Files and Directories

A file is a sequence of bytes

To the file system (FS), a
directory is a file that
contains some info. about
the files in the directory and
the directories in the directory

Hence, a file system has a
tree structure

Linux, macOS → single tree

Windows → tree per disk

A directory entry contains
the filename and an inode number

The file's metadata is stored
in its inode. (Run stat command
to demonstrate. See stat (2)
for syscall.)

Because of this organization
several files can share the
same inode, by creating a
"hard link"
(Demo using ls -li and stat)

The traditional permission bits
provide coarse-grained permission

Access control lists (ACLs)
provide much finer control

Example: you're working on a
project with two people and want to
grant file access.

Creating a filesystem

Partition the drive

Create filesystem on partition
mke2fs . . .   inodes
(Demo dumpe2fs /dev/sda2) ↗

Mount the filesystem

mount /dev/sda4   /home

- /etc/fstab