

Common errors and how to fix them

Introduction to R - Day 1

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When learning a programming language, you have to be prepared to spend a lot of your time with fixing bugs in the code. So don't worry: It's not you, it's just how programming works!

debugging



1.
I got this.



2.
Huh. Really
thought that
was it.



3.
(...)



4.
Fine. Restarting.



5.
OH WTF.



6.
Zombie
meltdown



7.



8.
A NEW HOPE!



9.
[insert awesome
theme song]



10.
I ♥ CODING!

Debugging

Debugging can be annoying and we can't avoid it, but ...

- ... it's an **effective learning experience** (I actually learned the most from debugging my code)
- ... it will get easier over time
- ... there are some **debugging techniques** to decrease the time in stages 2-7
- ... if nothing helps, there are great people all over the internet willing to help




Most common  errors and problems for
beginners and how to deal with them

Syntax errors

Example

```
mean(c(1,2,3)na.rm=TRUE)
## Error: <text>:1:14: unexpected symbol
## 1: mean(c(1,2,3)na.rm
##                      ^
```

How to fix

- look for missing commas, misspelled arguments, ...
- read the error message
- the RStudio syntax checker warns you before you run code with syntax errors
 - look for  next to line numbers in your script

```
306
307
308 mean(c(1,2,3)na.rm=TRUE)
309
```

expected ',' after expression
expected whitespace around '=' operator

Error: could not find function

Examples

```
##      b  a
## 1    1  1
## 2    2  2
## 3    3  3
## 4    4  4
## 5    5  5
## 6    6  6
## 7    7  7
## 8    8  8
## 9    9  9
## 10  10 10
```

```
## Error in lenght(1:10): could not find function "lenght"
```

How to fix

Could not find function errors have two main reasons:

1. You forgot to load the package that the function belongs to

Error: object `x` not found

Example

```
## Error in eval(expr, envir, enclos): object 'hello' not found
## Error in eval(expr, envir, enclos): object 'variable_A' not found
```

How to fix

- you are trying to access an object that does not exist
- Mostly because:
 - typos in variable name (variable name is `variableA` but you try to access `variable_A`)
 - forgot to put quotes around string: `print(hello)` → looks for a variable named `hello` but instead you wanted to print the string `print("hello")`

Wrong data format

Example

- does not necessarily trigger an error message
- if there is an error message, it can also appear later in your code

How to fix it

- Look at `str()` of your data and check whether all columns are there and in correct format
 - e.g. is a column of type `character` but should be of type `integer`?
- Do that at multiple locations in your script to find the line where the error actually happens
 - everytime you change something in your data, check its structure

R crashes

Sometimes R crashes completely and you see this:



How to fix it


- There is no fix but to start a new session
- Make sure to save your scripts regularly!

Console prints +

R is not running code anymore and the console only prints `+` if you try to execute a command.

```
122:1 (Top Level) 
# R console window showing R code and output. The code defines a vector 'names' with 10 taxonomic groups and uses 'barplot' to plot the number of species for each group. The output shows the barplot with the x-axis labeled 'Taxa' and the y-axis labeled 'Number of species'. The bars are colored in a light blue/purple shade. The x-axis labels are 'beetle', 'bird', 'butterfly', 'dragonfly', 'fl.plants', 'fungus', 'hymenopteran', 'lichen', 'liverwort', and 'mammal'. The y-axis labels are 'Number of species' and the values are 0, 600, 1200, 1800, 2400, 3000, 3600, 4200, 4800, and 5400. The legend indicates that the bars represent 'Number of species'.
```

How to fix it

- First, go to the console and hit `Escape`. Then you should see the `>` sign instead of `+` again.
- Likely you forgot to close a bracket somewhere. Go to your script and check where this happened
 - look for  next to line numbers

Warnings

R can give you warnings for many reasons, e.g.

- you have `NA` values in your data and try to plot them
- implicit type conversion returned `NA`
- the function you are using is deprecated
- the package you are using was built for another version of R

Warnings are no errors and can sometimes be ignored but:

- make sure to read and understand warnings
- only ignore them if you know that that's okay, otherwise fix the underlying issue

How to troubleshoot R code

A step by step guide

Troubleshoot R: Step by step

Often, you don't need to do all the steps but a systematic approach to bug fixing is very helpful.

Step 1: Carefully read the error message and try to fix it

Step 2: Is it any of the errors you learned about just now?

Step 3: If the error is about data or other variables: look at the structure using `str()`

Step 4: If the error is about a function: Read the documentation using `?functionName`.

- Did you use the function correctly?
- Did you forget an argument?

Step 5: Look for answers online

- often you can also jump directly to this step

Step 6: Ask others for help

Step 5: Look for answers online

- Search with keywords R + package name + Error message/Warning
- If you don't know how to do something try searching R + package name + What you want to do, e.g.
 - "R ggplot change axis title"
 - "R sort vector"
- Usually you can pick any of the top search results, but I recommend results from [Stack Overflow](#)
- Always search in English to get more results

💡 Change language of R messages to English with `Sys.setenv(LANGUAGE='en')`

Step 6: Ask others for help

There are plenty of places where you can ask for help online. Some common and good options are:

- Ask a question on [Stack Overflow](#)
- Ask in the [R Discord server](#)
 - usually fast answers
 - but: you need a Discord account
- Ask on Twitter using the `#rstats` hashtag (maybe a bit less common)

But: You have to make sure that before, you tried all the other 5 steps.

To ask questions online, you have to learn **how to ask a good R question**. This includes:

- clear question
- reproducible example

Look [here](#) for more info on how to ask a good question about R