Explore your computer

#### Goals

- Learn the different types of files
- Browse the file system
- Create/delete/move folders and files from the command line

## File types

- A possible classification:
  - executable files: they contain programs
  - data files: they contain different types of information: text, image, audio, video.
- Another taxonomy:
  - text files: data is stored using electronic text (characters). They are human-readable.
  - binary files: data is stored in binary format. They are computer-readable but not human-readable.



Punched card decks by Arnold Reinhold

#### **Formats**

- The file extension can be used as a hint to the format
- The format tells us the specific software we need to read it and/or manipulate it (e.g. data files) or run it (i.e. executable files)

## Character encoding

- Any "text" is created from characters.
- Characters that are needed for a specific purpose are grouped into a character set.
- To refer to a character in an unambiguous way, each character is associated to a code point (a number).
- Characters are stored in the computers as one of more bytes.
- A character encoding is a set of mappings between the bytes and the character set.

## Which character encoding?

UTF-8

Your machine might be using a different encoding by default (eg. Windows-1252 or CP-1252)

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#### The terminal

- Also known as console, command-line interface
- It processes commands to a computer program in the form of lines of text
- To open the terminal:
  - Linux: press CTRL + ALT + T
  - Windows: press Windows + X; select Windows PowerShell or open the start menu and type "Powershell"
  - Mac: in the Finder, open /Applications/Utilities (or use Launchpad and type "Terminal")

#### Command

It is a request the user sends to the OS for it to execute it. Elements:

- 1. Name of a executable program (e.g. **curl**)
- A set of options whose name is preceded by one or two hyphens (e.g. -f or --help)
- 3. A set of arguments to define the file(s) or the data that must be used

## Command example

```
curl
https://digital.library.upenn.edu/women/sultana/dream/dream.
html
```

File/directory naming conventions



# Do not use whitespaces (and avoid special characters as well)

#### **Paths**

A path specifies a unique location in a file system. It points to a location by following the directory tree hierarchy, thus it looks like a slash-separated list of directory names followed by either a directory name or a file name. Eg.:

- macOS: /Users/username/Desktop
- Linux: /home/username/Desktop
- Windows: C:\Users\username\Desktop

## Types of path

- relative: path in relation to the current location
- **absolute**: path in relation to the disk root

## Path representation (conventions)

- root directory
  - O UNIX: /
  - Windows: \ (relative to current working directory root) or drive\_letter:\
- directory separator
  - O UNIX: /
  - Windows: \
- Current directory: .
- Parent directory: . .

## To change folder

- UNIX:
  - cd directory\_name
- Windows:
  - Set-Location directory\_name
  - cd directory\_name
  - o chdir directory\_name

## Navigation example



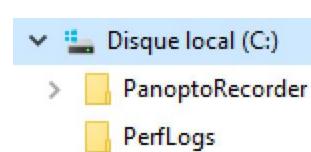
We are in "dossier3"

- "my" absolute path: /arborescence/dossier1/dossier3
- to move to *dossier5* (relative path): cd dossier5
- to move to dossier1 (relative path): cd ...
- to move to dossier4 (relative path): cd ../dossier4
- to move to root: cd /

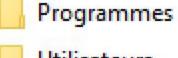
#### **Directories**

When we open the terminal, we are at the root of our personal folder

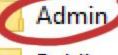
	/bin	User Binaries
	/sbin	System Binaries
	/etc	Configuration Files
	/dev	Device Files
	/proc	Process Information
	/var	Variable Files
	/tmp	Temporary Files
7		
	/usr	User Programs
	/home	Home Directories
	/boot	Boot Loader Files
	/lib	System Libraries
	/opt	Optional add-on Apps
	/mnt	Mount Directory
	/media	Removable Devices
	/srv	Service Data

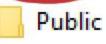


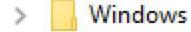


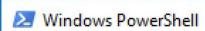






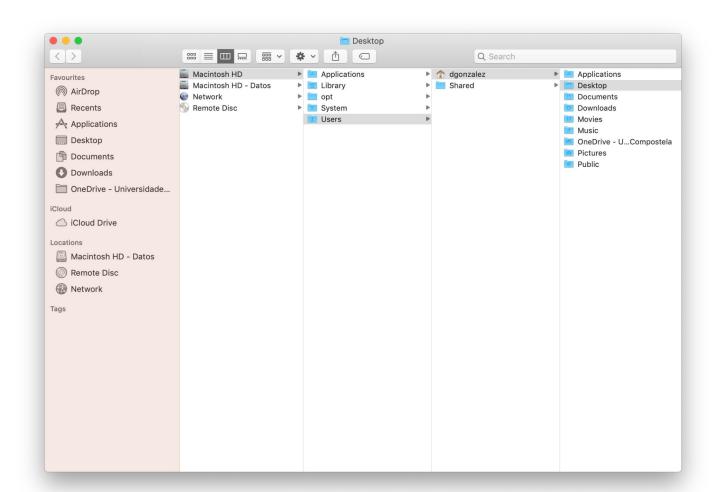






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PS C:\Users\Admin> \_



## List the contents of a directory

- UNIX: 1s
- Windows: **ls** or **dir**

### Exercise

- 1. Open the terminal
- 2. List all files and directories
- 3. Go to your desktop

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## Create a directory

- UNIX:
  - mkdir directory\_name
- Windows:
  - mkdir directory\_name
  - New-Item directory\_name

## Copy a file

cp file\_name\_source file\_name\_output

Move a file

mv file\_name\_source file\_name\_output

Delete a file

rm file\_name

## Delete a directory

rm -r directory\_name

#### Exercise

#### Using the command line:

- 1. Open the terminal and go to your desktop or documents folder
- 2. Create the folder "my\_data"
- 3. Create a new empty file with the command touch <code>name\_of\_my\_new\_file</code>
- 4. Delete this newly created file

#### To learn more

- OS: All
  - Milligan, Ian & Baker, James: "Introduction to the Bash Command Line".
     The Programming Historian.
  - W3C: "Character encodings for beginners".
  - Princeton University Library: "File naming and structure". Research Data Management at Princeton.
- OS: Windows
  - Dawson, Ted: "Introduction to the Windows Command Line with PowerShell". The Programming Historian.