



SOCIAL NETWORK ANALYSIS for DATA SCIENTISTS

today's menu: R programming (LECTURE 01B)

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R & RStudio



Why R?

R is a programming language specifically thought for

- data analysis
- statistics

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It is also quite similar to Python in many levels

- if you are a Pythonist you will 'translate' quickly
- you can do in R anything that you usually do in Python

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- you can do in R anything that you usually do in Python

R has already more packages for statistical analysis

This software choice makes your life easier.

How about your programming skills?

www.menti.com code: 7203 0239

Have you installed R and Rstudio?

did you run the `snaverse::rstudiofy()` function?

Did you encounter any problems?

R studio set up

The screenshot displays the RStudio interface with the following components:

- Menu Bar:** File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, Help.
- Toolbar:** Includes icons for opening files, saving, running, and adding packages.
- Source Editor:** Shows a file named 'Untitled1' with a single line of code: `1`.
- Console:** Displays the R version 4.1.1 (2021-08-10) -- "Kick Things" and copyright information. It also shows the R license and a list of contributors.
- Environment:** Shows the 'Global Environment' with the message 'Environment is empty'.
- Packages:** A table listing installed and available packages.

Name	Description	Version
System Library		
<input type="checkbox"/> abind	Combine Multidimensional Arrays	1.4-5
<input type="checkbox"/> afex	Analysis of Factorial Experiments	1.0-1
<input type="checkbox"/> animation	A Gallery of Animations in Statistics and Utilities to Create Animations	2.6
<input type="checkbox"/> arm	Data Analysis Using Regression and Multilevel/Hierarchical Models	1.11-2
<input type="checkbox"/> askpass	Safe Password Entry for R, Git, and SSH	1.1
<input type="checkbox"/> assertthat	Easy Pre and Post Assertions	0.2.1
<input type="checkbox"/> backports	Reimplementations of Functions Introduced Since R-3.0.0	1.2.1
<input checked="" type="checkbox"/> base	The R Base Package	4.1.1
<input type="checkbox"/> base64	Base64 Encoder and Decoder	2.0
<input type="checkbox"/> base64enc	Tools for base64 encoding	0.1-3
<input type="checkbox"/> BayesFactor	Computation of Bayes Factors for Common Designs	0.9.12-4.2
<input type="checkbox"/> beeswarm	The Bee Swarm Plot, an Alternative to Stripchart	0.4.0
<input type="checkbox"/> BH	Boost C++ Header Files	1.75.0-0

R studio set up

The screenshot shows the RStudio interface. The 'Addins' menu is circled in red, and a red arrow points from the text 'select pane layout' to the 'select pane layout' button in the top toolbar. The console shows the R version 4.1.1 (2021-08-10) and the R Foundation for Statistical Computing copyright notice. The Environment pane shows the Global Environment with an empty environment. The Packages pane shows the System Library with a list of installed packages.

select pane layout

Console

```
R version 4.1.1 (2021-08-10) -- "Kick Things"
Copyright (C) 2021 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.

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.

> |
```

Environment

Global Environment

Environment is empty

Packages

Name	Description	Version
System Library		
<input type="checkbox"/> abind	Combine Multidimensional Arrays	1.4-5
<input type="checkbox"/> afex	Analysis of Factorial Experiments	1.0-1
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R studio set up

The screenshot shows the RStudio interface with the 'Pane Layout' dialog box open. The dialog box allows users to choose the layout of the panels in RStudio by selecting from the controls in each panel. The 'General' tab is selected, showing options for 'Source', 'Console', 'Environment, History, Connections', 'Files, Plots, Packages, Help, View', 'Packages', 'R Markdown', 'Sweave', 'Spelling', 'Git/SVN', 'Publishing', 'Terminal', 'Accessibility', and 'Python'.

The 'Source' pane shows the R script editor with the following text:

```
1  
R is free software  
You are welcome  
Type 'license()' to  
R is a collaborative  
Type 'contributor'  
'citation()' on  
Type 'demo()' for  
'help.start()' for  
Type 'q()' to quit  
> |
```

The 'Console' pane shows the R version and platform information:

```
R version 4.1.1 (2021-08-10) -- "Kick Things"  
Copyright (C) 2021 The R Foundation for Statistical Computing  
Platform: x86_64-w64-mingw32/x64 (64-bit)
```

The 'Environment' pane shows the 'Global Environment' with the message 'Environment is empty'.

The 'Files' pane shows the 'System Library' with a list of installed packages:

Name	Version
abind	1.4-5
afex	1.0-1
animation	2.6
arm	1.11-2
askpass	1.1
assertthat	0.2.1
backports	1.2.1
base	4.1.1
base64	2.0
base64enc	0.1-3
BayesFactor	0.9.12-4.2
beeswarm	0.4.0
BH	1.75.0-0

Have you installed the snaverse?

`snaverse::packagefy()`

`snaverse::snaversify()`

Have you installed GERGM?

If it did not work in the regular installation, try:

```
remotes::install_github("matthewjdenny/GERGM",  
dependencies = TRUE, force = TRUE)
```

If it doesn't work, emails us at SNA4DS@jads.nl

(especially mac users)

snaverse suite

snaverse - The sna package to rule them all ;-)

Written by Roger and Claudia for the SNA4DS class

Attempting to make this class more enjoyable :)

composed of 3 packages

sna4tutti

It contains 9 interactive tutorials

It makes easier learning SNA4DS since

- you study the theory
- immediately get to practice it

snafun

Doing analysis of dyadic data can be quite challenging

We introduced a set of function that will make your life much easier

without *snafun* you would have to navigate at least three packages everyday

- *igraph*
- *sna*
- *network*
- ...

SNA4DSData

It contains the Data tha we will use for...

- Tutorials
- Demonstration
- Examples
- Houseplay
- Class play

... during the semester

You can also use it to practice for the exam

Any questions about the snaverse?



Opening Tutorials

```
sna4tutti::open_sna4tutti_tutorials()
```

similar to the bootcamp ones

Any Problems/Questions?

Solving Possible problems you can encounter

The tutorial does not open

- 1) Close R studio
- 2) Restart R studio
- 3) Try again

Still not working?

- 4) Clear the cache

Still not working?

- 5) Contact us

Solving Possible problems you can encounter

Tutorials have a system to automatically report errors

In case there is an error, you will see it in two places

- where the error takes place in the tutorial flow
- at the end of the tutorial

If you see this, copy and paste the error code and email it to us

Bug reporting

First complete version of the suite

Still, this package is work in progress

You might find some bugs as code or text typos

If you do, please report them to us so we can fix them

SNA4DS@jads.nl

Forbidden Items

- attaching Libraries

```
library(igraph)
```

- using the suite of packages tidyverse

```
library(dplyr)
```



DO NOT DO THAT!

JUST DO IT

prefix packages

`igraph::degree(net)` OR `stats::lm(Ovar ~ Pred)`

do data analysis and manipulation in R base

`var$col1` OR `Var[,1]`

etc...

If you attach libraries and/or use tidyverse we will mark you down

Tutorial 01

Intro to programming in R

It has been written with two main purposes

- Giving you an overview of the programming skills you need in this class
- Getting you started with them

It will take you between 1 and 3 hours to complete the tutorial

It depends on your programming level and your R level

It's not difficult!

Please do it carefully. -- No LLMs cannot code everything for you!

Topics in the tutorial (I)

- Checking installation
- Operators, Variables and Conditions
- Make your code readable
- R Objects
- Looking for help
- Missing Data
- Data Structures
- Reading files into R

Topics in the tutorial (2)

- Inspecting Data
- Data Manipulation
- Packages in R
- Functions
- Loops
- The `apply` family
- basics R graphics

Tutorial 01 is a companion

Refer to it everytime you have to code something in R

There should be everything you need

No need to remember things if you know where to find them!

BUT DO FIND THEM!

For next week:

- Tutorial 1
- Tutorial 2
- Homeplay data manipulation in R
- Homeplay descriptives

You can do it! :)

Speed Disclaimer

We start FAST -- keep up with the speed!



See you next week!



