
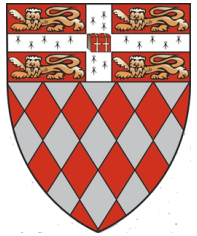

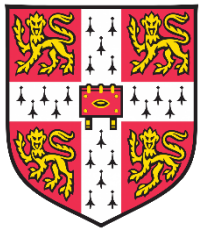

# Introduction to R

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Previous experience with R?

Start here:

github.com/alexeymorgunov/Rcourse

# What is R?

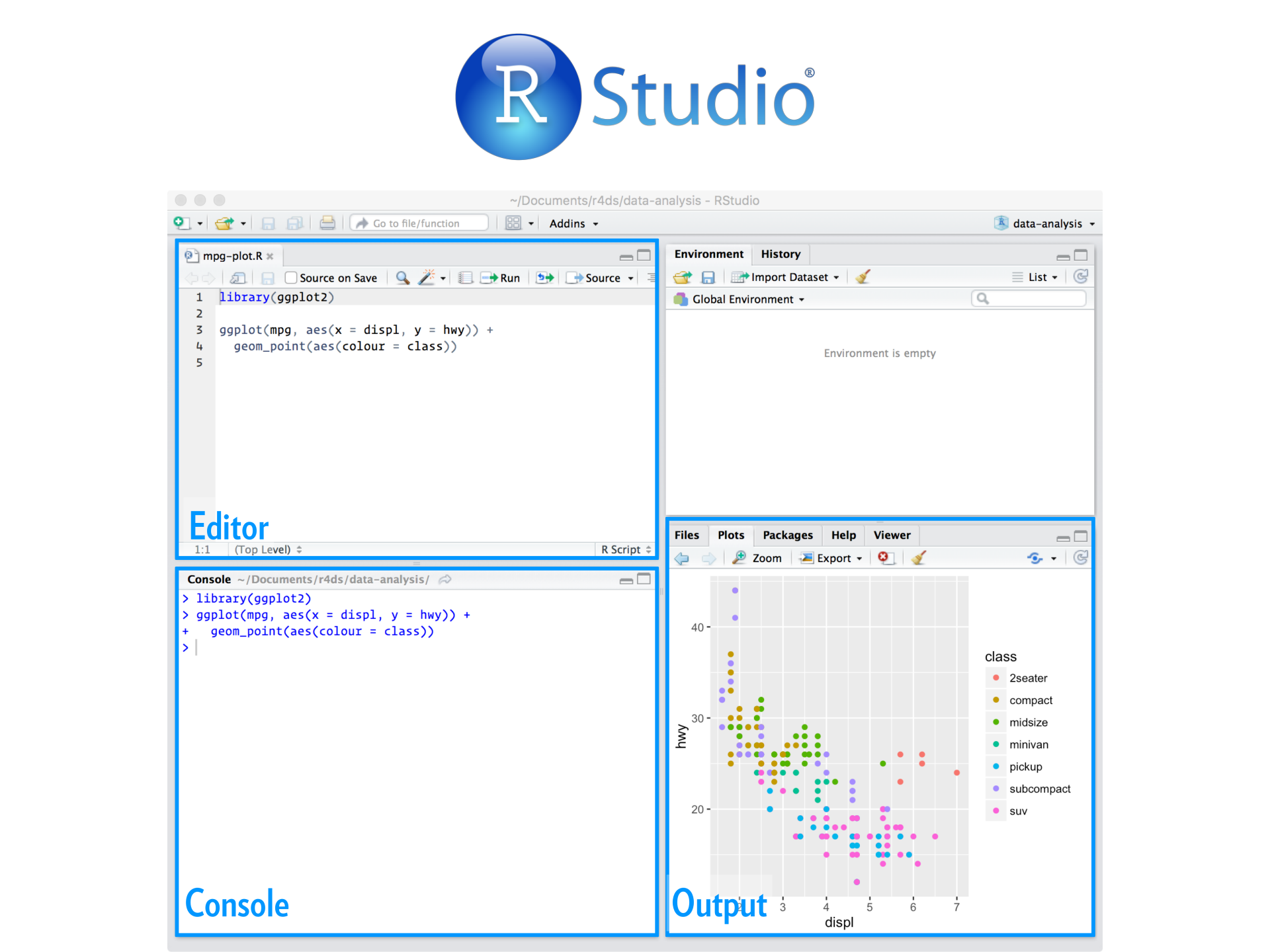
- 12th most popular programming language (TIOBE index, Jan 2019)
- Statistical computing, data analysis and graphics
- Interpreted language with a command line interface
- Several IDEs, e.g. RStudio
- Supports matrix arithmetic and data frames (c.f. tables in a relational database)
- Many packages available (CRAN, Bioconductor)
- tidyverse!



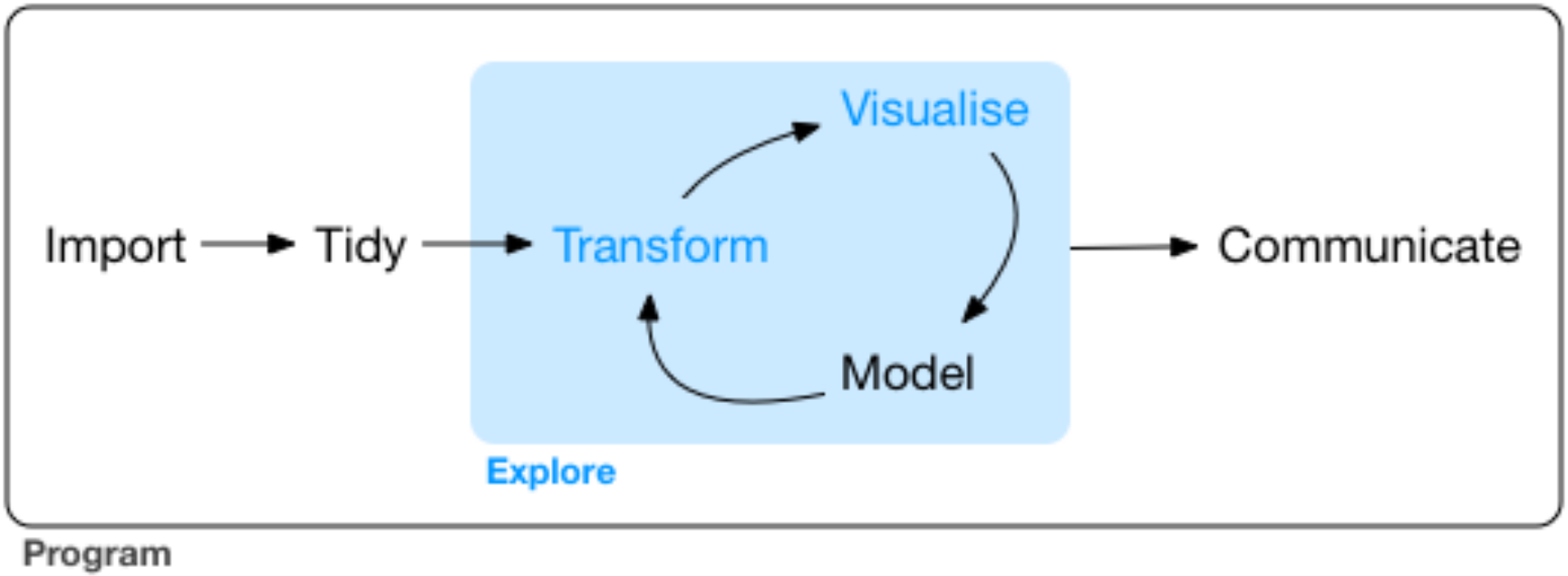
# Useful R links

- r-project.org (project homepage)
- cran.r-project.org (download R)
- rstudio.com (download RStudio)
- bioconductor.org (bioinformatics packages)
- tidyverse.org (more about tidyverse packages)





RStudio
~/Documents/r4ds/data-analysis - RStudio
Go to file/function
Addins
data-analysis
mpg-plot.R
Source on Save
Run
Source
1 library(ggplot2)
2
3 ggplot(mpg, aes(x = displ, y = hwy)) +
4 geom_point(aes(colour = class))
5
Editor
1:1
(Top Level)
R Script
Environment
History
Import Dataset
List
Global Environment
Environment is empty
Files
Plots
Packages
Help
Viewer
Zoom
Export
Console ~/Documents/r4ds/data-analysis/
> library(ggplot2)
> ggplot(mpg, aes(x = displ, y = hwy)) +
+ geom_point(aes(colour = class))
>
Console
hwy
displ
class
2seater
compact
midsize
minivan
pickup
subcompact
suv
Output

# Data Science



# Un-tidy data

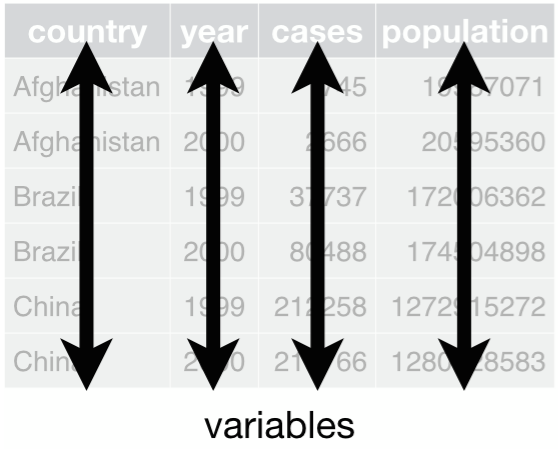
```
> table2
# A tibble: 12 x 4
   country      year type            count
   <chr>       <int> <chr>           <int>
 1 Afghanistan  1999 cases             745
 2 Afghanistan  1999 population    19987071
 3 Afghanistan  2000 cases            2666
 4 Afghanistan  2000 population    20595360
 5 Brazil       1999 cases            37737
 6 Brazil       1999 population   172006362
 7 Brazil       2000 cases            80488
 8 Brazil       2000 population   174504898
 9 China        1999 cases           212258
10 China        1999 population  1272915272
11 China        2000 cases           213766
12 China        2000 population  1280428583
> 
```

```
> table4a
# A tibble: 3 x 3
  country     `1999` `2000`
* <chr>        <int>  <int>
1 Afghanistan    745   2666
2 Brazil       37737  80488
3 China       212258 213766
> table4b
# A tibble: 3 x 3
  country         `1999`     `2000`
* <chr>            <int>      <int>
1 Afghanistan   19987071   20595360
2 Brazil       172006362  174504898
3 China       1272915272 1280428583
> 
```

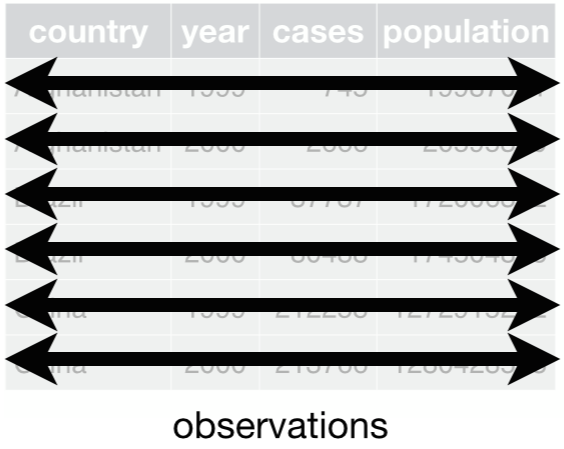
# Tidy data

```
> table1
# A tibble: 6 x 4
  country      year  cases population
  <chr>       <int>  <int>      <int>
1 Afghanistan  1999    745   19987071
2 Afghanistan  2000   2666   20595360
3 Brazil       1999  37737  172006362
4 Brazil       2000  80488  174504898
5 China        1999 212258 1272915272
6 China        2000 213766 1280428583
>
```

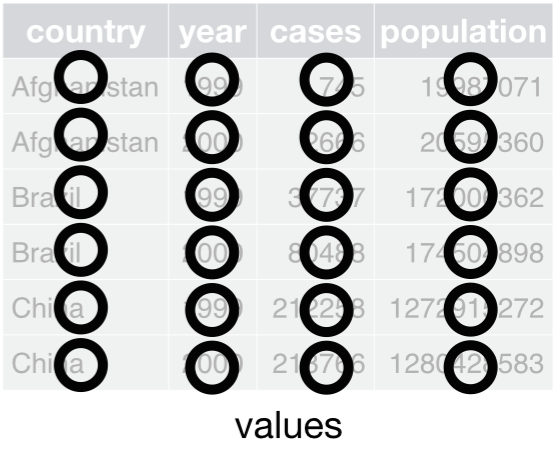
- Each variable must have its own column
- Each observation must have its own row
- Each value must have its own cell




variables




observations




values

# Start here

github.com/alexeymorgunov/Rcourse

# Thank you!

Have any questions, comments?
Email me: asm63@cam.ac.uk