Operating System

Lab – 11

Objectives:

1. Understanding the concept of Hard and Soft links, their differences and limitations.
2. Understanding the concept of permissions and controlling user access on files.

Resources:

- Video Lecture 21: https://www.youtube.com/watch?v=g8xZgtuYiWI&spfreload=10
- Video Lecture 22: https://www.youtube.com/watch?v=tEYYasCVxRc

Task 1:

- What are **hard** and **soft** links? Elaborate your answer to TA by drawing a comprehensive diagram.
- What are the limitations and differences between hard and soft links? Explain your answer with help of set of commands and explain it to TA.
- What happen if we delete the original file? Is it still accessible from its **hard** link? Justify your answer.
- What happen if we delete the original file? Is it still accessible from its **soft** link? Justify your answer.
- Why the inode numbers of original file and its hard link are same where soft link has different inode from original file?
- Use **`find`** to look in your home directory for regular files that **do not** (!) have one hard link.

Task 2:

- As normal user, create a directory **`~/permissions`**. Create a file owned by yourself in this directory. Copy a file owned by root from **`/etc/passwd`** to your permissions dir, who owns this file now and why?
- As root, create a file in the user's **`~/permissions`** directory. As **normal** user, look at who owns this file created by **root**.
- Change the ownership of all files in **`~/permissions`** to yourself. Make sure you have all rights to these files, and others can only read.
- With chmod, is **734** the same as **`rwxr-xr--`**?
- Create a file as **normal** user, give only read to **others**. Can another normal user read this file? Test writing to this file with vim. Can **root** read this file? Can **root write** to this file with vim?
- In order to copy **f1.txt** from **`/d1/d2/d3/f1.txt`** to **`d4/d5/d6/`** directory what should be the minimum permissions on these directories and why?