The application of R+HTML based on packages knitr and rmarkdown

Yuxuan Li

2019.5.25

What is R+HTML

Compile the data and the result to a document and output as other formats in R environment, such as HTML, PDF, WORD

R Markdown

R Markdown: **Markdown**

created by John Gruber in 2004

- a plain text formatting syntax
- a software tool, written in Perl, that converts the plain text formatting to HTML

This is a simple demo:

effect	Markdown
bold	**text**
emphasize	*text*
~~Strike-through~~	\~\~text\~\~
Link	`[title](http://)`
image	`![alt](http://)`
List	`* item`
Blockquote	`> quote`
heading	`#/##/###`

R Markdown: **Markdown**

The overriding design goal for Markdown's formatting syntax is to make it as readable as possible. The idea is that a markdown-formatted document should be publishable as-is, as plain text, without looking like it's been marked up with tags or formatting instructions.

features

- simple
- embedded code
- no syntax

R Markdown: **Analyze,Share,Reproduce**

First introduced in the knitr package written by Xie Yihui in early 2012.

```
---
title: "Untitled"
author: "XXX"
date: "XXXX年X月XX日"
output: html_document
---

```{r setup, include=FALSE}
knitr::opts_chunk$set(echo = TRUE)
```

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```{r cars}
summary(cars)
```
```

Figure 1: Rmd

knitr and rmarkdown: **knitr**

"**Executes the computer code embedded in Markdown**"

quote from *Little_Cookie*

参数1
eval: (TRUE; 逻辑)：是否执行代码
tidy: (TRUE; 逻辑)：是否整理代码
prompt: (FALSE; 逻辑)：是否添加引导符'>'
highlight: (TRUE; 字符)：是否高亮代码
size: ('normalsize'; 字符)：大小 background: ('#F7F7F7'; 字符或数值)：背景颜色
comment: ('##'; 字符)：结果输出前缀符号
echo: (TRUE; 逻辑或数值)：是否输出代码或输出哪些行
results: ('markup'; 字符)：装裱输出('markup')、原样输出('asis')、隐藏('hide')
warning, error, message: (TRUE; 逻辑)：是否显示相应信息
split: (FALSE; 逻辑)：是否剥离代码和文本到外部文件
include: (TRUE; 逻辑)：是否保留代码或结果到最终文档
参数2
fig.path: ('figure/'; 字符)：图片路径，支持前缀模式('figure/prefix-')
fig.keep: ('high'; 字符)：保存图形类型，高级图形('high')、不保存('none')、所有图形('all')、第一张('first')、最后一张('last')
fig.show: ('asis'; 字符)：展示方式，紧随代码输出('asis')、最后统一输出('hold')、动画输出('animate')
dev: (LaTeX 为'pdf', HTML/markdown 为'png'; 字符)：输出设备，knitr 支持很多种设备
fig.width, fig.height: (7; 数值)：图片文件的宽、高(英寸2.54cm 为单位)
out.width, out.height: (NULL; 字符)：图片在输出文档中的宽、高
fig.align: ('default'; 字符)：对齐方式，不做调节('default')、左('left')、右('right')、居中('center')
interval: (1; 数值)：动画参数，切换画面时间，单位为秒

knitr and rmarkdown: **Pandoc**

John MacFarlane created Pandoc in 2006.

"If you need to **convert files from one markup format into another**, pandoc is your swiss-army knife."

Lightweight markup formats
- ↔ Markdown (including CommonMark and GitHub-flavored Markdown)
- ↔ reStructuredText
- → AsciiDoc
- ↔ Emacs Org-Mode
- ↔ Emacs Muse
- → Textile
- ← txt2tags

HTML formats
- ↔ (X)HTML 4
- ↔ HTML5

Ebooks
- ↔ EPUB version 2 or 3
- ↔ FictionBook2

Documentation formats
- → GNU TexInfo
- ↔ roff man
- → roff ms
- ↔ Haddock markup

TeX formats
- ↔ LaTeX
- → ConTeXt

XML formats
- ↔ DocBook version 4 or 5
- ↔ JATS
- → TEI Simple

Word processor formats
- ↔ Microsoft Word docx
- ↔ OpenOffice/LibreOffice ODT
- → OpenDocument XML
- → Microsoft PowerPoint

Page layout formats
- → InDesign ICML

Outline formats
- ↔ OPML

Wiki markup formats
- ↔ MediaWiki markup
- ↔ DokuWiki markup
- ← TikiWiki markup
- ← TWiki markup
- → Vimwiki markup
- → XWiki markup
- → ZimWiki markup

Slide show formats
- → LaTeX Beamer
- → Slidy
- → reveal.js
- → Slideous
- → S5
- → DZSlides

Custom formats
- → custom writers can be written in lua.

PDF

knitr and rmarkdown: **rmarkdown**

J. Allaire, Xie, McPherson created in early 2014:

A relatively complete ecosystem for authoring documents

output

- document
- notebooks
- slides
- dashboards
- Shiny
- journal
- books
- websites

Rmarkdown

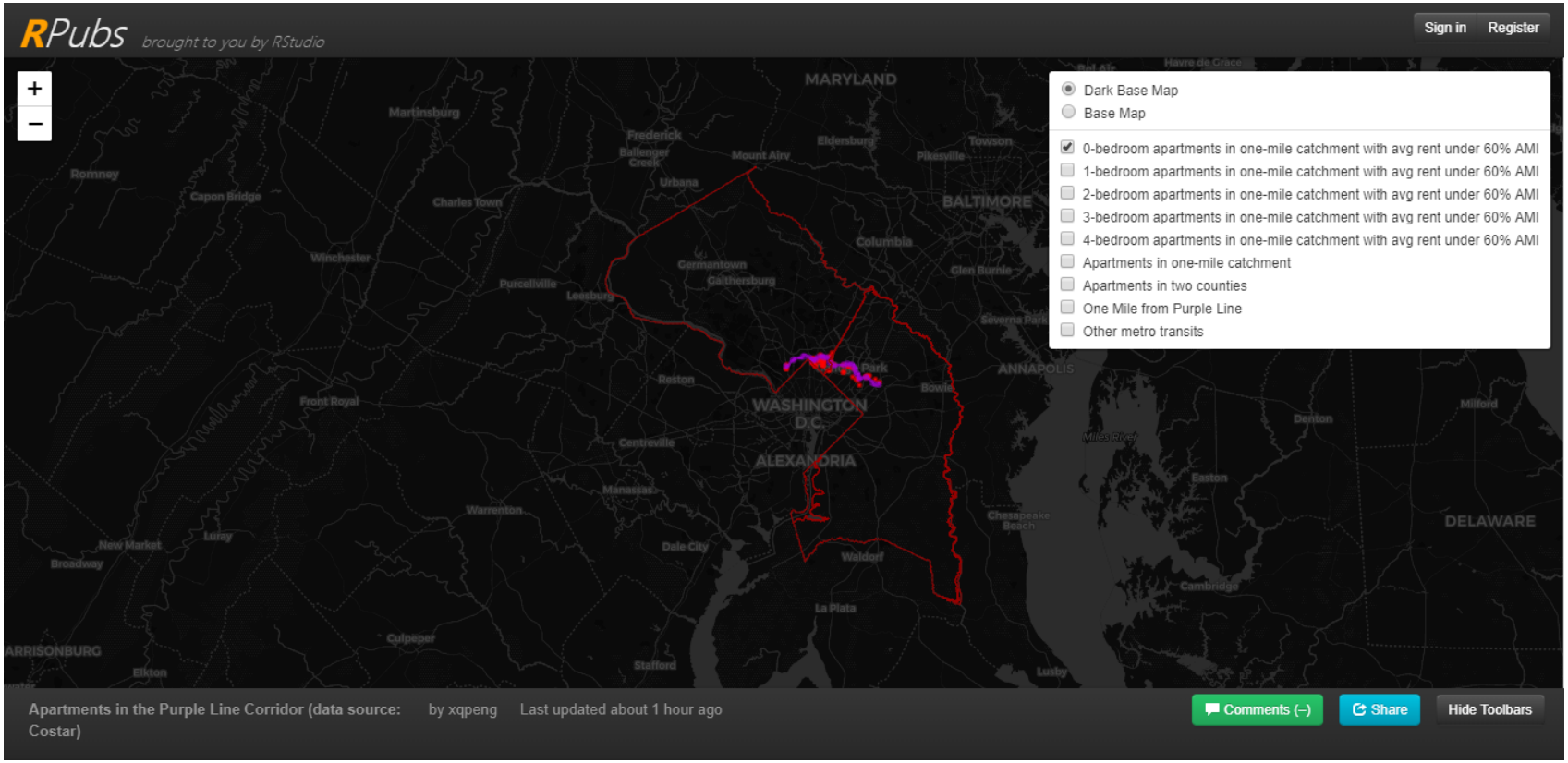


Figure 4: rmd_example1

Rmarkdown

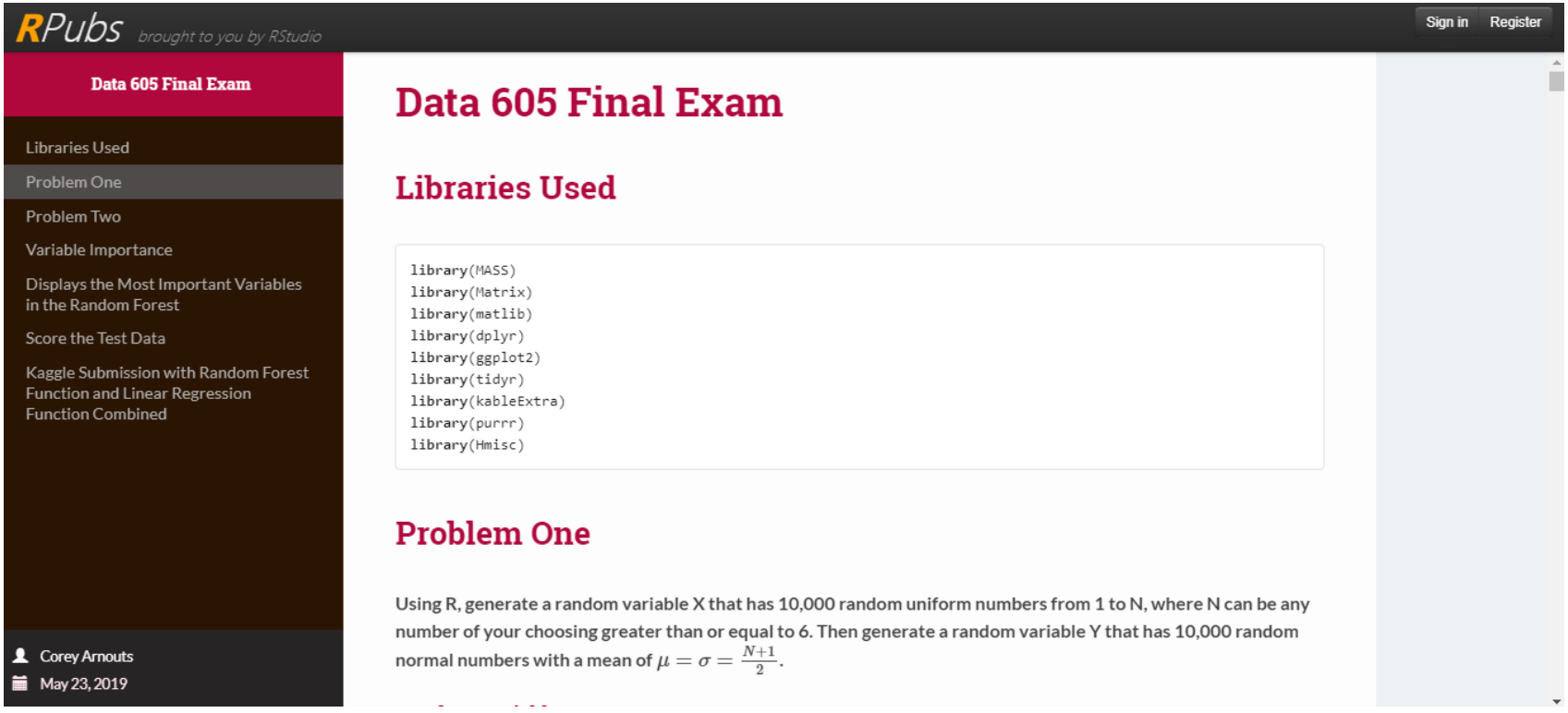


Figure 5: rmd_example2

Document + Blog + Presentation: useful and convenient output

Document

Pagebreak

- style
- color
- size
- select

https://datascienceplus.com/
r-markdown-how-to-insert-page-breaks-in-a-ms-word-document/

Document

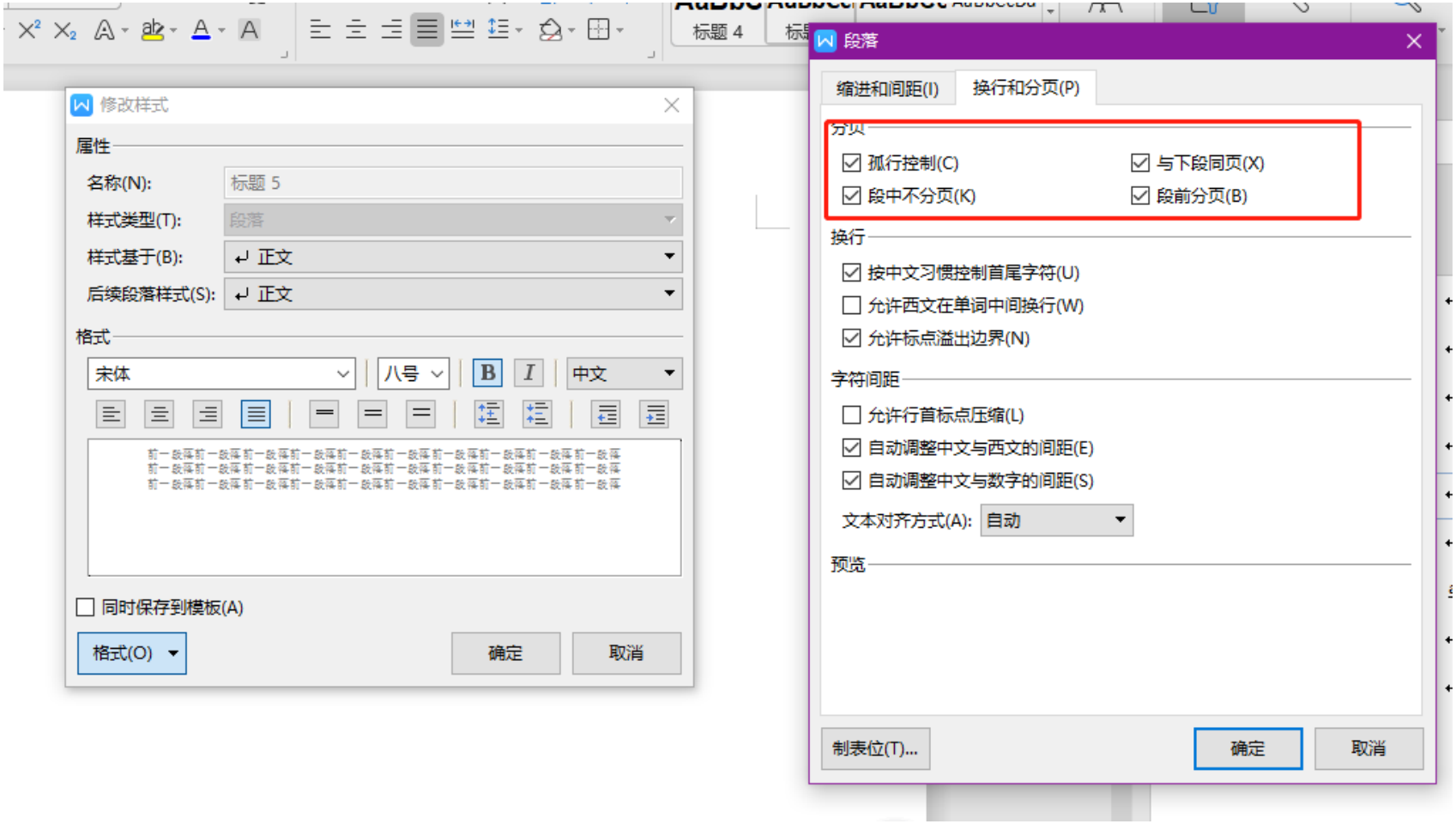


Figure 6: setting

Document

```
---
title: "Untitled"
output:
  word_document:
    reference_docx: mystyles.docx
---

```{r setup, include=FALSE}
knitr::opts_chunk$set(echo = TRUE)
```

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

Page Break

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:
```

Figure 7: rmd_docx

Document

Untitled

R Markdown

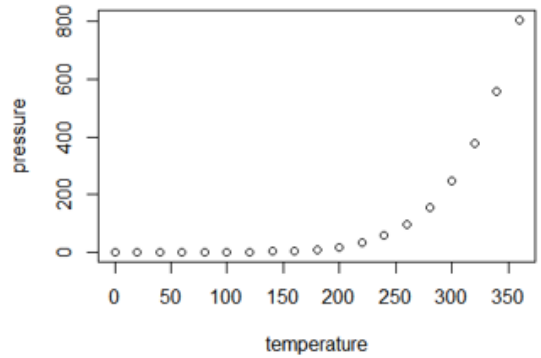
This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
##      speed           dist
## Min.   : 4.0   Min.   :  2.00
## 1st Qu.:12.0   1st Qu.: 26.00
## Median :15.0   Median : 36.00
## Mean   :15.4   Mean   : 42.98
## 3rd Qu.:19.0   3rd Qu.: 56.00
## Max.   :25.0   Max.   :120.00
```

Including Plots

You can also embed plots, for example:



Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the

Figure 8: output_docx

Document

pagedown

paged HTML/Resume/Poster/Letter

4 2 Paged documents

launch a local web server via the **servr** package (Xie 2019a).

Please note that the layout of the pages is very sensitive to the zoom level in your browser. Elements on a page are often not zoomed strictly linearly, e.g., as you zoom out, certainly elements may start to collapse into each other. The 100% zoom level usually gives the best result (press `Ctrl + 0` or `Command + 0`). You are strongly recommended to use this level when printing the page to PDF.

2.2 The CSS overriding mechanism

We have provided a few default CSS stylesheets in this output format:

```
output:
  pagedown::html_paged:
    css: ["default-fonts", "default-page",
"default"]
```

To find the actual CSS files behind these names, use

2.3 Print to PDF 5

If you do not like any of these default stylesheets, you can use a subset of them, or override certain CSS rules. For example, if you do not like the default typeface, you may create a CSS file `my-fonts.css` (assuming it is under the same directory of your Rmd file):

```
body {
  font-family: "Palatino Linotype", "Book
Antiqua", Palatino, serif;
}
```

Then include this CSS file via the `css` option:

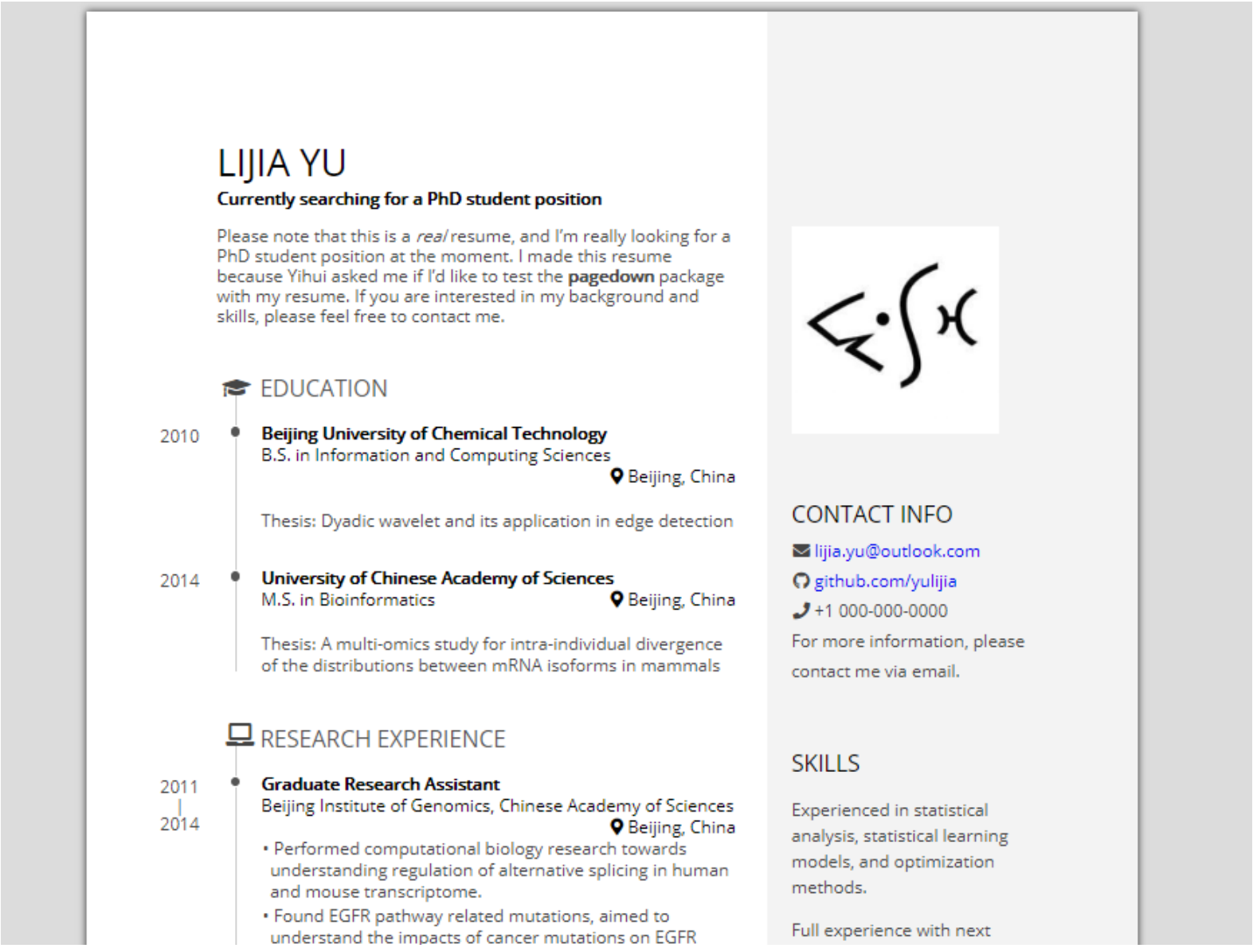
```
output:
  pagedown::html_paged:
    css: ["my-fonts.css", "default-page",
"default"]
```

Note that this overriding mechanism also works for other output formats in **pagedown**.

2.3 Print to PDF

Figure 9: paged_html

Document



LIJIA YU

Currently searching for a PhD student position

Please note that this is a *real* resume, and I'm really looking for a PhD student position at the moment. I made this resume because Yihui asked me if I'd like to test the **pagedown** package with my resume. If you are interested in my background and skills, please feel free to contact me.

EDUCATION

2010 — **Beijing University of Chemical Technology**
B.S. in Information and Computing Sciences
Beijing, China

Thesis: Dyadic wavelet and its application in edge detection

2014 — **University of Chinese Academy of Sciences**
M.S. in Bioinformatics
Beijing, China

Thesis: A multi-omics study for intra-individual divergence of the distributions between mRNA isoforms in mammals

RESEARCH EXPERIENCE

2011 | 2014 — **Graduate Research Assistant**
Beijing Institute of Genomics, Chinese Academy of Sciences
Beijing, China

- Performed computational biology research towards understanding regulation of alternative splicing in human and mouse transcriptome.
- Found EGFR pathway related mutations, aimed to understand the impacts of cancer mutations on EGFR

CONTACT INFO

lijia.yu@outlook.com
github.com/yulijia
+1 000-000-0000
For more information, please contact me via email.

SKILLS

Experienced in statistical analysis, statistical learning models, and optimization methods.

Full experience with next

Figure 10: paged_html

Document

```r
# 加载所需R包
library(ggplot2)
library(reshape2)
# 将PM25的各列列名调整为一列
PM25_melt <- melt(PM25)
# 对新数据集进行排序并绘制PM2.5浓度的分组箱线图
PM25_melt$variable = factor(PM25_melt$variable, levels =
    c("奥体中心","东四","丰台花园","南三环","农展馆","前门","万柳","西直门北"))
ggplot(PM25_melt,aes(x = variable,y = value))+
  geom_boxplot(fill = "moccasin")+
  xlab("")+
  ylab("PM2.5")+
  scale_y_continuous(breaks = seq(0, 350, 50))+
  theme_set(theme_bw())+
  theme(axis.text.x = element_text(angle = 90))
```

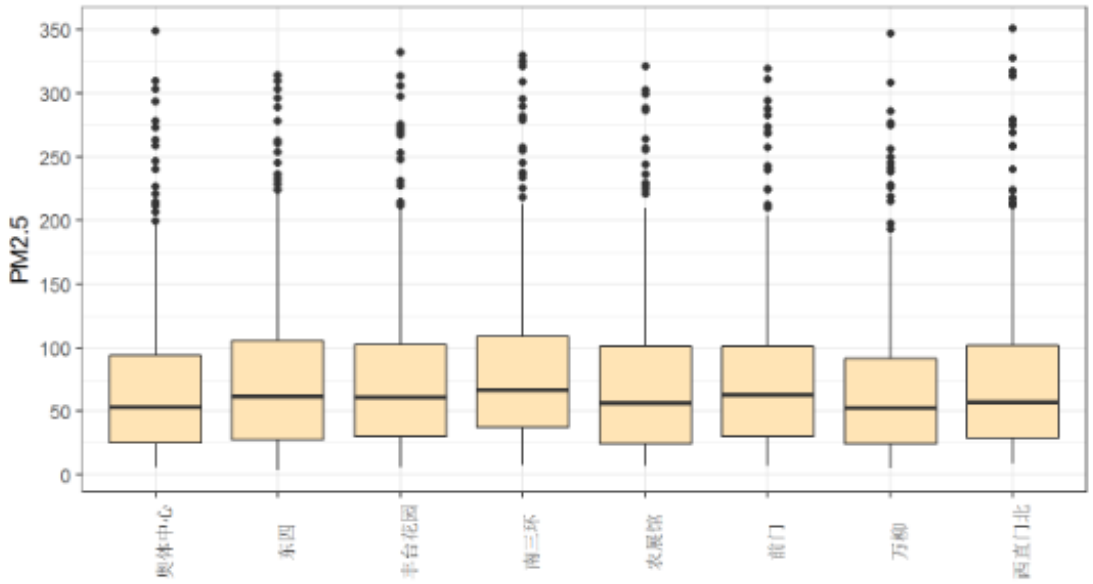


Figure 11: doc_example

Website/Blog

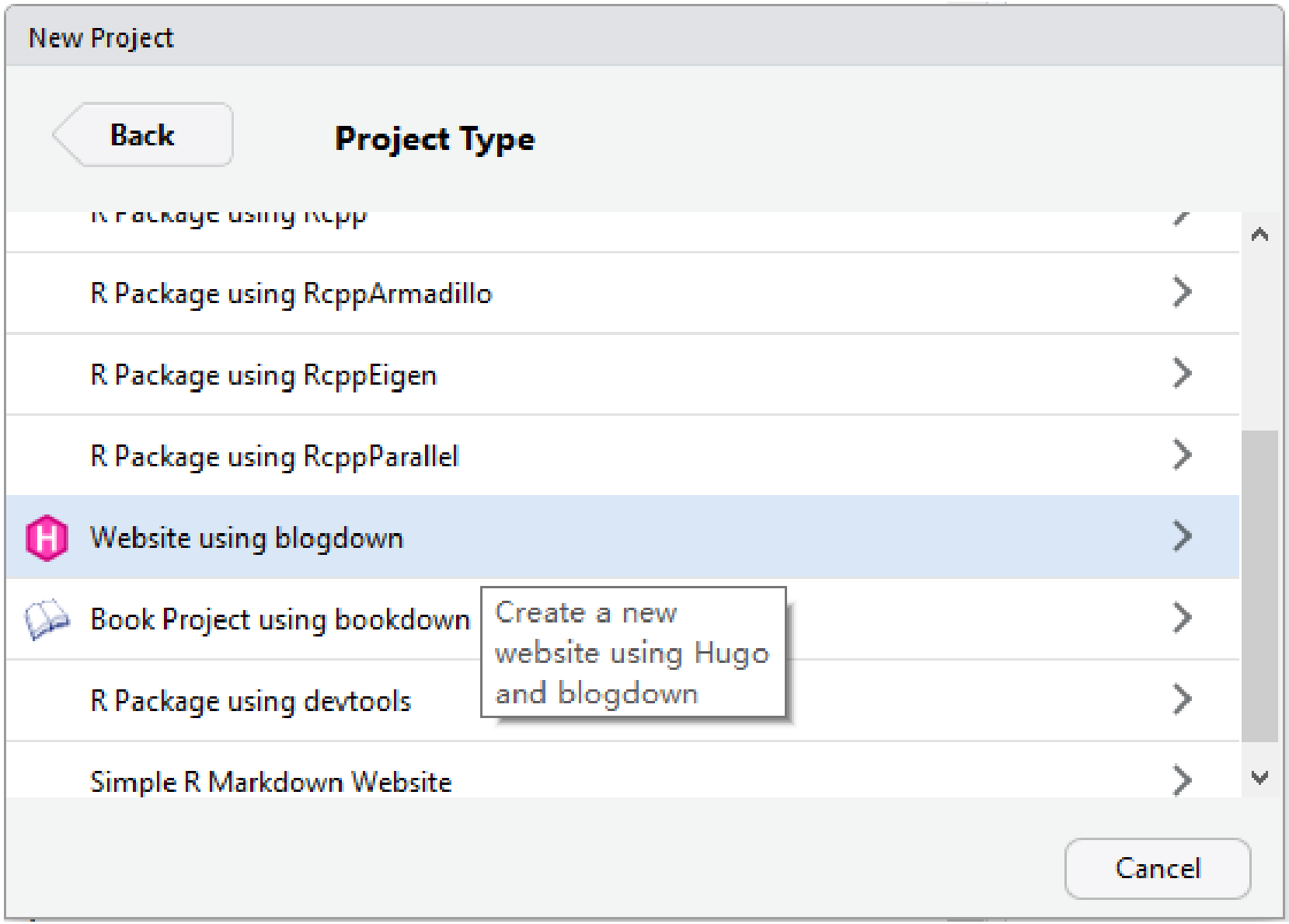
create and update blogs

- start
- blogdown
- content
- deployment

Figure 12: website_example

Website/Blog: **Start**

File > New Project > New Directory



Website/Blog: **Start**

blog_down::new_site()/blog_down::serve_site()

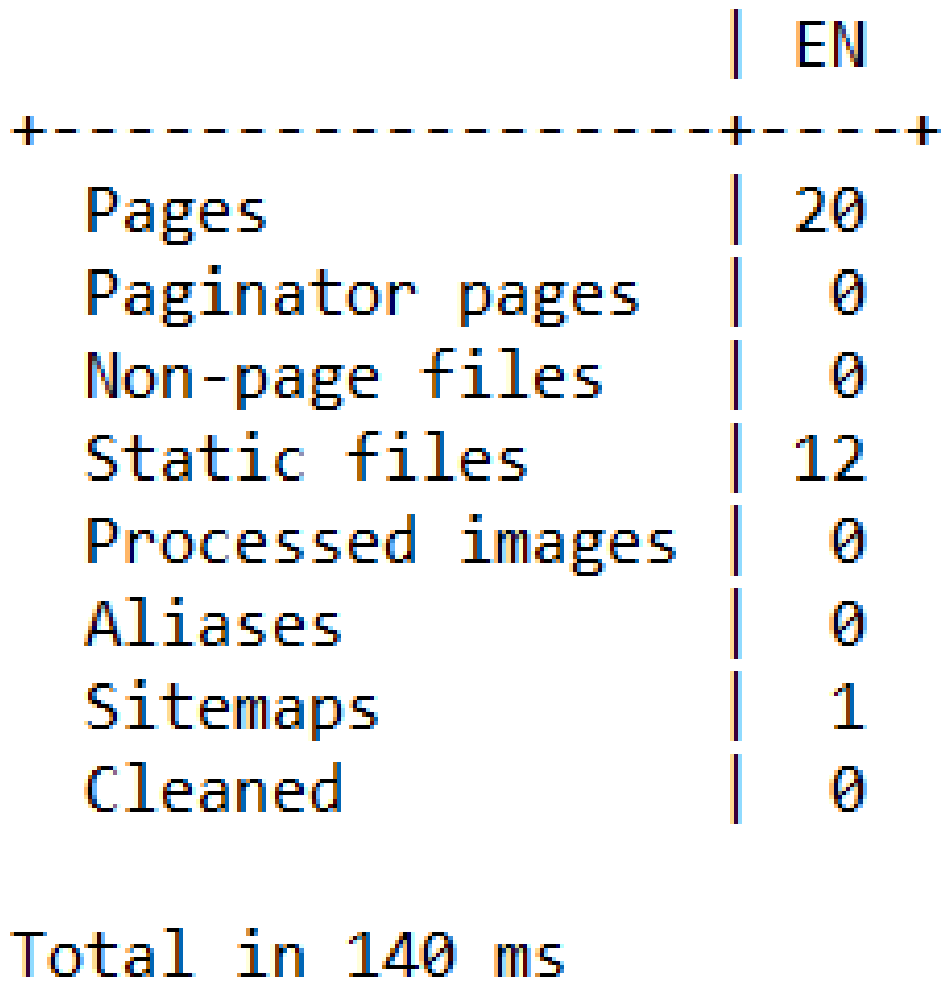


Figure 14: example

Website/Blog: **Start**

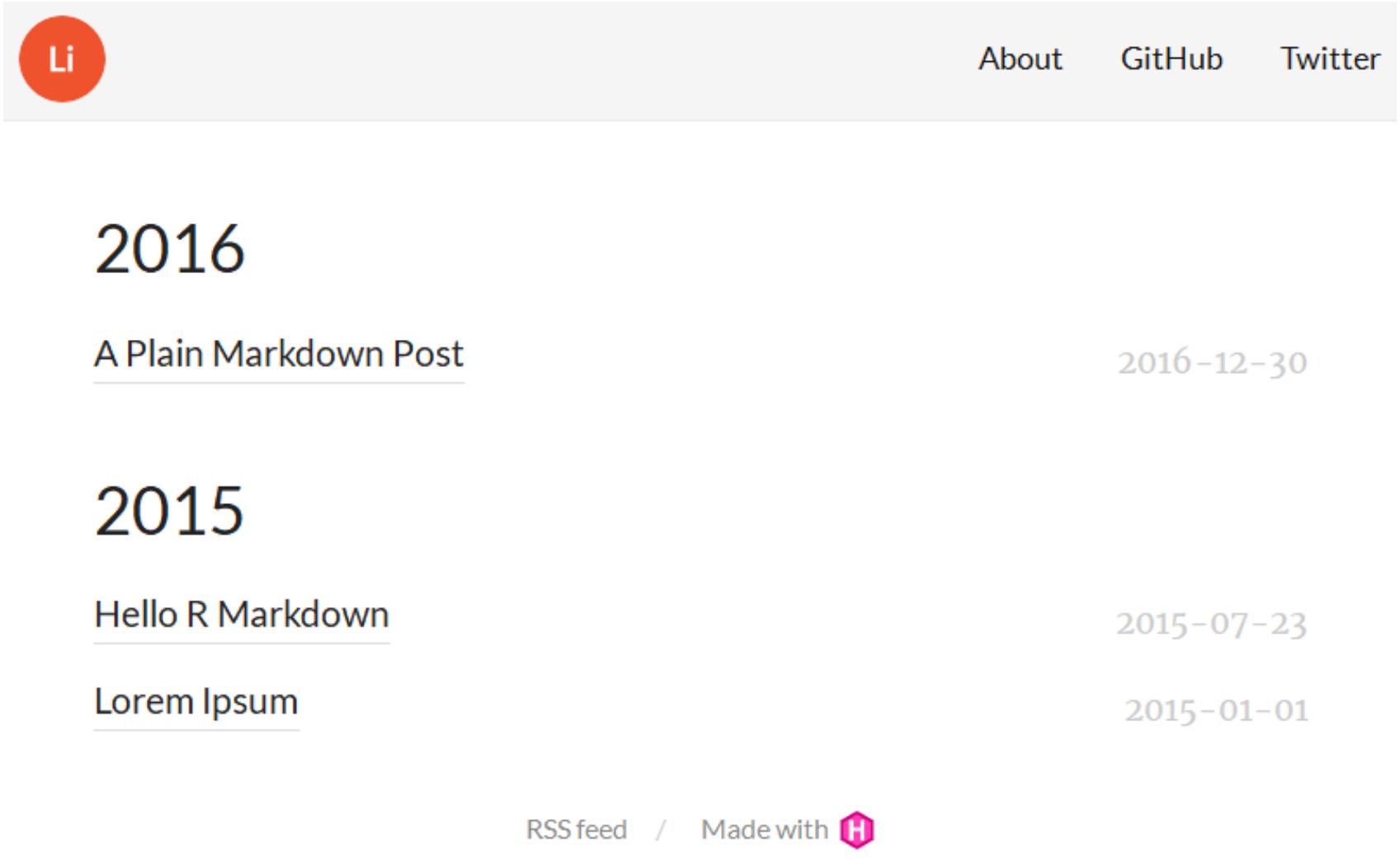


Figure 15: new_site

Website/Blog: **blogdown**

- hugo install_hugo()
- theme new_site(theme = "yihui/hugo-lithium")
- post

Addins

Filter...

Using RStudio Addins

Package	Name	Description
blogdown	Insert Image	Insert an external image into a blog post.
blogdown	New Post	Create a new post with blogdown::new_post().
blogdown	Quote Poem	Add > to the beginning of selected paragraphs and two trailing spaces to selected lines.
blogdown	Serve Site	Run blogdown::serve_site() to live preview a website locally.
blogdown	Touch File	Change the timestamp of the current file in the editor.
blogdown	Update Metadata	Update the title, author, date, categories, and tags of the current blog post.
bookdown	Input LaTeX Math	Input math expressions via the MathQuill library.
bookdown	Preview Book	Run bookdown::serve_book() to live preview a book.
tfruns	Training Run	Execute a training run with the current source document
tfruns	View Latest Run	View the most recent training run
tfruns	View Run History	View all training runs

Website/Blog: **Content**

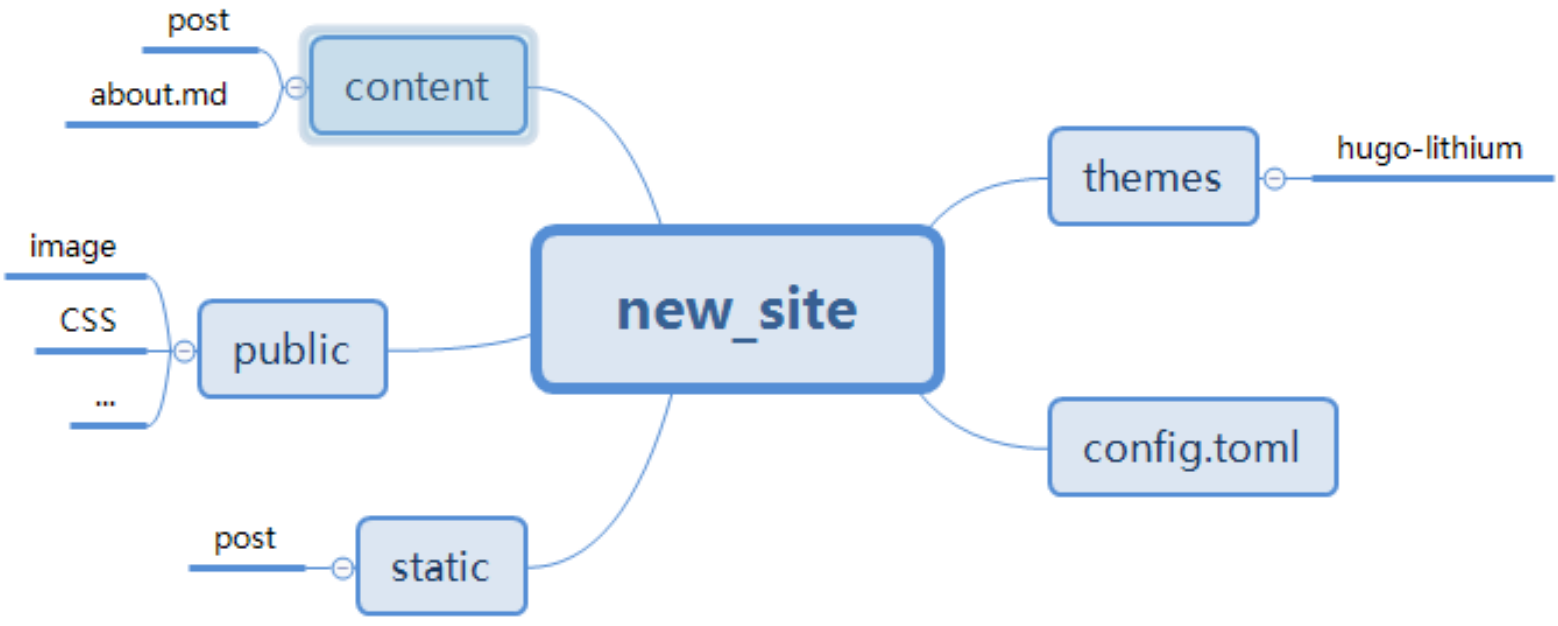


Figure 17: blog_content

Website/Blog: **Content**

config.toml:

```
baseurl = "/"
languageCode = "en-us"
title = "A Hugo website"
theme = "hugo-lithium"

[params]
  description = "A website built by Hugo and blogdown"

  highlightjsVersion = "9.12.0"
  highlightjsCDN = "//cdnjs.cloudflare.com/ajax/libs"
  highlightjsLang = ["r", "yaml"]
  highlightjsTheme = "github"
```

Website/Blog: **Deployment**

Github Pages

Netlify:

1. https://app.netlify.com/signup
2. Choose github and its repos
3. check the information

Website/Blog: **Tips**

- Also support Jekyll and Hexo
- Also support other formats(PDF,Word)
- options(blogdown.generator.server = TRUE)
- options(blogdown.hugo.server = c('-D', '-F', '–navigateToChanged'))
- options(blogdown.title_case = TRUE)

Presentation

```
---
title: "The application of R+HTML based on packages knitr and
rmarkdown"
author: "Yuxuan Li"
date: "2019.5.25"
output: beamer_presentation
---

## What is R+HTML
# R Markdown

## R Markdown

### Markdown

created by John Gruber in 2004

- a plain text formatting syntax
- a software tool, written in Perl, that converts the plain text
formatting to HTML

This is a simple demo:

| effect     | Markdown     |
| --------   | -----:       |
| **bold**   | \*\*text\*\* |
| *emphasize*| \*text\*     |
| ~~Strike-through~~| \~\~text\~\~ |
| Link       | `[title](http://)` |
```

Figure 18: pre_rmd

Additions

Prospect

- specify theme
- other contents
- other formats

References

1. https://bookdown.org/yihui/rmarkdown/
2. https://bookdown.org/yihui/blogdown/
3. https://resources.rstudio.com/r-markdown/
4. https://cosx.org/2018/01/build-blog-with-blogdown-hugo-netlify-github/
5. https://blog.coderzh.com/2015/08/29/hugo/
6. https://blog.csdn.net/kMD8d5R/article/details/82754968
7. https://rpubs.com/
8. https://resources.rstudio.com/r-markdown/

Thank you!