Working directories, relative paths and absolute paths.

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Introduction

Aims

The aim of this section is to show you what is meant by a working directory and a path.

Learning outcomes

The successful student will be able to:

- find and change their current working directory
- list files in their current working directory
- understand what is meant by working directory, absolute and relative paths

Introduction

If you are very unfamiliar with these concepts you might want to start up RStudio and follow along. In which case…

🎬 this is an instruction to do something

What is a working directory?

What is a directory?

Directory is the old word for what many now call a folder 🗀 .

It is commonly used in scientific computing. Commands that act on directories in most programming languages and environments reflect this.

For example, all of these mean "tell me my working directory":

- `getwd()` **get w**orking **d**irectory in R
- `pwd` **p**rint **w**orking **d**irectory in Unix systems
- `os.getcwd()` **get c**urrent **w**orking **d**irectory in Python

What is a working directory?

The working directory is the default location a program is using. It is where the program will read and write files by default. You have only one working directory at a time.

The terms 'working directory', 'current working directory' and 'current directory' all mean the same thing.

🎬 Find your current working directory with:

```
getwd()

## [1] "C:/Users/er13/Desktop/BIO00058M-Data-science-2020/s
```

What is a working directory?

If you do not like the working directory that R automatically chooses on starting up you can change it using the Tools menu

🎬 Tools | Global Options. Then, under the General tab, edit the box labelled "Default working directory (when not in a project):".

If you want to change your working directory as you are working then use `setwd("address/to/folder/")` . For example:

```
setwd("C:/Users/er13/Desktop/gist-lm/")
```

What is a working directory?

Your working directory *can* be the same as the location of the script file you are using ....

... but does not have to be.

When using RStudio projects the working directory is the project directory and you will rarely, if ever, use `setwd()`.

What is a path?

What is a path?

A path gives the address - or location - of a filesystem object, such as a file or directory.

Paths appear in the address bar of your browser or file explorer.

We need to know a file path whenever we want to read, write or refer to a file using code rather than interactively pointing and clicking to navigate.

A path can be **absolute** or **relative**

Absolute paths

An Absolute path is given from the "root directory" of the object.

The root directory of a file system is the first or top directory in the hierarchy.

For example, `C:\` or `M:\` on windows or `/` on a Mac which is displayed as Macintosh HD in Finder.

Absolute paths

The absolute path for a file, `pigeon.txt` could be:

- windows: `C:/Users/er13/Desktop/pigeons/data-raw/pigeon.txt` [1]

- Mac/unix systems: `/Users/er13/Desktop/pigeons/data-raw/pigeon.txt`

- web: `http://www-users.york.ac.uk/~er13/58M_BDS_2019/data/pigeon.txt`

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1. this appears as `C:\Users\er13\Desktop\pigeons\data-raw\pigeon.txt` in Windows Explorer because Microsoft DOS didn't have directories in 1981 when it was released. At the time it used the `/` character for 'switches' (instead of the existing convention `-` 😵) so when it did start using directories it couldn't use `/`

Relative paths

A relative path gives the location of a filesystem object *relative* to the working directory, (i.e., that returned by `getwd()`).

When `pigeon.txt` is in the working directory the relative path is just the file name: `pigeon.txt`

If there is a folder in the working directory called `data-raw` and `pigeon.txt` is in there then the relative path is `data-raw/pigeon.txt`

Paths: moving up the hierarchy

`../` allows you to look in the directory above the working directory

When `pigeon.txt` is in folder above the working the relative path is `../pigeon.txt`

And if it is in a folder called `data-raw` which is in the directory above the working directory then the relative path is `../data-raw/pigeon.txt`

What's in my directory?

You can list the contents of a directory using the `dir()` command

- `dir()` list the contents of the working directory
- `dir("..")` list the contents of the directory above the working directory
- `dir(../..)` list the contents of the directory two directories above the working directory
- `dir("data-raw")` list the contents of a folder call data-raw which is in the working directory.

Relative or absolute

Most of the time you should use relative paths because that makes your work portable.

You only need to use absolute paths when you are referring to filesystem outside the one you are using.

58M students will learn about the `here` package (Müller, 2017) to construct file paths relative to your RStudio project.

Example

Example

🎬 Download and unzip pigeons.zip which has the following structure:

```
-- pigeons
    |__data-processed
        |__pigeon_long.txt
    |__data-raw
        |__pigeon.txt
    |__figures
        |__fig1.tiff
    |__scripts
        |__analysis.R
        |__import_reshape.R
    |__pigeons.Rproj
```

Example

🎬 Open the two script files check you can alter the paths for file import and export commands if you set your working directory to

- `pigeons`
- `scripts`
- the directory above `pigeons` on your set up
- the directory two directories above `pigeons` on your set up

🎂 Congratulations! Keep practising! 🎉

More if you need it: What do we mean by paths?

References

Aden-Buie, G. (2020). *xaringanExtra: Extras And Extensions for Xaringan Slides*. R package version 0.2.3.9000. URL: https://github.com/gadenbuie/xaringanExtra.

Müller, K. (2017). *here: A Simpler Way to Find Your Files*. R package version 0.1. URL: https://CRAN.R-project.org/package=here.

Xie, Y. (2019). *xaringan: Presentation Ninja*. R package version 0.12. URL: https://CRAN.R-project.org/package=xaringan.

Slides made with with xaringan (Xie, 2019) and xaringanExtra (Aden-Buie, 2020)

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