

ICO Workshop R & RStudio

Part 2

Markdown & Quarto

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Overview

- What is markdown --- ([Go to that section](#))
- Integrating Markdown and R code --- ([Go to that section](#))
- Creating a basic Quarto document --- ([Go to that section](#))

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1. What is markdown?

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Markdown

- 'low end' text editor system
- make content that can be read on different systems
- mainly easy way to generate **html** files
- you write in 'plain text' and an interpreter generates an nice edited version

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Basic syntax

Element	Markdown Syntax
Heading	# H1 ## H2 ### H3
Bold	**bold text**
Italic	<i>*italicized text*</i>
Blockquote	> blockquote
Ordered List	1. First item 2. Second item 3. Third item
Unordered List	- First item - Second item - Third item
Code	`code`
Horizontal Rule	---
Link	[title](https://www.example.com)
Image	![alt text](image.jpg)

Extension

Element	Markdown Syntax
Table	Syntax Description ----- ----- Header Title Paragraph Text
Fenced Code Block	```\n{\n "firstName": "John",\n "lastName": "Smith",\n "age": 25\n}\n```
Footnote	Here's a sentence with a footnote. [^1]\n\n[^1]: This is the footnote.
Heading ID	### My Great Heading {#custom-id}
Definition List	term\n: definition
Strikethrough	~~The world is flat.~~
Task List	- [x] Write the press release\n- [] Update the website\n- [] Contact the media

2. Integrating Markdown and R code

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Rmarkdown & Quarto

Two roads with the same destination, but...

Rmarkdown

- developed 10 years ago by RStudio company
- an R package
- only works in RStudio
- still supported but no major advances in development
- generates pdf, html and word-docs

Quarto

- recently developed by RStudio company
- stand alone software
- integrates with RStudio but also with other software
- cross-language platform (python, Julia, Observable, ...)
- all new cool new stuff will be implemented in Quarto
- generates pdf, html, word, open-office, ppt, ePub, Observable JS, Jira Wiki, websites, online books, etc
- CEO of RStudio company announced the development of an online editing application (like google docs)

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How Quarto works...



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Quarto info

If you want to learn more about Quarto, a lot of information is available at

<https://quarto.org/docs/guide/>

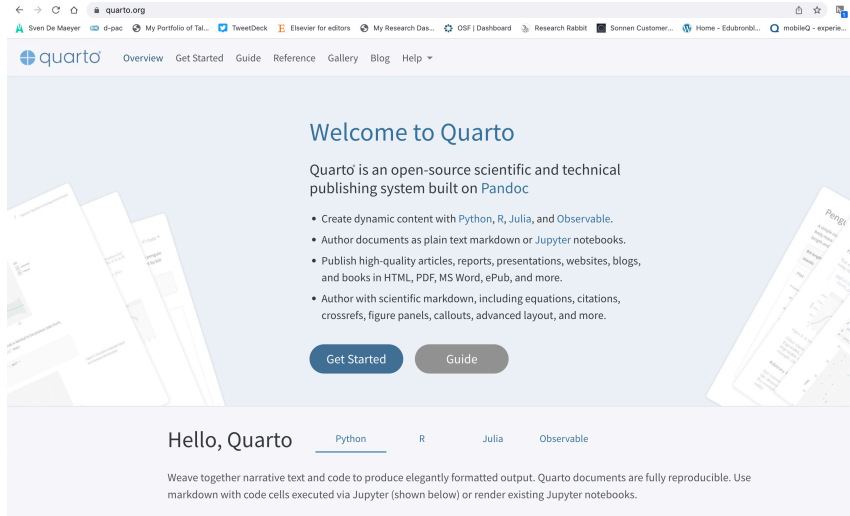
AND

there are great extensions!

see: <https://quarto.org/docs/extensions/>

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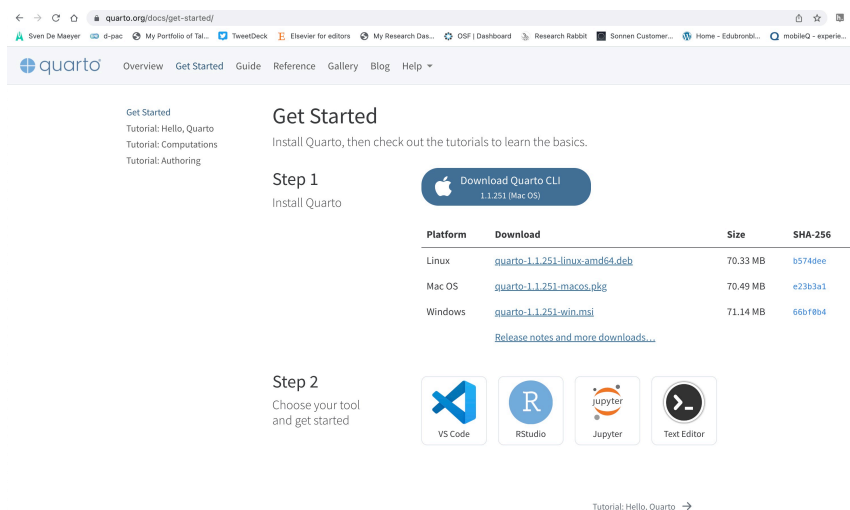
Installing Quarto



Click on **GET STARTED**

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Installing Quarto



Choose the correct version for your pc

Install the software and restart RStudio

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Check the installation

You should see the option to open a new "Quarto document" in RStudio

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3. Creating a basic Quarto document

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A first basic hands-on exploration of Quarto

</> *Let's create a first Quarto Document...*

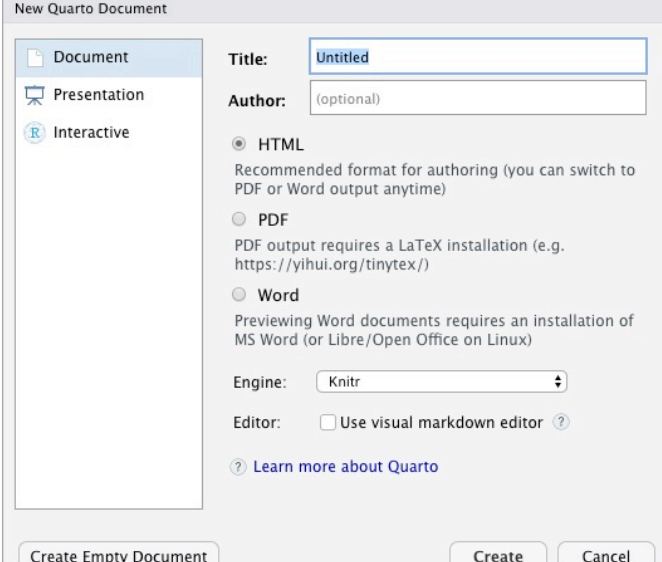
The following slides are some screen shots of what we all did together, hands-on 😊

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Open a New File

- Click on **File**
- Choose **New File**
- Choose **Quarto Document...**

Result:



The screenshot shows the 'New Quarto Document' dialog box. On the left, there is a sidebar with three options: 'Document' (selected), 'Presentation', and 'Interactive'. The main area on the right contains the following fields and options:

- Title:** A text input field containing 'Untitled'.
- Author:** A text input field with the placeholder '(optional)'.
- Format Selection:** Three radio buttons are present:
 - HTML** (selected): Recommended format for authoring (you can switch to PDF or Word output anytime).
 - PDF**: PDF output requires a LaTeX installation (e.g. <https://yihui.org/tinytex/>).
 - Word**: Previewing Word documents requires an installation of MS Word (or Libre/Open Office on Linux).
- Engine:** A dropdown menu set to 'Knitr'.
- Editor:** A checkbox labeled 'Use visual markdown editor' which is currently unchecked.
- Help:** A link with a question mark icon labeled 'Learn more about Quarto'.

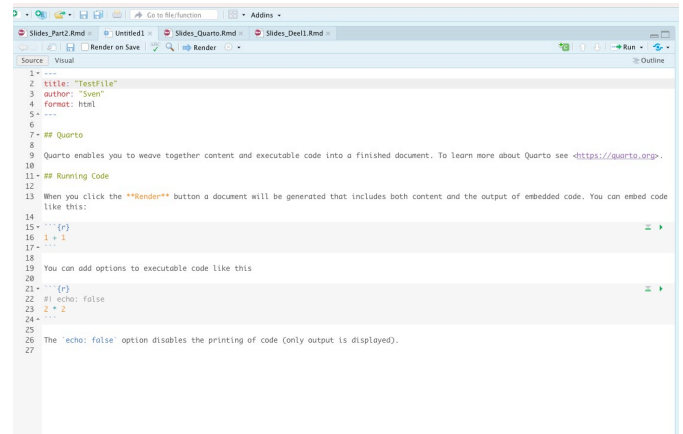
At the bottom of the dialog, there are three buttons: 'Create Empty Document', 'Create', and 'Cancel'.

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Fill in some basic info

- Fill in a **title** and an **author**
- Click on **Create**

Result:

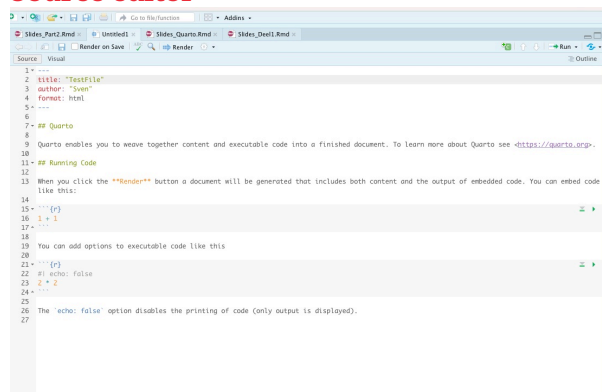


```
1 ---
2 title: "TestFile"
3 author: "Sven"
4 format: html
5 ---
6
7 ## Quarto
8
9 Quarto enables you to weave together content and executable code into a finished document. To learn more about Quarto see <https://quarto.org>.
10
11 ## Running Code
12
13 When you click the Render button a document will be generated that includes both content and the output of embedded code. You can embed code like this:
14
15 ```{r}
16 1 + 1
17 ```
18
19 You can add options to executable code like this
20
21 ```{r}
22 #| echo: false
23 2 * 2
24 ```
25
26 The 'echo: false' option disables the printing of code (only output is displayed).
27
```

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Two different views

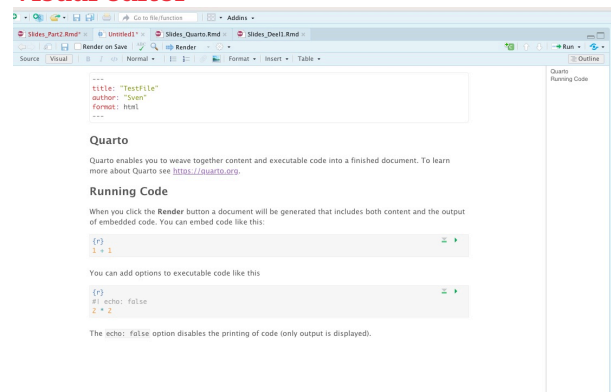
Source editor



```
1 ---
2 title: "TestFile"
3 author: "Sven"
4 format: html
5 ---
6
7 ## Quarto
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24 ```
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26 The 'echo: false' option disables the printing of code (only output is displayed).
27
```

= raw 'markdown' language

Visual editor



```
---
title: "TestFile"
author: "Sven"
format: html
---

Quarto

Quarto enables you to weave together content and executable code into a finished document. To learn more about Quarto see https://quarto.org.

Running Code

When you click the Render button a document will be generated that includes both content and the output of embedded code. You can embed code like this:



```
{r}
1 + 1
```



You can add options to executable code like this



```
{r}
#| echo: false
2 * 2
```



The 'echo: false' option disables the printing of code (only output is displayed).
```

= like a worddoc editor (see what you get)

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Two parts of a Quarto document

YAML

```
---  
title: "TestFile"  
author: "Sven"  
format: html  
---
```

To set some of the parameters (aka **Metadata**)

Your narrative:

Titles +
text +
code +
output +
tables +
figures (generated by code) +
images +
(external and internal) links +
references +
embedded content (e.g., YouTube Video)
etc.

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Code chunks

All R-code can be written in **Code chunks**

While constructing your Quarto document you can RUN code chunks

Click the green arrow (top-right corner of code chunk)

```
{r}  
1 + 1
```



As a result you get the output printed in your Quarto document

```
{r}  
1 + 1
```



```
[1] 2
```

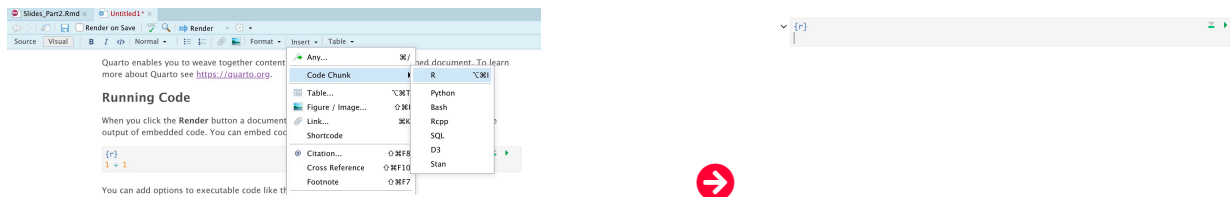
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Code chunks

ATTENTION!: The order of code chunks do matter. If you want to run all the code in the code chunks before a certain code chunk, you can click on the button aside of the green arrow (downward green arrow)

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Adding a new code chunk



Or with a short-cut (on your keyboard)...

Windows: **ctrl + alt + i**

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Code chunk options

You can add options to executable code like this

```
{r}
#| echo: false
2 * 2
```

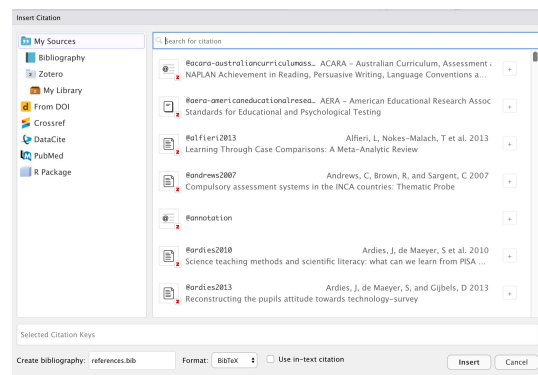
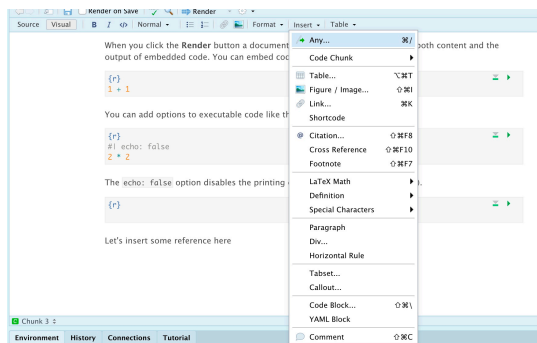
- #| include: false / *rightarrow* code and output (result) are hidden but code is executed
- #| echo: false: only results are printed, code is hidden
- #| message: false hides messages coming from R related to running the code
- #| warning: false hides warnings coming from running the code
- #| error: false hides error messages coming from running the code
- #| fig.cap = "... " adds a caption for a figure created

More detailed information: <https://yihui.org/knitr/options/>

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Inserting references

You can easily insert citations and references



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Inserting references

If you work with **Zotero** there is an easy integration! (<https://www.zotero.org/>)

Search references based on DOI

Easy to find and insert citations of R packages installed on your computer

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Inserting a callout

To highlight some specific piece of text you can use a callout

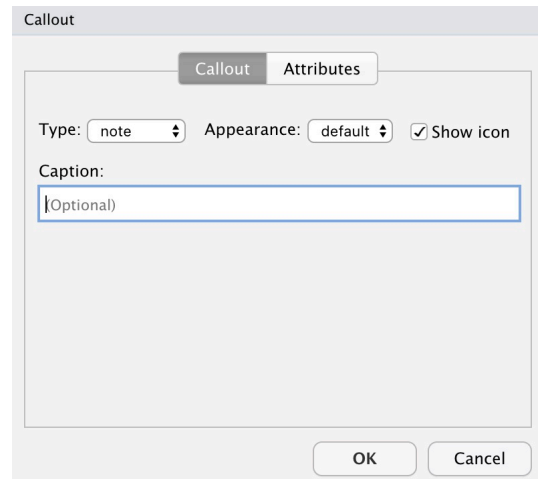
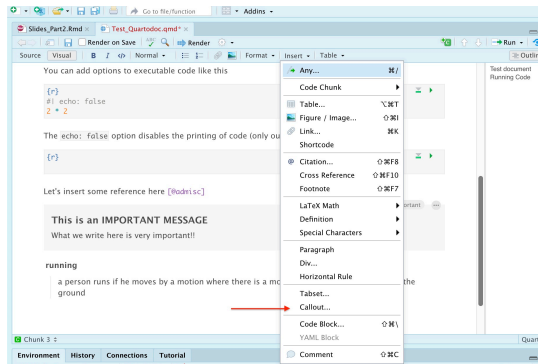
It will generate something like this in your final html document:

💡 This is a tip!

Use callout boxes to highlight important messages for your readers...

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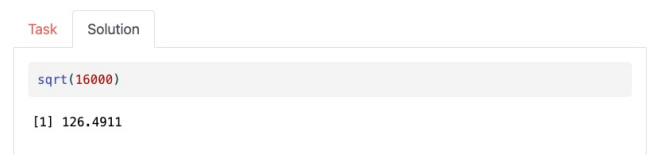
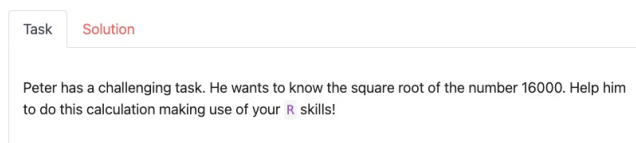
Inserting a callout



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Adding a Tabset

In an html file you can also add Tabsets... They look like this in the resulting html file:

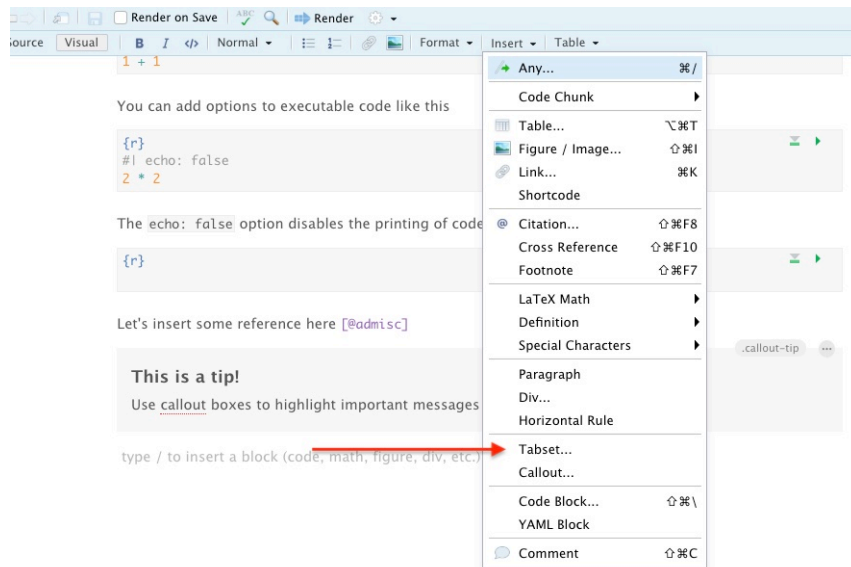


This is a way to save space on the canvas and keep your file tight and neat.

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Adding a Tabset

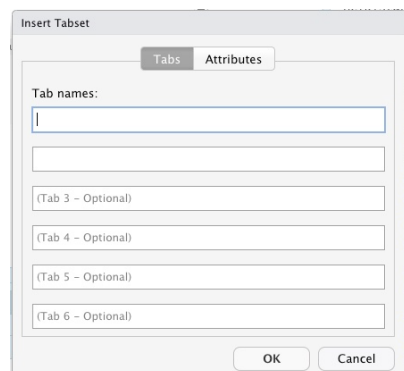
Go to **Insert** and choose **Tabset**



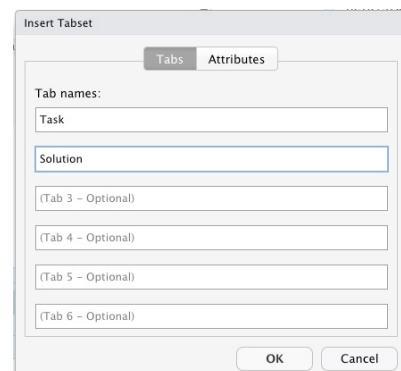
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Adding a Tabset

This opens the following menu:



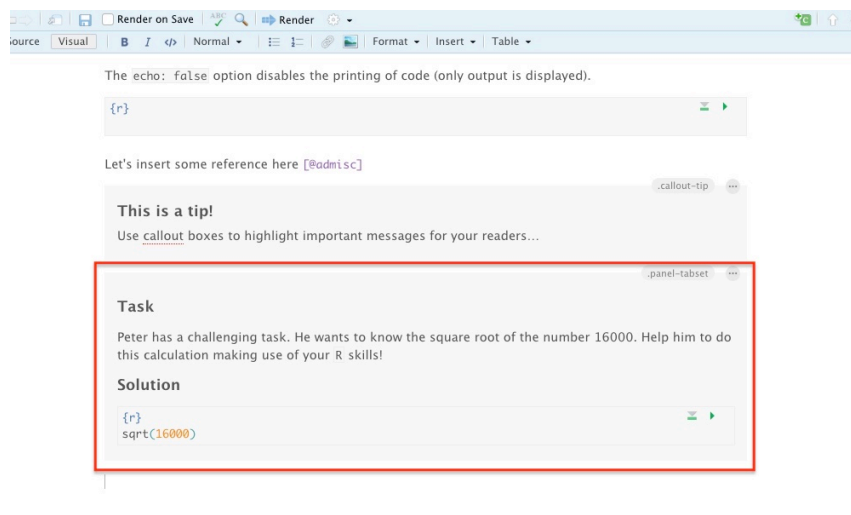
You can fill in the titles for each tab in the Tabset:



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Adding a Tabset

In the Quarto document you now have a section to make content for each tab in the Tabset:



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Changing your theme

If you don't like the formatting of the rendered html file, there are some other themes that can be used!

See: <https://quarto.org/docs/output-formats/html-themes.html>

This is something you can tweak in the YAML of the file

For instance, let's choose the formatting according to the `journal` theme



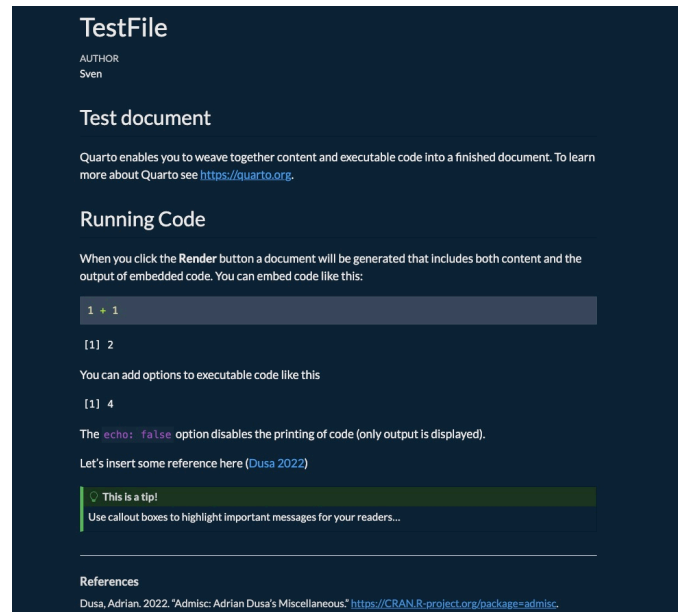
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Changing your theme

Let's try another one: superhero!

This one is clearly different from the default theme.

Of course, if you feel adventurous you can build your own theme (e.g., to meet the branding of your university)



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Tweaking your theme in the YAML

Some elements of formatting can be easily added in the YAML

See <https://quarto.org/docs/output-formats/html-basics.html>

For instance, let's also add a *table of contents* (toc) that contains all headers up till level 3

```
---
title: "TestFile"
author: "Sven"
format:
  html:
    theme: journal
    toc: true
    toc-level: 3
bibliography: references.bib
---
```

← Add a table of contents

← toc contains H1, H2 and H3 level titles

TestFile

AUTHOR
Sven

Test document

Quarto enables you to weave together content and executable code into a finished document. To learn more about Quarto see <https://quarto.org>.

Running Code

When you click the **Render** button a document will be generated that includes both content and the output of embedded code. You can embed code like this:

```
1 + 1
```

```
[1] 2
```

You can add options to executable code like this

```
[1] 4
```

The `echo: false` option disables the printing of code (only output is displayed).

Let's insert some reference here ([Dusa 2022](#))

This is a tip!
Use callout boxes to highlight important messages for your readers...

References



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Code folding

By default all the code is shown for code chunks that have not set the option `#| echo: false`

This behaviour can be changed in the YAML by introducing the `code-fold: true` option

```
---
title: "TestFile"
author: "Sven"
format:
  html:
    theme: journal
    toc: true
    toc-level: 3
    code-fold: true
    code-summary: "Show me the code"
bibliography: references.bib
---
```

← Hide the code by default

← Text printed in the html file

TestFile

AUTHOR
Sven

Table of contents

Test document
Running Code

Test document

Quarto enables you to weave together content and executable code into a finished document. To learn more about Quarto see <https://quarto.org>.

Running Code

When you click the **Render** button a document will be generated that includes both content and the output of embedded code. You can embed code like this:

► Show me the code

[1] 2

← Code is hidden !!