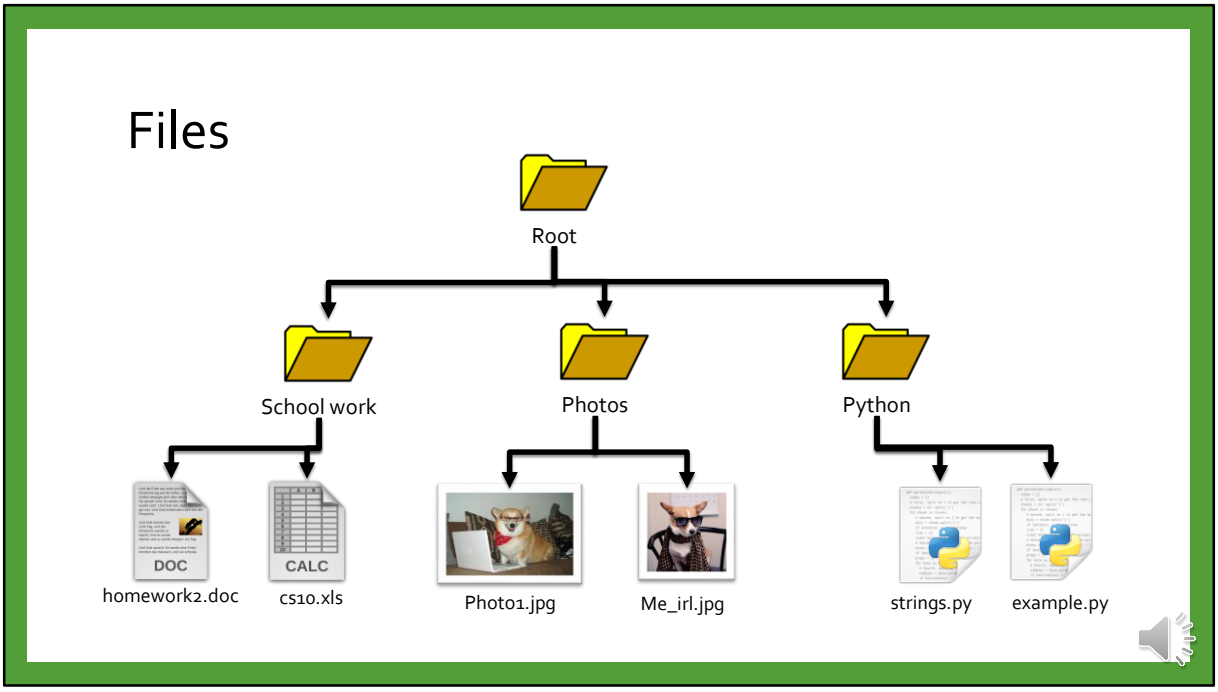
FILESYSTEMS

An Introduction to Computer Science

Let's learn about Filesystems

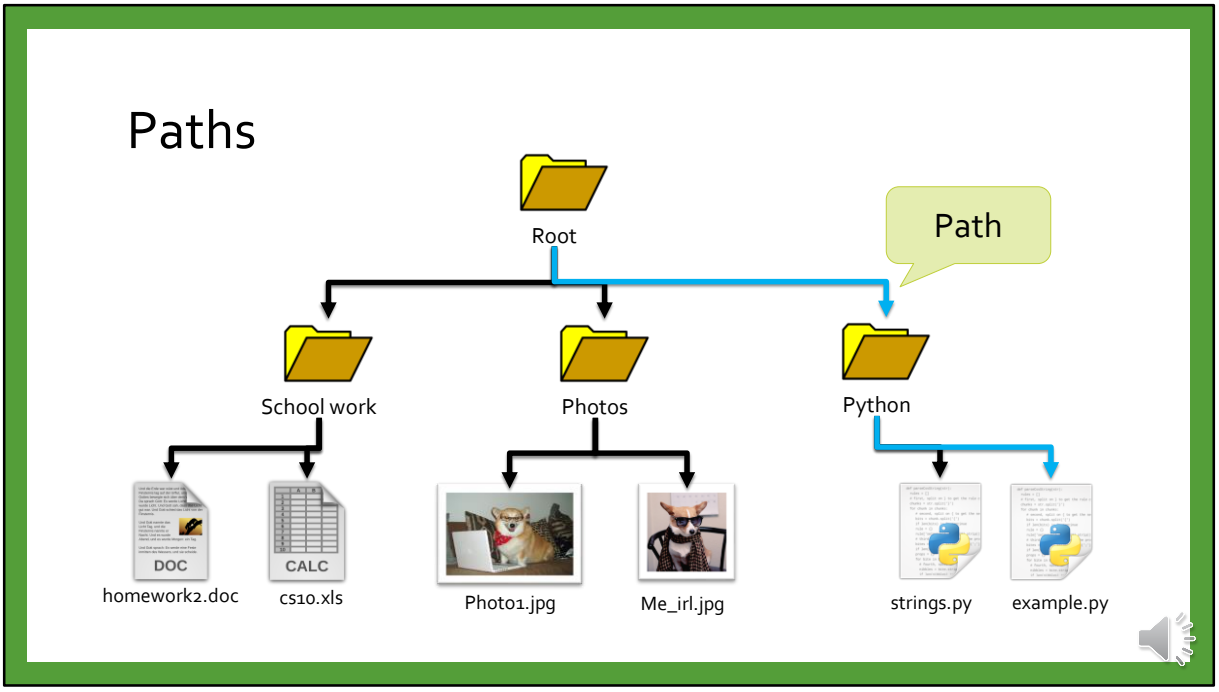


Your computer is equipped with a filesystem that lets you save and load files.
A file is simply a sequence of data, not unlike a string.
You create files all the time - text documents, pictures, music, python files, and so on.
These files are organized by your File System.

Directories

"Directories" are "Folders"

Directories, also known as folders, are a way to group files and other directories together. Because we can put directories inside of directories, we end up with a hierarchical system.



Think of files as a house.
Directories are neighborhoods, cities, states, and successively bigger ways to group houses.
Each file has a unique address within your file system called its "path".
We use these paths to navigate files and directories, just like we would houses and neighborhoods.

Absolute Path

```
"/root/python/example.py"
```

Or maybe...

```
"/home/acbart/python/example.py"
```

Or maybe...

```
"C:/Users/acbart/python/example.py"
```

The full address for a file is known as its "absolute path".
The exact format of the path will depend on your platform, but typically they are a series of folder names separated by slashes.
In Python, it is typically best to use forward slashes, since these tend to work regardless of the platform.

The Working Directory

```
>>> !pwd
'/c/Users/acbart/Documents'
```

Exclamation Mark only necessary in Thonny!

Most programming environments, like Thonny, have a command line that let you interact with the file system.
These command lines have a "Current Working Directory".
It's essentially "where you are" at the moment.
In Thonny, you can check your current directory using the "pwd" command with an exclamation mark in front of it.
PWD stands for Print Working Directory.
Note that this only only works in the command line, it's not actually a Python command.

Relative Paths

```
>>> !ls
```

Formats vary by operating system!

```
Date        Time        Type  Size     Name
09/17/2017  09:41 PM    <DIR>          .
09/17/2017  09:41 PM    <DIR>          ..
09/12/2017  03:11 PM    <DIR>          photos
09/14/2017  05:34 PM    <DIR>          music
09/11/2017  02:45 PM    <DIR>          python
09/02/2016  06:08 PM             6,228 homework5.pdf
09/02/2016  06:08 PM             9,650 example.py
08/08/2015  07:43 PM           340,489 historyOfDogs.png
08/08/2015  07:44 PM           422,316 taxReturns.docx
```

If there are folders in your current working directory, you can reference them without writing the Absolute path.
Instead, the folder's path is simply it's name.
You can see a list of the folders in your current directory by using the "ls" command.
LS stands for "list", as in "list the files".

Moving between directories

```
>>> !cd /c/Users/acbart/projects
```

Absolute Path

```
>>> !cd pythonmisc/
```

Relative Path

```
>>> !cd ../
```

Move up a level

To move from one directory to another, we use the "cd" command.
You can move to an absolute path or a relative path.
You can also move up a folder level by using a pair of periods.

Commands

Command	Description
`!pwd`	Print current working directory
`!ls`	List files in current working directory
`!ls <path>`	List files in the directory of the path
`!cd <path>`	Change the current working directory

It can be tricky to remember these commands, but knowing how to use them will serve you well when you start working on larger projects.