Operating System HW
File system

Task1 - Soft Link and Hard Link (30%)

UNIX provides two types of links: hard links and soft links. Do the following steps:

1. Create a text file as *file1.txt*
2. Create a hard link from *file1.txt* to *file2.txt*
3. Create a soft link from *file1.txt* to *file3.txt*

What are the inode values of each file? Do they have the same content? You can try to edit and delete to each file and observe the impact on other files. Describe how you did and the corresponding result in the report.

Task2 - Creating and mounting file system (30%)

Follow the steps below to creating and mounting file system

1. Use the **fdisk** command to add a new 500MB logical partition to your hard drive.
2. Use the **fdisk -l** command to verify that the new partition has been created.
3. Format this partition with an **ext4** file system that contains **800** inodes and block size is **4096** bytes.
4. Edit */etc/fstab* and reboot to mount file system.
5. Use the **df** command to confirm whether the mount is success.

Task3 – Inode and block (40%)

According to the file system in the Task2, implement and answer the following questions

1. Try to create directories in this file system as many as you can. How many directories can be created in this file system? Why? (Hint: inode)
2. Try to create 1-byte files in this file system as many as you can. How many 1-byte files can be created in this file system? Can it completely use all space in this file system? (Hint: block size is 4096 bytes)
3. Try to create a file which size as large as you can. What is the maximum file size? Can it completely use all space in this file system?

Environment

Please do the experiments above under Linux environment

Submission Rules

- Please write down your answer, including which commands (or script) you use to complete the task and screen snapshots of result, and submit as {Student_id}.pdf file.
- Your report can be written in Chinese or English.

- 10% of the score will be taken as punishment once you submitted your HW inwrong formats.
- 30% of the score will be taken if you submitted your HW late.