"Directory"
(Latin: *directorium*)

Something that "directs"

3ft

5ft

FOOD, RESTAURANTS & SPECIALTY cont

KK15	Great American Cookie Co.
▲	Kay Express Convenience Store
139	McAlister's Deli
KK5	Planet Smoothie
167	Starbucks Coffee

HEALTH & BEAUTY

109	Bath & Body Works
111A	Bella Dona
185	Complete Nutrition
151	GNC
141	Golden Nails
173	Hair Plus
176	Lee Nail Spa
138	MasterCuts
186	Perfumania
▲	Proactiv Solution
210	Regis
166	Trade Secret

Shopping Mall
- Directory is just a board of **business name** and **store location**
- Directory is **not** a space for placing the store

Filesystem
- Directory is just a *special file* that hold **file name** and **its location**
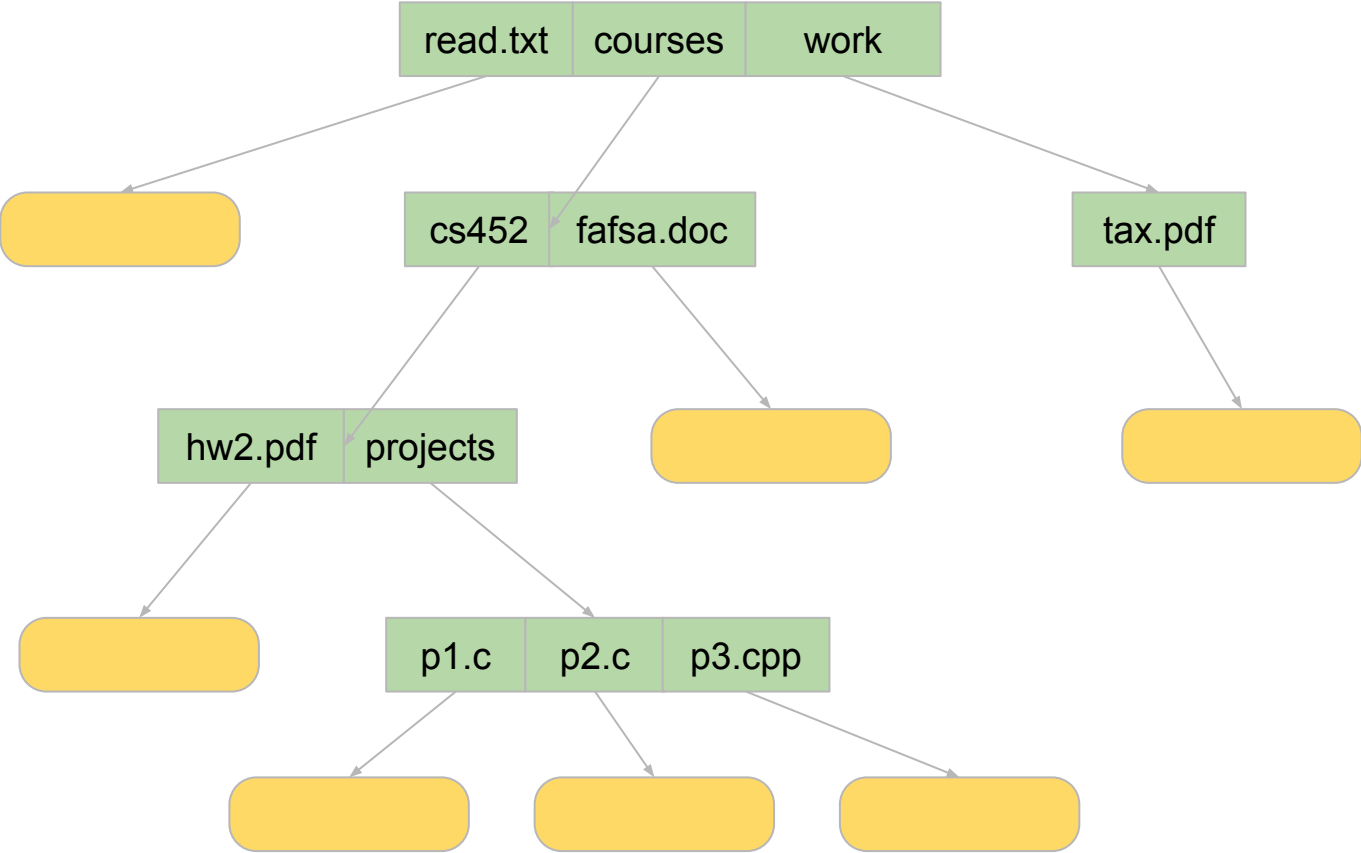- Directory is **not** a space for holding the file contents

Misconception:
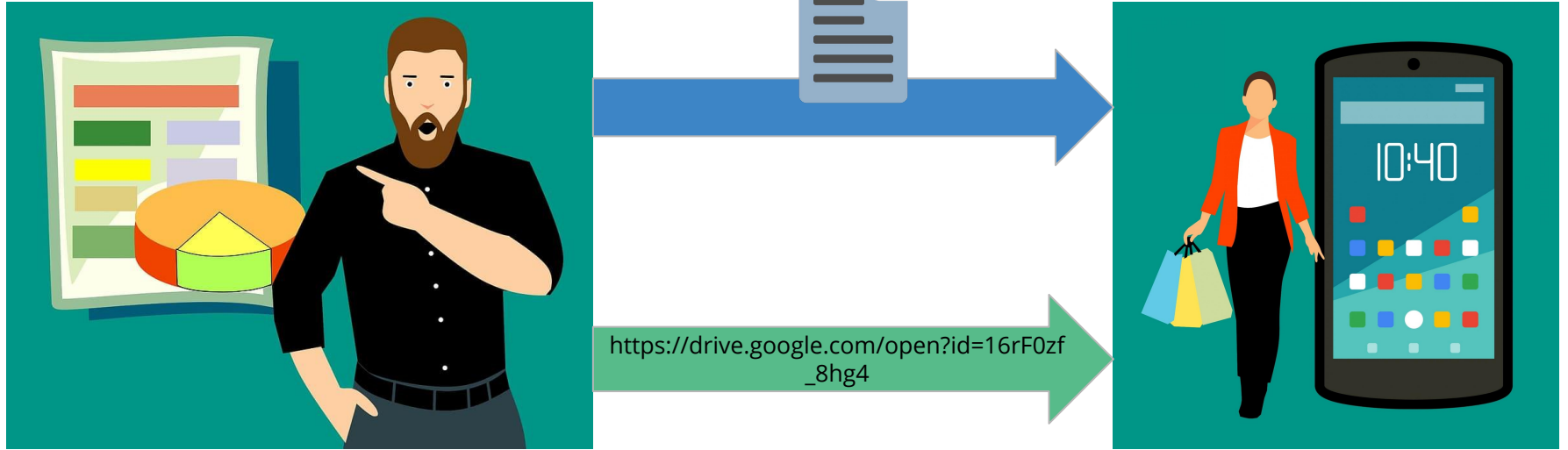
Directories store (the data of) my files

Fact:

Directories hold only my file metadata

(filename, size, location, owner, type, modification date, ...)
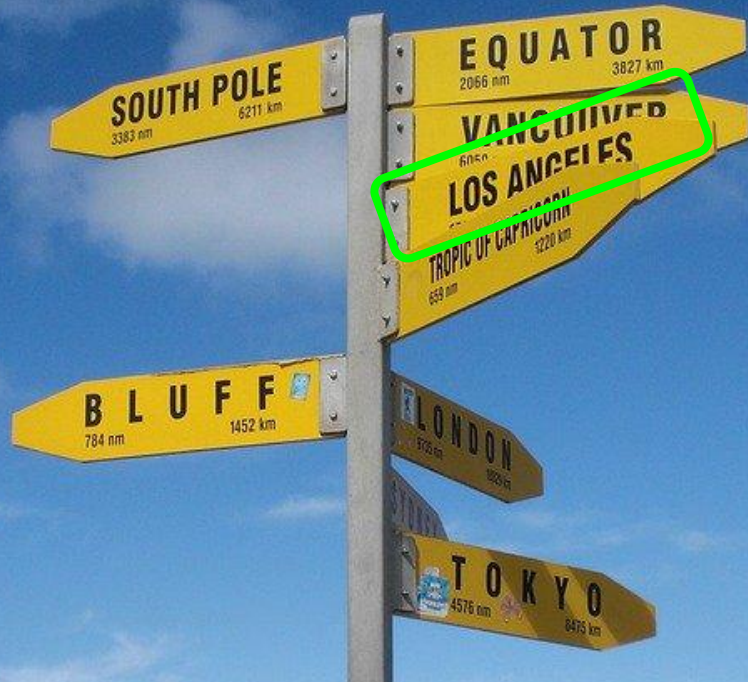
Directory Structure: Tree Structure

directory
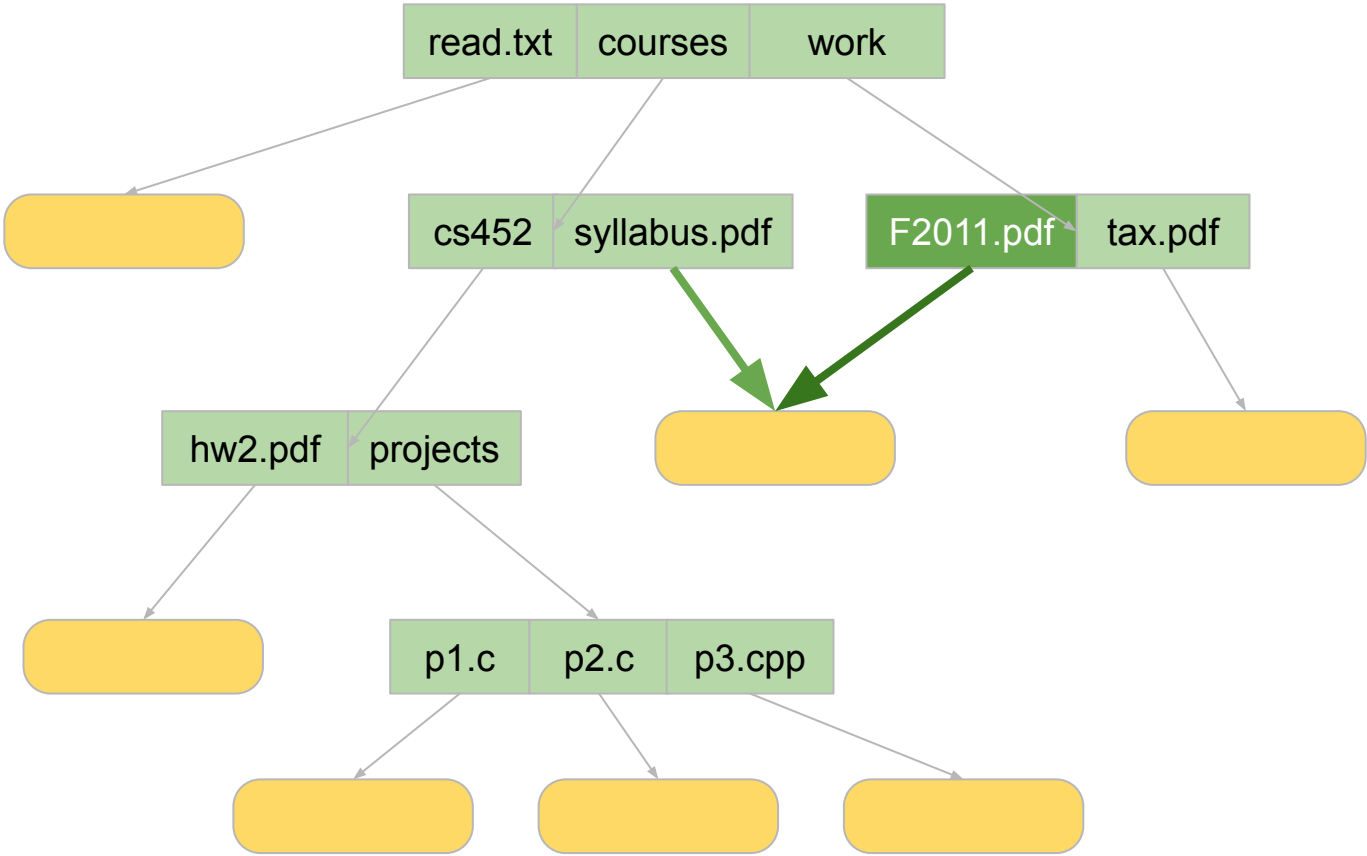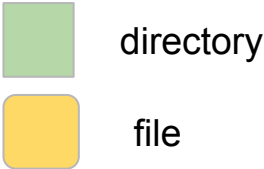
file

read.txt	courses	work

cs452	fafsa.doc

tax.pdf

hw2.pdf	projects

p1.c	p2.c	p3.cpp

File Sharing

https://drive.google.com/open?id=16rF0zf_8hg4

Google Drive

Google Drive

Links in Directory Entry

Two different 'Links" pointing to "Los Angeles"

Directory Structure: File Sharing via Links

directory

file

read.txt | courses | work

cs452 | syllabus.pdf

F2011.pdf | tax.pdf

hw2.pdf | projects

p1.c | p2.c | p3.cpp

Directory Operations

- CRUD operations
  - Create a new directory entry (after creating a new file)
  - Read: List the contents of a directory
  - Update: Change file metadata (Linux chown, chmod, chgrp)
  - Delete an existing directory entry (after deleting a file)
- **Linking a file: a mechanism to share a file**
  - **Hard links** are created in one step
    - Create a new directory entry by copying **metadata** of the source file S
      multiple directory boards in a mall
      two pointers to one file

  - **Symbolic links** are created in two steps
    - Create a new file T whose content is the path to the source file S
    - Create a new directory entry for T

      a "pointer" to a "pointer" to a file

Disk Structure
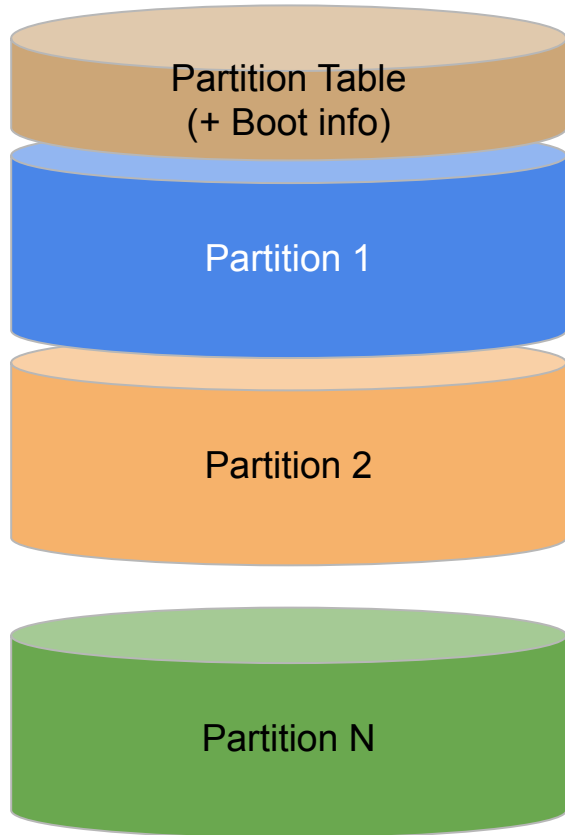
Partition Types
- MBR (Master Boot Record)
  - Older technique
  - Max 4 partitions
- GPT (GUID Partition Table)
  - Newer specification (2010)
  - Max 128 partitions

| Partition Table (+ Boot info) |
| Partition 1 |
| Partition 2 |
| Partition N |

Windows Partition formatted for VFAT

Linux Partition formatted for Ext4

Logical Volumes vs. Physical Drives

One **Logical** Volume
1024 TB = 1 Petabyte

(508 + 310 + 206) TB

Disk #1
508 TB

Disk #3
310 TB

Disk #2
206 TB
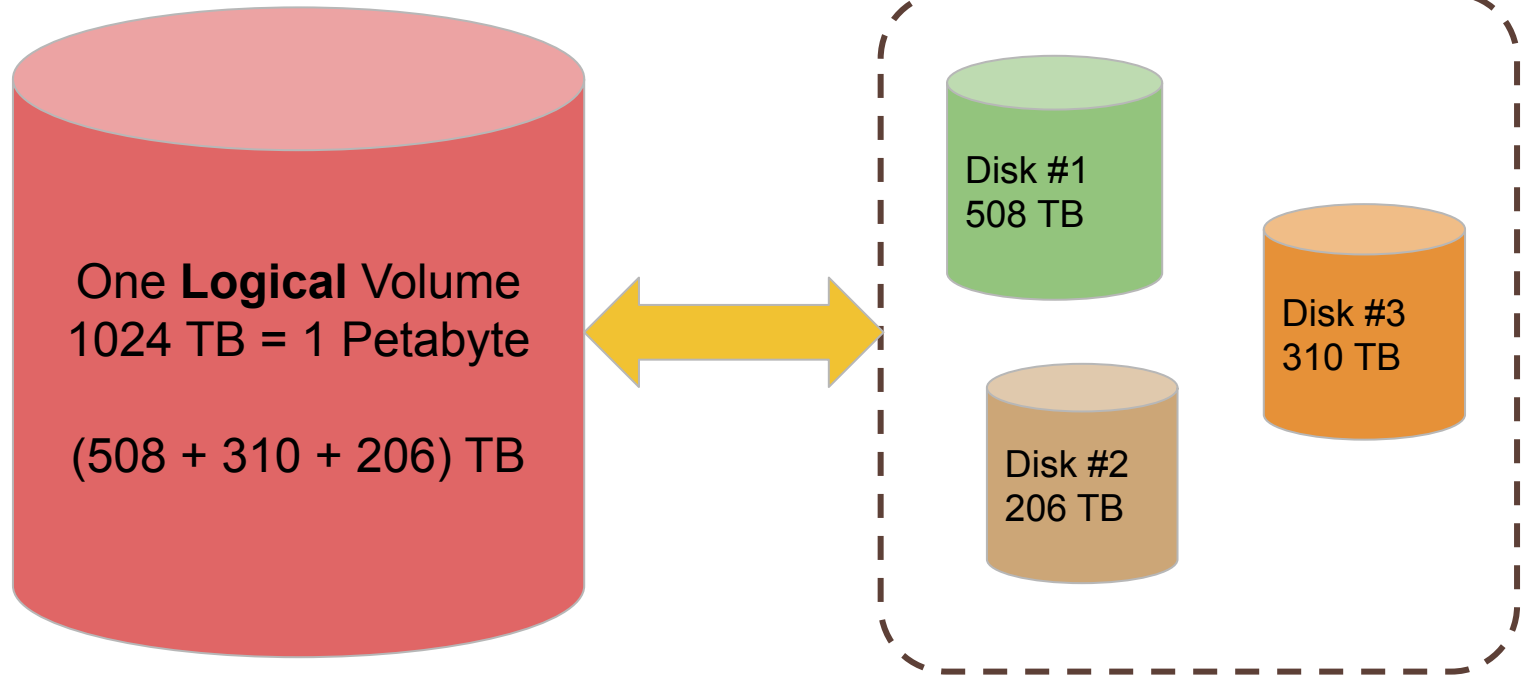
"Mounting" a Filesystem

- *Historical background*
  - **Off-line** magnetic tape drives required operators to **mount** them to make them **on-line**
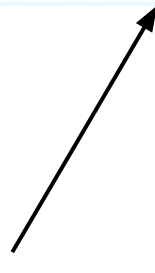- EOS examples (`df`)

```
[2] ~$ df | grep volume
35.39.165.172:/volume1/homes      9851112192 5370644608 4480467584   55% /home
35.39.165.172:/volume1/multimedia 9851112192 5370644608 4480467584   55% /lab/groups/multimedia
```

Total disk space

Used

Available