



Cabinet Office

Duncan Garmonsway

Data Scientist

Government Digital Service

@nacnudus

Customising R Markdown

~~Customising R Markdown~~

How R Markdown works

~~Customising R Markdown~~

~~How R Markdown works~~

How to work out how stuff
works

~~Customising R Markdown~~

~~How R Markdown works~~

~~How to work out how stuff
works~~

Contribute to {govdown}
and the RAP website

The RAP
website is
made with
{rmarkdown}

ALPHA This is a new service – your [feedback](#) will help us to improve it.

RAP: Reproducible Analytical Pipelines

The Reproducible Analytical Pipeline (RAP) is a methodology for automating the bulk of steps involved in creating a statistical report.

RAP is also a community of people who work with data using methods adapted from software development. The RAP community promotes the use of programming languages, version control, automated testing, peer review, and other tools and methods.

This website is a place for the community to publish materials that it finds useful. In particular, materials that include code can be published on this website.


Other RAP websites

The [RAP Champions network](#) is coordinated by the Government Statistical Service, who maintain a list of people to contact for help, a list of examples of RAP projects, and links to blog posts, guides and courses.

Contribute to this website

Contribute to this website by discussing it in the [Slack channel](#) (#rap_collaboration), or by opening an [issue on GitHub](#).

Actually it's
made with
{govdown}

 **govdown**

GOV.UK-style markdown documents

[Home](#) [Tech docs](#) [News](#)

ALPHA This is a new service – your [feedback](#) will help us to improve it.

Govdown

Govdown is an R package for creating websites and standalone HTML pages that use the GOV.UK Design System. This website is an example.

Use govdown in the same way as [R Markdown](#), but specify output: govdown::govdown_document instead of output: html_document in the YAML metadata of the document, or in the _site.yml file of the website.

Installation

The package is only hosted on GitHub, not on CRAN. Install it with the devtools package.

```
# install.packages("devtools") # if devtools is not already installed
devtools::install_github("ukgovdatascience/govdown")
```

Blog

Accessibility in government

Search blog



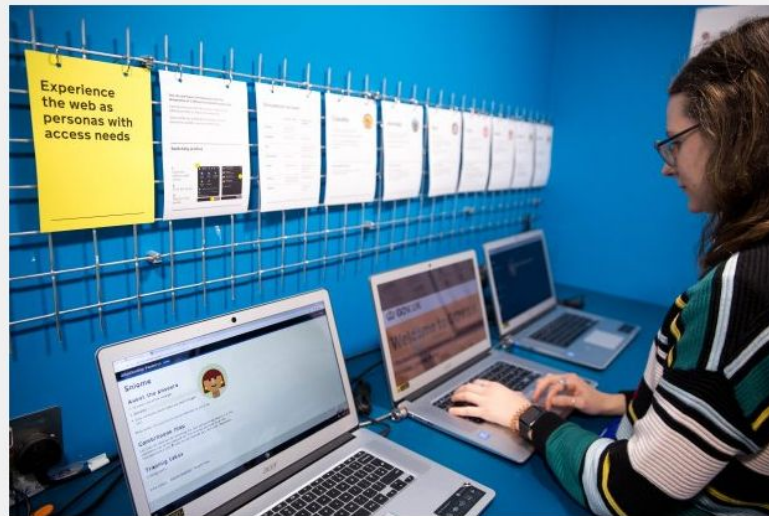
Organisations: [Civil Service](#)

Our websites
must be
accessible, by
law


Using persona profiles to test accessibility

At the Government Digital Service we've created a series of accessibility persona logs, so that people can experience different conditions and test their services. Here's how they work.

[Read more](#)



The GOV.UK Design System is accessible

 **GOV.UK** Design System

BETA This is a new service – your [feedback](#) will help us to improve it.

[Get started](#) [Styles](#) [Components](#) [Patterns](#) [Community](#)

Design your service using GOV.UK styles, components and patterns

Use this design system to make your service consistent with GOV.UK. Learn from the research and experience of other service teams and avoid repeating work that's already been done.

[Get started](#) ➤

Components

Inset text

[Open this example in a new window](#)

It can take up to 8 weeks to register a lasting power of attorney if there are no mistakes in the application.

HTML

Nunjucks

[Copy code](#)

```
<div class="govuk-inset-text">
  It can take up to 8 weeks to register a lasting power of attorney if
</div>
```

Output created: temp.html

```
##      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
```

You can also embed plots, for example:

temp/temp-rstudio - RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

temp.Rmd x Untitled.Rmd

Insert Run

```
---
title: "GOV.UK-style R Markdown
Document"
organisation: "govdown"
logo: "crown"
output:
  govdown::govdown_document:
    font: "new-transport"
---
```

This file will be rendered to look like GOV.UK. If it will be hosted on GOV.UK then set the crown logo and New Transport font.

```
---
title: "GOV.UK-style
standalone R Markdown document"
date: ""
output:
  govdown::govdown_document
```

3:12 GOV.UK-style R Markdown Document R Markdown

History Files Plots Connections Packages Help Viewer

temp-rstudio

Console Terminal R Markdown Jobs

~/Untitled/Untitled.Rmd


```
6_64-pc-linux-gnu-library/
3.5/govdown/rmarkdown/reso
urces/govuk.lua --resource
-path './home/nacnudus/R/
x86_64-pc-linux-gnu-librar
y/3.5/govdown/rmarkdown/re
sources' --highlight-style
=pygments --mathjax --incl
ude-in-header /tmp/Rtmp13Z
FPe/rmarkdown-str30b426ddf
b3e.html --include-before-
body /tmp/Rtmp13ZFPe/rmark
down-str30b4683b30fc.html
output file: Untitled.kni
t.md
```

Output created: Untitled.h
tml

Environment

~/temp/temp-rstudio/Untitled/Untitled.html

Untitled.html Open in Browser Find

 **govdown**

GOV.UK-style R Markdown Document

GOV.UK-style R Markdown Document

This file will be rendered to look like GOV.UK. If it will be hosted on GOV.UK then set the crown logo and New Transport font.

```
---
title: "GOV.UK-style standalone R
date: ""
output:
  govdown::govdown_document
logo: "crown"
font: "new-transport"
```

~~Customising R Markdown~~

~~How R Markdown works~~

How to work out how stuff
works

Sequence of
operations



R Markdown

knitr

markdown

pandoc + html template

HTML

browser


```
temp.Rmd x Untitled.Rmd x
---
title: "Untitled"
author: "Duncan Garmonsway"
date: "16/06/2018"
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:

18:12 Chunk 2: cars R Markdown

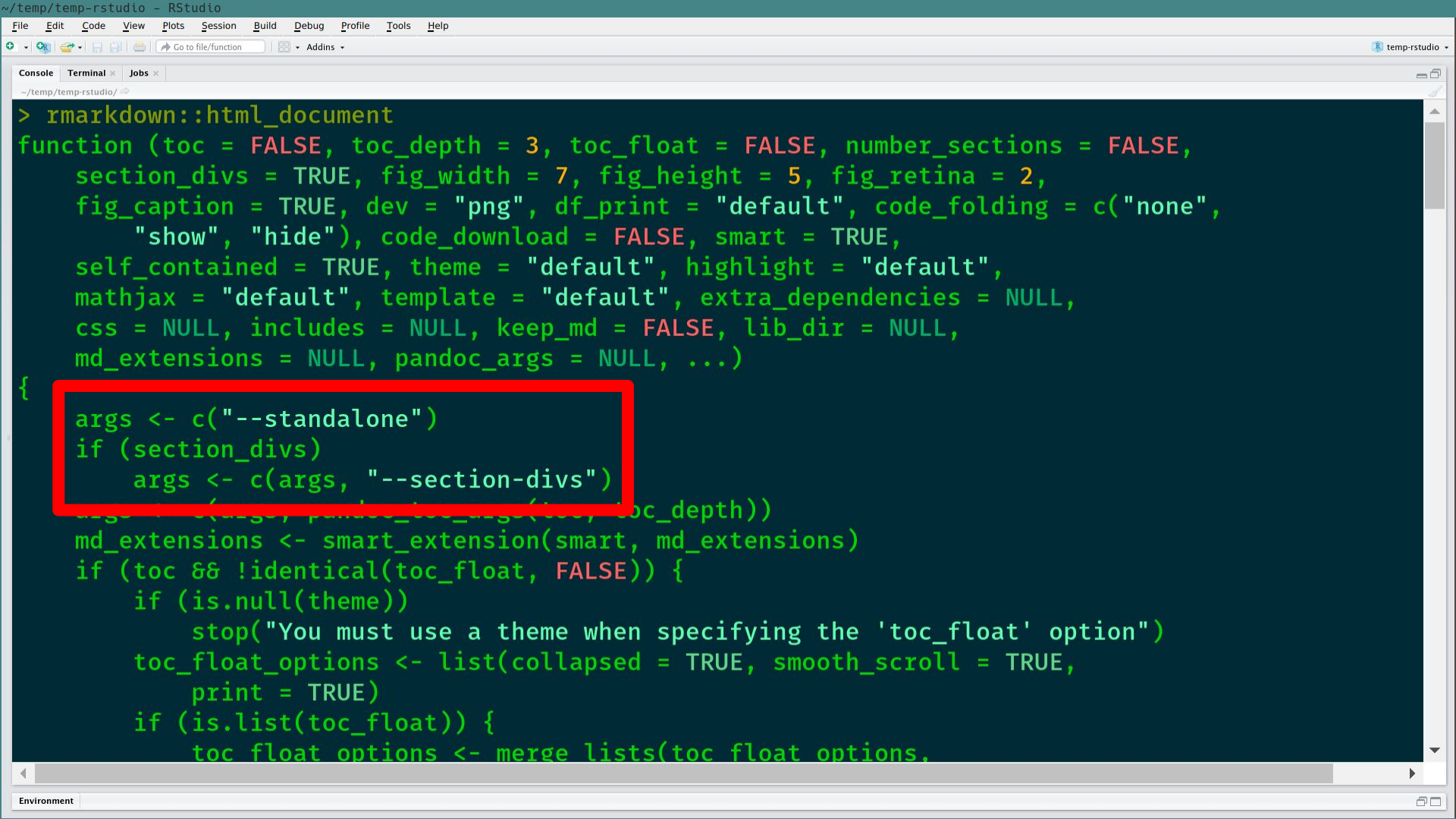
```
~/temp/temp-rstudio/temp.Rmd
/usr/lib/rstudio/bin/pandoc/pandoc +RTS -K
512m -RTS temp.utf8.md --to html4 --from m
arkdown+autolink_bare_uris+ascii_identifie
rs+tex_math_single_backslash+smart --output
temp.html --email-obfuscation none --sel
f-contained --standalone --section-divs --
template /home/nacnudus/R/x86_64-pc-linux-
gnu-library/3.5/rmarkdown/rmd/h/default.ht
ml --no-highlight --variable highlightjs=1
--variable 'theme:bootstrap' --include-in
-header /tmp/RtmpL2Mlk0/rmarkdown-str324d3
4e707a3.html --mathjax --variable 'mathjax
-url:https://mathjax.rstudio.com/latest/Ma
thJax.js?config=TeX-AMS-MML_HTMLorMML'
output file: temp.knit.md
```

Output created: temp.html

```
> rmarkdown::html_document
function (toc = FALSE, toc_depth = 3, toc_float = FALSE, number_sections = FALSE,
  section_divs = TRUE, fig_width = 7, fig_height = 5, fig_retina = 2,
  fig_caption = TRUE, dev = "png", df_print = "default", code_folding = c("none",
    "show", "hide"), code_download = FALSE, smart = TRUE,
  self_contained = TRUE, theme = "default", highlight = "default",
  mathjax = "default", template = "default", extra_dependencies = NULL,
  css = NULL, includes = NULL, keep_md = FALSE, lib_dir = NULL,
  md_extensions = NULL, pandoc_args = NULL, ...)
{
  args <- c("--standalone")
  if (section_divs)
    args <- c(args, "--section-divs")
  args <- c(args, pandoc_toc_args(toc, toc_depth))
  md_extensions <- smart_extension(smart, md_extensions)
  if (toc && !identical(toc_float, FALSE)) {
    if (is.null(theme))
      stop("You must use a theme when specifying the 'toc_float' option")
    toc_float_options <- list(collapsed = TRUE, smooth_scroll = TRUE,
      print = TRUE)
    if (is.list(toc_float)) {
      toc_float_options <- merge_lists(toc_float_options,
```

```
function (toc = FALSE, toc_depth = 3, toc_float = FALSE, number_sections = FALSE,  
  section_divs = TRUE, fig_width = 7, fig_height = 5, fig_retina = 2,  
  fig_caption = TRUE, dev = "png", df_print = "default", code_folding = c("none",  
    "show", "hide"), code_download = FALSE, smart = TRUE,  
  self_contained = TRUE, theme = "default", highlight = "default",  
  mathjax = "default", template = "default", extra_dependencies = NULL,  
  css = NULL, includes = NULL, keep_md = FALSE, lib_dir = NULL,  
  md_extensions = NULL, pandoc_args = NULL, ...)
```

```
{  
  args <- c("--standalone")  
  if (section_divs)  
    args <- c(args, "--section-divs")  
  args <- c(args, pandoc_toc_args(toc, toc_depth))  
  md_extensions <- smart_extension(smart, md_extensions)  
  if (toc && !identical(toc_float, FALSE)) {  
    if (is.null(theme))  
      stop("You must use a theme when specifying the 'toc_float' option")  
    toc_float_options <- list(collapsed = TRUE, smooth_scroll = TRUE,  
      print = TRUE)  
    if (is.list(toc_float)) {  
      toc_float_options <- merge_lists(toc_float_options,
```

```

> rmarkdown::html_document
function (toc = FALSE, toc_depth = 3, toc_float = FALSE, number_sections = FALSE,
  section_divs = TRUE, fig_width = 7, fig_height = 5, fig_retina = 2,
  fig_caption = TRUE, dev = "png", df_print = "default", code_folding = c("none",
    "show", "hide"), code_download = FALSE, smart
  self_contained = TRUE, theme = "default", highlightjs
  mathjax = "default", template = "default", extra_css
  css = NULL, includes = NULL, keep_md = FALSE, lib
  md_extensions = NULL, pandoc_args = NULL, ...)
{
  args <- c("--standalone")
  if (section_divs)
    args <- c(args, "--section-divs")
  args <- c(args, pandoc_args(toc, toc_depth))
  md_extensions <- smart_extension(smart, md_extensions)
  if (toc && !identical(toc_float, FALSE)) {
    if (is.null(theme))
      stop("You must use a theme when specifying the 'toc_float' option")
    toc_float_options <- list(collapsed = TRUE, smooth_scroll = TRUE,
      print = TRUE)
    if (is.list(toc_float)) {
      toc_float_options <- merge_lists(toc_float_options,

```

```

rmarkdown+autotlink_bare_urls+ascii_identifiers+tex_math_single_backslash+smart --out
t temp.html --email-obfuscation none --s
f-contained --standalone --section-divs
template /home/nachudus/R/x86_64-pc-linux
gnu-library/3.5/rmarkdown/rmd/h/default.l
ml --no-highlight --variable highlightjs

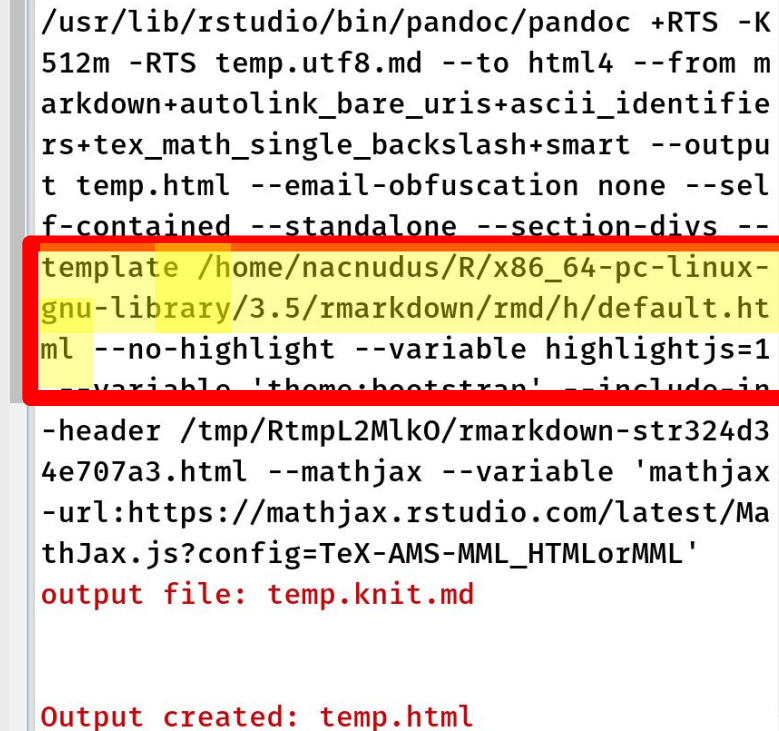
```

You can also read
the source online

The screenshot shows a GitHub web interface for the repository `rstudio / rmarkdown`. The top navigation bar includes links for `Code`, `Issues` (93), `Pull requests` (7), `Projects` (0), `Wiki`, `Pulse`, and `Community`. Below the navigation bar, there is a dropdown menu for the `Branch: master` and buttons for `Find file` and `Copy path`. The main content area displays the file path `rmarkdown / inst / rmd / h / default.html`. A commit summary by `Rlesur` is shown, with the message `Fix #1235: Indent Level Headings in TOC (#1243)` and a commit hash of `67a36c6` from 15 days ago. Below the commit summary, it indicates `17 contributors`. The file content is displayed in a code editor with tabs for `Raw`, `Blame`, and `History`. The file statistics show `646 lines (558 sloc)` and `11.9 KB`. The code content is as follows:

```
1 <!DOCTYPE html>
2
3 <html xmlns="http://www.w3.org/1999/xhtml"$if(lang)$ lang="$lang$" xml:lar
4
5 <head>
6
7 <meta charset="utf-8" />
8 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
9 <meta name="generator" content="pandoc" />
```

The HTML template
file is on my computer

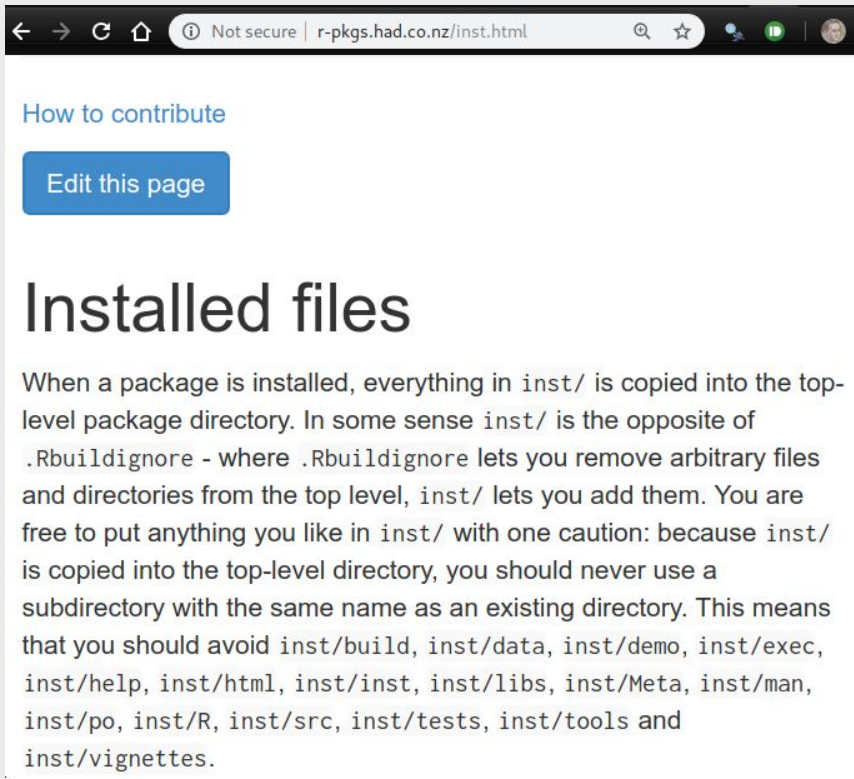


```
/usr/lib/rstudio/bin/pandoc/pandoc +RTS -K
512m -RTS temp.utf8.md --to html4 --from m
arkdown+autolink_bare_uris+ascii_identifie
rs+tex_math_single_backslash+smart --outpu
t temp.html --email-obfuscation none --sel
f-contained --standalone --section-divs --
template /home/nacnudus/R/x86_64-pc-linux-
gnu-library/3.5/rmarkdown/rmd/h/default.ht
ml --no-highlight --variable highlightjs=1
--variable 'theme:bootstrap' --include-in
-header /tmp/RtmpL2Mlk0/rmarkdown-str324d3
4e707a3.html --mathjax --variable 'mathjax
-url:https://mathjax.rstudio.com/latest/Ma
thJax.js?config=TeX-AMS-MML_HTMLorMML'
output file: temp.knit.md

Output created: temp.html
```

You can install files on users' computers along with your package

R packages by Hadley Wickham



The screenshot shows a web browser window with the address bar displaying 'r-pkgs.had.co.nz/inst.html'. The page content includes a 'How to contribute' link, an 'Edit this page' button, and a section titled 'Installed files'. The text under 'Installed files' explains that when a package is installed, the contents of the 'inst/' directory are copied into the top-level package directory. It notes that 'inst/' is the opposite of '.Rbuildignore', which is used to remove files and directories from the top level. It warns that 'inst/' should not be used to add files or directories that already exist at the top level, as they would be overwritten. A list of existing directories is provided: inst/build, inst/data, inst/demo, inst/exec, inst/help, inst/html, inst/inst, inst/libs, inst/Meta, inst/man, inst/po, inst/R, inst/src, inst/tests, inst/tools, and inst/vignettes.

How to contribute

Edit this page

Installed files

When a package is installed, everything in `inst/` is copied into the top-level package directory. In some sense `inst/` is the opposite of `.Rbuildignore` - where `.Rbuildignore` lets you remove arbitrary files and directories from the top level, `inst/` lets you add them. You are free to put anything you like in `inst/` with one caution: because `inst/` is copied into the top-level directory, you should never use a subdirectory with the same name as an existing directory. This means that you should avoid `inst/build`, `inst/data`, `inst/demo`, `inst/exec`, `inst/help`, `inst/html`, `inst/inst`, `inst/libs`, `inst/Meta`, `inst/man`, `inst/po`, `inst/R`, `inst/src`, `inst/tests`, `inst/tools` and `inst/vignettes`.


```
temp/temp-rstudio - RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function Addins temp-rstudio
temp.Rmd x default.html x Untitled.Rmd x
body Next Prev All Replace Replace All
In selection Match case Whole word Regex Wrap
<body>
<h1>HELP I'M TRAPPED IN R MARKDOWN!</h1>
$if(theme)$
<div class="container-fluid main-container">
$if(toc_float)$
<!-- setup 3col/9col grid for toc_float and
main content -->
<div class="row-fluid">
<div class="col-xs-12 col-sm-4 col-md-3">
<div id="$idprefix$TOC" class="tocify">
</div>
</div>
<div class="toc-content col-xs-12 col-sm-8 col-md-9">
```

temp.html Open in Browser Find Publish

HELP I'M TRAPPED IN R MARKDOWN!

Untitled

Duncan Garmonsway

16/04/2019

R Markdown

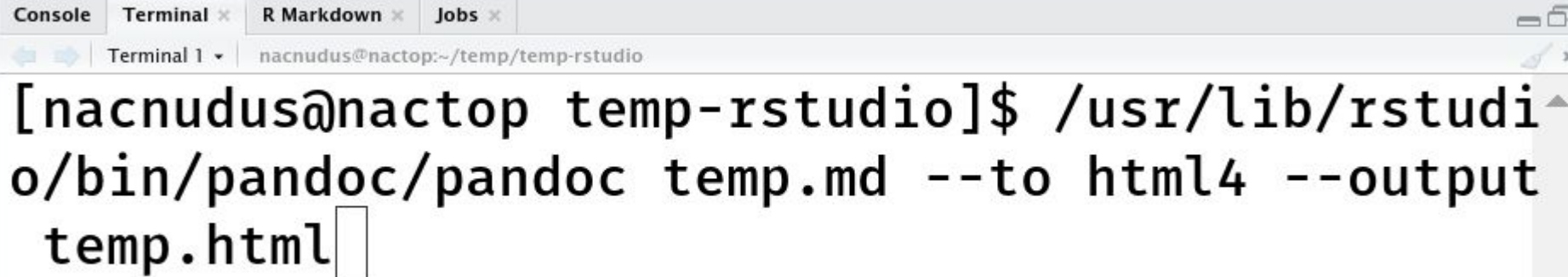
This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

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)
```

Run pandoc in the terminal and edit the arguments

```
---  
title: "Untitled"  
author: "Duncan Garmonsway"  
date: "16/04/2019"  
output:  
  html_document:  
    keep_md: true  
---
```



The screenshot shows the RStudio interface with a terminal window open. The terminal title bar includes tabs for 'Console', 'Terminal', 'R Markdown', and 'Jobs'. The active terminal window is titled 'Terminal 1' and shows the command prompt 'necnudus@nactop:~/temp/temp-rstudio'. The command entered is `/usr/lib/rstudio/bin/pandoc/pandoc temp.md --to html4 --output temp.html`, with the cursor at the end of the line.

```
Console Terminal x R Markdown x Jobs x  
Terminal 1 | necnudus@nactop:~/temp/temp-rstudio  
[necnudus@nactop temp-rstudio]$ /usr/lib/rstudio  
o/bin/pandoc/pandoc temp.md --to html4 --output  
temp.html
```

Default

Untitled

Duncan Garmonsway

16/04/2019

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
```

Hacked

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:

Customising R Markdown

Custom css controls appearance

```
output:  
  html_document:  
    keep_md: true  
    css: temp.css
```

```
h2 {  
  font-size: 11em;  
}
```

Untitled

Duncan Garmonsway

16/04/2019

R
Marko

The GOV.UK Design System CSS only works on elements with a particular 'class'

It can take up to 8 weeks to register a lasting power of attorney if there are no mistakes in the application.

HTML

Nunjucks

Copy code

```
<div class="govuk-inset-text">  
  It can take up to 8 weeks to register a lasting power of attorney i  
</div>
```

Lua is a language that
can modify the way
pandoc writes HTML

Pandoc Lua Filters

Introduction

Pandoc has long supported filters, which allow the pandoc abstract syntax tree (AST) to be manipulated between the parsing and the writing phase. [Traditional pandoc filters](#) accept a JSON representation of the pandoc AST and produce an altered JSON representation of the AST. They may be written in any programming language, and invoked from pandoc using the `--filter` option.

This is the Lua ‘filter’ to add a GOV.UK class to inset text

```
-- Inset text
BlockQuote = function(el)
  return pandoc.Div(el.content, pandoc.Attr("", {"govuk-inset-text"}))
end
```

Learn more about Lua filters on the {govdown} website



govdown

GOV.UK-style markdown documents

Home

[Tech docs](#)

News

ALPHA

This is a new service – your [feedback](#) will help us to improve it.

Technical Documentation

This page explains the design and implementation of Govdown.

Design

Govdown was created so that the [Reproducible Analytical Pipelines](#) community could publish its materials on the web, collaboratively, using familiar technology, using accessible components from the GOV.UK Design System.



Cabinet Office

Thanks!

Duncan Garmonsway
@nacnudus