Teach Once, Use Often

Building AI Skills for Data Analysis

Tyson Barrett · posit::conf(2026)

Environmental impact

Stochastic output

Skill atrophy

Verbose co

e offloading

Shallow learning

"AI is like a box of chocolates. You never know what you're gonna get."

Forrest Gump

CRAFTSMAN
NICKEL PLATED

Delegate

Trust AI to do the work entirely (or errors are easy to catch).

Collaborate

AI does the typing or planning. But you own the decisions.

Own

You own the judgment, the decisions, the typing, the planning, the output.

Delegate

Trust AI to do the work entirely (or errors are easy to catch).

Slide drafts, Quarto/Jupyter/Rmarkdown scaffolding, color palettes, code documentation, data labeling.

Collaborate

AI does the typing or planning. But you own the decisions.

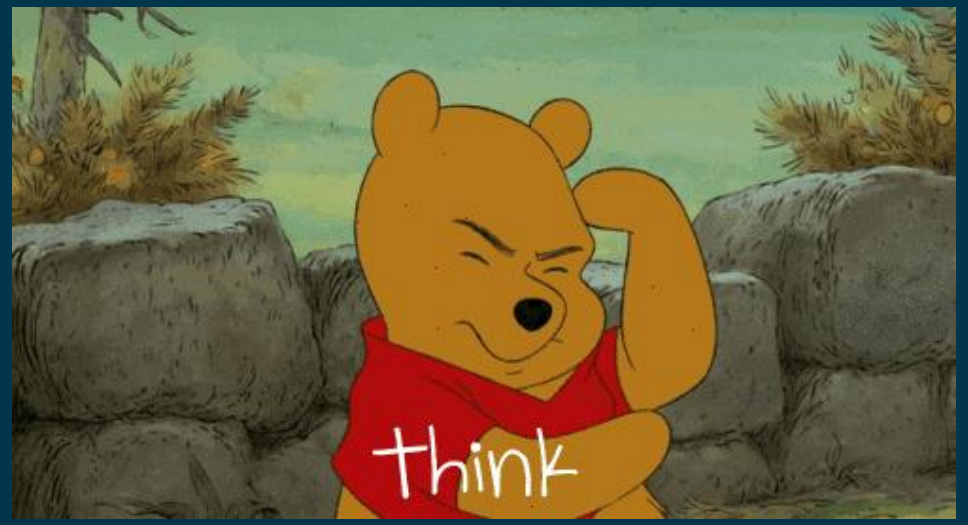
Drafting code, planning the analysis, exploratory data analysis, brainstorming solutions to data issues.

Own

You own the judgment, the decisions, the typing, the planning, the output.

The model specs, the estimand, the interpretation, improving code performance, reviewing code/output.

Pause and



1 CLAUDE.md (or Agents.md)

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- Be concise. Skip preamble and restating question.
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- In R, use `<-` for assignment. Two-space indentation. `snake_case` names.

# Data Analysis

- When doing exploratory data analysis, provide graphics over tables.
- When cleaning the data, do not change the data without asking me
- State your assumptions about all joins and filters
- Folder structure should look something like this:

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```

Make Errors Visible

- Never drop NAs
- Create checks after any major data step
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Statistical Modeling

- I own every modeling decision.
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Teaching

- For teaching materials, default to python using `pandas`, `statsmodels`, `bambi`, and `plotnine`
- Use Quarto for course materials.
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# Purpose question, estimand/target in plain language, data source
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# Descriptives Table 1, distributions, key bivariate plots
# Analysis models exactly as specified by the analyst
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## Core rules (and why)

- **Be brief in prose.** Do not explain things in long paragraphs. Keep any commentary short.
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- **Set a seed once in setup** and state it in the text, for anything stochastic.
- **Show exclusions as a flow.** Report n at each cleaning step; readers need to know who the results apply to.
- **Don't suppress warnings globally for model chunks.** Convergence and singular-fit warnings are results. Suppress package-load messages only.
- **Missing data is reported, never silently dropped.** State the n used in every table and model.

## Language defaults

**R (knitr engine):** `tidyverse` for wrangling, `furniture::table1()` or `gtsummary` for descriptive tables, `ggplot2` for figures, `broom`/`broom.mixed` or `parameters` for tidying estimates, `gt` or `great_tables`-style output for display. Use `renv` if the project has a lockfile.


**Python (jupyter engine):** `polars` or `pandas`, `tableone` for descriptives, `great_tables` for display, `statsmodels`/`pingouin` for classical stats, `plotnine` for figures (unless built in function is easy and clear). Environments via `uv`; render with
`uv run quarto render`.


## Render checks
After rendering, confirm:
- [ ] Render completes from a clean session (`quarto render analysis.qmd`) with no errors
- [ ] No unexpected warnings in the output (expected ones are explained in text)
- [ ] Every figure and table has a caption
- [ ] Every number in prose comes from inline code
- [ ] n is stated for each table and model
- [ ] Session info section is present
- [ ] If `cache: true` was used anywhere, re-render with `--cache-refresh` once before sharing

Report any check that fails instead of declaring the document finished.

## Files in this skill

- `references/chunk-options.md` — chunk and YAML options with when to use each
- `references/stats-reporting.md` — how to present estimates, uncertainty, diagnostics
- `assets/analysis-template-r.qmd` — starting template (R/knitr)
- `assets/analysis-template-py.qmd` — starting template (Python/Jupyter)
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- Use functions from packages rather than writing new complex functions.
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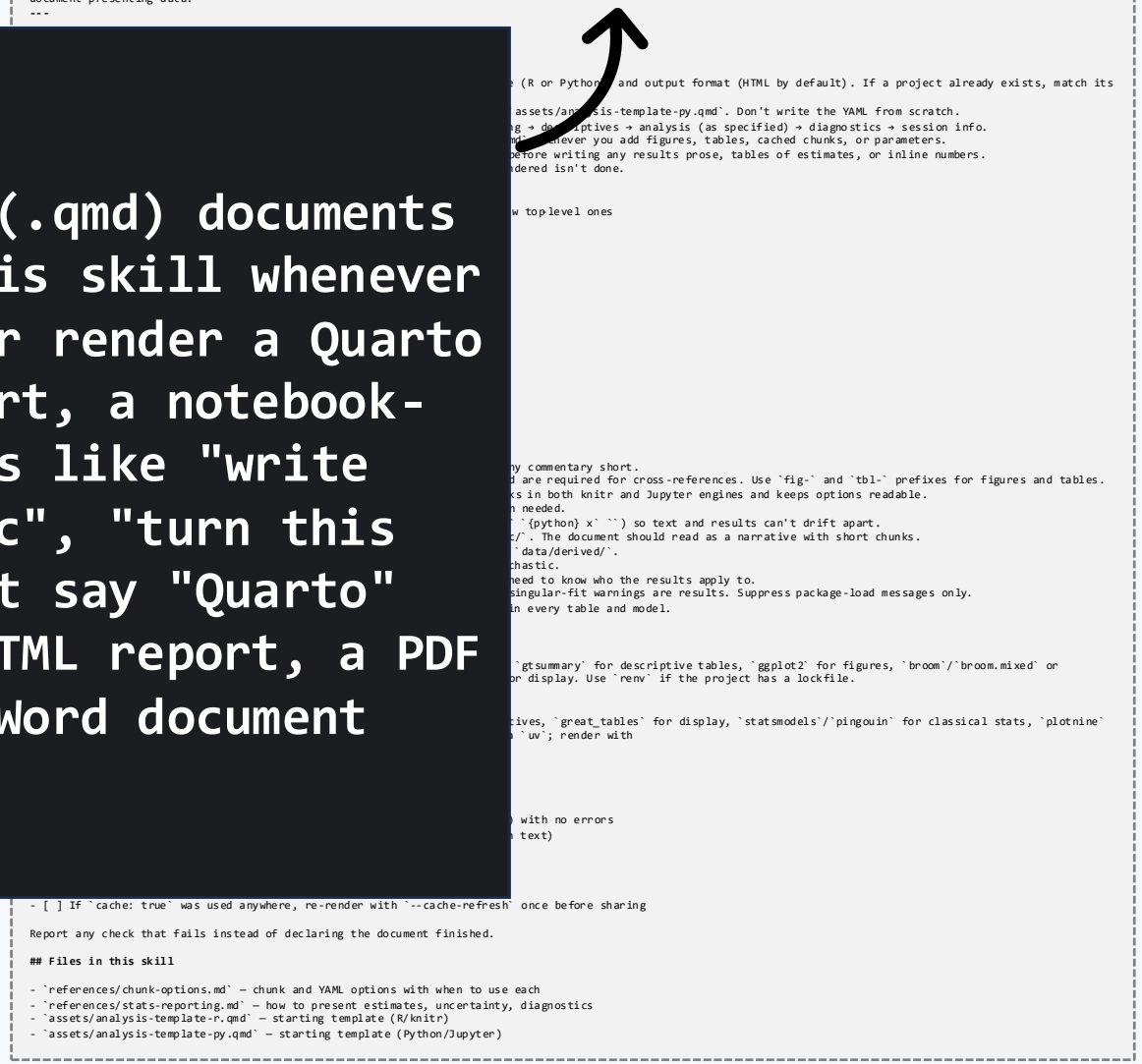

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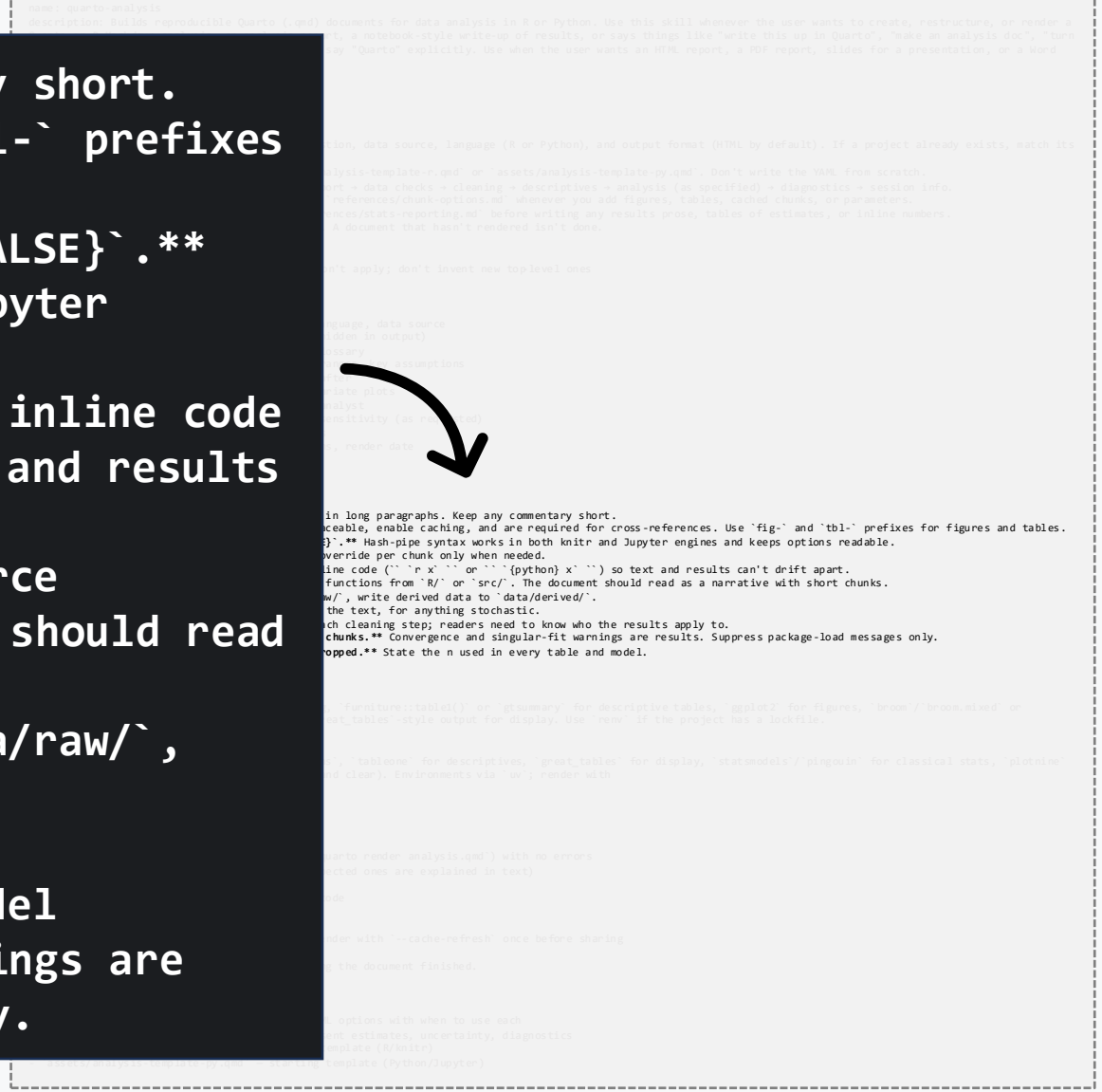

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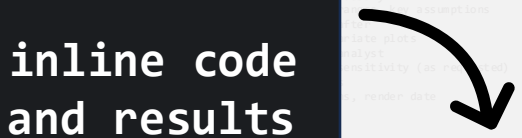

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- **Raw data is read-only.** Read from `data/raw/`, write derived data to `data/derived/`.
- **Set a seed once in setup** and state it in the text, for anything stochastic.
- **Show exclusions as a flow.** Report n at each cleaning step; readers need to know who the results apply to.
- **Don't suppress warnings globally for model chunks.** Convergence and singular-fit warnings are results. Suppress package-load messages only.
- **Missing data is reported, never silently dropped.** State the n used in every table and model.

Language defaults

R (knitr engine): `tidyverse` for wrangling, `furniture::table1()` or `gtsummary` for descriptive tables, `ggplot2` for figures, `broom`/`broom.mixed` or `parameters` for tidying estimates, `gt` or `great_tables`-style output for display. Use `renv` if the project has a lockfile.

Python (jupyter engine): `polars` or `pandas`, `tableone` for descriptives, `great_tables` for display, `statsmodels`/`pingouin` for classical stats, `plotnine` for figures (unless built in function is easy and clear). Environments via `uv`; render with `uv run quarto render`.

Render checks
After rendering, confirm:
- [ ] Render completes from a clean session (`quarto render analysis.qmd`) with no errors
- [ ] No unexpected warnings in the output (expected ones are explained in text)
- [ ] Every figure and table has a caption
- [ ] Every number in prose comes from inline code
- [ ] n is stated for each table and model
- [ ] Session info section is present
- [ ] If `cache: true` was used anywhere, re-render with `--cache-refresh` once before sharing

Report any check that fails instead of declaring the document finished.

Files in this skill

- `references/chunk-options.md` — chunk and YAML options with when to use each
- `references/stats-reporting.md` — how to present estimates, uncertainty, diagnostics
- `assets/analysis-template-r.qmd` — starting template (R/knitr)
- `assets/analysis-template-py.qmd` — starting template (Python/Jupyter)
```

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assistant.posit.co

A note about Posit Assistant

Thanks!

tysonbarrett.com/assets/posit26/posit2026.pdf


tyson.barrett@usu.edu


github.com/tysonstanley


tysonbarrett.com

Photography by the artists at Unsplash

RESOURCES

Templates and Examples

opensource.posit.co/software/skills

github.com/nimrodfisher/data-analytics-skills

opensource.posit.co/software/skills

Posit's skill library

github.com/posit-dev/skills

opensource.posit.co/software/skills

Posit AI

posit.co/blog/introducing-ai-in-rstudio