



Installing R and RStudio

CSI 500

Spring 2018

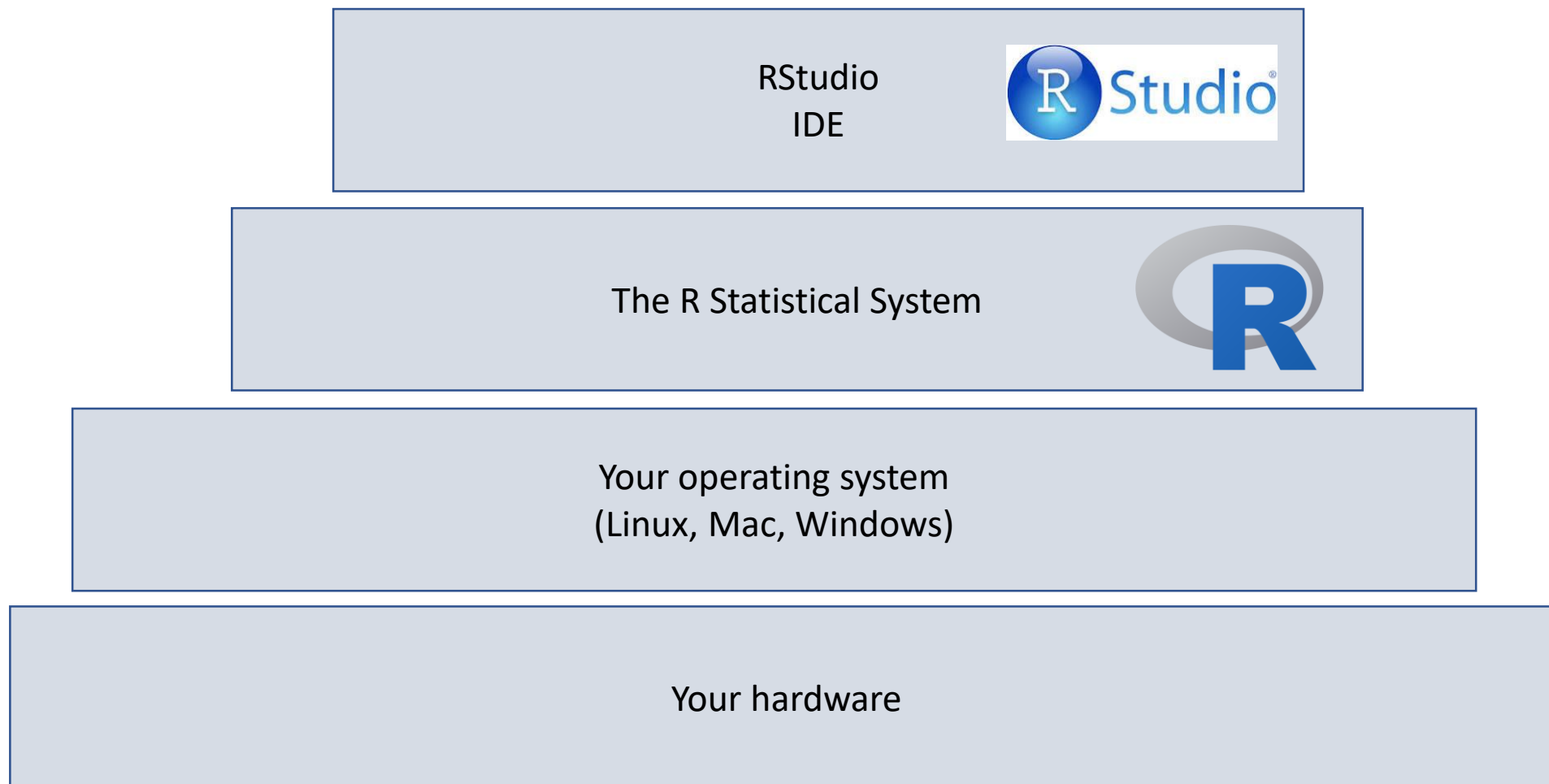
Course material derived from:

An Introduction to R. Notes on R: A Programming Environment for Data Analysis and Graphics

Version 3.4.3 (2017-11-30)

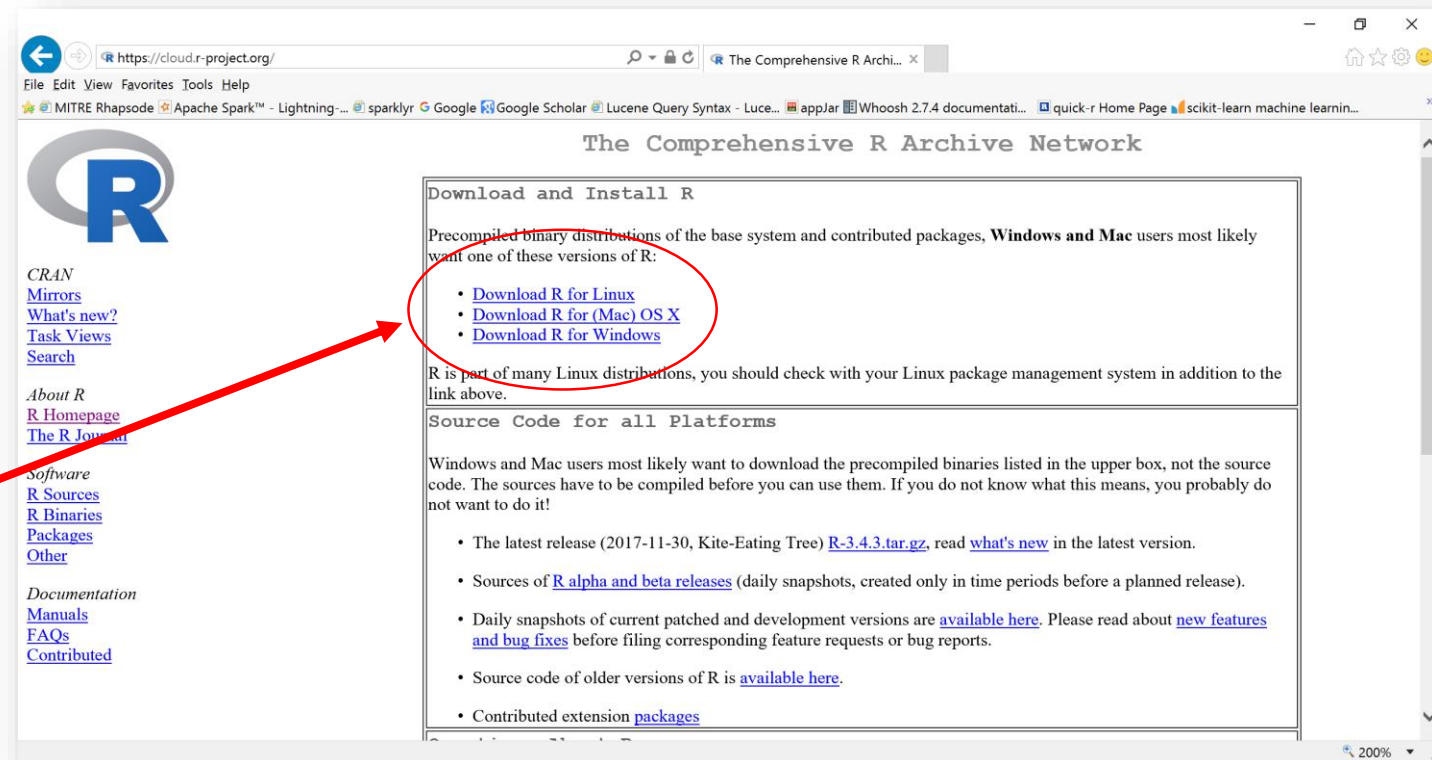
<https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf>

The R/Rstudio Stack



Installing R

- R is available for free download for a variety of platforms
 - Go to the download site at <https://cloud.r-project.org/>
 - Download R for your platform (Linux, Mac, Windows)



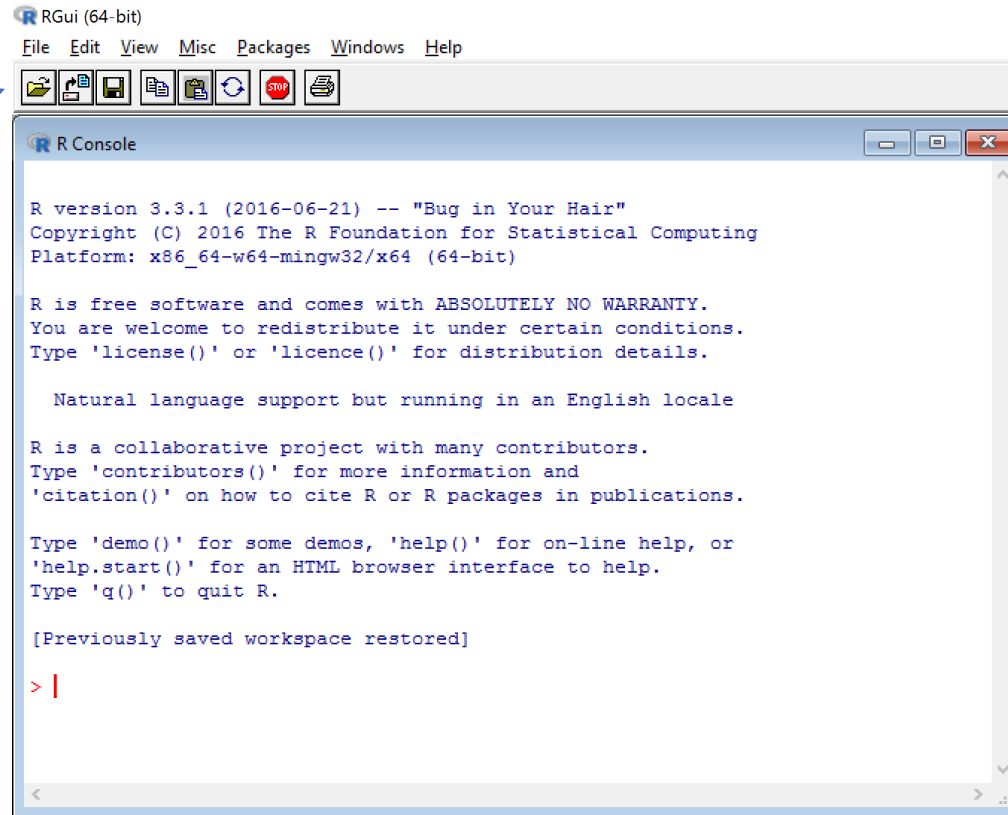
Your R installation

Menu bar

Tool shortcuts

Mandatory
legal blurb

Interactive
session prompt



RGui (64-bit)

File Edit View Misc Packages Windows Help

R Console

```
R version 3.3.1 (2016-06-21) -- "Bug in Your Hair"
Copyright (C) 2016 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

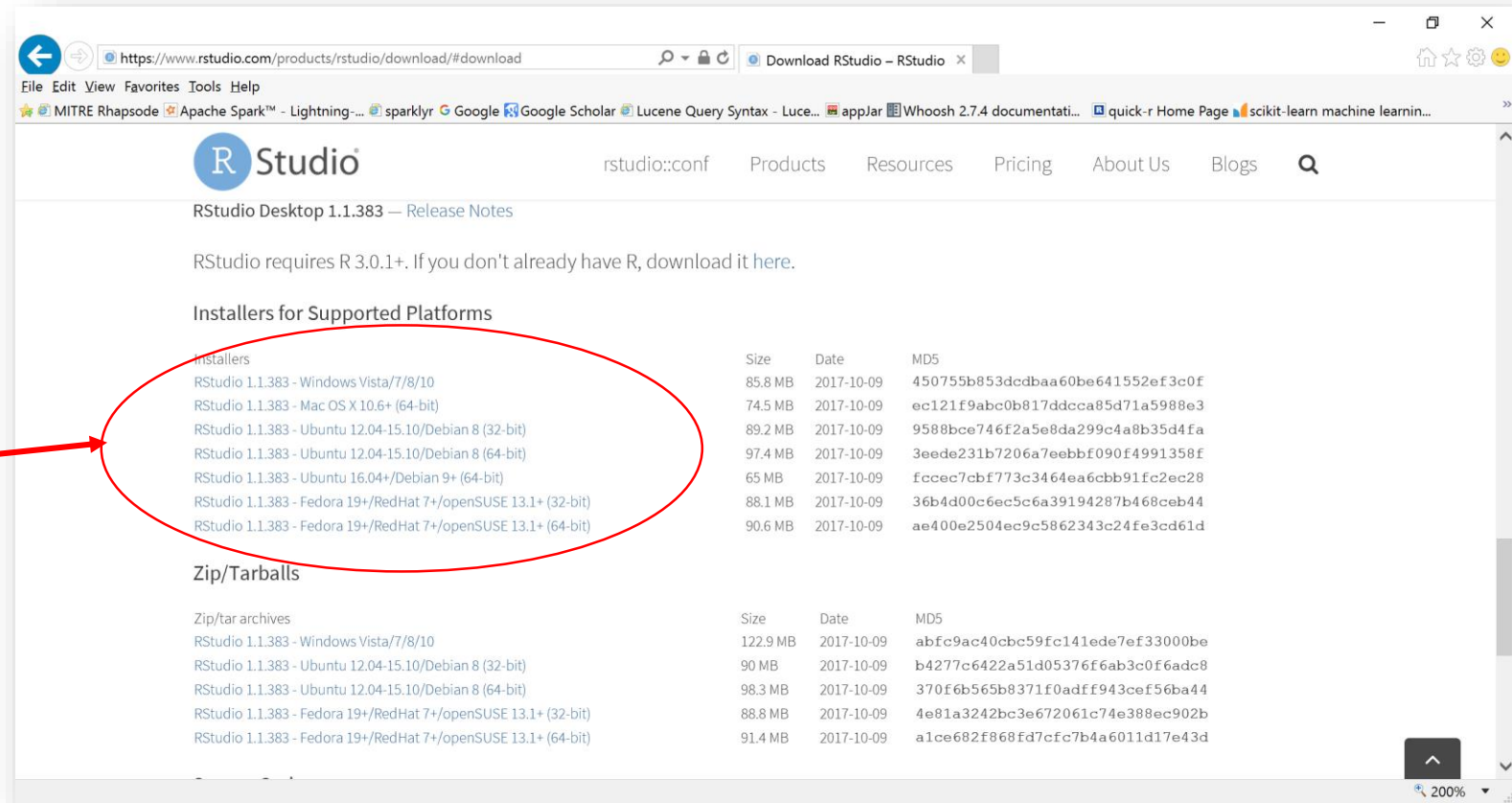
[Previously saved workspace restored]

> |
```

Extra space for graphs

Installing Rstudio Desktop Open Source

- Rstudio Desktop is a commercial product with a free Open Source version
 - Downloads are available at <https://www.rstudio.com/products/rstudio/download/#download>



Your Rstudio Desktop Installation

Menu Bar
and Tools

Editor

Command
Prompt

Objects
in
Workspace

Plots,
Help,
other
tools

The screenshot shows the RStudio desktop environment with the following components and annotations:

- Menu Bar and Tools:** The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below it is a toolbar with icons for running, saving, and other functions.
- Editor:** The central pane shows an R script with the following code:

```
20 # now draw a sigmoid
21 #
22 plot(x, sigmoid(x), ty="l", col="black",
23      xaxt="n", yaxt="n",
24      ylab="", xlab="")
25 }
26
27 #
28 # first plot graphic of area we want to shade
29 #
30 curve(dnorm(x,0,1),
31       xlim=c(-3,3),
32       main='Normal Density',
33       ylab="p(x)",
34       xlab="z")
35
36 #
37 # now use the polygon() function to define a shaded area
38 # example let's shade the normal curve from -3 to -2
39 #
40
```
- Command Prompt:** The console at the bottom shows the execution of the script:

```
> x = 1:20
> y = log(x)
> x
[1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
> y
[1] 0.0000000 0.6931472 1.0986123 1.3862944 1.6094379 1.7917595 1.9459101
[8] 2.0794415 2.1972246 2.3025851 2.3978953 2.4849066 2.5649494 2.6390573
[15] 2.7080502 2.7725887 2.8332133 2.8903718 2.9444390 2.9957323
> plot(x, y, main="Log(x)")
> |
```
- Objects in Workspace:** The Environment pane on the right shows the following objects in the Global Environment:

Object	Class	Value
tmp	int	[1:7] 1 2 3 4 8 9 10
tobs	int	[1:500] 1 2 3 4 5 6 7 8 9 10 ...
ub	int	120
val	List of 5	
w	num	[1:3] 0.7919 1.2764 0.0577
x	int	5000
x	int	[1:20] 1 2 3 4 5 6 7 8 9 10 ...
x0	num	[1:10] 1 2 3 4 5 6 7 8 9 10
x1	num	[1:10] 1 2 3 4 5 6 7 8 9 10
x2	int	[1:10] 1 2 3 4 5 6 7 8 9 10
xseq	num	[1:801] -4 -3.99 -3.98 -3.97 -3.96 -3.95 -3.94 -3.93 -3.92 ...
y	num	[1:20] 0 0.693 1.099 1.386 1.609 ...
- Plots, Help, other tools:** The Plots pane at the bottom right shows a scatter plot titled "Log(x)" with the x-axis labeled "x" and the y-axis labeled "y". The plot shows a positive linear trend on a log scale.

Summary

- R is an open-source mathematical and statistical system widely used in industry, government, and academia
 - Based on the "S-Plus" system developed by AT&T
- Rstudio is an open-source Integrated Development Environment (IDE) for R
 - provides syntax sensitive editor, formatting tools
 - provides command console
 - provides data object management tools
 - provides online help and graphics windows