The `HTMLreport()` function in the `doBy` package

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1 Introduction

The `HTMLreport()` function in the doBy package provides facilities for translating an R–script (a file with R commands and text comments) into an HTML document. This HTML document contains the text and the R–code along with the results from executing the R–code (i.e. tables, graphics etc).

A small example is shown in Figure 1. This R–script contains R code and text comments (in the lines starting with `##`). The result from processing this R–script file is an HTML document which is shown in Figures 2, 3 and 4.

`HTMLreport()` is nowhere as flexible as using `Sweave()` with LaTeX or using `odfWeave()` with `OpenOffice`. The facilities of `HTMLreport()` may be summarized as follows (details are provided in Section 3):

- There are a few markup facilities for the text. These are inspired by `txt2tags` markups (see `http://txt2tags.org/`).
- The specification of R–code follows the `noweb` syntax also employed by Sweave (see `http://www.stat.uni-muenchen.de/~leisch/Sweave/Sweave-manual.pdf`).

```
##    = HTMLreport Example 1 =
##    == The Puromycin data  ==
##    === Søren Højsgaard  ===
##    %%date

## === The &&Puromycin&& data ===
## The first lines of data are:

## <<>>=
head(Puromycin,3)
## @

## Transformation almost gives __linearity__
## <<fig=T,HTMLheight=300,HTMLwidth=600>>=
par(mfrow=c(1,2))
plot(rate~conc,        data=Puromycin, col=as.numeric(state))
plot(1/rate~I(1/conc), data=Puromycin, col=as.numeric(state))
## @

## Fit a model to **transformed** data
## <<>>=
m1 ← lm(1/rate~state + I(1/conc) + state*I(1/conc), data=Puromycin)
summary(m1)
## @

### TODO: Maybe more could be done...
```

Figure 1: An R–script file with a few markups of text.

2 Usage

Suppose the text in Figure 1 is in the file `Example1-Puromycin.R`. Then the HTML file is created with

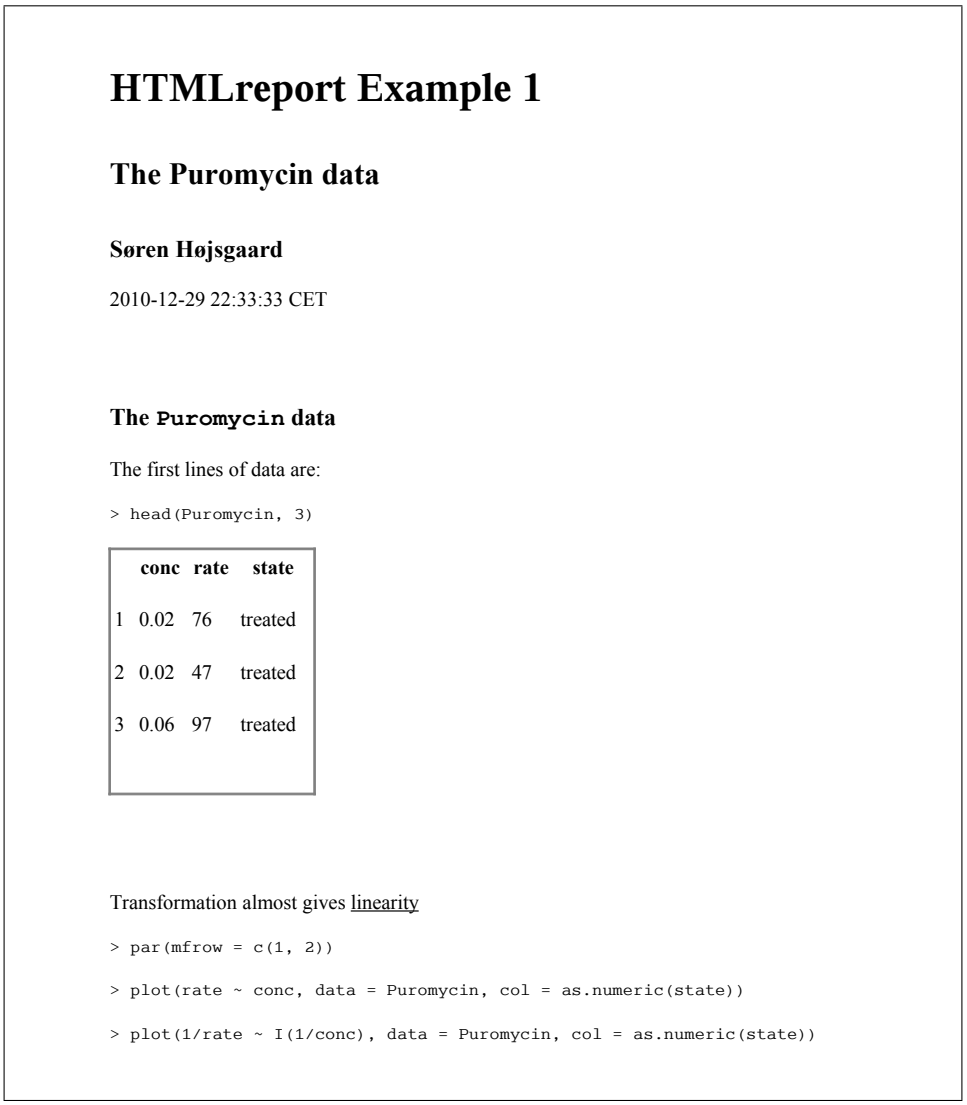
```
 HTMLreport("Example1-Puromycin.R")

tmpfile.name: Example1-Puromycin-filed435751
filename Example1-Puromycin
destdir.filename: ./Example1-Puromycin-REPORT
Preprocessing...
 source file      : Example1-Puromycin.R
 filename         : Example1-Puromycin
 temp source file : Example1-Puromycin-filed435751
Writing to file Example1-Puromycin-filed435751.html
Processing code chunks ...
 1 : term Robj
 2 : echo term Robj
 3 : echo term Robj png
 4 : echo term Robj
file  Example1-Puromycin-filed435751.html is completed
Postprocessing...
 target file    : ./Example1-Puromycin-REPORT.html
```

This creates the file `Example1-Puromycin-REPORT.html` which (by default) is located in the working directory of R.

3 Text markup

All text lines start with one or more hashes (`#`).

- Lines starting with one or two hashes are regarded as text which are transferred (possibly after some additional processing; see below) to the resulting HTML document.



HTMLreport Example 1

The Puromycin data

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2010-12-29 22:33:33 CET

The `Puromycin` data

The first lines of data are:

```
> head(Puromycin, 3)
```

	conc	rate	state
1	0.02	76	treated
2	0.02	47	treated
3	0.06	97	treated

Transformation almost gives linearity

```
> par(mfrow = c(1, 2))
> plot(rate ~ conc, data = Puromycin, col = as.numeric(state))
> plot(1/rate ~ I(1/conc), data = Puromycin, col = as.numeric(state))
```

Figure 2: The resulting HTML document produced by `HTMLreport()`.

- Lines starting with three hashes are not transferred to the HTML document. This is useful e.g. for TODOs.

3.1 Text beautifiers

- Beautifiers: **boldface**, *italics*, underline, `monospace` :
  These are produced with: `**`boldface`**`, `//`italics`//` `__`underline`__`, `&&`monospace`&&`
- The beautifiers can be combined in any way, e.g. `**__`some text`__**`.

3.2 Headings

- Headings at different font sizes are produced with:

`= Title level 1 =`, `== Title level 2 ==`, `=== Title level 3 ===`

- The text beautifiers can be used in the headings.

3.3 Miscellaneous

- The time of creation of the HTML document is produced by `%%date`.
- All text markups must appear on one line; that one may write

```
## = HERE COMES A TITLE =
```

whereas is it is not allowed to write

```
## =
##   HERE COMES A TITLE
## =
```

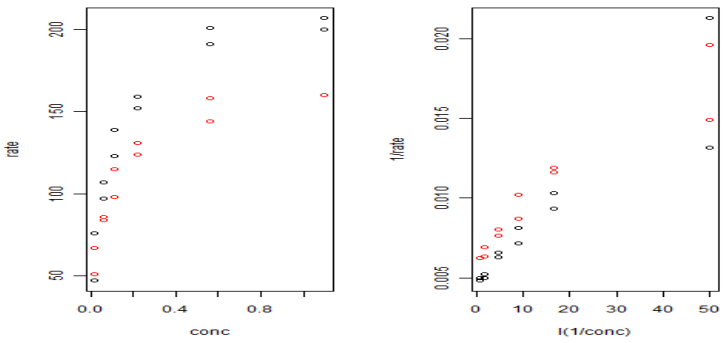
3.4 R code

- A chunk of R–code lines start with `##<<>>=` and ends with `##@`.
- Various options to code chunks can be specified between `<<` and `>>=`; see the example.

4 Implementation of `HTMLreport()`

A major design goal of `HTMLreport()` has been that no additional software must be installed. `HTMLreport()` is based processing the source file line–by–line (using `gsub()`) and therefore all text markups must not be split over several lines.

The workhorse of `HTMLreport()` is the `Sweave()` function using the `RweaveHTML` driver of the `R2HTML` package.



Fit a model to **transformed** data

```
> m1 <- lm(1/rate ~ state + I(1/conc) + state * I(1/conc), data = Puromycin)

> summary(m1)
```

- Call: lm(formula = 1/rate ~ state + I(1/conc) + state * I(1/conc), Call: data = Puromycin)
- Residuals

Min	1Q	Median	3Q	Max
-0.0043	-0.0005	-0.0002	0.0009	0.0038

- Coefficients

	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	5.11e-03	6.27e-04	8.14	1.3e-07	***
stateuntreated	1.86e-03	9.20e-04	2.03	0.057	.
I(1/conc)	2.47e-04	2.86e-05	8.64	5.2e-08	***
stateuntreated:I(1/conc)	-3.22e-05	4.10e-05	-0.79	0.442	

Figure 3: The resulting HTML document produced by `HTMLreport()`.

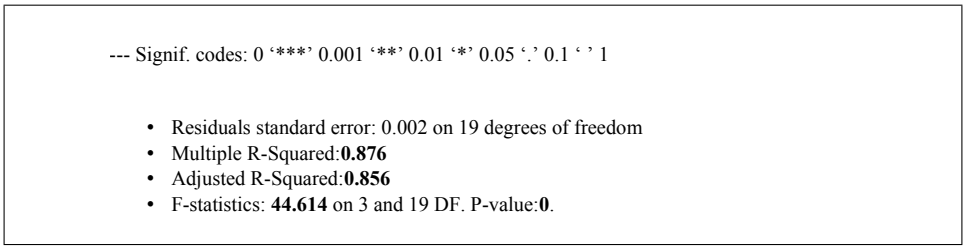


Figure 4: The resulting HTML document produced by `HTMLreport()`.