

Introduction to R Environment

Objectives: To learn and Use R programming for statistical analysis of the data:

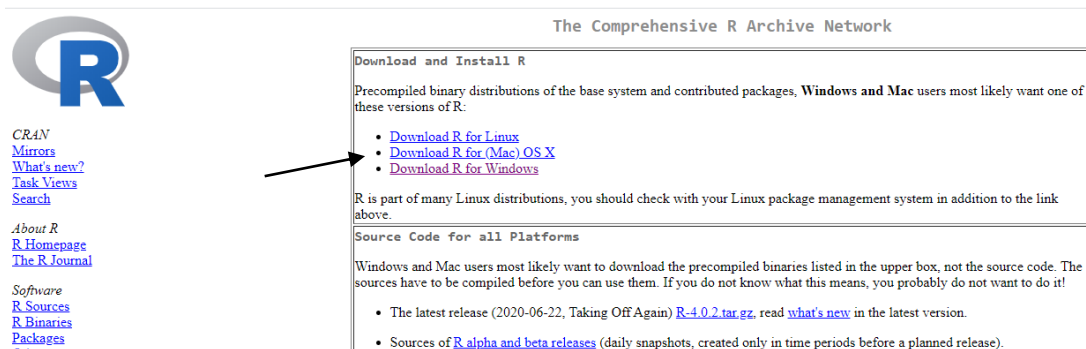
- Basic Computations in R
- Computing descriptive statistics of the data
- Summarize samples and tables
- Correlation and Correlogram
- Linear Regression Models
- Clustering and Classification

How to Install R / R Studio

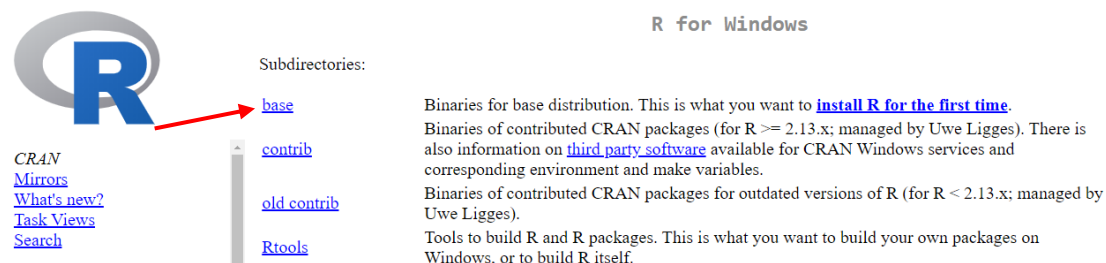
R is available at:



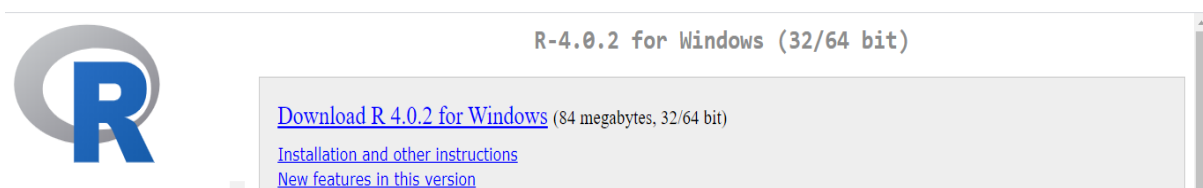
- Click on **Download R for Windows /Linux/Mac** depending on the available operating system



- Click on *base*



- Click on **Download R 4.0.2 for windows**



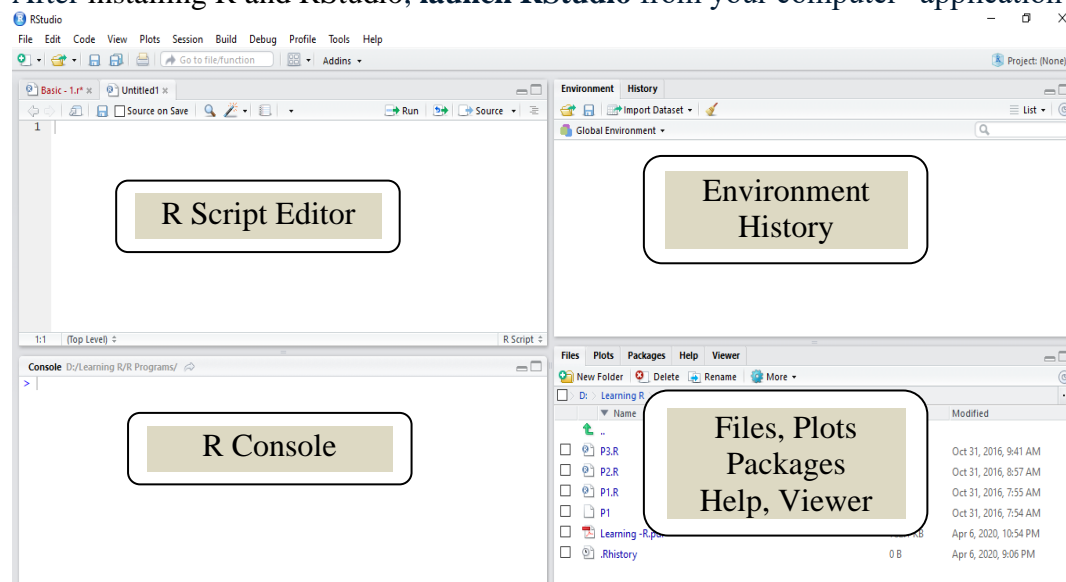
R Studio is available at:



Download RStudio Desktop (Open Source License)

- Under “Installers for Supported Platforms” select the appropriate installer for your operating system:
- When the file finishes downloading, double-click to install. You should be able to click “Next” to all dialogs to finish the installation.

After installing R and RStudio, **launch RStudio** from your computer “application folders”.



**Open Interface of RStudio*

1. **R Console:** This area shows the output of code you run. Also, you can directly write codes in console.
2. **R Script:** As the name suggest, here you get space to write codes. Code editor allowing you to create and open a file containing R script. The R script is where you keep a record of your work. R script can be created as follow: **File** → **New** → **R Script**.
To run those codes, simply select the line(s) of code and press **Ctrl + Enter**.
3. **R environment:** This space displays the set of external elements added. To check if data has been loaded properly in R, always look at this area.
4. **Graphical Output:** This space display the graphs created during exploratory data analysis.
 - a. Files tab: show files in your working directory
 - b. Plots tab: show the history of plots you created. From this tab, you can export a plot to a PDF or an image files
 - c. Packages tab: show external R packages available on your system. If checked, the package is loaded in R.

***Key Points**

- # Use **(Ctrl + L)** to clear the R Console
- # '#' is used for comments
- # Use double backward slash "\\" or single forward slash "/" in commands
- # Commands in R **are case sensitive** so its better to use either lower case always in file and folder names
- # R is insensitive to white spaces
- # Loading of corresponding libraries is a pre-requisite to use the functions/arguments provided in that particular library. These libraries are useful, although there are many. Before starting your work you need to load the libraries first
 - # library(ggplot2)
 - # library(corrplot)
 - # library(psych)
 - # library(data.table)
 - # library(curl)
 - # library(agricolae)
- # libraries can be installed both online (**using the Tools-Install Packages-From CRAN**) and Offline using the downloaded zipped folders of the packages (using the Tools-Install Packages-From .zip/.tar/.gz files).

***Set your working directory**

Recall that, the working directory is a folder where R reads and saves files.

You can change/set your working directory as follow:

1. Create a sub-directory named "Learning R" in your "Documents" folder/D/C drives
2. From RStudio, use the menu to change your working directory under **Session > Set Working Directory > Choose Directory**.
3. Choose the directory you've just created in step 1

It's also possible to use the R function **setwd()**, which stands for "set working directory".

```
setwd("c:/Documents/my/working/directory")
```