Org-mode coding assignment

This file contains the first `Org-mode` assignment, a glossary of terms, and a sample solution in the programming language R instead of C. The main challenge is not the programming language but managing the complexity of writing a "literate" program, which includes layout, documentation, source code and result elements. Note that the sample solution also lists relevant references at the end.

Assignment

Create an Org-mode file with the following characteristics:

1. A headline with the text `My first Org-mode file`.
2. A paragraph that explains what the following code block does.
3. A C source code block. The block should contain one line of code only. It should have the name `first_program`.

4. For the source code block header, use the following arguments:

```
:main yes
:includes stdio.h
:tangle first.c
:exports both
:comments both
:results raw
```

5. Inside the block, put the C statement:

```
puts("My first program");
```

6. Save the file as `YourName.org` (e.g. `MarcusBirkenkrahe.org`)
7. Upload the file to this GitHub repo.

Glossary

TERM	EXPLANATION
Org-mode headline	Starts with one ore more * characters
Org-mode code block	An executable (in some language) block of text
Org-mode code block header	Language and optional arguments
Argument	Some data passed on for further processing
Function	Algorithm f(x) expecting an argument x
String	Data type representing text
Begin/End statement	Symbol to signal the start/end of a command
File	Storage unit in a computer
Uploading	Sending so that file exists locally and remotely

Example solution in R (not C)

My first Org-mode file

- The function `str()` prints all variables (column vectors) of a data structure.
- In the code block, `str()` is applied to the built-in data frame `mtcars`.
- The result shows that `mtcars` contains 32 rows (observations) of 11 variables.
- The code block header exports both source code and result, starts an R session, and prints the result to `stdout`.
- The syntax is not highlighted (language keywords like `str` and data like `mtcars` are not visually distinguished).

```
str(mtcars)
```

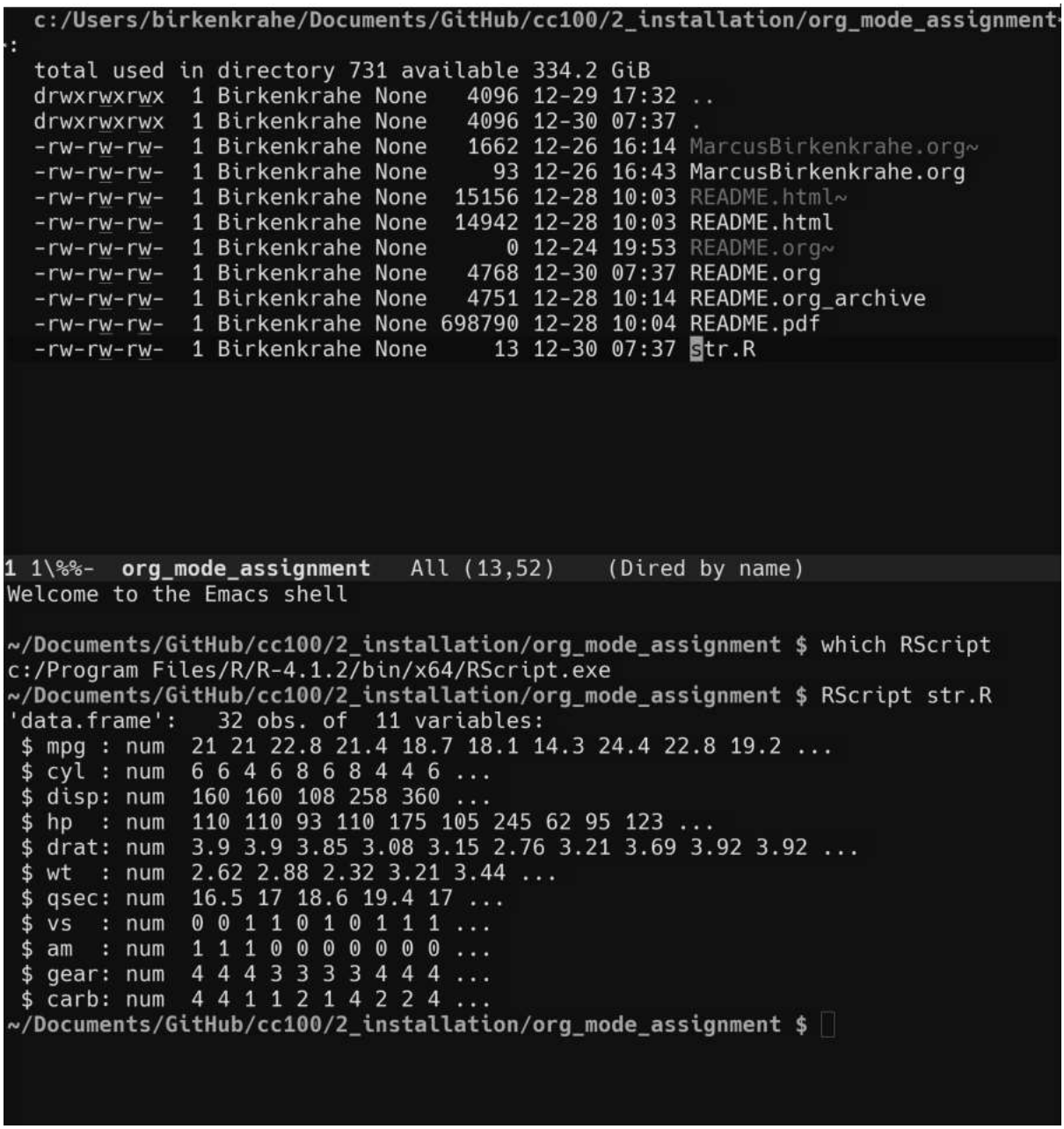
```
'data.frame':   32 obs. of  11 variables:
 $ mpg : num  21 21 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 ...
 $ cyl : num  6 6 4 6 8 6 8 4 4 6 ...
 $ disp: num  160 160 108 258 360 ...
 $ hp  : num  110 110 93 110 175 105 245 62 95 123 ...
 $ drat: num  3.9 3.9 3.85 3.08 3.15 2.76 3.21 3.69 3.92 3.92 ...
 $ wt  : num  2.62 2.88 2.32 3.21 3.44 ...
 $ qsec: num  16.5 17 18.6 19.4 17 ...
 $ vs  : num  0 0 1 1 0 1 0 1 1 1 ...
 $ am  : num  1 1 1 0 0 0 0 0 0 0 ...
 $ gear: num  4 4 4 3 3 3 3 4 4 4 ...
 $ carb: num  4 4 1 1 2 1 4 2 2 4 ...
```

Executing the program on the command line

In Emacs:

```
M-x eshell
Rscript str.R
```

See screenshot:



References

- `mtcars`: Motor Trend Car Road Tests. URL: rdocumentation.org.
- tecosaur (n.d.). The Org Manual: 16 Working with Source Code [website]. URL: orgmode.org.
- R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL: r-project.org.
- `str`: Compactly Display the Structure of an Arbitrary R Object. URL: rdocumentation.org.

Created: 2021-12-30 Thu 08:16
Validate