

# PH 718 Data Management and Visualization in R

## Part 4: Quarto

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### Introduction

- File extension: `.qmd` (instead of `.Rmd`)
  - The next-generation version of R Markdown
  - Retain almost everything about R Markdown while adding significant improvements
    - Native support for multiple languages (R, Python, Julia, JavaScript) in the same document
    - More consistent and powerful output formats (HTML, PDF, Word, Revealjs presentations, websites, books, etc.)
    - Enhanced cross-format publishing capabilities
  - For R users, the transition is very smooth.
  - Quick tour of Quarto: <https://quarto.org/docs/get-started/hello/rstudio.html>
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### Installation

- Still install the `rmarkdown` package
  - No other installation needed for recent versions of RStudio (2023.09 or later; 2024+ recommended)
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## Key Differences from R Markdown

### Header

- Use `format:` instead of `output:`

### Code chunks

- Old style in R Markdown still works for Quarto
- But preferred way for options is giving comments at the top

Example (old style):

```
data(cars)
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

Example (giving comments at the top):

```
data(cars)
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

Example (old style):

```
result1 = 0
for (i in 1:10^4){
  result1 = result1 + i^2
}
result1
```

[1] 333383335000

Example (giving comments at the top):

```
result1 = 0
for (i in 1:10^4){
  result1 = result1 + i^2
}
result1
```

[1] 333383335000

- You may include code trunks on other languages (e.g., Python) in the same document

```
print("\nNumber | Square | Cube")
print("-----|-----|-----")
for i in range(1, 11):
  print(f"{i:>6} | {i**2:>6} | {i**3:>4}")
```

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## More differences between R Markdown and Quarto

Aspect	R Markdown (.Rmd)	Quarto (.qmd)
<b>Core Engine</b>	R package (rmarkdown) tightly integrated with R.	Standalone (not an R package).
<b>Built-in Features</b>	Relies on separate packages (e.g., <code>bookdown</code> for books, <code>distill</code> for blogs, <code>xaringan</code> for slides).	Including books, websites, blogs, advanced presentations, manuscripts, etc., in one system.
<b>Advanced Layouts</b>	Limited; often requires custom CSS or packages.	Native support for column layouts, tabsets, callout blocks, figure panels, code folding, floating table of contents.

Aspect	R Markdown (.Rmd)	Quarto (.qmd)
<b>Editor Support</b>	Best in RStudio; limited elsewhere.	Full support in RStudio, VS Code, Jupyter, etc.; easier outside RStudio.
<b>Cross-Referencing &amp; Citations</b>	Good, but format-specific.	More consistent across formats; improved figure/table labeling.
<b>Compatibility</b>	N/A	Renders most .Rmd files unmodified; not 100% backward-compatible.
<b>Future Focus</b>	Maintenance mode (no major new features).	Active development; Posit's primary publishing system.

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## When to use which?

- Stick with R Markdown: if you have complex existing workflows that work well.
- Switch to Quarto: for new projects, multi-language support, modern layouts, team collaboration with Python/Julia users, or when you want the latest features.

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## Resources

- [Quarto Guide](#)
- [Quarto FAQ for R Markdown users](#)