Dynamic documents in R

reproducible research with R Markdown

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Artwork by @allison_horst

R Markdown

Authoring framework: code and text in same document

Reproducible: re-run your analysis

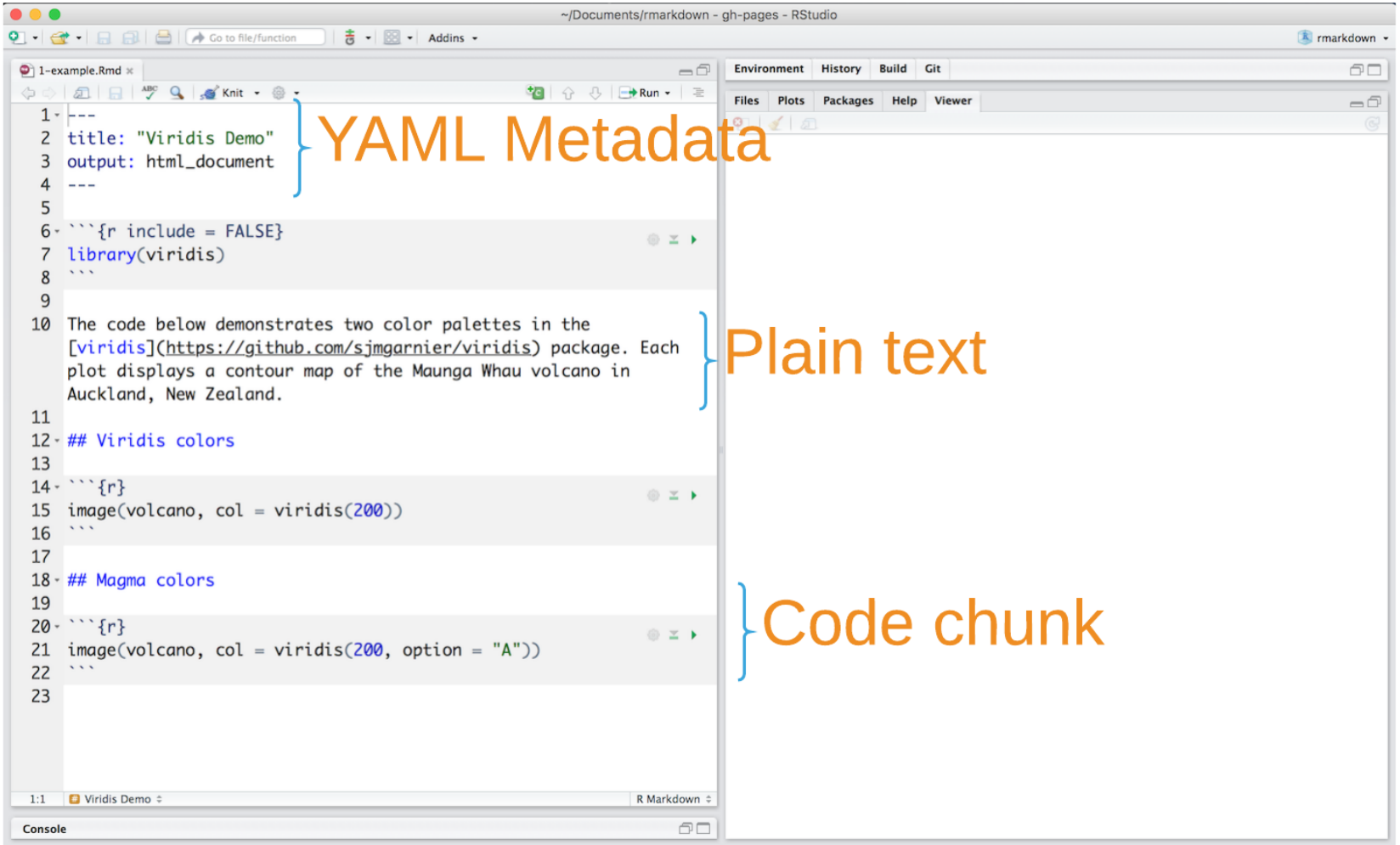
Flexible: Output to different formats easily


knitting

Your turn 1

Create a new R Markdown file. Go to File > New File > R Markdown. Press OK. Save the file and press the "Knit" button above.

02:00


~/Documents/rmarkdown - gh-pages - RStudio
Addins
rmarkdown
1-example.Rmd
Knit
Run
Environment
History
Build
Git
Files
Plots
Packages
Help
Viewer
1 ---
2 title: "Viridis Demo"
3 output: html_document
4 ---
5
6 ```{r include = FALSE}
7 library(viridis)
8 ```
9
10 The code below demonstrates two color palettes in the
[viridis](https://github.com/sjmgarnier/viridis) package. Each
plot displays a contour map of the Maunga Whau volcano in
Auckland, New Zealand.
11
12 ## Viridis colors
13
14 ```{r}
15 image(volcano, col = viridis(200))
16 ```
17
18 ## Magma colors
19
20 ```{r}
21 image(volcano, col = viridis(200, option = "A"))
22 ```
23
YAML Metadata
Plain text
Code chunk
1:1
Viridis Demo
R Markdown
Console

R Markdown

Prose

Code

Metadata

R Markdown

Prose = **Markdown**

Code

Metadata

Basic Markdown Syntax

```
*italic*   **bold**

_italic_   __bold__
```

Basic Markdown Syntax

```
# Header 1

## Header 2

### Header 3
```

Try this later:

Do the ten-twenty minute tutorial on markdown at https://commonmark.org/help/tutorial.

R Markdown

Prose

Code = **R code chunks**

Metadata

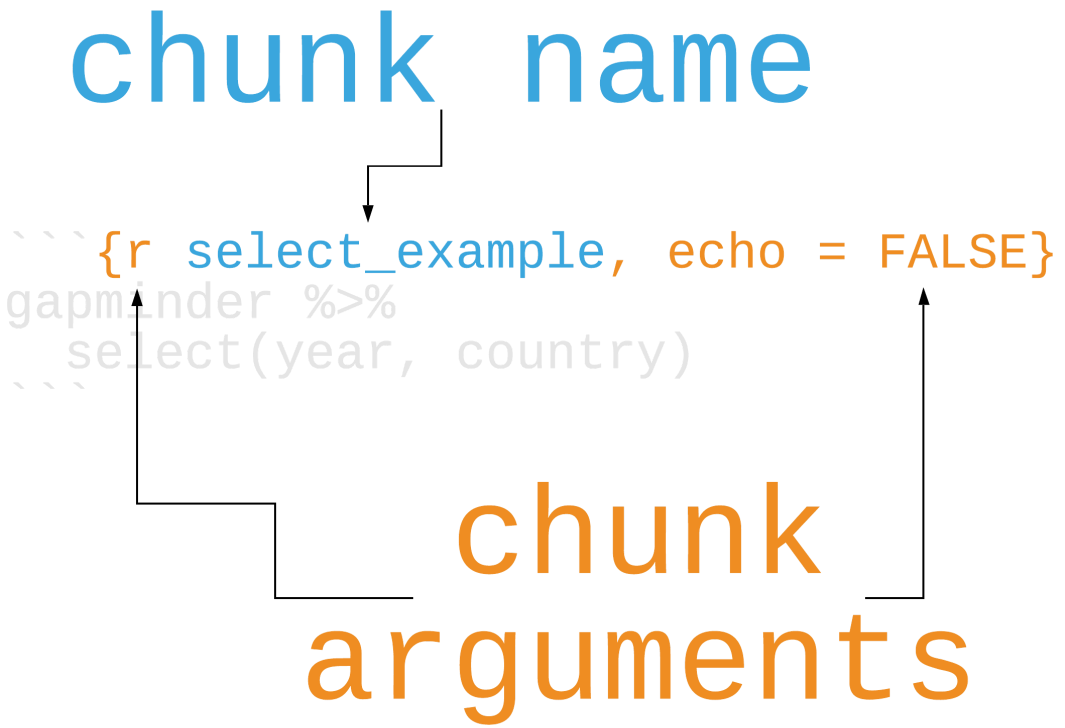
Code chunks

````
```{r select_example, echo = FALSE}
gapminder %>%
  select(year, country)
```
````

Code chunks


fences (3 backticks)
```{r select_example, echo = FALSE}
gapminder %>%
  select(year, country)
```

Code chunks


chunk name
```{r select_example, echo = FALSE}
gapminder %>%
select(year, country)
```
chunk
arguments

Chunk options

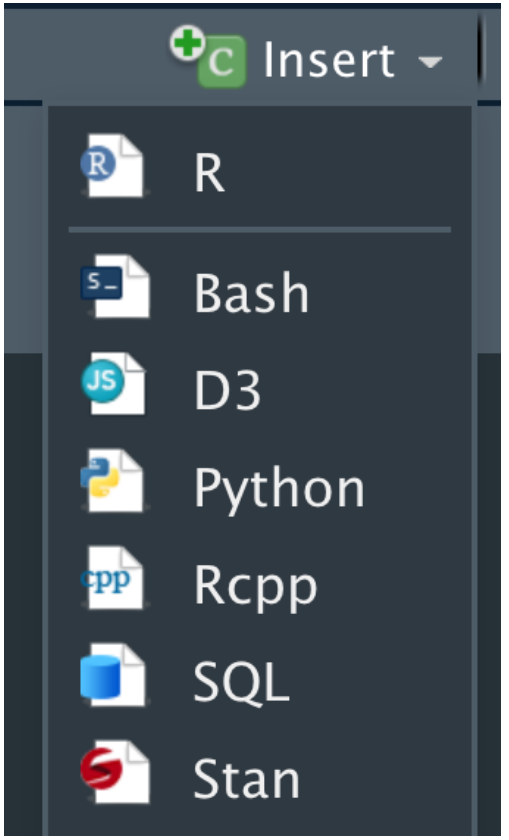
Option	Effect
include = FALSE	run the code but don't print it or results
eval = FALSE	don't evaluate the code
echo = FALSE	run the code and output but don't print code
message = FALSE	don't print messages (e.g. from a function)
warning = FALSE	don't print warnings
fig.cap = "Figure 1	caption output plot with "Figure 1"

See the knitr web page

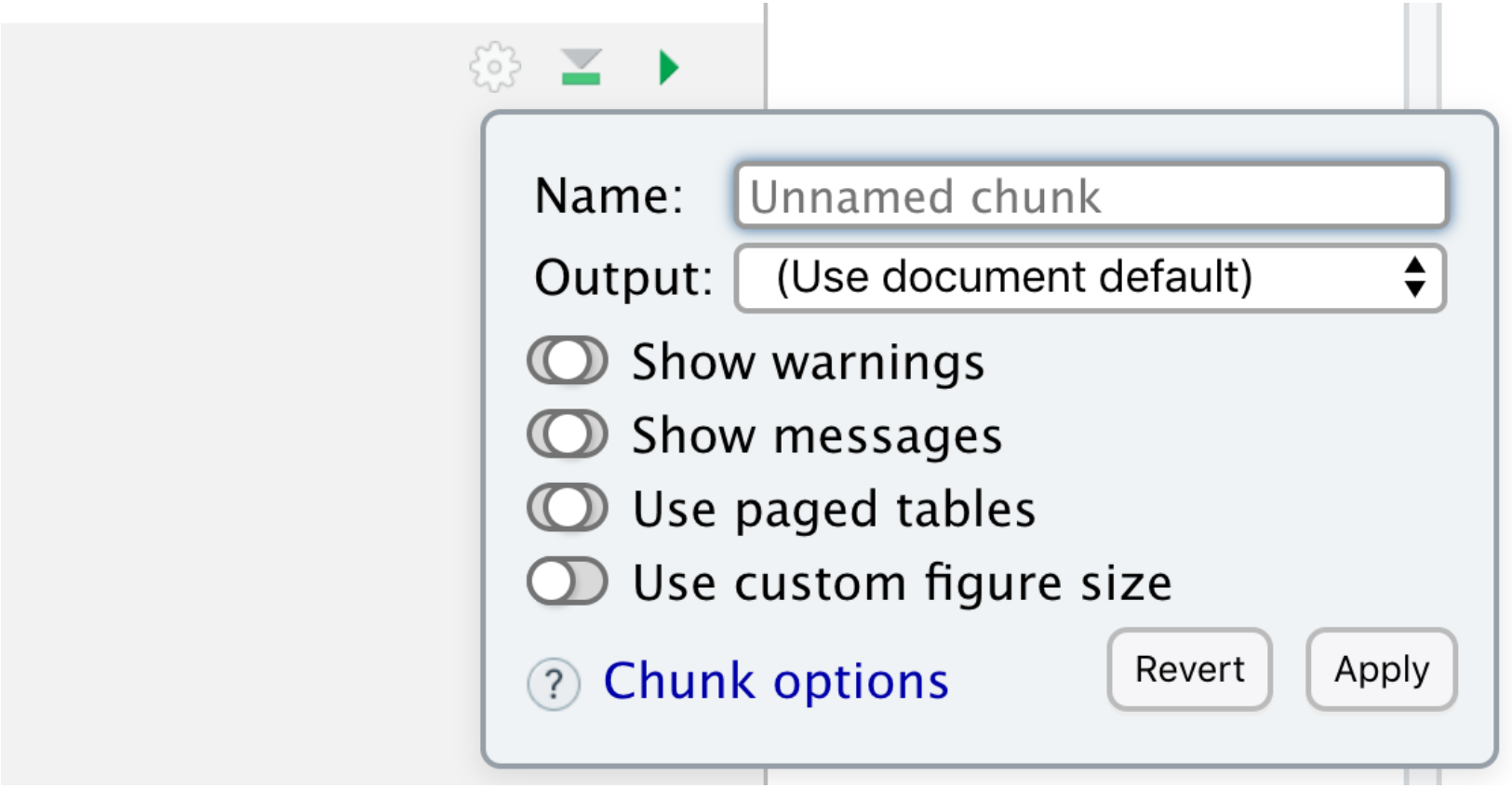
Engines

52! Including **Python**, **Julia**, **C++**, **SQL**, **SAS**, and **Stata**

Insert code chunks with cmd/ctrl + alt/option + I



Edit code chunk options



Your turn 2 (open 04_exercises_rmarkdown.Rmd)

Create a code chunk. You can type it in manually, use the keyboard short-cut (Cmd/Ctrl + Option/Alt + I), or use the "Insert" button above. Put the following code in it:

```
gapminder %>%
  slice(1:5) %>%
  knitr::kable()
```

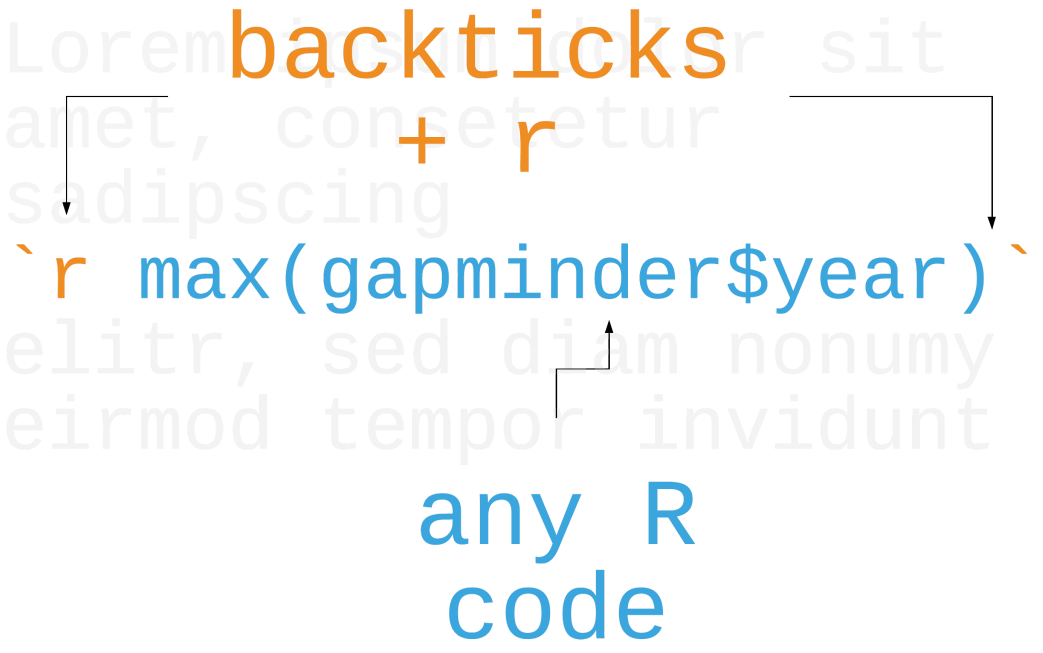
Knit the document

03:00

Inline Code

```
Lorem ipsum dolor sit
amet, consetetur
sadipscing
`r max(gapminder$year)`
elitr, sed diam nonumy
eirmod tempor invidunt
```

Inline Code



Your turn 3

Remove eval = FALSE **so that R Markdown evaluates the code.**

Use summarize() **and** n_distinct() **to get the the number of unique years in gapminder and save the results as** n_years**.**

Use inline code to describe the data set in the text below the code chunk and re-knit.

05:00

R Markdown

Prose

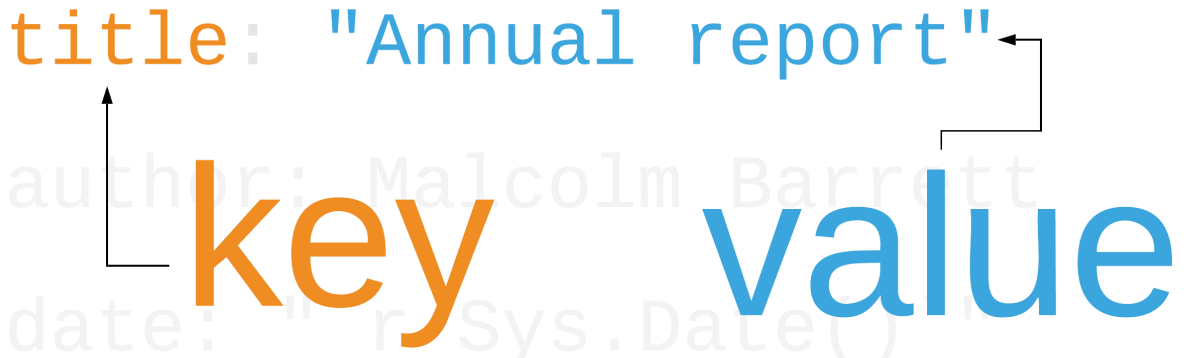
Code

Metadata = **YAML**

YAML Metadata

```
---
author: Malcolm Barrett
title: Quarterly Report
output:
  html_document: default
  pdf_document:
    toc: true
---
```

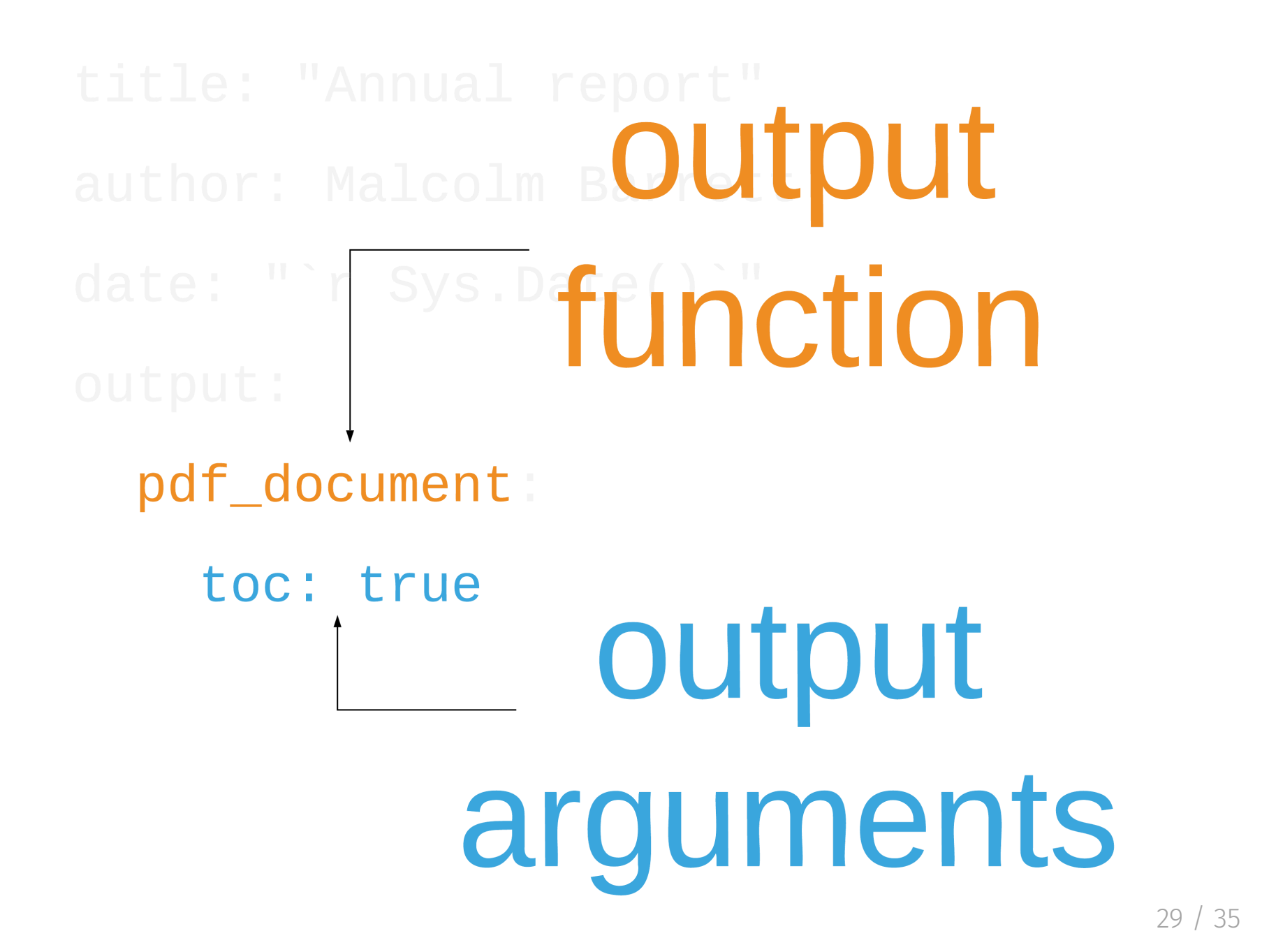
```
title: "Annual report"
author: Malcolm Barrett
date: "`r Sys.Date()`"
output:
  pdf_document:
    toc: true
```


title: "Annual report"
key
value

```
title: "Annual report"
author: Malcolm Barrett
date: "`r Sys.Date()`"
output:
  pdf_document:
    toc: true
```

top level

nested


output
function
pdf_document:
toc: true
output
arguments

```
title: "Annual report"
author: Malcolm Barrett
date: "`r Sys.Date()`"
output:
  pdf_document:
    toc: true
```

pdf_document(toc = TRUE)

Output formats

Function	Outputs
html_document()	HTML
pdf_document()	PDF
word_document()	Word .docx
odt_document()	.odt
rtf_document()	.rtf
md_document()	Markdown
slidy_presentation()	Slidy Slides (HTML)
beamer_presentation()	Beamer Slides (PDF)
ioslides_presentation()	ioslides (HTML)
powerpoint_presentation()	Powerpoint Slides

Your turn 4

Set figure chunk options such as dpi**,** fig.width**, and** fig.height**. Run** knitr::opts_chunk$get() **in the console to see the defaults.**

Change the YAML header above from output: html_document **to another output type like** pdf_document **or** word_document**.**

Add your name to the YAML header using author: Your Name**.**

05:00

What else can you do in R Markdown?

Parameterized reports

Include bibliographies and citations

Make cool stuff in R Markdown!

bookdown

blogdown

these slides!

Resources

R Markdown: A comprehensive but friendly introduction to R Markdown and friends. Free online.

R for Data Science: A comprehensive but friendly introduction to the tidyverse. Free online.

R Markdown for Scientists: R Markdown for Scientists workshop material.