



Lab 01 - Getting Started with R

Learning outcomes

This week's lab focuses on

- installing *R* and *RStudio* on home computing devices
- learning the basic R Syntax

Software Environment - Get Started

Local Installation

Use Posit Cloud

Use UWA Lab Machine

Install R and RStudio on your Own Machine

If you have a laptop to work with, feel free to ask for help on installation.

Step 1. Install R

Download the R installation file suitable to your operating system at <https://cloud.r-project.org/>. Install the downloaded file on your device. Note that, as the installation process will create files in the system directory, you will need to have the superuser privilege to do the installation (on Linux, you will need to be a *sudoer* so that you can act as a superuser).

Step 2. Install RStudio

RStudio is a graphical user interface (a.k.a **Integrated Development Environment** (or **IDE**)) for working with R. Even though it is not needed for R code to run, it makes the coding experience a bliss.

Download RStudio from <https://www.rstudio.com/products/rstudio/download/>


Same as before, you will need to be a superuser for this installation step.

Step 3. Start RStudio

To start RStudio on Windows and MacOS, find out where it is installed and simply double-click on the RStudio icon once you have found it. You can also add a short-cut to RStudio on your Desktop so that you don't need to repeat this search process in the future.

On the Linux platform, the installation process above should automatically put R and RStudio in the standard system directory which should be in your PATH environment variable already. To start RStudio, you should be able to simply open a terminal window and type: `rstudio` (Note that the name contains only lowercase letters)

Basic R Syntax

 Read the subpage of this lab: [R Coding Conventions](#) first before getting into the `swirl` tutorials.

We will learn R in the R environment using the package `swirl`.

Step 1. Install `swirl`

Firstly, check whether you already have `swirl` installed by typing the following in R or RStudio:

```
> ip <- installed.packages()
> is.element("swirl", ip[,1])
```

In each statement above, the `>` character at the beginning of the line is the *prompt* symbol, which, depending on your environment setting for R, may be different on your computer. If the second line returns `TRUE`, it means the package `swirl` is already installed and you can skip to Step 2. Otherwise, type:

```
> install.packages("swirl")
```

Step 2. Start `swirl`

First, we will need to load `swirl` using the library loading function `library()`. Then we will call the function `swirl()` to start the interactive learning environment. Type the following, pressing the *Enter* keypad after each line:

```
> library("swirl")
> swirl()
```

Step 3. Choose Lessons

Follow the interactive shell to enter the required information such as your name, etc., then select the course as indicated by the red circles in the screenshot below. Complete lessons 1-7. You can skip lesson 5 for the time being. Get assistance from the lab facilitator if you run into any problems, or simply ask for confirmation or clarification of understanding.

```
| Also, when you see 'ANSWER:', the R prompt (>), or when you are asked to select from a list, that means it's your turn to enter a response, then press
| Enter to continue.

Select 1, 2, or 3 and press Enter

1: Continue.
2: Proceed.
3: Let's get going!

Selection: 1

| You can exit swirl and return to the R prompt (>) at any time by pressing the Esc key. If you are already at the prompt, type bye() to exit and save your
| progress. When you exit properly, you'll see a short message letting you know you've done so.

| When you are at the R prompt (>):
| -- Typing skip() allows you to skip the current question.
| -- Typing play() lets you experiment with R on your own; swirl will ignore what you do...
| -- UNTIL you type nxt() which will regain swirl's attention.
| -- Typing bye() causes swirl to exit. Your progress will be saved.
| -- Typing main() returns you to swirl's main menu.
| -- Typing info() displays these options again.

| Let's get started!

...

| To begin, you must install a course. I can install a course for you from the internet, or I can send you to a web page
| (https://github.com/swirldev/swirl_courses) which will provide course options and directions for installing courses yourself. (If you are not connected to
| the internet, type 0 to exit.)

1: R Programming: The basics of programming in R
2: Regression Models: The basics of regression modeling in R
3: Statistical Inference: The basics of statistical inference in R
4: Exploratory Data Analysis: The basics of exploring data in R
5: Don't install anything for me. I'll do it myself.

Selection: 1
|=====| 100%

| Course installed successfully!

| Please choose a course, or type 0 to exit swirl.

1: R Programming
2: Take me to the swirl course repository!

Selection: 1

| Please choose a lesson, or type 0 to return to course menu.

1: Basic Building Blocks
2: workspace and Files
3: Sequences of Numbers
4: Vectors
5: Missing Values
6: Subsetting Vectors
7: Matrices and Data Frames
8: Logic
9: Functions
10: lapply and sapply
11: vapply and tapply
12: Looking at Data
13: Simulation
14: Dates and Times
15: Base Graphics
```

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