Activity 10: File system

Naron Chatjitakornkul 6530113921
Pongpak Manoret 6532126421
Pupipat Singkhorn 6532142421

a. What is the name of the filesystem used by your system? Please also briefly explain its features (eg. maximum number of files and file size limitation)

```
Type: ext2/ext3
Block size: 4096       Fundamental block size: 4096
Blocks: Total: 997043     Free: 386456     Available: 382360
Inodes: Total: 524288     Free: 400371
```

Name of the filesystem: ext2/ext3
Maximum number of files: 524,288 (based on total inodes available in the filesystem)
Maximum file size limitation: 2 TB (with a 4 KiB block size).

b. What will happen if you change the permission of the file test.txt? Does the permission affect both test.s and test.h?

Changing `test.txt`'s permission affects `test.h` (hard link), but not `test.s` (symbolic link).

c. What is the difference between symbolic link and hard link?

Hard link: Points directly to the same inode as the original file; shares content and metadata.
Symbolic link: Points to the file path; acts like a shortcut and can break if the target file is moved or deleted.

d. Is it possible to create a hard link for a directory? If not, Why is it (not) possible? Please provide your analysis.

Hard links to directories are disallowed to preserve the tree structure of the filesystem and prevent loops or inconsistencies during navigation and maintenance.

e. What is the block size of your filesystem? When will a new block be allocated to a file? Please explain.

Block size: 4096 bytes
New block allocated: When file size grows beyond current blocks or new data is added that doesn't fit in existing blocks.

f. In "/proc", what is the filesystem there? What does the content suggest? What are files in /proc/[pid]/fd? Please explain.

Filesystem: `proc`
Content suggests: It provides real-time system and process information. The files are virtual and reflect the current state of the system.

```
ubuntu@Ubuntu-OS:/proc/1040$ ls
attr        comm            fd              latency    mountinfo   oom_adj        root
smaps_rollup  task
autogroup   coredump_filter  fdinfo          limits     mounts      oom_score
sched       stack          timens_offsets
auxv        cpuset          gid_map         loginuid   mountstats  oom_score_adj
schedstat  stat           timers
cgroup      cwd             io              map_files  net         pagemap        sessionid
statm         timerslack_ns
clear_refs  environ         ksm_merging_pages  maps       ns          personality
setgroups  status        uid_map
cmdline     exe             ksm_stat        mem        numa_maps   projid_map
smaps       syscall        wchan
```

Files in /proc/[pid]/fd: Symbolic links to all open files used by that process (e.g., stdin, stdout, sockets, files).

```
lrwx------ 1 ubuntu ubuntu 64 Mar 24 15:30 0 -> /dev/pts/0
lrwx------ 1 ubuntu ubuntu 64 Mar 24 15:30 1 -> /dev/pts/0
lrwx------ 1 ubuntu ubuntu 64 Mar 24 15:30 2 -> /dev/pts/0
```