

Before the workshop

Anastasios Chanalaris

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1 INSTALLING R

1.1 Mac Users

1.1.1 To Install R

Open an internet browser and go to www.r-project.org. Click the “download R” link in the middle of the page under “Getting Started.” Select a CRAN location (a mirror site) and click the corresponding link. Click on the “Download R for (Mac) OS X” link at the top of the page. Click on the file containing the latest version of R under “Files.” Save the .pkg file, double-click it to open, and follow the installation instructions. Now that R is installed, you need to download and install RStudio.

1.1.2 To Install RStudio

Go to www.rstudio.com and click on the “Download RStudio” button. Click on “Download RStudio Desktop.” Click on the version recommended for your system, or the latest Mac version, save the .dmg file on your computer, double-click it to open, and then drag and drop it to your applications folder.

1.2 Windows Users

1.2.1 To Install R:

Open an internet browser and go to www.r-project.org. Click the “download R” link in the middle of the page under “Getting Started.” Select a CRAN location (a mirror site) and click the corresponding link. Click on the “Download R for Windows” link at the top of the page. Click on the “install R for the first time” link at the top of the page. Click “Download R for Windows”

and save the executable file somewhere on your computer. Run the .exe file and follow the installation instructions.

Now that R is installed, you need to download and install RStudio.

1.2.2 To Install RStudio

Go to www.rstudio.com and click on the “Download RStudio” button. Click on “Download RStudio Desktop.” Click on the version recommended for your system, or the latest Windows version, and save the executable file. Run the .exe file and follow the installation instructions.

2 Installing conda

The fastest way to obtain conda is to install Miniconda, a mini version of Anaconda that includes only conda and its dependencies. If you prefer to have conda plus over 720 open source packages, install Anaconda.

We recommend you install Anaconda for the local user, which does not require administrator permissions and is the most robust type of installation. You can also install Anaconda system wide, which does require administrator permissions.

For information on using our graphical installers for Windows or macOS, see the instructions for installing Anaconda.

2.1 System requirements

32- or 64-bit computer.

For Miniconda---400 MB disk space.

For Anaconda---Minimum 3 GB disk space to download and install.

Windows, macOS or Linux.

Python 2.7, 3.4, 3.5 or 3.6.

pycosat.

PyYaml.

Requests.

You do not need administrative or root permissions to install Anaconda if you select a user-writable install location.

2.2 Regular installation

Go to: <https://conda.io/projects/conda/en/latest/user-guide/install/download.html> Read the information on deciding on Anaconda or miniconda. Decide on what base to install and follow the instructions for your decided base. We recommend installing the latest Python version (>3, 3.7 preferably)

You do not need to uninstall other Python installations or packages in order to use conda. Even if you already have a system Python, another Python installation from a source such as the macOS Homebrew package manager and globally installed packages from pip such as pandas and NumPy, you do not need to uninstall, remove, or change any of them before using conda.

Install Anaconda or Miniconda normally, and let the installer add the conda installation of Python to your PATH environment variable. There is no need to set the PYTHONPATH environment variable.

To see if the conda installation of Python is in your PATH variable:

On macOS and Linux, open the terminal and run-- `--*echo $PATH*`.

On Windows, open an Anaconda Prompt and run---`*echo %PATH%*`.

To see which Python installation is currently set as the default:

On macOS and Linux, open the terminal and run---`*which python*`.

On Windows, open an Anaconda Prompt and run---`*where python*`.

To see which packages are installed in your current conda environment and their version numbers, in your terminal window or an Anaconda Prompt, run *conda list*. This also tests your installation. On a successful installation a list of packages will appear.

3 Creating an R project

RStudio projects make it straightforward to divide your work into multiple contexts, each with their own working directory, workspace, history, and source documents.

3.1 Creating Projects

RStudio projects are associated with R working directories. You can create an RStudio project:

In a brand new directory

In an existing directory where you already have R code and data

By cloning a version control (Git or Subversion) repository

To create a new project use the Create Project command (available on the Projects menu and on the global toolbar).

When a new project is created RStudio:

1. Creates a project file (with an .Rproj extension) within the project directory. This file contains various project options (discussed below) and can also be used as a shortcut for opening the project directly from the filesystem.
2. Creates a hidden directory (named .Rproj.user) where project-specific temporary files (e.g. auto-saved source documents, window-state, etc.) are stored. This directory is also automatically added to .Rbuildignore, .gitignore, etc. if required.
3. Loads the project into RStudio and display its name in the Projects toolbar (which is located on the far right side of the main toolbar)

3.2 Working with Projects

3.2.1 Opening Projects

There are several ways to open a project:

1. Using the Open Project command (available from both the Projects menu and the Projects toolbar) to b
2. Selecting a project from the list of most recently opened projects (also available from both the Proj
3. Double-clicking on the project file within the system shell (e.g. Windows Explorer, OSX Finder, etc.)

When a project is opened within RStudio the following actions are taken:

- A new R session (process) is started
- The .Rprofile file in the project's main directory (if any) is sourced by R
- The .RData file in the project's main directory is loaded (if project options indicate that it should
- The .Rhistory file in the project's main directory is loaded into the RStudio History pane (and used
- The current working directory is set to the project directory.

- Previously edited source documents are restored into editor tabs
- Other RStudio settings (e.g. active tabs, splitter positions, etc.) are restored to where they were t

3.2.2 Quitting a Project

When you are within a project and choose to either Quit, close the project, or open another project the following actions are taken:

- .RData and/or .Rhistory are written to the project directory (if current options indicate they should
- The list of open source documents is saved (so it can be restored next time the project is opened)
- Other RStudio settings (as described above) are saved.
- The R session is terminated.

4 COMPLETE EXERCISES 1 AND 2