

Introduction

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What is R?

R is statistical software that you can use to build, clean, analyze, visualize your data.

Building & Cleaning

Table 1: Automobile Performance

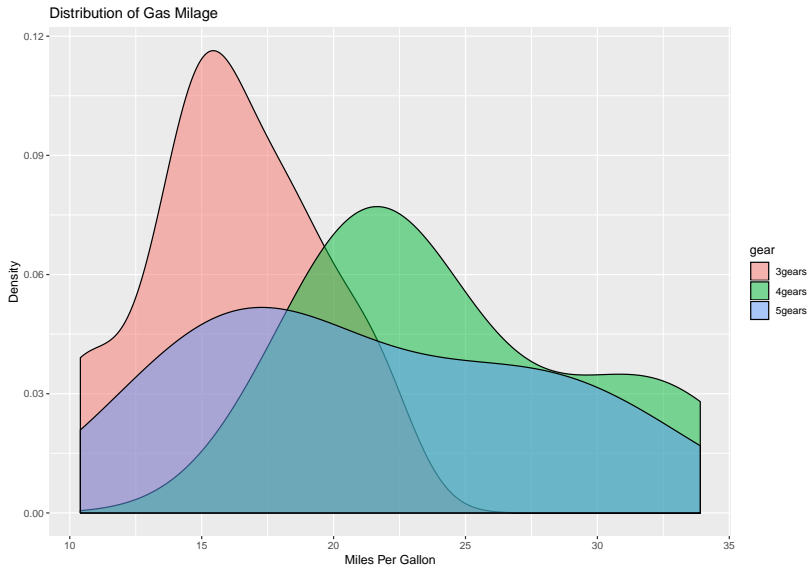
	mpg	cyl	disp	hp	drat	wt
Mazda RX4	21.0	6	160.0	110	3.90	2.620
Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875
Datsun 710	22.8	4	108.0	93	3.85	2.320
Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215
Hornet Sportabout	18.7	8	360.0	175	3.15	3.440
Valiant	18.1	6	225.0	105	2.76	3.460
Duster 360	14.3	8	360.0	245	3.21	3.570
Merc 240D	24.4	4	146.7	62	3.69	3.190

Analyzing

Table 2:

<i>Dependent variable:</i>	
	mpg
cyl	−0.813 (0.663)
hp	−0.022 (0.016)
gear	0.363 (1.000)
wt	−3.023*** (0.851)
Constant	36.690*** (5.970)
Observations	32
R ²	0.844
Adjusted R ²	0.821
Residual Std. Error	2.551 (df = 27)
F Statistic	36.494*** (df = 4; 27)
<i>Note:</i> * p<0.1; ** p<0.05; *** p<0.01	

Visualizing



Can't Stata and SPSS do this as well?

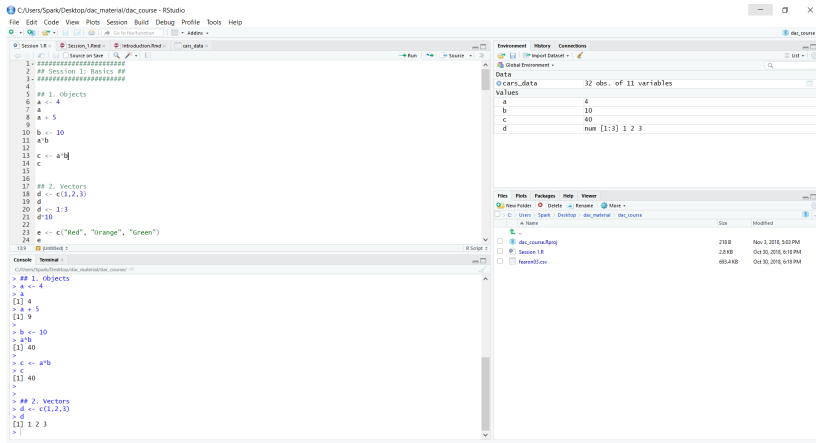
R is more powerful and flexible: Code-based UI allows for more functions, which can also be customized. - No limits to variables and observations like Stata or SPSS - A stepping stone for coding in general

R is open source: New functions and packages being added and updated constantly. Much less restricted to the version you have.

Course Schedule

- ▶ Session 1 (Nov 7): Intro to R, basic functions
- ▶ Session 2 (Nov 14): Data manipulation
- ▶ Session 3 (Nov 21): Data visualization
- ▶ Session 4 (Nov 28): Data presentation + ?

R studio interface



R studio interface

The screenshot displays the RStudio interface with the following components:

- Source Editor (Left):** Contains R code for Session 1.8. A red box highlights the code area. The code includes comments and assignments for objects, vectors, and a character vector.
- Console (Bottom Left):** Shows the output of the R code executed in the source editor.
- Environment (Right):** Displays the current environment, showing the 'Data' environment with a table of values for 'cars_data'.
- Files (Bottom Right):** Shows the file explorer with a list of files and folders.

Source:

- Write your R code here and save it for later use
- You can also view other scripts or dataframes by switching between the tabs

Environment:

Global Environment
Data
cars_data
Values
a
b
c
d

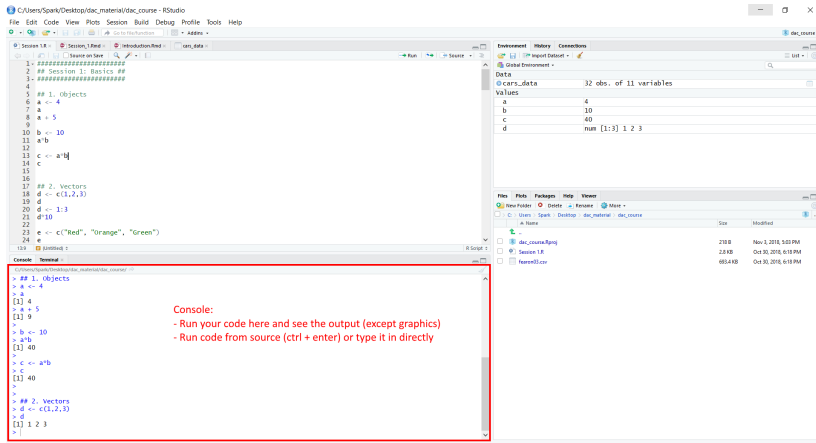
Files:

Name	Size	Modified
cars_data		
dac_course.Rproj		
Session 1.8		
feature02.csv		

Console:

```
> ## 1. Objects
> a <- 4
> a
[1] 4
> a + 5
[1] 9
> b <- 10
> a*b
[1] 40
> c <- a*b
[1] 40
> c
[1] 40
> ## 2. Vectors
> d <- c(1,2,3)
> d
[1] 1 2 3
>
```

R studio interface



R studio interface

The screenshot displays the RStudio interface with the following components:

- Script Editor:** Contains R code for Session 1.8, including comments, object creation, and vector creation.
- Console:** Shows the output of the R code, including the creation of objects 'a', 'b', 'c', and 'd'.
- Environment Pane:** Displays the current environment, showing the Global Environment and the Data environment. A red box highlights the Data environment, which contains the object 'cars_data'.

Script Editor Code:

```
#####  
## Session 1: Basics ##  
#####  
## 1. Objects  
a <- 4  
b <- 10  
a*b  
c <- a*b  
## 2. Vectors  
d <- c(1,2,3)  
d  
e <- c("Red", "Orange", "Green")  
e
```

Console Output:

```
> ## 1. Objects  
> a <- 4  
[1] 4  
> b <- 10  
[1] 9  
> a*b  
[1] 40  
> c <- a*b  
[1] 40  
> ## 2. Vectors  
> d <- c(1,2,3)  
[1] 1 2 3
```

Environment Pane:

Global Environment

Data

cars_data 32 obs. of 11 variables

Values

a	4
b	10
c	40
d	num [1:3] 1 2 3

Environment: You can see all your stored objects here (variables, dataframes, etc.)

Files | Plots | Packages | Help | Viewer

New Project | Open Recent | Recent | More

C:\Users\Spark\Desktop\dac_material\dac_course

Name	Size	Modified
dac_course.Rproj	210 B	Nov 1, 2016, 5:03 PM
Session 1.8	2.8 KB	Oct 30, 2016, 6:10 PM
feareon2.csv	693.4 KB	Oct 30, 2016, 6:10 PM

R studio interface

The screenshot displays the RStudio interface with the following components:

- Script Editor:** Contains R code for Session 1.8, including object creation and vector assignment.
- Console:** Shows the execution output of the script, including object creation and vector assignment.
- Environment:** Displays the current environment, showing the 'cars_data' object with 32 observations and 11 variables.
- Files:** A pane showing the file explorer, highlighting the 'cars_data' file.

Environment Pane Details:

Variable	Value
a	4
b	10
c	40
d	num [1:3] 1 2 3

Files Pane Details:

Name	Size	Modified
cars_data.Rproj	219 B	Nov 1, 2016, 5:53 PM
Session 1.8	2.8 KB	Oct 30, 2016, 6:10 PM
feature01.csv	485.4 KB	Oct 30, 2016, 6:10 PM

Files: Files in your working directory
Plots:
Packages: packaged installed
Help: information about functions and packages