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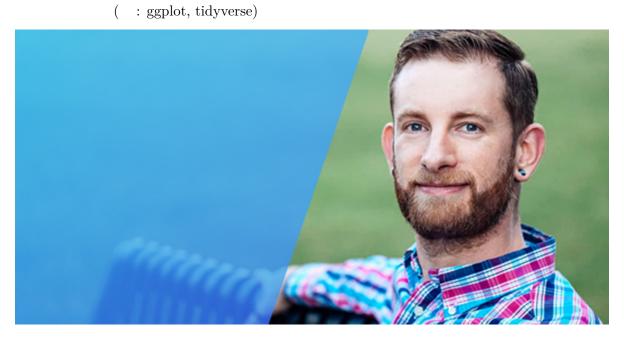


### 1 1 Introduction

 $\begin{array}{ccc} & & & & \\ & & & \\ & & & \\ & & & \\ \end{array}$  tidyverse R .

 ${f R}$ 

: (Robert Gentleman) (Ross Ihaka)



1 ( 0 )

,

- $\bullet \ \ install.packages (`` \ \ ")$
- library( )

#### 1.1



# **Front End**

- Markup and web languages such as HTML, CSS and Javascript
- Asynchronous requests and Ajax
- Specialized web editing software
- Image editing
- Accessibility
- Cross-browser issues
- Search engine optimisation



## **Back End**

- Programming and scripting such as Python, Ruby and/or Perl
- Server architecture
- · Database administration
- Scalability
- Security
- Data transformation
- Backup

Back end tidyverse , .  $8 \qquad \quad . \ \, (1\ 2\ ,$   $16\ )$ 

### 2 2

1. R , (1 )

https://dplyr.tidyverse.org/articles/dplyr.html

2. dplyr (2)

https://m-clark.github.io/data-processing-and-visualization/intro.html