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Network Operating System

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Introduction

Modern operating systems if traced, links it’s root to early days Unix based system initiating in early 1970s. Unix was developed by Ken Thompson , Dennis Ritchie, Douglas Mcllory and Joe Ossanna at AT&T Bell labs with other tech partners. It was a revolution in computer science field as it’s futher development allows the system capabilities like multi-users, portable, multi-tasking, and hierarchical file system. Unix introduced the concept of modularity, simplicity, and multitasking. (Javatpoint, n.d.)

Linux system and Minix system were derived from basic design and principles from Unix system in 1970 to 1980s. Unix system were designed to operate with command line interface with running various function with certain set of command. Early version of Unix ran on computer like PDP-11 and VAX, mostly on minicomputers and mainframe computers. (Stonebank, 2001) Later on Unix system was developed to be portable allowing it to run on variety of system making it modular.

Operating system like Sun Solaris, GNU/Linux, MacOS, and etc are most popular system with use of Unix system. Before the introduction of graphical user interface in the system, Unix developed systax for regular expressions to interact with operating system. Influence of Unix system can be seen to Minix developed by Andrew S Tanenbaum, development of Linux started from concept of Minix system in 1991 aiming to create independent, robust kernel system.

The commands used in this workshop highlight the need of efficient navigation through CLI for file management, directory management and its navigation, and access control in Unix systems. Development of the system has resulted in graphical user interface which provides users ease of use, speedy navigation, various information at glance and flexibility. Unix's command-line interface utilities remain unparalleled in speed, flexibility, and automation. However, the steep learning curve and command memorization are notable drawbacks compared to GUI-based systems. Eg: ls, ls -a, cat, etc.

Objective

This lab focuses on use of command to interact with the operating system in Command Line Interface (CLI) and aquire basic knowledge of how UNIX system works under, even if the various skin of operating system with graphical interface.

- Understand and practice Unix commands.
- relative path navigation within a file system and understand directory hierarchy.
- learn file manipulation techniques like copying, moving, renaming, and deletion.
- File and directory permission controls to user, group and others.

Required Tools and Concepts

Hardware Requirments:

- Intel Pentium 4 class
- 512MB memory
- 50GB hard drive space
  Minimum hardware specs to run as native system
- Or, PC capable of ruuning Unix system in virtual enviroment
  (Unix Client System Requirment, n.d.)

Software Requirements:

- Unix based OS iso file
- Vmware, Parrallel Desktop, or others for virtualization
- Native Operating system to run virtualization

Key Concepts:

- Shell, terminal to run the commands
- Command Line Interface (CLI)
- Directory navigation relative and absolute path
- Command for directory management and permission management
- Mkdir, ls, chmod, cat, echo, and others

Steps to perform:

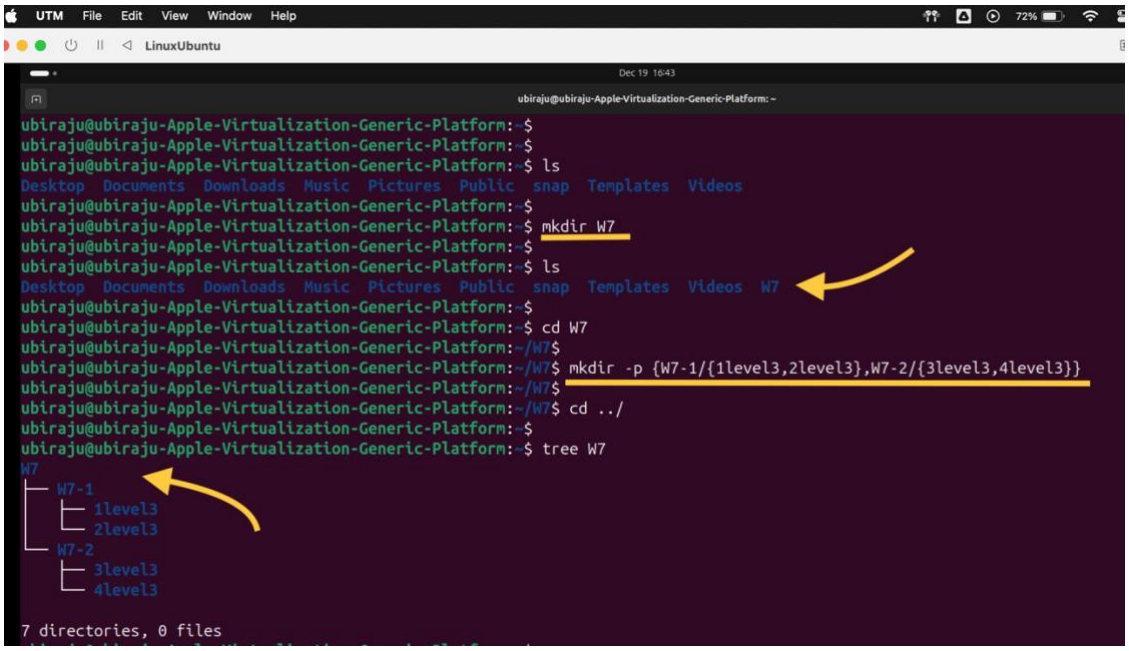


Figure 1: command "mkdir"

make directory it is for creating a new direcotry and “mkdir -p” will create hierarchy of folders
W7 folder tree shown

Figure 2: command "cd"

it is for changing directory where “../” moves to parent directory and “./” moves into same hirerarchy of folder level
command: cd W7/W7-1/1level3 changes directory to the specific folder from path home directory

Figure 4: command "cd"

used to move inbetween various directory, from W7/W7-1/1level3 to W7/W7-1/2level3 which is another folder to this same parent directory.
“cd ../../W7-2/4level3” changes directory at one command

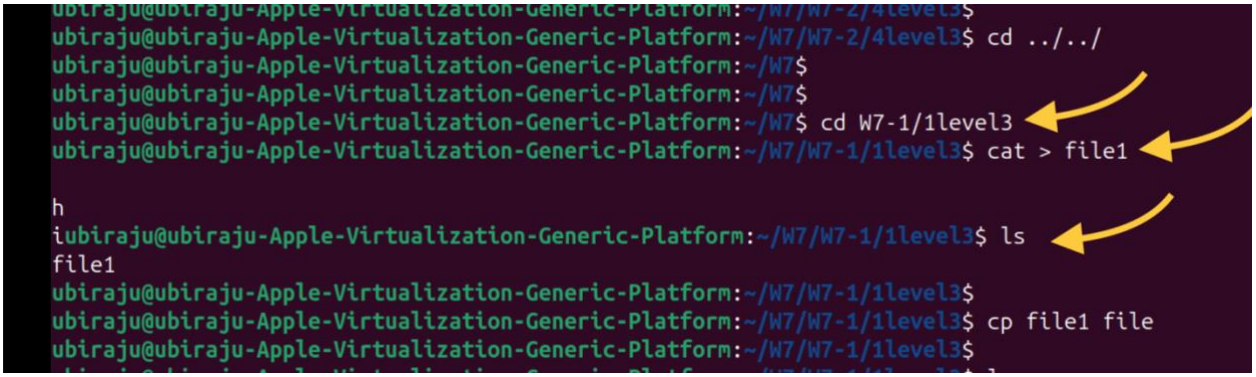


Figure 3: command "cat"

cat > file1 is used to create text file as file1.txt inside directory /W7/W7-1/1level3

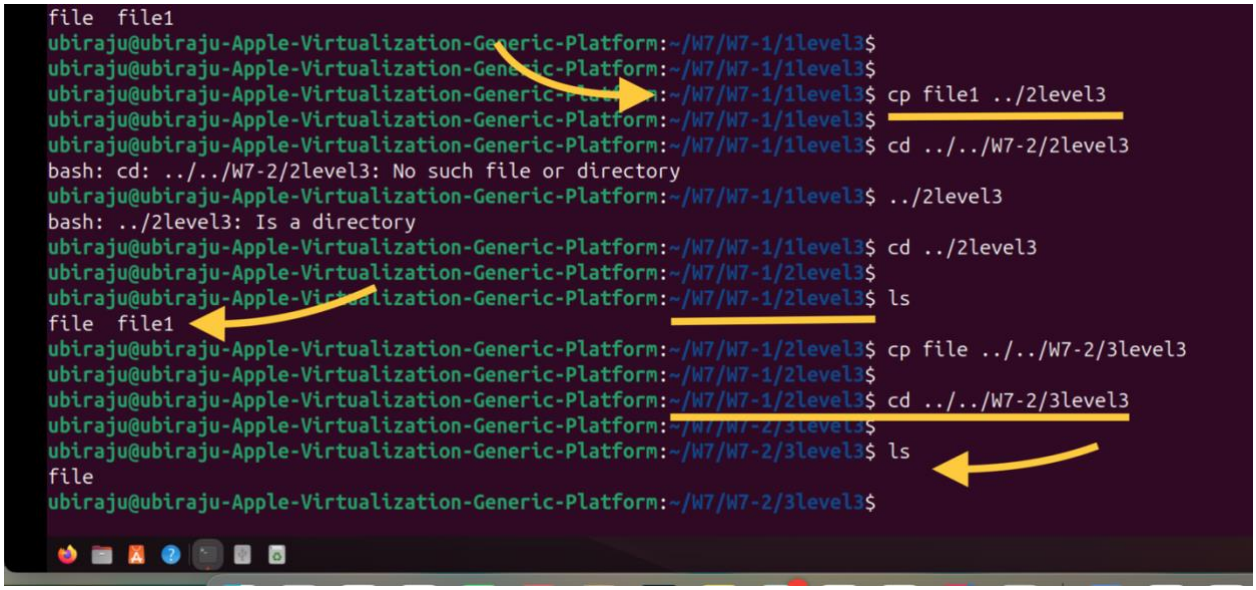


Figure 5: command "cp"

- it is used to copy file inbetween directories, copying file1 to 3rd hierarchical folder 2level3.
- checking for file1 using “ls” command in /W7/W7-1/2level3

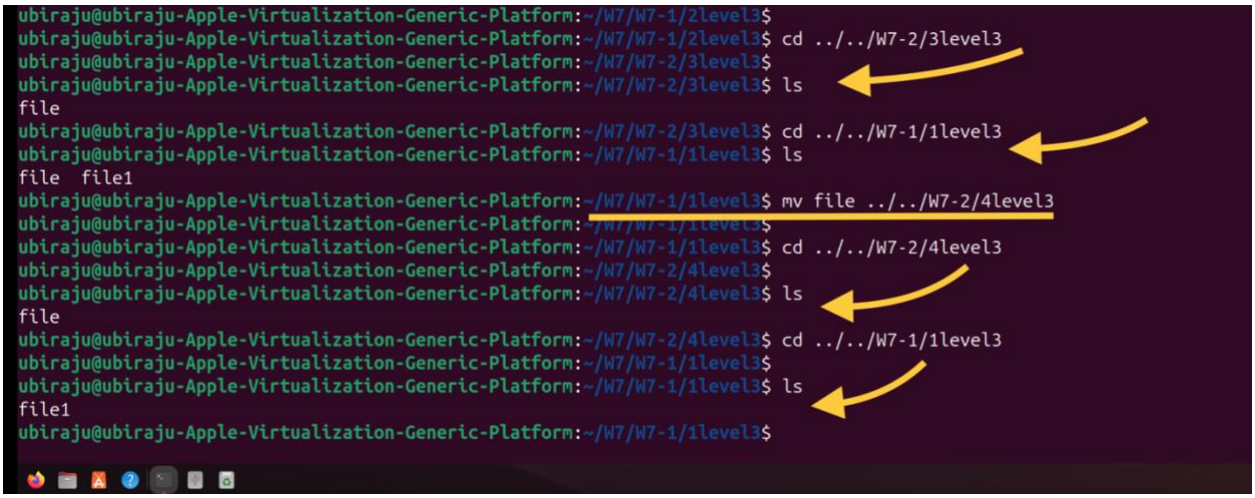


Figure 6: command "mv"

it is used to move file inbetween directories,

- checking the files in 1level using “ls”
- moving file to 4level3 using “mv”
- checking file back again “ls”

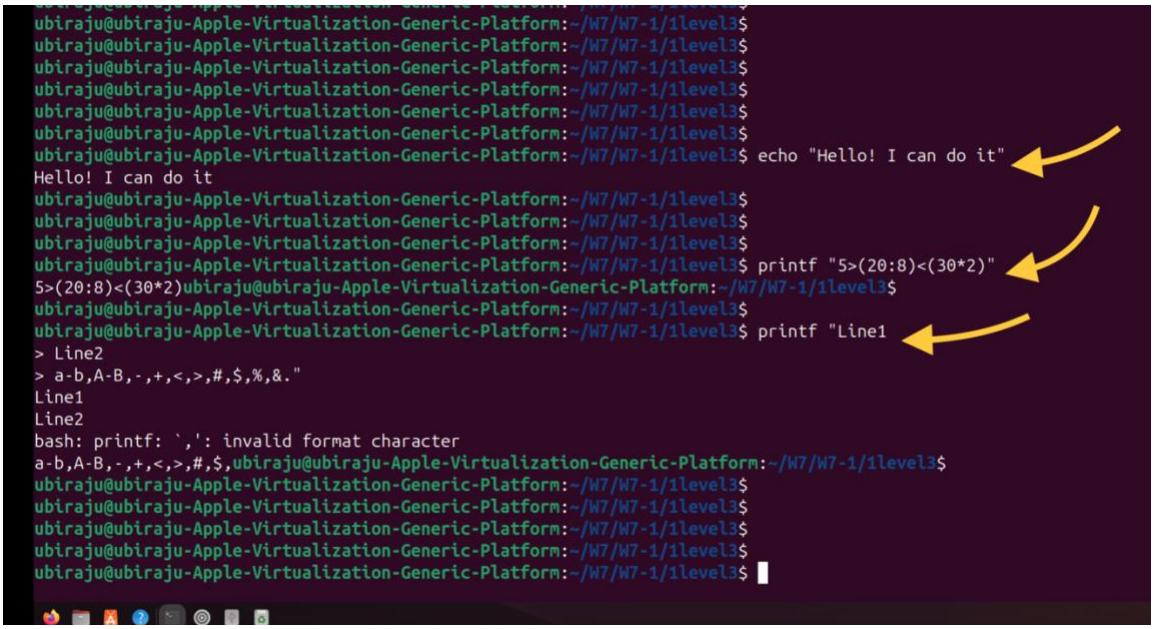


Figure 7: Print statement in terminal

- using “echo” and “printf”.

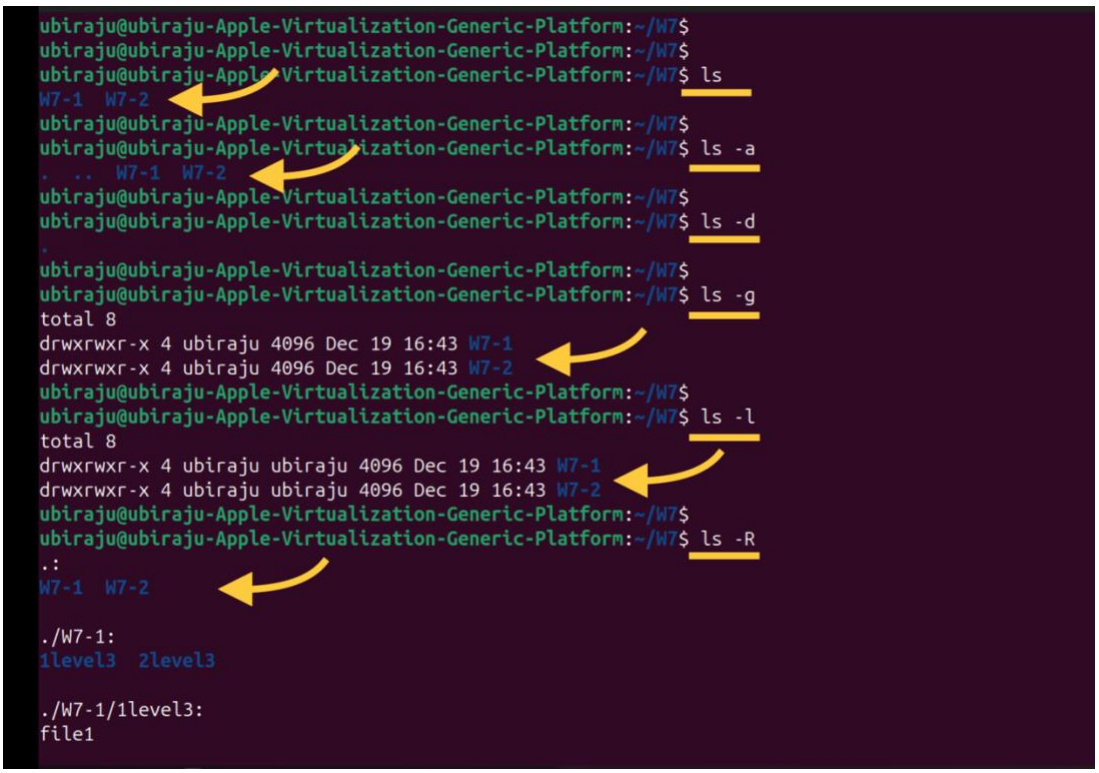
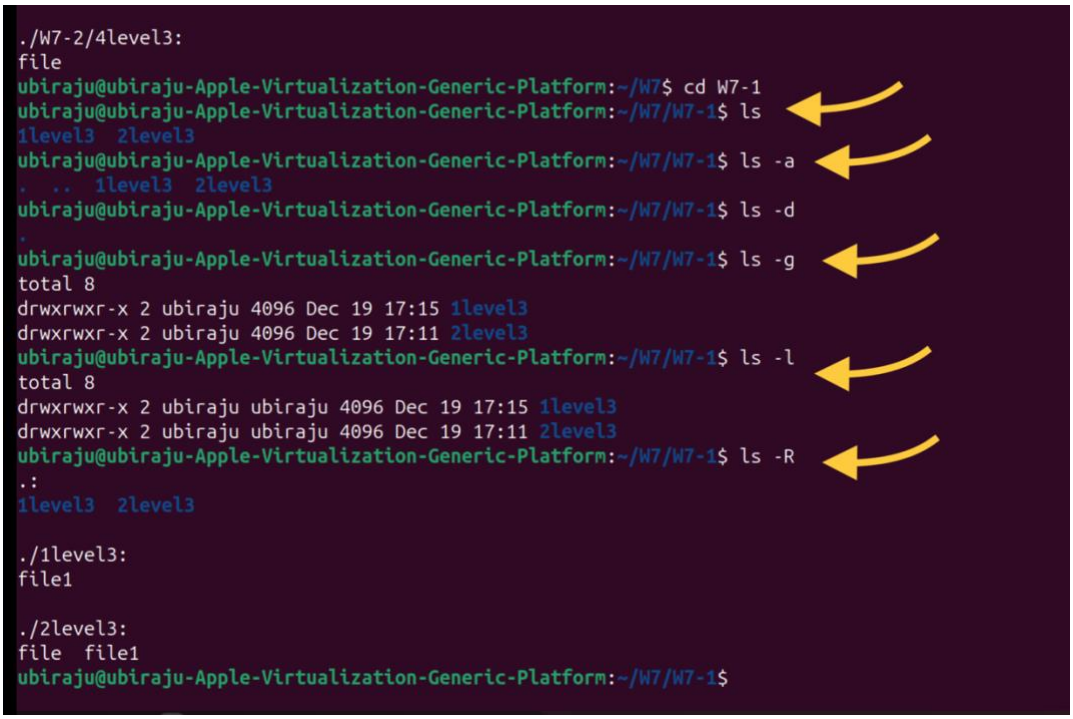


Figure 8: command “ls”

- “ls” to get list of files and sub directories
- “-a” list all hidden files
- “-d” display directory not content
- “-g” display format information and permission without much of user detail
- “-l” display long list of information and permission
- “-R” listing files and all sub directories and contents



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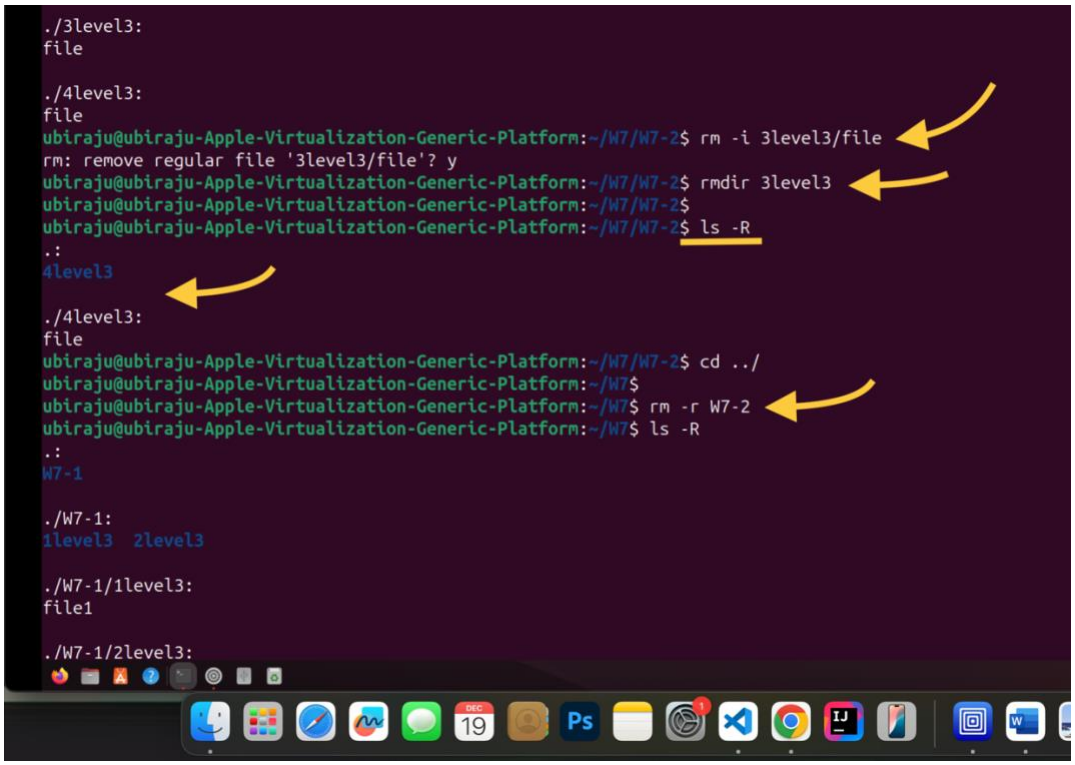

Figure 11: ***command "rm", "rmdir"***

- "rm -i" removes file with comfirmation before executing
- "rmdir" removes the directory only
- "rm -r" removes subdirectories and contents

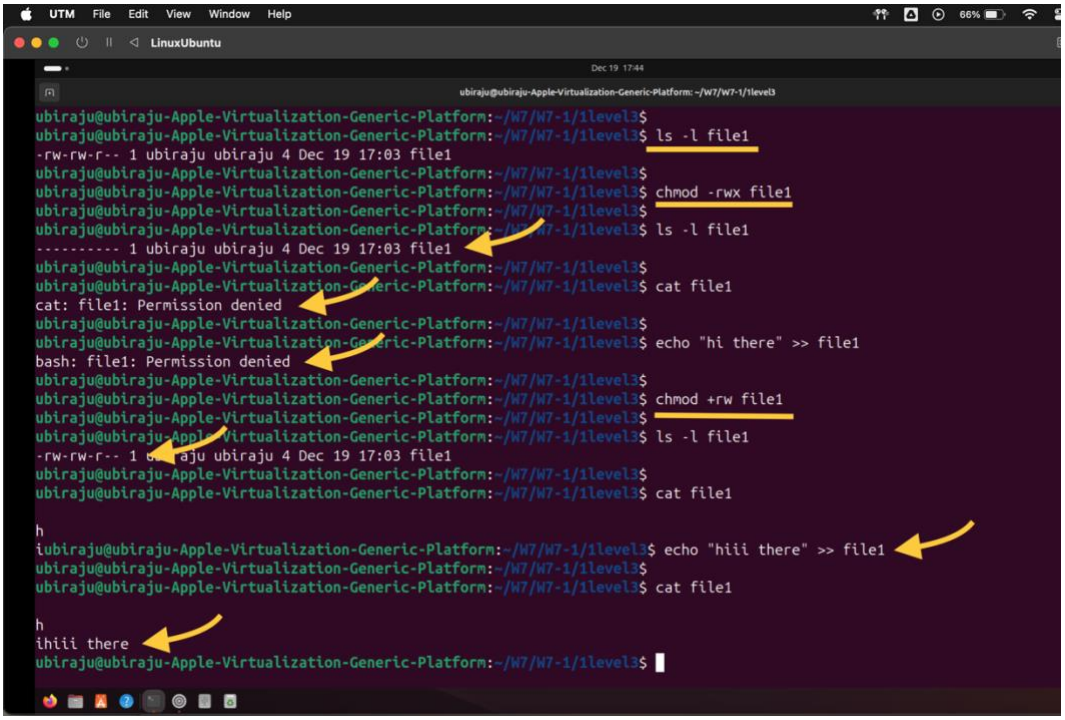

Figure 12: ***"chmod" changes the permission to the file or directory***

- "chmod -rwx" removes all permission to file1 as per screenshot
- reading, writing and executing operations were denied
- adding permission to read and write with "chod +rw file1"
- writing into the file and read the contents of file 1 using "cat" and "echo"

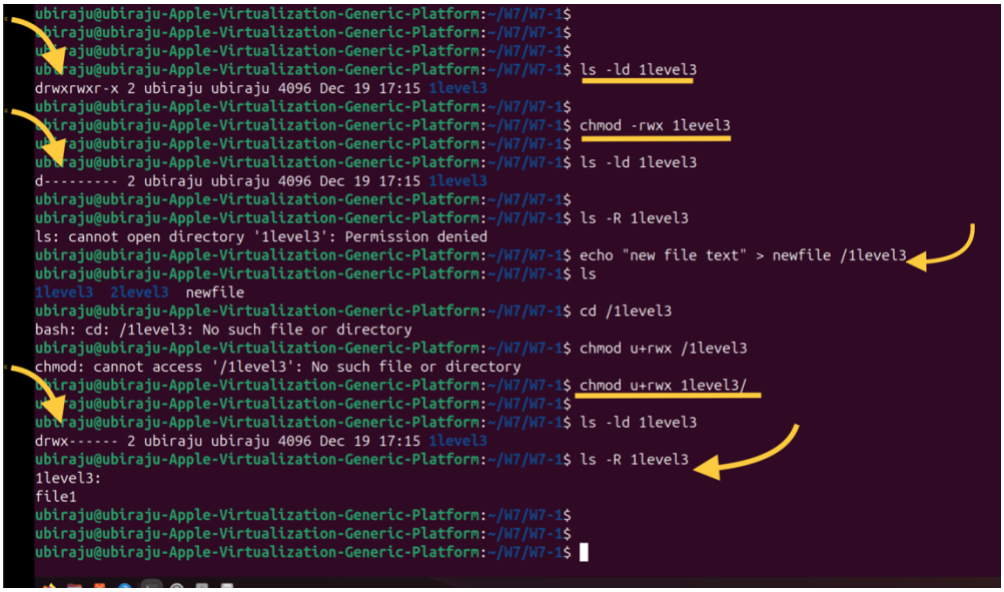

Figure 13: *using command "chmod"*

- *"chmod -rwx 1level3" removes all permission to folder 1level3*
- *unable to read 1level3 with "ls -R 1level3"*
- *"chmod u+rwx" adds user level permission only*
- *"ls -R" reads content of 1level3*

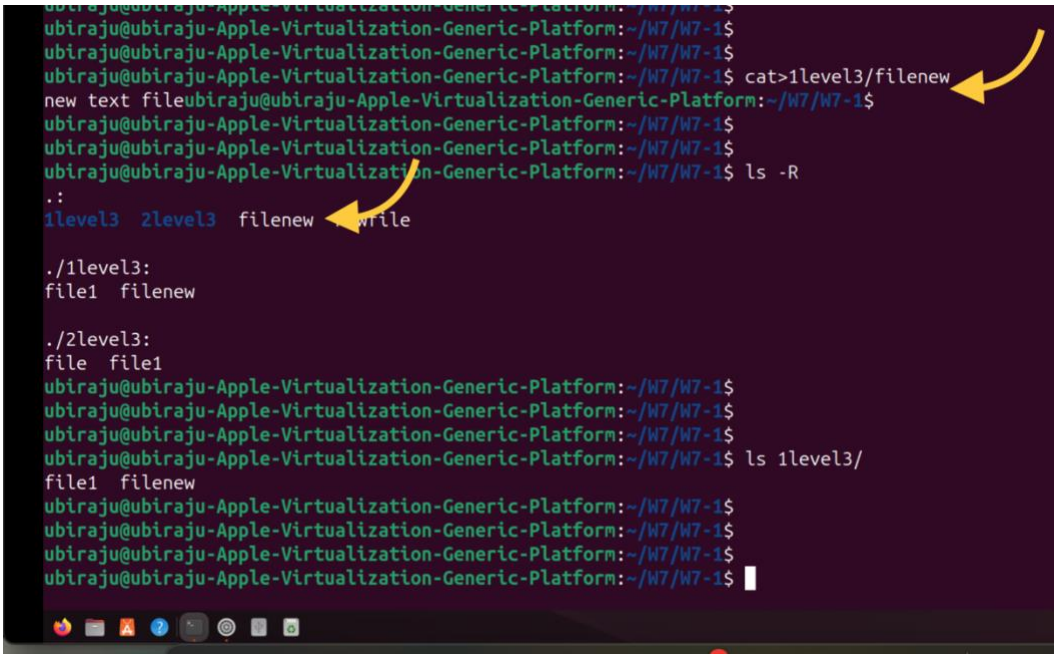

Figure 14: *adding file and reading from directory*

Conclusion

Through this workshop, I gathered knowledge of using Command Line Interface in Unix system and explored the practical applications of Unix utilities for directory structure management, navigation, and file operations. This log is complete documentation of week7 workshop, task focusing on navigation of directory, removing files, removing directories, file and folder permission management, copying files and moving files to different directories.

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Unix Manual :

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Javatpoint. (n.d.). *Linux Tutorial*. From Javatpoint: https://www.javatpoint.com/unix-operating-system

Stonebank, M. (2001). *Unix Introduction*. From Iowa State University: https://www.hpc.iastate.edu/guides/unix-introduction