

□ UNIX Filesystem – In-Depth Notes

□ Filesystem: UNIX organizes files in a hierarchical tree structure. Everything is a file: text files, directories, dev

□ Types of Files:

- Regular file: Text or binary data
- Directory: Folder containing files or other directories
- Special files: Device files (in /dev), symbolic links, named pipes

□ File Naming Conventions:

- Case-sensitive (file.txt ≠ File.txt)
- Avoid special characters: use `_`, `-` instead of spaces
- Max filename length: 255 characters

□ Parent-Child Relationship:

- Each directory (except root `/`) has a parent
- Use `..` to refer to the parent

□ HOME variable:

- Stores the path to the user's home directory
- Access with `\$HOME` or `~`

□ Inode Number:

- Every file is associated with an inode (index node)
- Inode stores metadata (permissions, timestamps, size) but not name

□ Absolute vs Relative Pathname:

- Absolute: From root `/`, e.g., `/home/user/docs`
- Relative: From current directory, e.g., `../docs`

□ Significance of `.` and `..`:

- `.` = current directory
- `..` = parent directory

□ Basic Commands:

- `pwd` □: Show current directory path
- `cd dir_name` □: Change directory
- `mkdir dir_name` □: Make new directory
- `rmdir dir_name` □: Remove empty directory
- `ls` □: List directory contents

□ Important UNIX Directories:

- `/bin` – Essential user binaries
- `/usr/bin` – Non-essential user commands
- `/sbin`, `/usr/sbin` – System binaries
- `/etc` – System config files
- `/dev` – Device files
- `/lib`, `/usr/lib` – Libraries
- `/usr/include` – Header files
- `/usr/share/man` – Manual pages
- `/tmp` – Temporary files
- `/var` – Variable data like logs
- `/home` – User home directories

■ Ordinary File Handling – In-Depth Notes

■ Creating & Displaying Files:

- `cat > filename` ■: Create new file
- `cat filename` ■: Display file contents

■ File Operations:

- `cp source dest` ■→■■: Copy file
- `mv oldname newname` >❧■■=■: Move/rename file
- `rm filename` ■■: Remove file

■ Paging Output:

- `more filename` ■■: View long files page by page

■ Printing:

- `lp filename` ■■: Print file (if printer configured)

■ File Types:

- `file filename` ■■: Shows file type (text, binary, etc.)

■ Counting:

- `wc filename` ■: Count lines, words, characters

■ Comparing Files:

- `cmp file1 file2` ■■: Byte-by-byte comparison
- `diff file1 file2` ■■: Line-by-line differences
- `comm file1 file2` ■: Common/uncommon lines (sorted input)

■ Archiving & Compression:

- `tar -cvf file.tar files` ■: Create archive
- `gzip filename` ■■: Compress file
- `gunzip filename.gz` ■: Decompress gzip
- `zip archive.zip files` ■: Create zip archive
- `unzip archive.zip` ■: Extract zip

■ Effects of Commands on Directories:

- `cp` ■: Copies file into directory
- `rm` ■: Only deletes file, not directory unless `-r`
- `mv` ■: Can move/rename file to/from directory