

Data Science

Transforming Data into Knowledge and Vision

Introduction to R

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Correlation vs causality

- The stock market slump might correlate/predict recession
- The stock market slump might cause recession
 - Only when there is a wealth effect
- It is the best to know the true causality. But it is not necessary in order to predict well.



We still can use Excel

- Install Analysis ToolPak into your Excel Spreadsheet.
- In Excel, click FILE and then click Options → Add-ins → In Manage box, select Excel Add-ins and click Go → In the Add-ins available box, select the Analysis ToolPak and then click OK
- Click DATA on the toolbar, you should see the Data Analysis on the toolbar.

RStudio

Open the script:
Open File
Write a new script:
New File → R Script

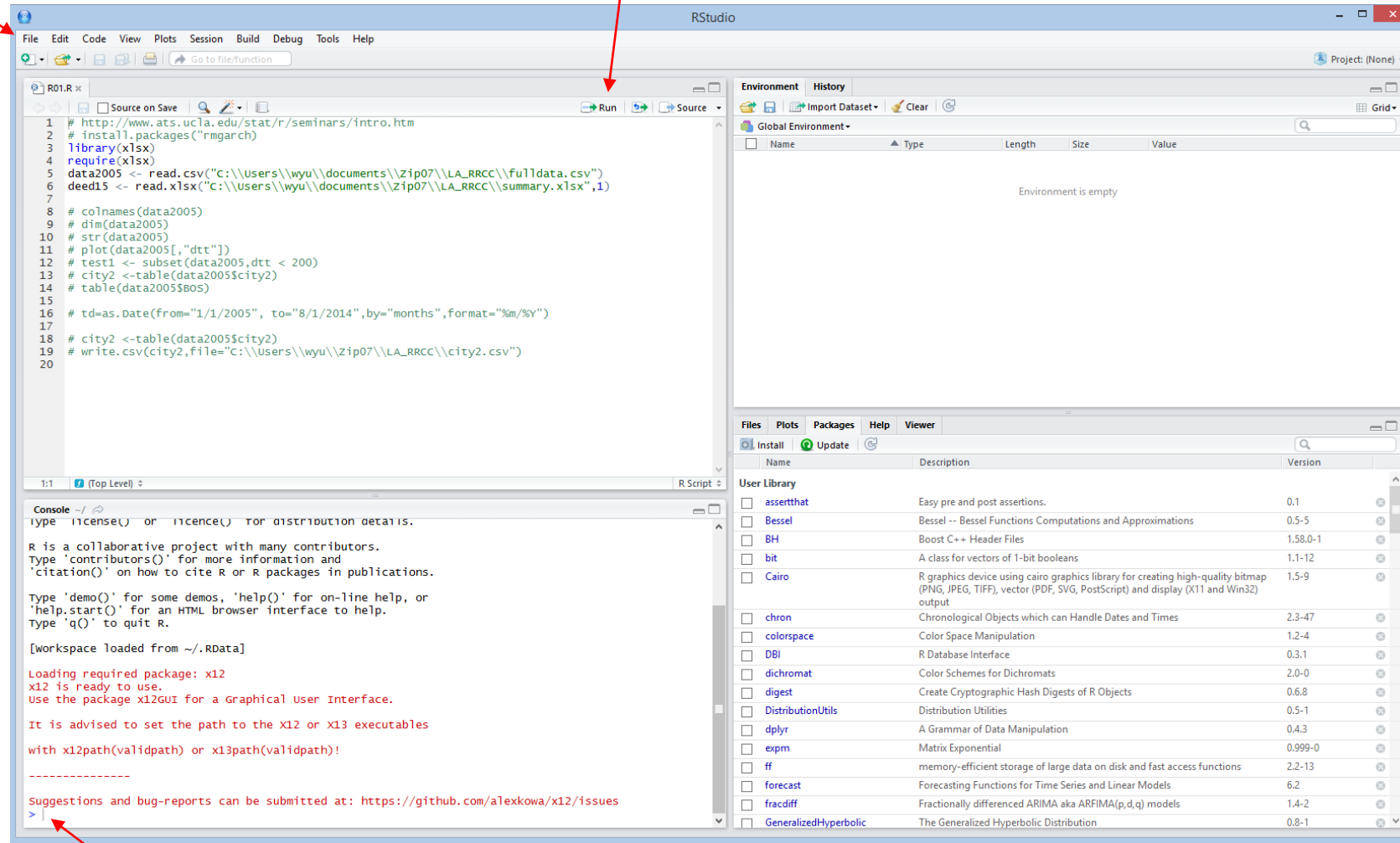
Program/
Script

Highlight and click and run the program!

Environment,
History

Console
/Command

Files,
Plots,
Packages,
Helps,
Viewer

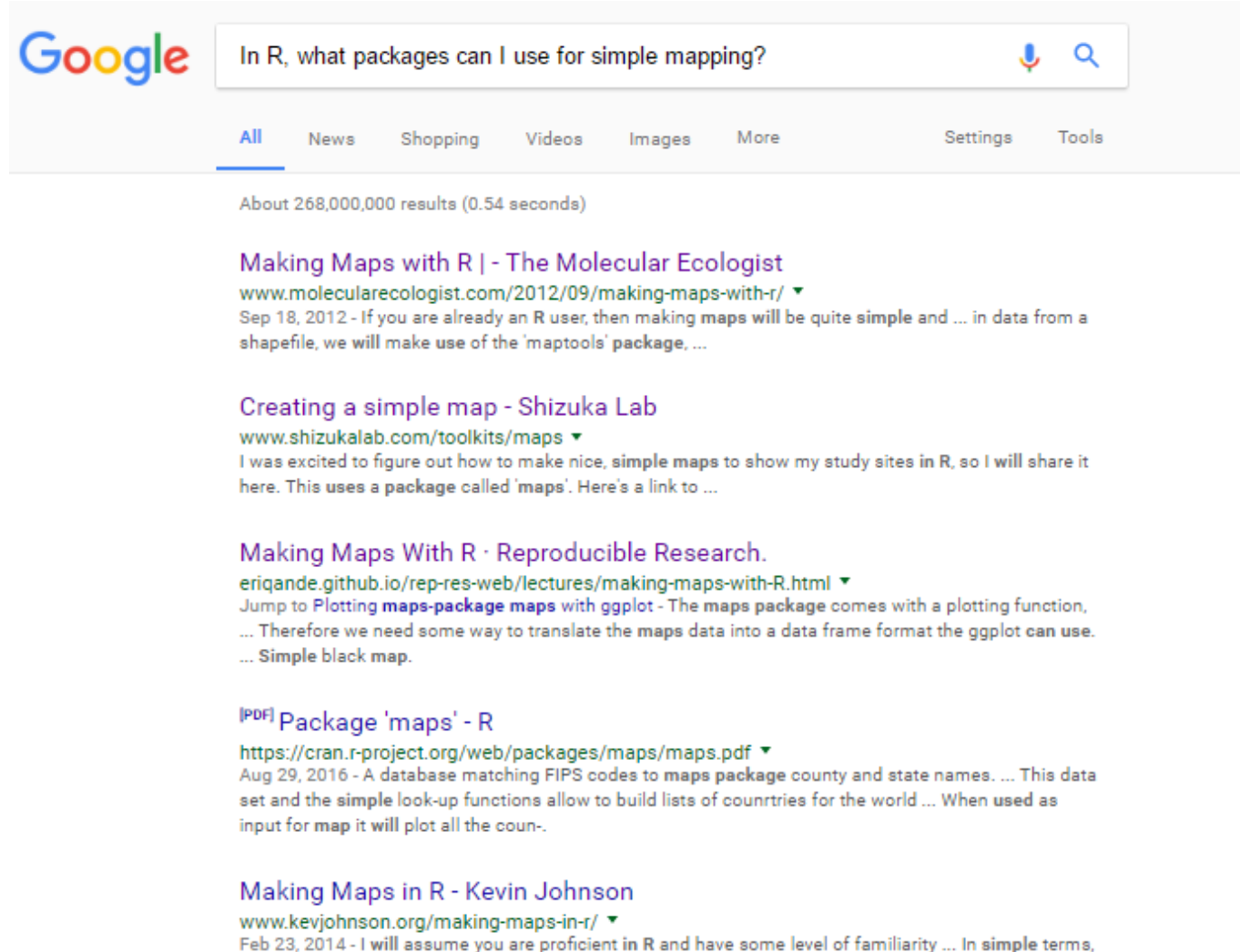


Type your command here

Introduction and data control in R

- Online help
 - `help(mean)`, `?sd`, `?rnorm`
- Basic operation
 - `+`, `-`, `*`, `/`, `^`, `exp()`, `log()`, `log10()`, `sqrt()`
 - Assignment and create new variables, `=`, `<-`
 - Comment operator:
 - everything after `#` until the end of the line is a comment
 - Legal names of objects
 - Mostly used: `"."`
 - No number at the first letter: `"3angeles"` → Wrong!
 - Names are **Case Sensitive**
 - **Data cannot contain comma**: 1600 is Good while 1,600 is Wrong!
 - Construction of vector and matrix
 - `> x=c(1,3,7,16)`
 - `> x`
 - `[1] 1 3 7 16`
 - `> x^2`
 - `[1] 1 9 49 256`
 - `> y = c(3:12)`
 - `> y`
 - `[1] 3 4 5 6 7 8 9 10 11 12`
- Matrix
 - `> y1 = matrix(0,4,5)` # a 4 (rows) by 5 (columns) matrix of zeros
 - `> y2 =matrix(1:10, nrow=2)` # a 2 by 5 matrix
 - `> y3 =matrix(1:10, ncol=5)` # the same as y2
 - `> y4 = y2+y3`
 - `> y5 = t(y2)` # the transpose of y2, which is 5 by 2 matrix
 - `> dim(y1)` # the size /dimensions of y1
 - `> nrow(y1)` # the number of rows of y1
 - `> ncol(y2)` # the number of columns of y2
 - `> length(c(1,4, 0, 7,9))` # the length of a vector
- Matrix element
 - `> y2[2,3]` # the second row and the third column of y2
 - `> y2[2,]` # the second row of y2
 - `> y2[,5]` # the fifth column of y2
 - `> y2[,3:5]`
- Logical value: TRUE(T) and FALSE (F)
 - Logical operators: `>`, `<`, `>=`, `<=`, `!=`
 - `> x1 = 1:5`
 - `> x1 <3`
- Previous command: ↑
- Generate random number with standardized normal distribution
 - `> x2=rnorm(1000)`
 - `> plot(x2)`
 - `> hist(x2)` # a simple histogram plot (distribution)
- **Data frame**: a matrix with names above the columns
- **Time Series**: a data frame with time date embedded
- Packages: you need to install packages into your computer only for the first time
- Library: you need to run library every time you open the script

Google Search: In R, how can I do @#\$^&*?



The screenshot shows a Google search interface with the query "In R, what packages can I use for simple mapping?". The search results are displayed under the "All" tab. The first result is "Making Maps with R | - The Molecular Ecologist" with a link to www.molecular ecologist.com/2012/09/making-maps-with-r/. The second result is "Creating a simple map - Shizuka Lab" with a link to www.shizuka lab.com/toolkits/maps. The third result is "Making Maps With R · Reproducible Research." with a link to eriqande.github.io/rep-res-web/lectures/making-maps-with-R.html. The fourth result is "[PDF] Package 'maps' - R" with a link to <https://cran.r-project.org/web/packages/maps/maps.pdf>. The fifth result is "Making Maps in R - Kevin Johnson" with a link to www.kevjohanson.org/making-maps-in-r/.

Google

In R, what packages can I use for simple mapping?

All News Shopping Videos Images More Settings Tools

About 268,000,000 results (0.54 seconds)

Making Maps with R | - The Molecular Ecologist
www.molecular ecologist.com/2012/09/making-maps-with-r/ ▼
Sep 18, 2012 - If you are already an R user, then making maps will be quite simple and ... in data from a shapefile, we will make use of the 'maptools' package, ...

Creating a simple map - Shizuka Lab
www.shizuka lab.com/toolkits/maps ▼
I was excited to figure out how to make nice, simple maps to show my study sites in R, so I will share it here. This uses a package called 'maps'. Here's a link to ...

Making Maps With R · Reproducible Research.
eriqande.github.io/rep-res-web/lectures/making-maps-with-R.html ▼
Jump to **Plotting maps-package maps with ggplot** - The maps package comes with a plotting function, ... Therefore we need some way to translate the maps data into a data frame format the ggplot can use. ... Simple black map.

[PDF] Package 'maps' - R
<https://cran.r-project.org/web/packages/maps/maps.pdf> ▼
Aug 29, 2016 - A database matching FIPS codes to maps package county and state names. ... This data set and the simple look-up functions allow to build lists of countries for the world ... When used as input for map it will plot all the coun-.

Making Maps in R - Kevin Johnson
www.kevjohanson.org/making-maps-in-r/ ▼
Feb 23, 2014 - I will assume you are proficient in R and have some level of familiarity ... In simple terms,

How to reduce health care spending?

-- A case on Head Start program 2016

Q09: When your child is sick, where do you First go to get help?

	Pre N	(%)	Post N	(%)
<i>call family or friends</i>	85	3.85	32	1.71
<i>doctor or phone-line</i>	880	39.91	126	6.72
<i>look in book</i>	51	2.31	1054	56.18
<i>no response</i>	27	1.22	4	0.21
<i>take to ER</i>	822	37.28	4	0.21
<i>treat at home</i>	340	15.42	656	34.97
Total	2205	100.00	1876	100.00

What To Do When Your Child Gets Sick

Easy to Read • Easy to Use

