



Getting Started with R

David Keyes // R for the Rest of Us



Installation



Install R

The first thing you need to do is download the R software. Go to the [Comprehensive R Archive Network \(aka “CRAN”\) website](#) and download the software for your operating system (Windows, Mac, or Linux).



Working Directly in R



RStudio

R: Engine



RStudio: Dashboard



Courtesy [Modern Dive](#)



RStudio

If you use RStudio, you'll have a graphical user interface, the ability to see all of your stored information, and much more.



Download RStudio

Download RStudio at the [RStudio website](#). Ignore the various versions listed there. All you need is the latest version of RStudio Desktop.



Tour of RStudio

The screenshot displays the RStudio interface with four main panes:

- Scripts**: Shows an R script with code for installing packages, loading tidyverse and skimr, importing faketucky data, and examining data.
- Environment/History**: Shows the Global Environment tab with the title "Environment/History".
- Files/Plots/Packages/Help**: Shows the Files tab with a file list:

Name	Size	Modified
Icon	0 B	Feb 12, 2019, 7:20 AM
images	15.1 KB	Feb 13, 2019, 9:39 AM
intro-to-r-slides.html	9.5 KB	Feb 12, 2019, 9:39 AM
intro-to-r-slides.Rmd		
libs		
setup.Rmd		Feb 12, 2019, 2:57 PM
style.css	2.3 KB	Feb 12, 2019, 3:07 PM

- Console/Terminal**: Shows the R startup message and a prompt for the user.



Packages



Packages

Packages add functionality that is not present in base R.

They're where much of the power of R is found.

R: A new phone



R Packages: Apps you can download



Courtesy [Modern Dive](#)



Packages We'll Use



tidyverse

The tidyverse is a collection of packages.

We'll use readr to import data.



Packages We'll Use

skimr

[skimr](#) provides easy summary statistics.





Install Packages

The syntax to install packages is as follows.

```
install.packages("tidyverse")
install.packages("skimr")
```

The package name must be in quotes.

Packages should be installed **once per computer** (i.e. once you've installed a package, you don't need to do it again on the same computer).



Load Packages

To load packages, use the following syntax:

```
library(tidyverse)  
library(skimr)
```

Package names don't need to be quoted here (though they can be).

Packages should be loaded **once per session** (i.e. every time you start working in R, you need to load any packages you want to use).



Import Data



Import Data

Let's read data from a CSV file.

```
faketucky <- read_csv("data/faketucky.csv")
```

We now have a data frame/tibble called `faketucky` that we can work with in R.



Where Does our Data Live?

Data we have imported is available in the environment/history pane.

The screenshot shows the RStudio interface with several panes open:

- Scripts**: An R script editor containing code for installing packages, loading tidyverse and skimr, importing faketucky data, and examining data.
- Environment/History**: A large orange-paneled window titled "Environment/History". It lists the "Global Environment" with objects like "Icon", "images", "intro-to-r-slides.html", "intro-to-r-slides.Rmd", "libs", "setup.Rmd", and "style.css".
- Console/Terminal**: Shows the R startup message, license information, and a help message about the 'demo()' function.
- Files/Plots/Packages/Help**: A large orange-paneled window titled "Files/Plots/Packages/Help". It lists the "Global Environment" with the same objects as the Environment pane.



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Examine Our Data



Examine Our Data

There are many ways to look at our data. We'll talk about a few.



faketucky

If you type the name of your data frame (i.e. faketucky), R will output the following:

```
faketucky
```

```
## # A tibble: 57,855 x 9
##   student_id first_high_scho... school_district gender race_ethnicity
##       <dbl> <chr>           <chr>           <chr>    <chr>
## 1       1622 Jackson         Jackson         Male    Multiple/Nati...
## 2       1877 Jackson         Jackson         Male    White
## 3       1941 Jackson         Jackson         Male    White
## 4       3442 Jackson         Jackson         Female  White
## 5       4623 Jackson         Jackson         Male    White
## 6       4913 Jackson         Jackson         Male    White
## 7       5754 Jackson         Jackson         Male    White
## 8       6293 Jackson         Jackson         Female  White
## 9       7010 Jackson         Jackson         Male    White
## 10      8343 Jackson         Jackson         Male    White
## # ... with 57,845 more rows, and 4 more variables: percent_absent <dbl>,
## #   gpa <dbl>, act_reading_score <dbl>, act_math_score <dbl>
```



View

View (note capital V) opens the RStudio viewer (or click on a data frame in the environment pane).

```
View(faketucky)
```



skimr

The `skimr` package provides more detailed information about our data frame. It is also broken up by the type of variable.

```
skim(faketucky)
```

```
## # Skim summary statistics
## # n obs: 57855
## # n variables: 9
##
## # — Variable type:character
## #          variable missing complete      n   min   max empty n_unique
## # first_high_school_attended      0     57855 57855     4    14     0       393
## #           gender        14     57841 57855     4     6     0       2
## #           race_ethnicity     794    57061 57855     5    24     0       5
## #           school_district      0     57855 57855     4    13     0      171
##
## # — Variable type:numeric
## #          variable missing complete      n     mean        sd   p0     p25
## # act_math_score    14101     43754 57855    18.99      4.65     1     16
```