cd, touch, ls, and rm, users can effectively organize and manage files in a Unix-based environment. Moreover, commands such as cat, less, head, and tail aid in efficiently viewing and inspecting file contents, while wc -w helps analyze file word count. Ultimately, this exercise enables users to interact proficiently with the command-line interface, an essential skill for system administrators and developers.