Лабораторная работа 6. Основы работы с R Markdown

Цель занятия — научиться форматировать текст, импортировать программный код (code chunks) в файлах R Markdown.

Вспомогательный материал: Литература.

Общие указания:

1. В качестве отчета о выполнении практического занятия студент представляет преподавателю с пакетом **mypackage** (см. л.р. №5) и файлом **info.Rmd** в папке **vignettes** пакета.
2. Задания должны быть выполнены наиболее оптимальным образом (автоматизация, минимизация строк кода, универсальность и др.).
3. Программный код должен быть оформлен в соответствии с Google's R Style Guide.
4. Смысловые блоки программного кода необходимо сопровождать комментариями.

ReadMe

A **vignette** is a long-form guide to your package. Function documentation is great if you know the name of the function you need, but it's useless otherwise. A vignette is like a book chapter or an academic paper: it can describe the problem that your package is designed to solve, and then show the reader how to solve it. A vignette should divide functions into useful categories, and demonstrate how to coordinate multiple functions to solve problems. Vignettes are also useful if you want to explain the details of your package. For example, if you have implemented a complex statistical algorithm, you might want to describe all the details in a vignette so that users of your package can understand what's going on under the hood, and be confident that you've implemented the algorithm correctly.

Many existing packages have vignettes. You can see all the installed vignettes with browseVignettes(). To see the vignette for a specific package, use the argument, browseVignettes("packagename"). Each vignette provides three things: the original source file, a readable HTML page or PDF, and a file of R code. You can read a specific vignette with vignette(x), and see its code with edit(vignette(x)). To see vignettes for a package you haven't installed, look at its CRAN page, e.g., http://cran.r-project.org/web/packages/dplyr.

Vignette workflow

To create your first vignette, run: `devtools::use_vignette("my-vignette")`. This will:

1. Create a vignettes/ directory.
2. Add the necessary dependencies to DESCRIPTION (i.e. it adds knitr to the Suggests and VignetteBuilder fields).
3. Draft a vignette, vignettes/my-vignette.Rmd.

The draft vignette has been designed to remind you of the important parts of an R Markdown file. It serves as a useful reference when you're creating a new vignette.

Once you have this file, the workflow is straightforward:

1. Modify the vignette.
2. Press Ctrl/Cmd + Shift + K (or click 

) to knit the vignette and preview the output.

The first few lines of the vignette contain important **metadata**. The default template contains the following information:

```
---
title: "Vignette Title"
author: "Vignette Author"
date: "`r Sys.Date()`"
output: rmarkdown::html_vignette
vignette: >
  %\VignetteIndexEntry{Vignette Title}
  %\VignetteEngine{knitr::rmarkdown}
  \usepackage[utf8]{inputenc}
---
```

This metadata is written in yaml, a format designed to be both human and computer readable. The basics of the syntax is much like the DESCRIPTION file, where each line consists of a field name, a colon, then the value of the field. The one special YAML feature we're using here is >. It indicates the following lines of text are plain text and shouldn't use any special YAML features.

The fields are:

- Title, author and date: this is where you put the vignette's title, author and date. You'll want to fill these in yourself (you can delete them if you don't want the title block at the top of the page). The date is filled in by default: it uses a special knitr syntax (explained below) to insert today's date.
- Output: this tells rmarkdown which output formatter to use. There are many options that are useful for regular reports (including html, pdf, slideshows, …) but rmarkdown::html_vignette has been specifically designed to work well inside packages. See ?rmarkdown::html_vignette for more details.
- Vignette: this contains a special block of metadata needed by R. Here, you can see the legacy of LaTeX vignettes: the metadata looks like LaTeX commands. You'll need to modifiy the \VignetteIndexEntry to provide the title of your vignette as you'd like it to appear in the vignette index. Leave the other two lines as is. They tell R to use knitr to process the file, and that the file is encoded in UTF-8 (the only encoding you should ever use to write vignettes) [1].

Задание 1

Откройте проект с пакетом **mypackage** (см. л.р. №5). Создайте vignette **“info”**:

```
devtools::use_vignette("my-vignette")
```

Напишите в info.Rmd руководство пользователя по пакету.

Пример руководства можно получить, открыв на панели Packages любой пакет, например, ggplot2 (не все пакеты содержат vignettes), и перейдя по ссылке User guides, package vignettes and other documentation. Либо воспользоваться соответствующими командами (см. ReadMe).

Руководство должно содержать все основные способы разметки текста:

- Sections
- Lists
- Inline formatting
- Tables,

а также интегрированный программный код. В руководстве должны быть раскрыты все возможности созданного пакета.

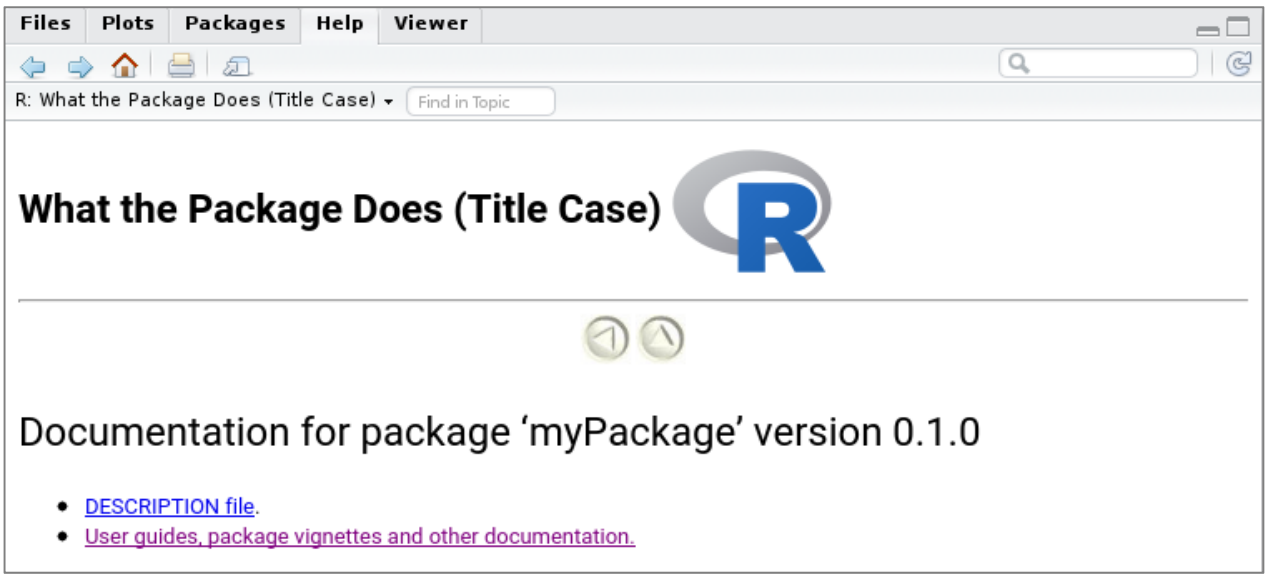
Задание 2

Добавьте руководство пользователя к пакету:

```
devtools::build_vignettes()
```

Выполните Build & Reload the package.

Убедитесь, что vignette добавлен к пакету:



Литература:

1. *Wickham, H. Vignettes: long-form documentation [Electronic resource] / R packages. – 2015. – Mode of access: http://r-pkgs.had.co.nz/vignettes.html. – Date of access: 20.02.2017.*
2. *R Markdown Reference Guide [Electronic resource] / RStudio Cheat Sheets. – 2014. – Mode of access: https://www.rstudio.com/wp-content/uploads/2015/03/rmarkdown-reference.pdf. – Date of access: 20.02.2017.*
3. *Grolemund, G. R for Data Science [Electronic resource] / Garrett Grolemund, Hadley Wickham. – 2016. – Mode of access: http://r4ds.had.co.nz/index.html. – Date of access: 01.09.2016.*