Organising Your Work

Data Science Workflows

Dr Zak Varty

Week 1: What are we trying to do?

- Data science is a collaborative discipline
- Be a good collaborator, to others and to your future self
- This week will show one framework to help you with that task
- Like flossing not difficult but requires discipline
- We will take an opinionated and R focused approach, ideas transfer to other settings.

One Project = One Directory

- Sounds easy, but in practice it is not.
- Requires prospective project scoping.
- Entropy is ever increasing.

1 project = 1 directory

Properties of a well organised project

Ideally, we would like to organise our projects so that they are:

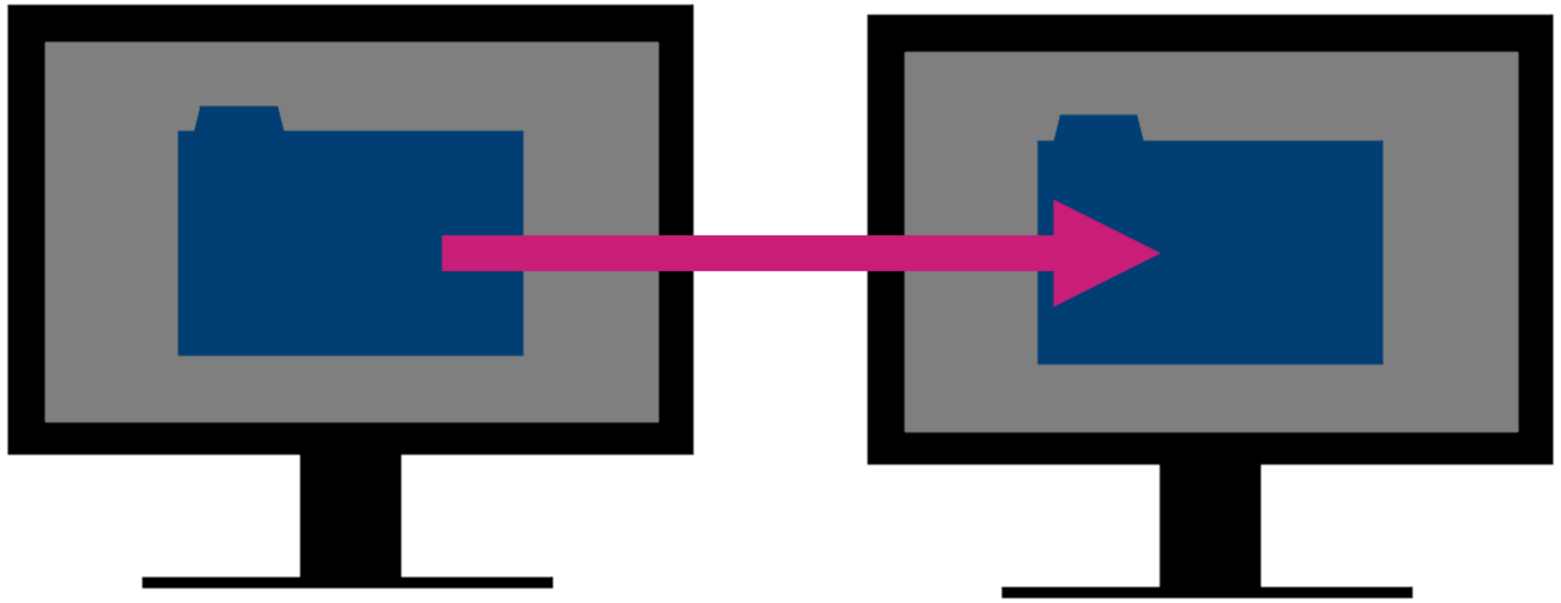
- Portable
- Version control friendly
- Reproducible
- Integrated Development Environment friendly

Portability

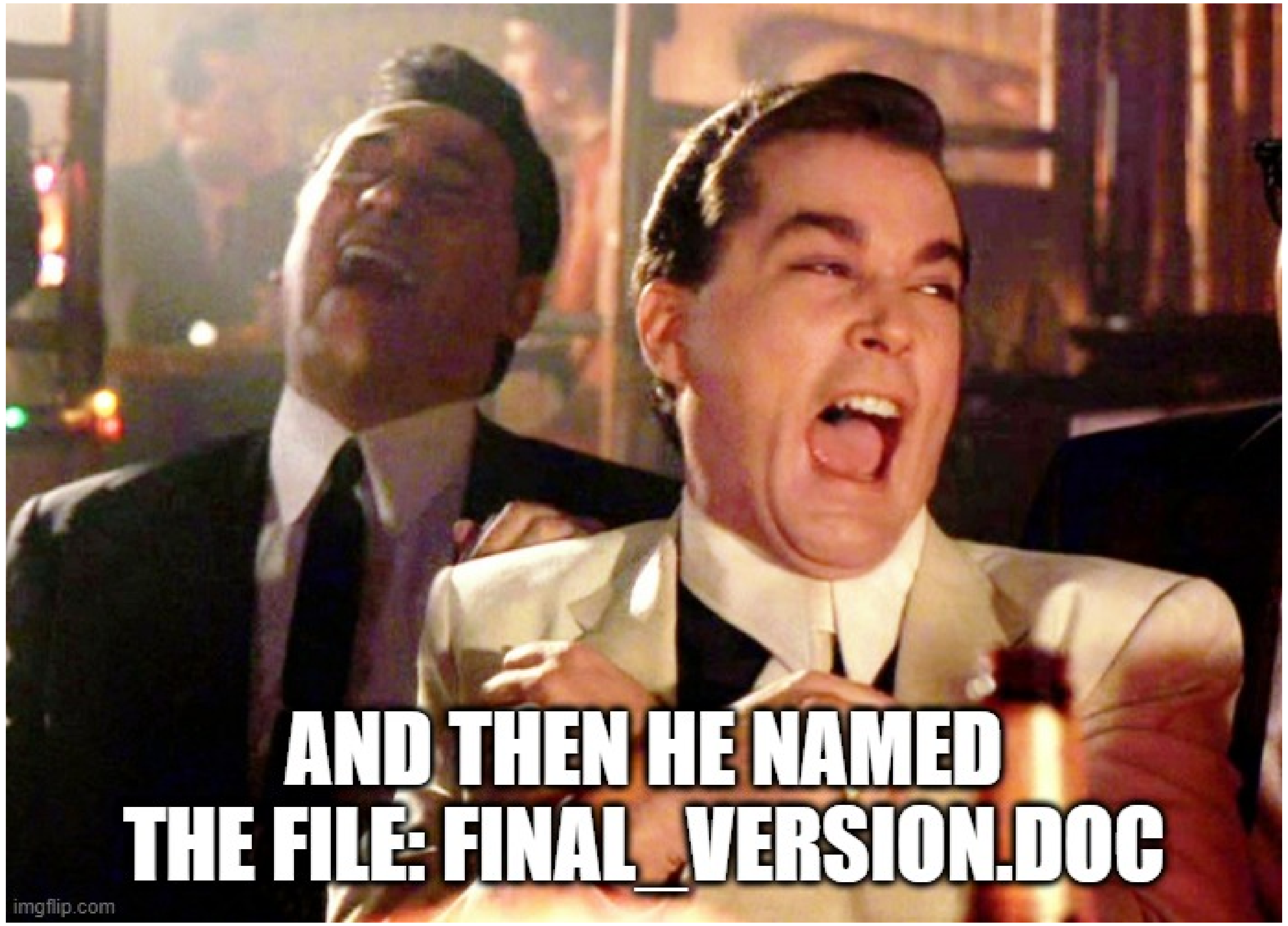
Is your work all in one place or scattered?

Can it be moved to a new location without breaking?

What do we mean by a new location, exactly?



Version Control Friendly



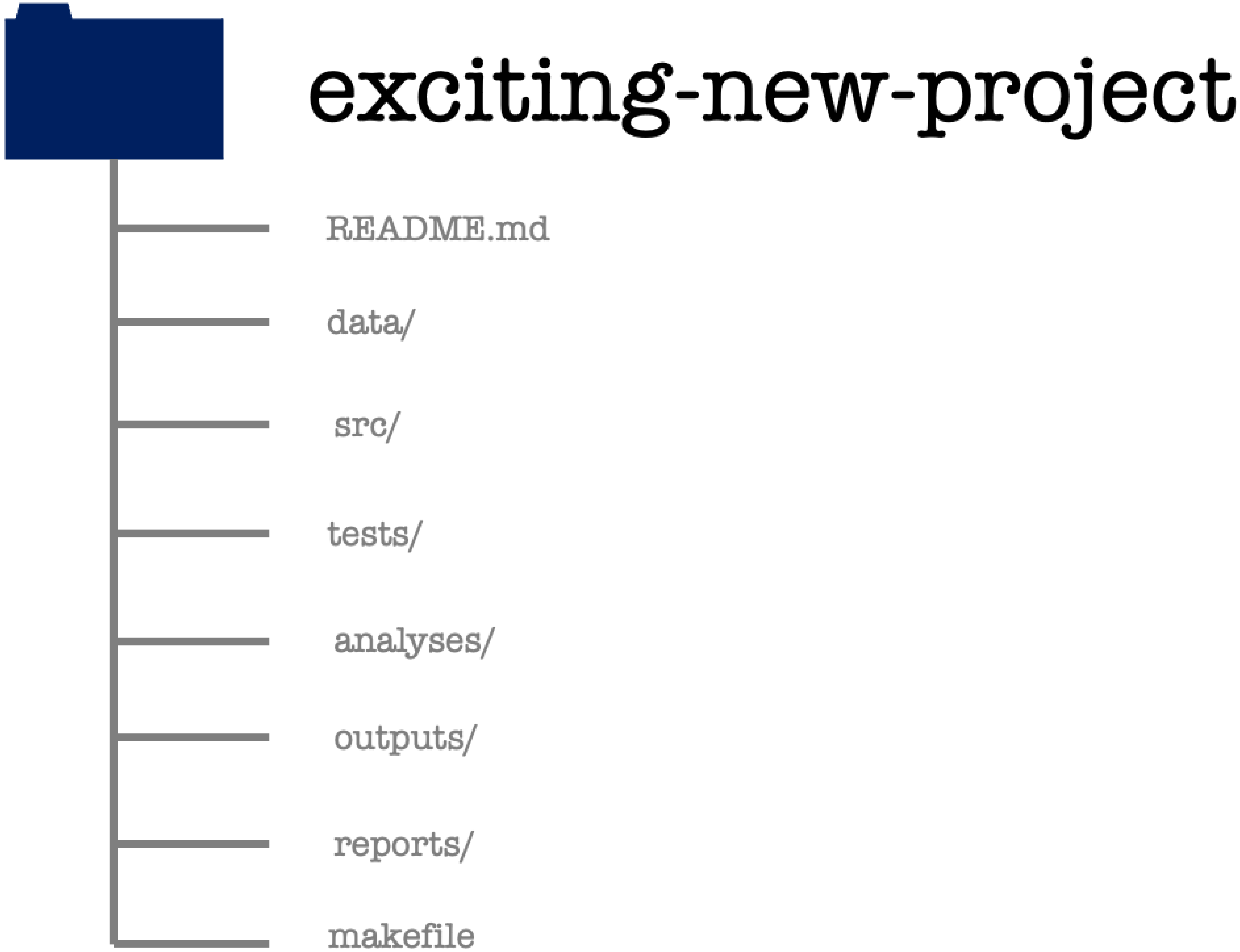
Reproducible

> A study is **reproducible** if you can take the original data and the computer code used to analyze the data and recreate all of the numerical findings from the study.
>
> Broman et al. (2017) "Recommendations to Funding Agencies for Supporting Reproducible Research"

Integrated Development Environment Friendly

- Possible to code and manage projects entirely in notepad or at the command line.
- Puts a lot of strain on you, both your fingers and your brain
- Integrated development environments such as RStudio, PyCharm and VisualStudio aim to reduce this burden
  - Autocomplete / shortcodes
  - Environment panes
  - Templating

exciting-new-project



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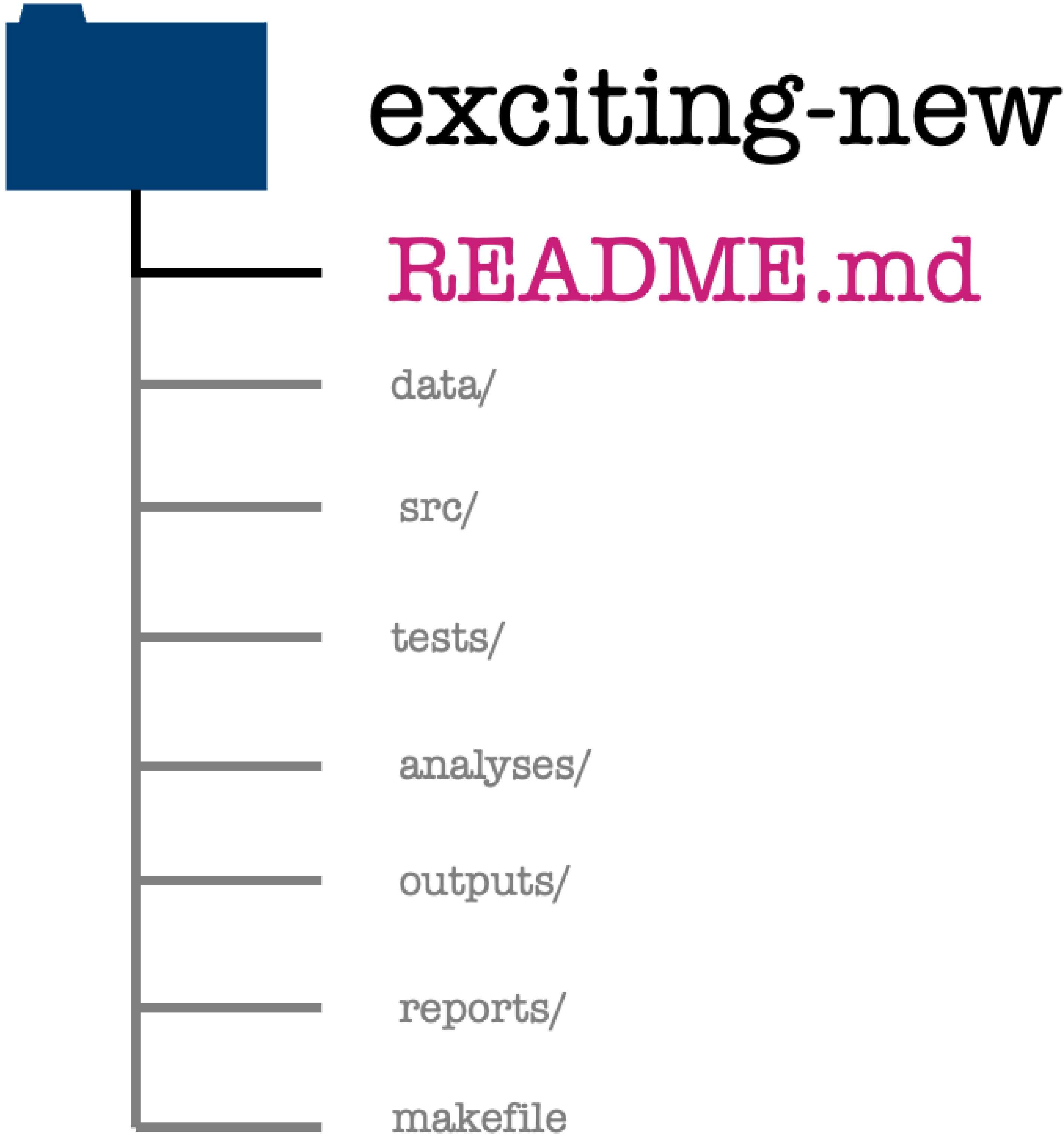

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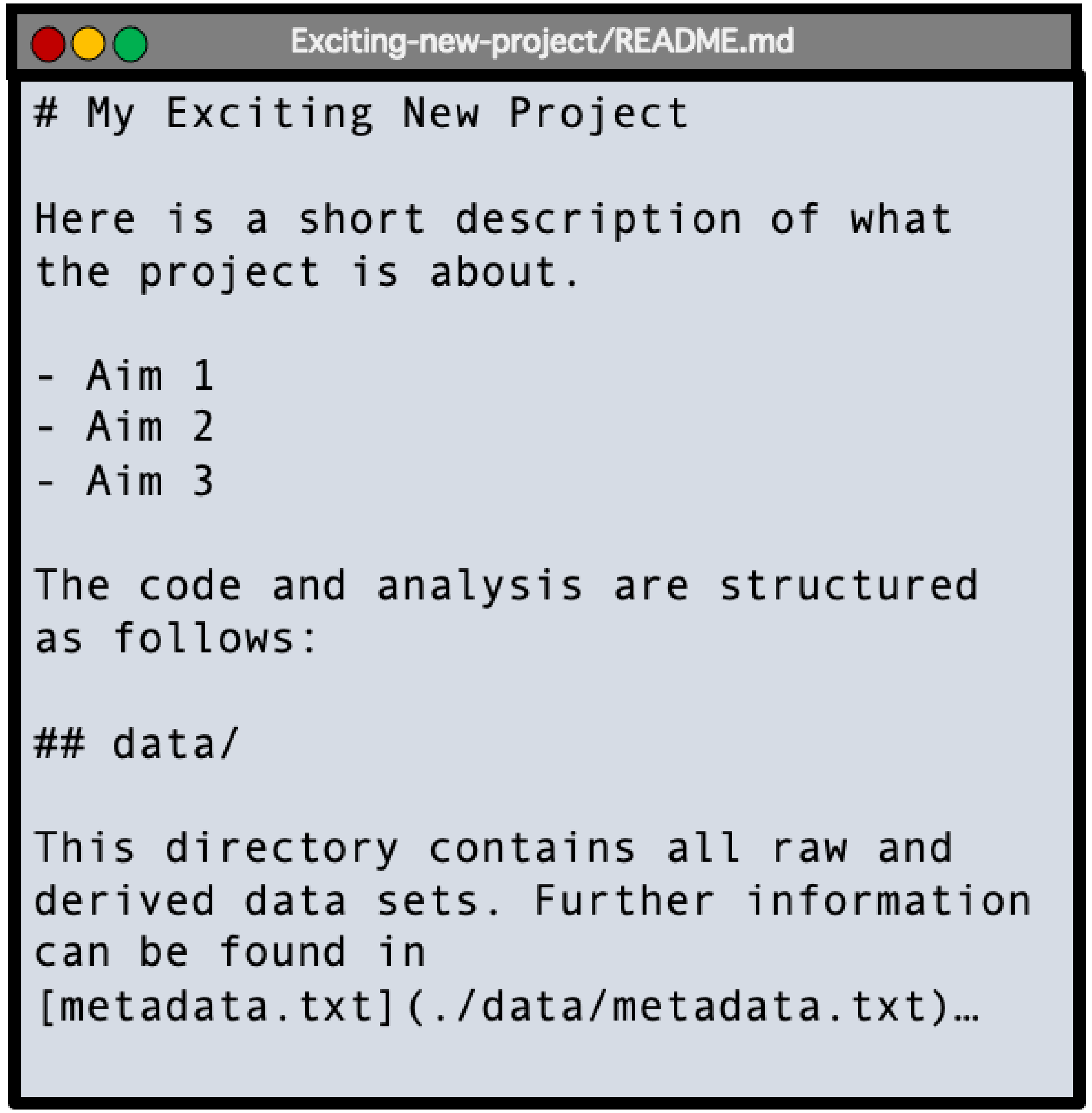
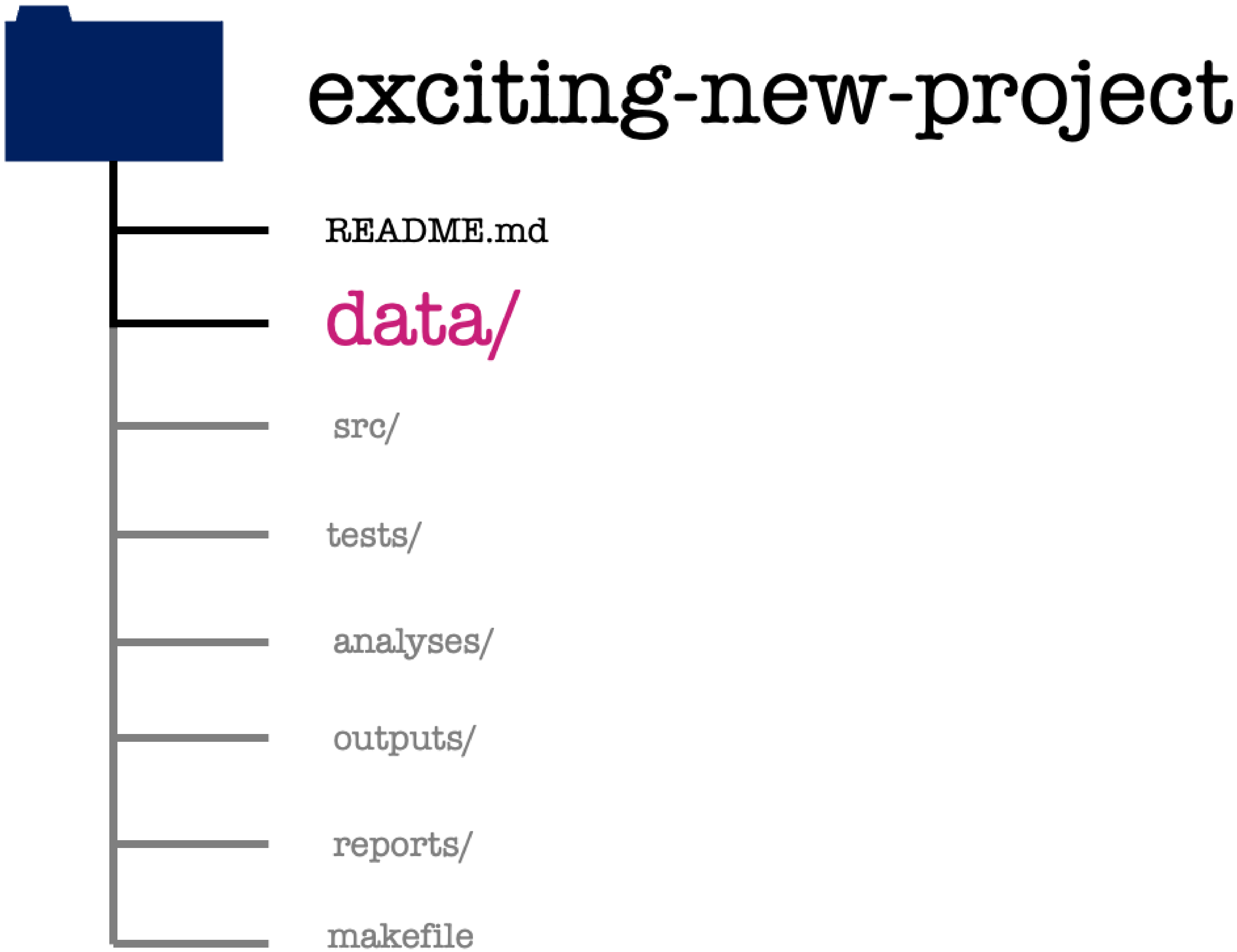


```
# My Exciting New Project

Here is a short description of what
the project is about.

- Aim 1
- Aim 2
- Aim 3

The code and analysis are structured
as follows:

## data/

This directory contains all raw and
derived data sets. Further information
can be found in
[metadata.txt](./data/metadata.txt)…
```

Inside the README

- Name
- Project Status
- Description
- Installation
- Usage / Examples
- Support
- Contributing



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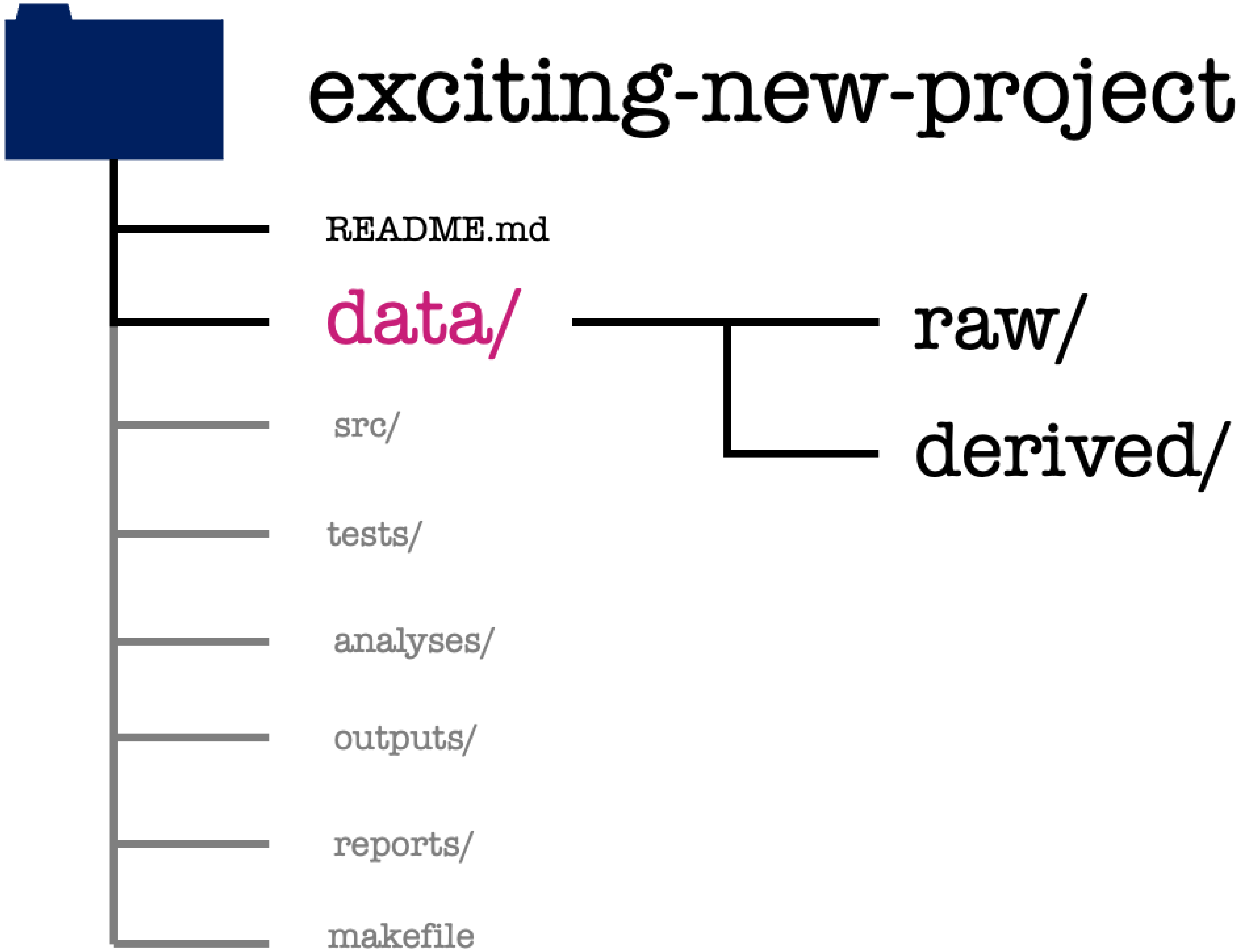

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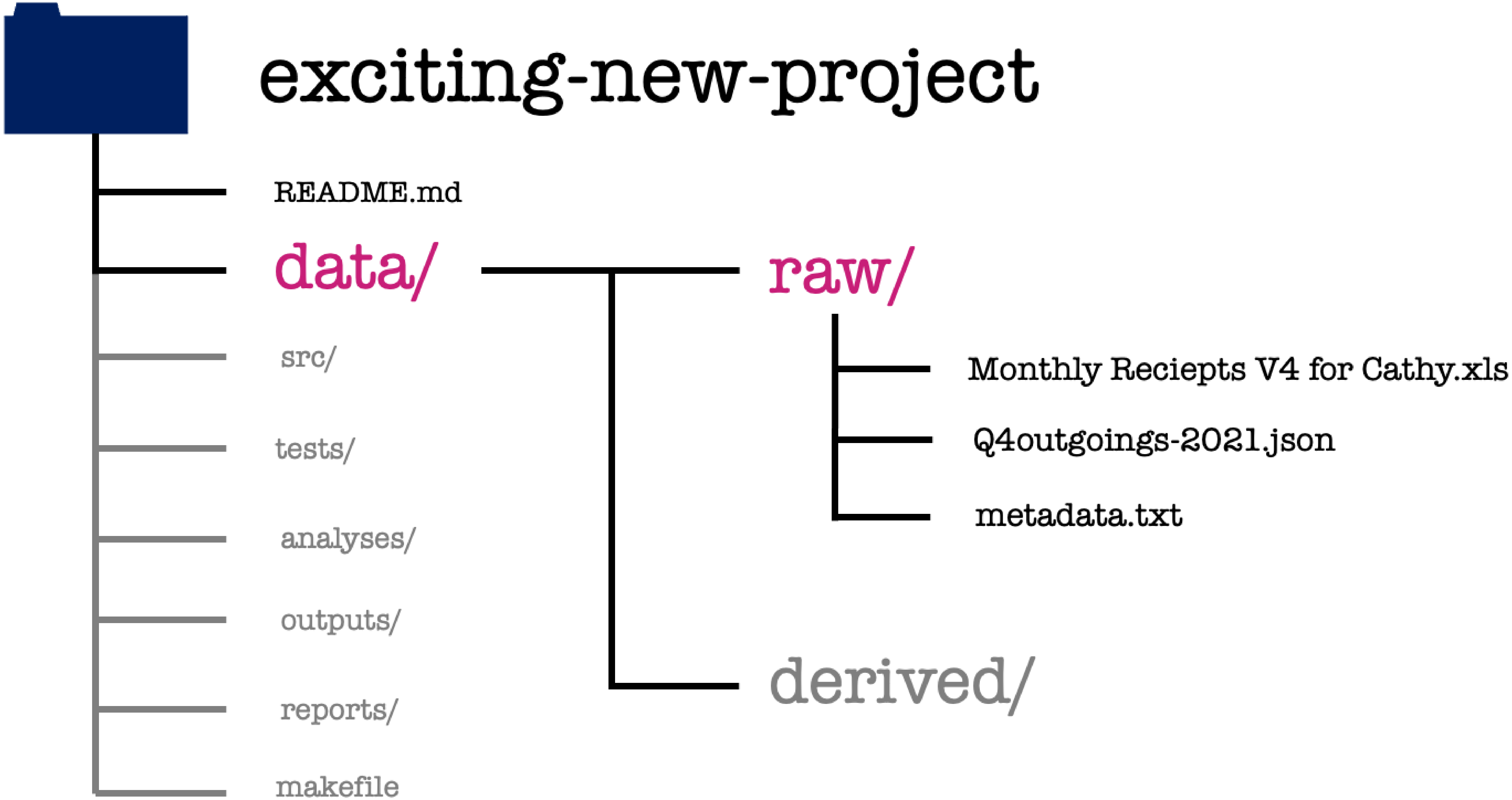

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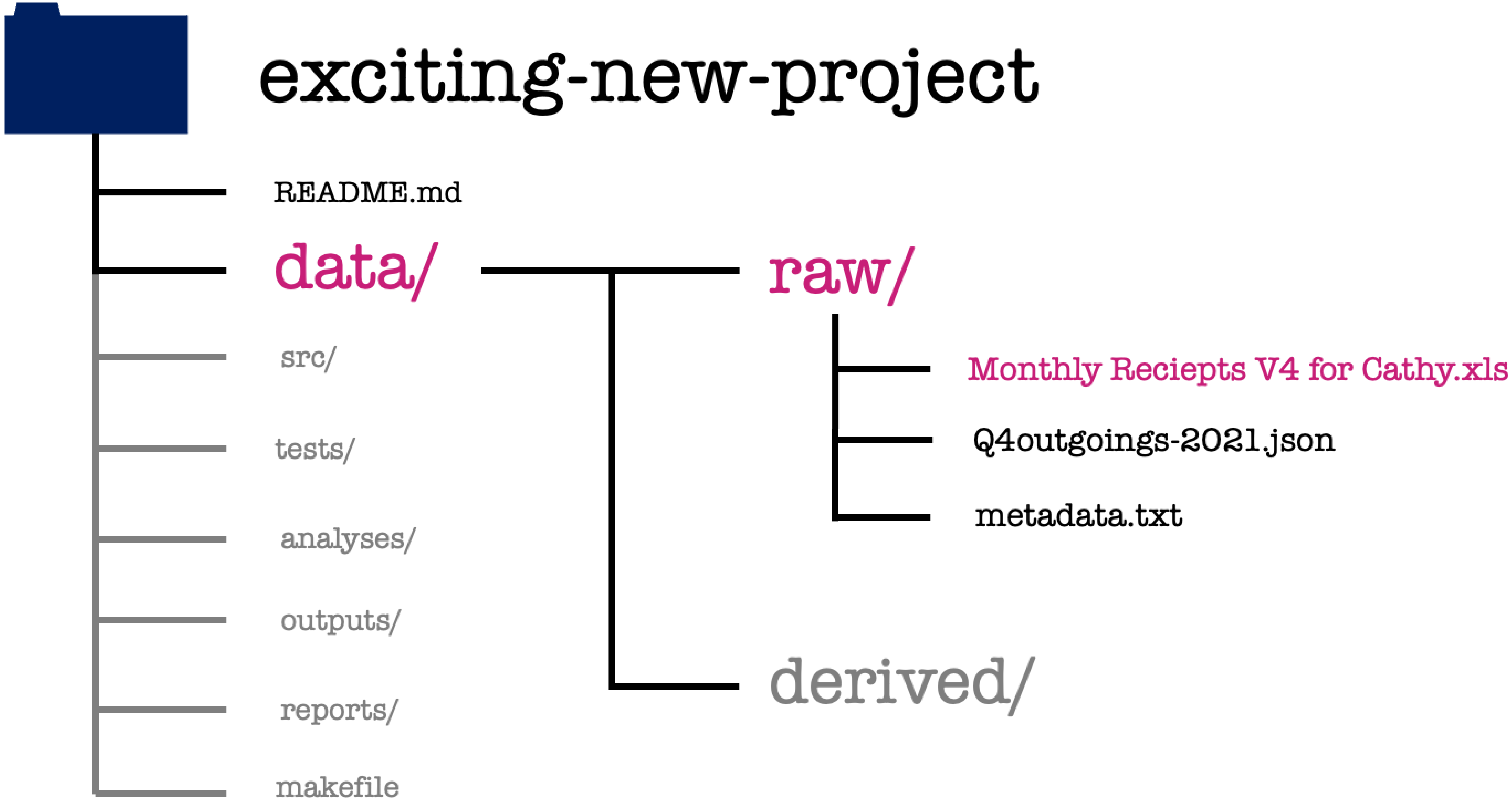

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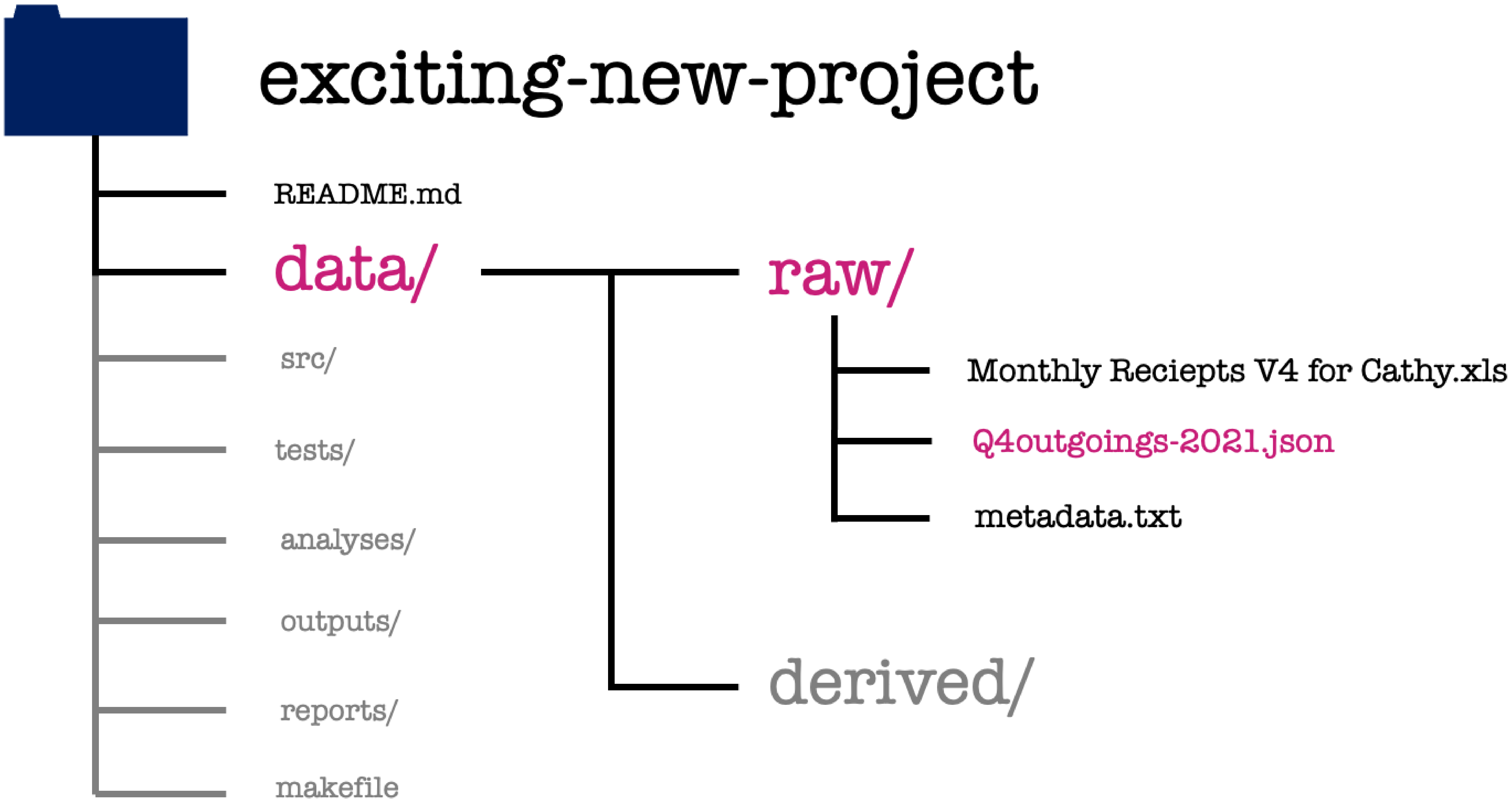

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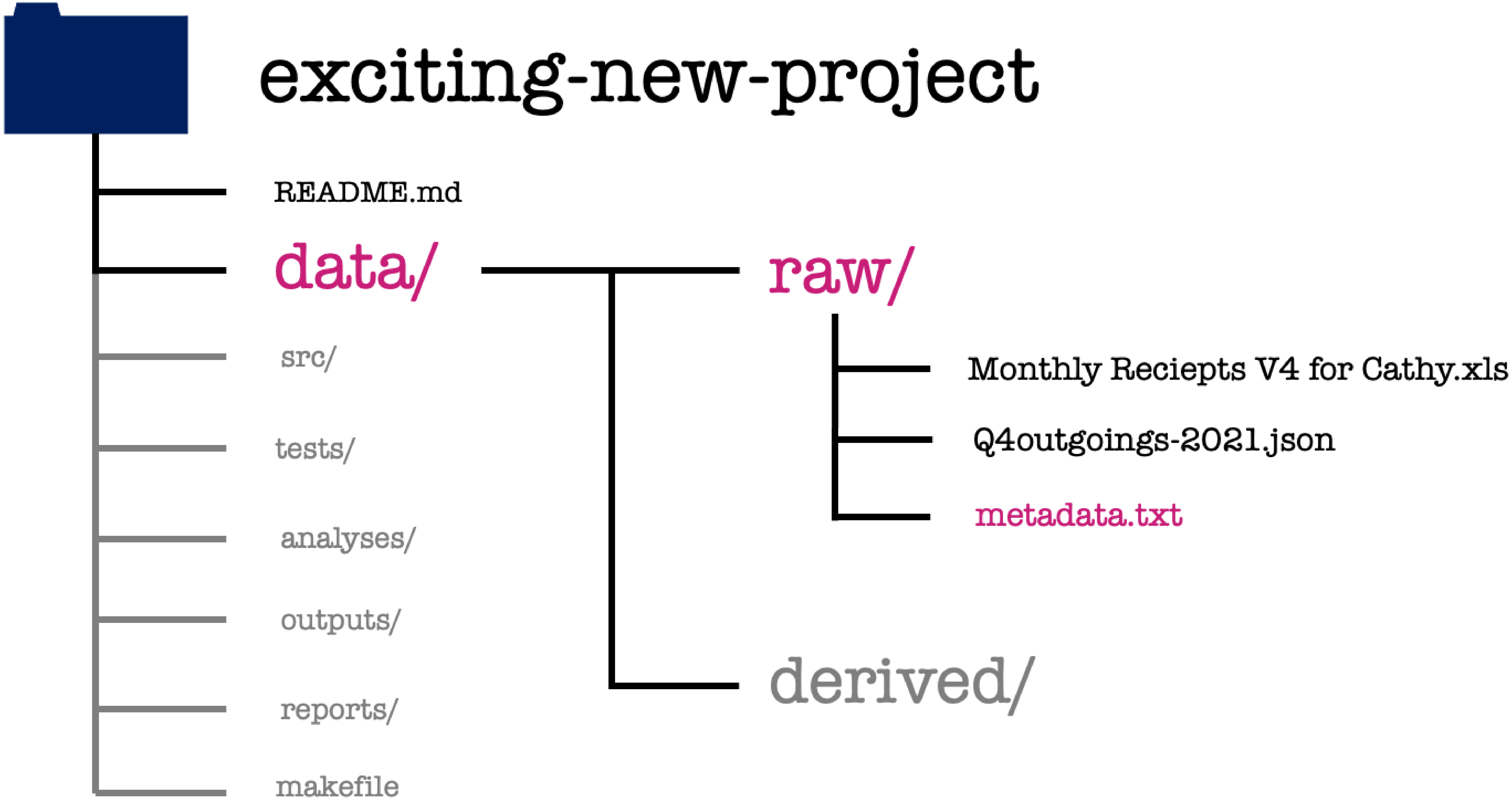

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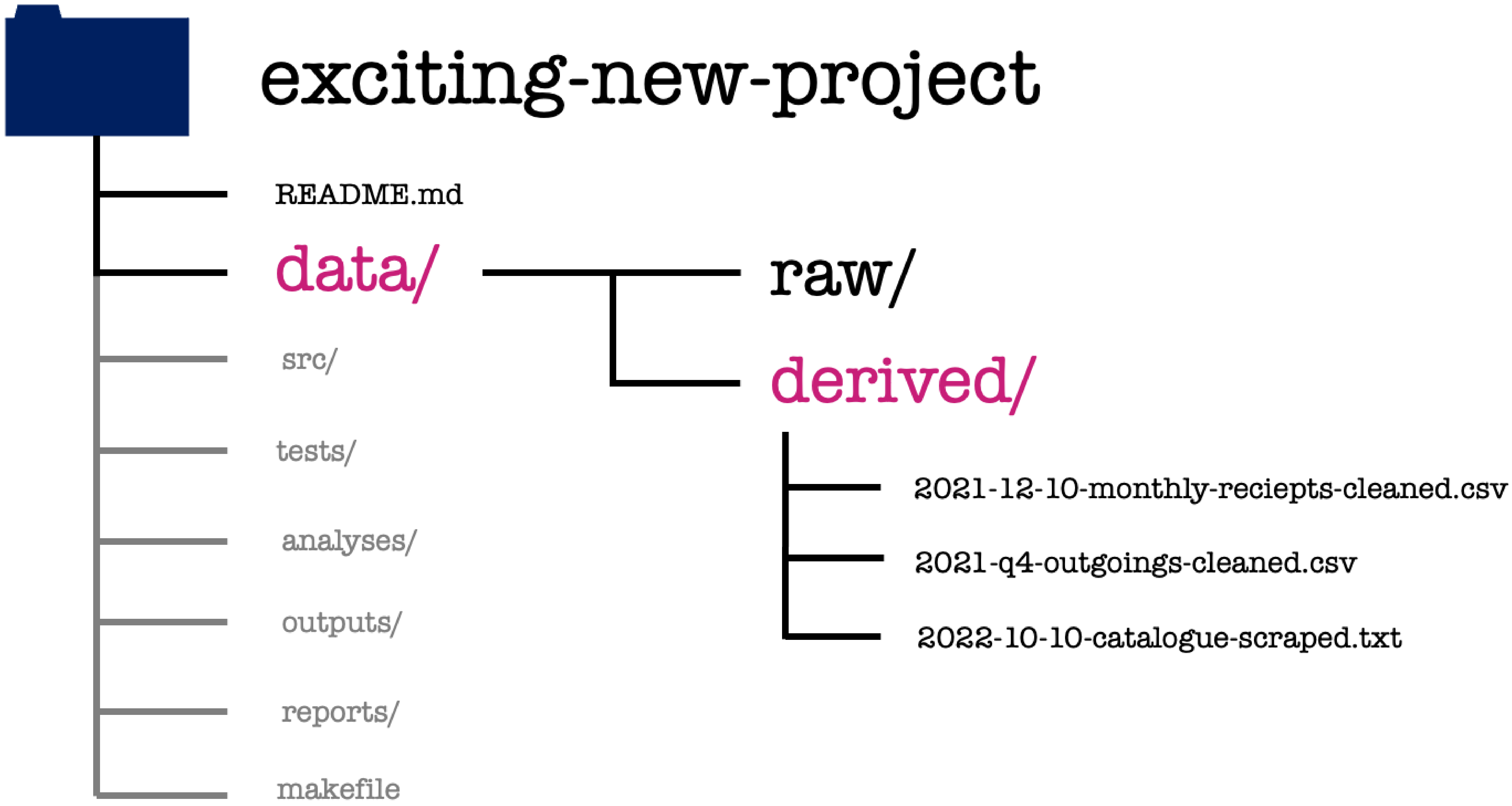

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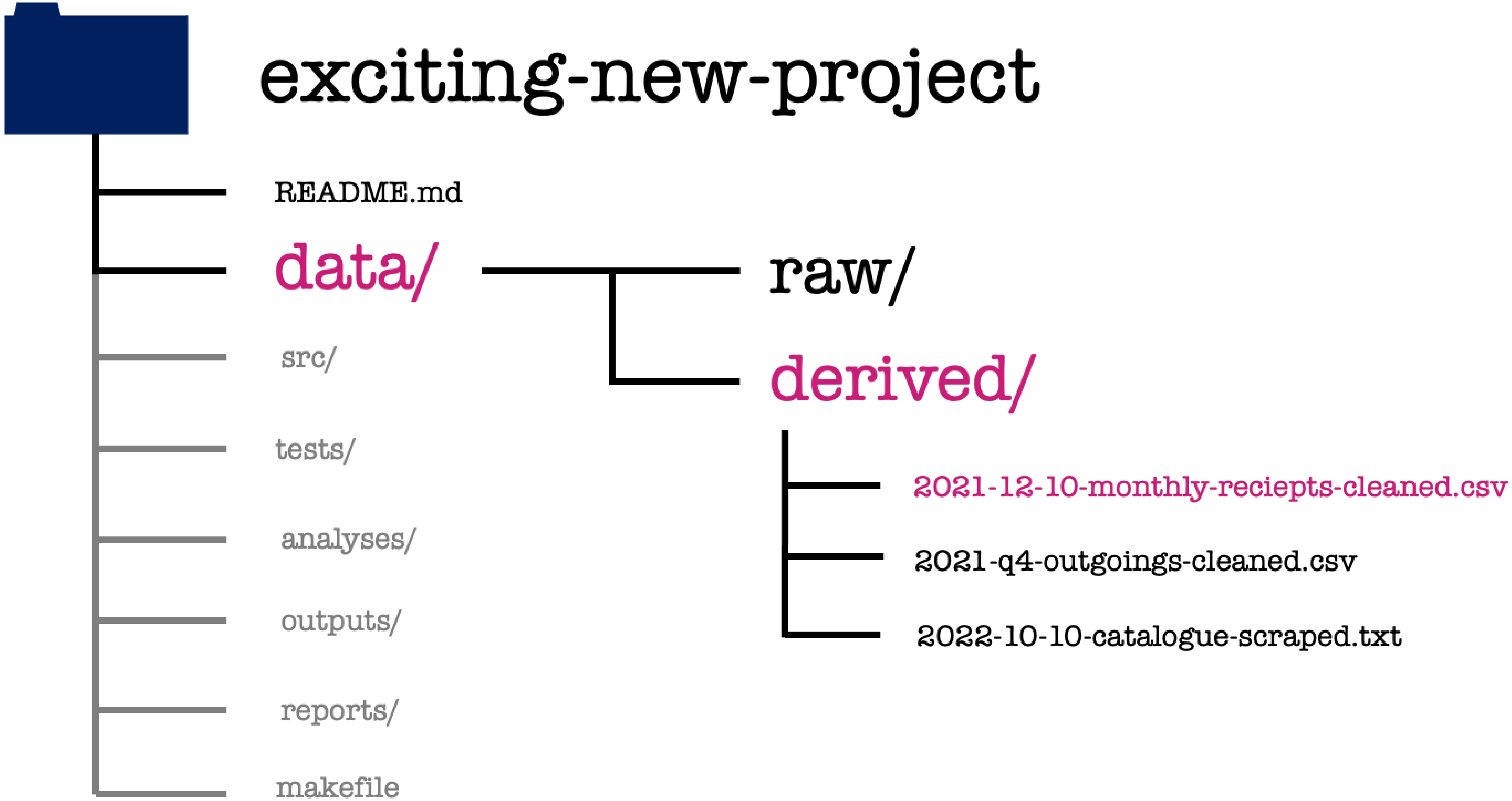

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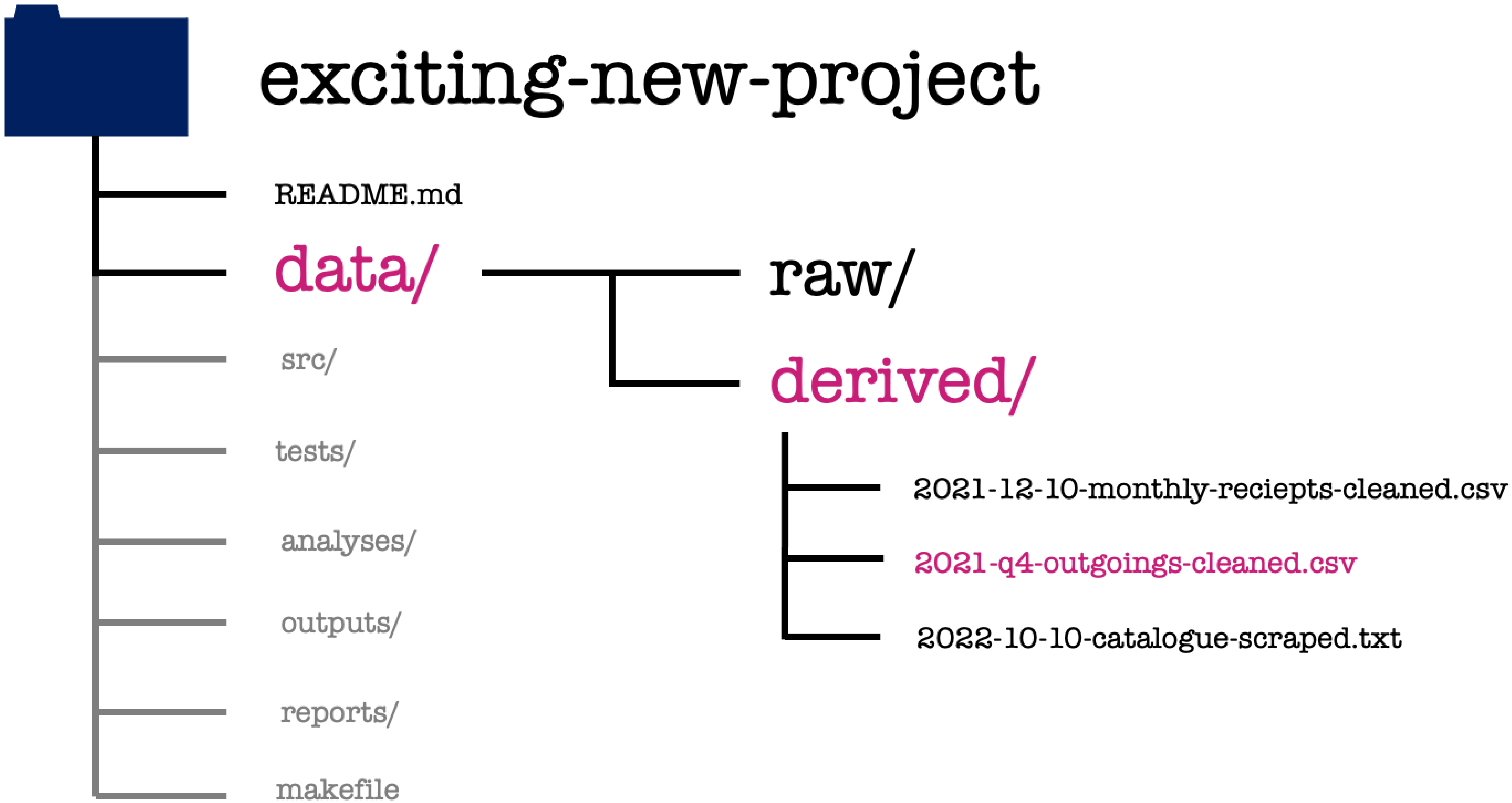

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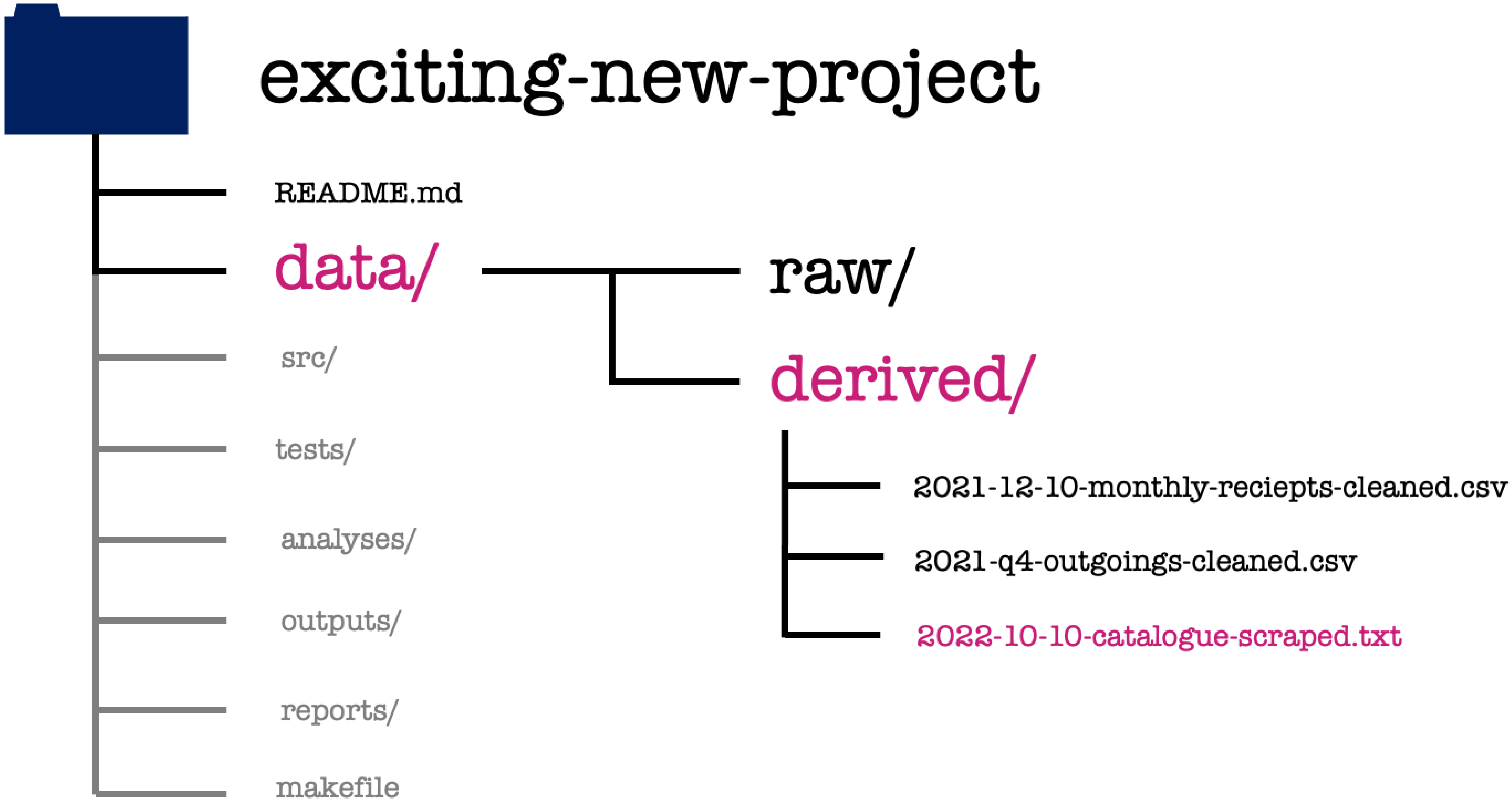

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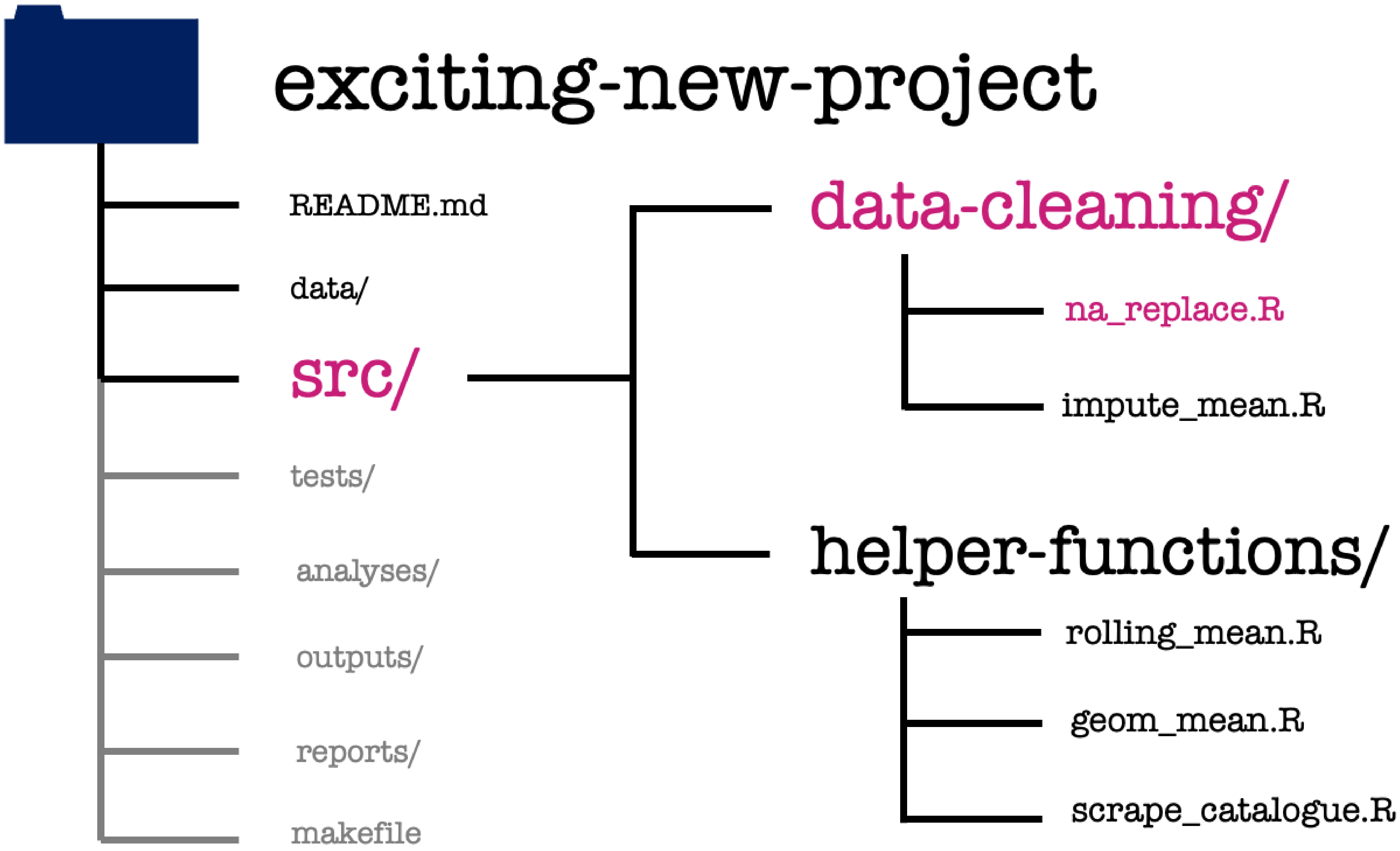

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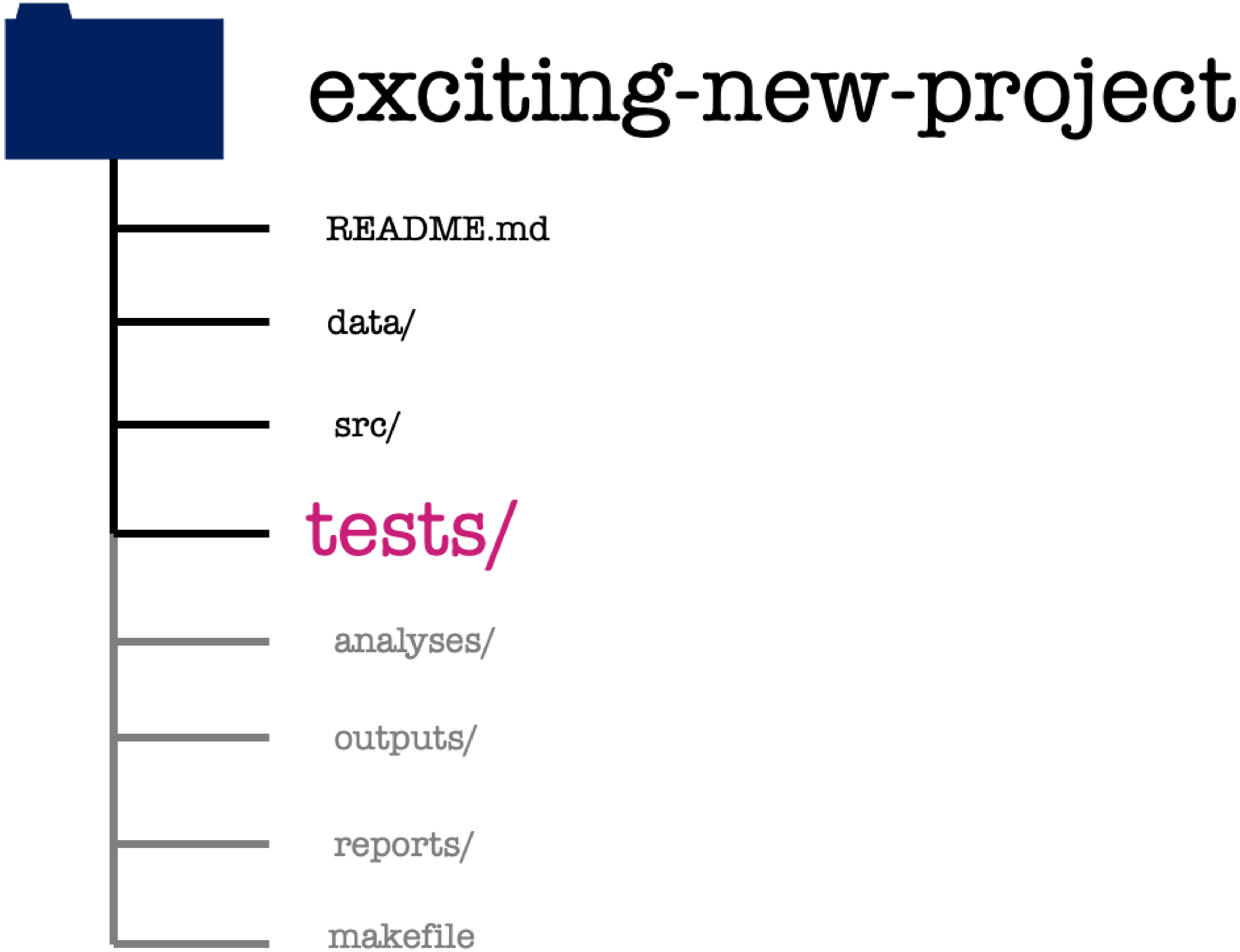

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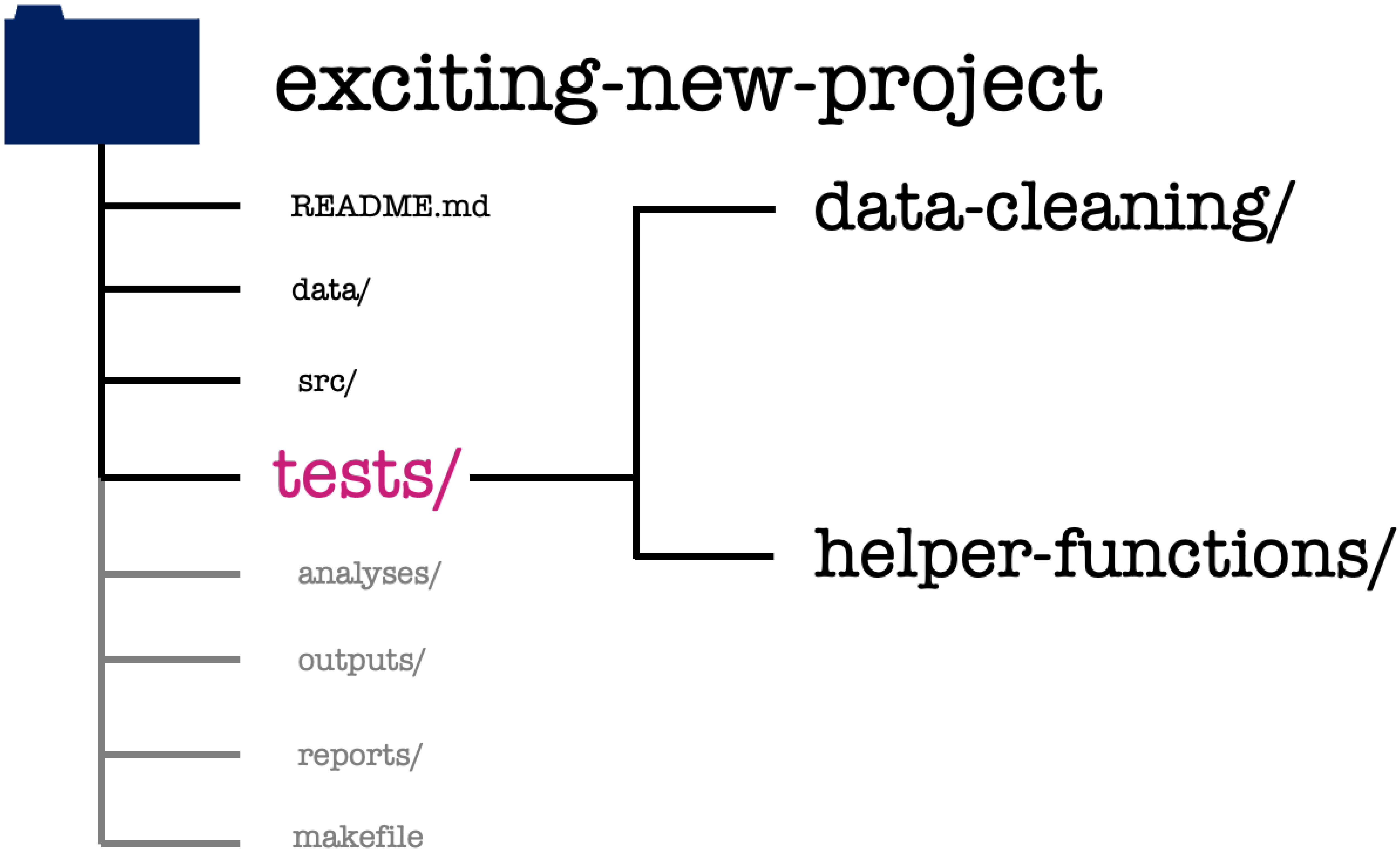

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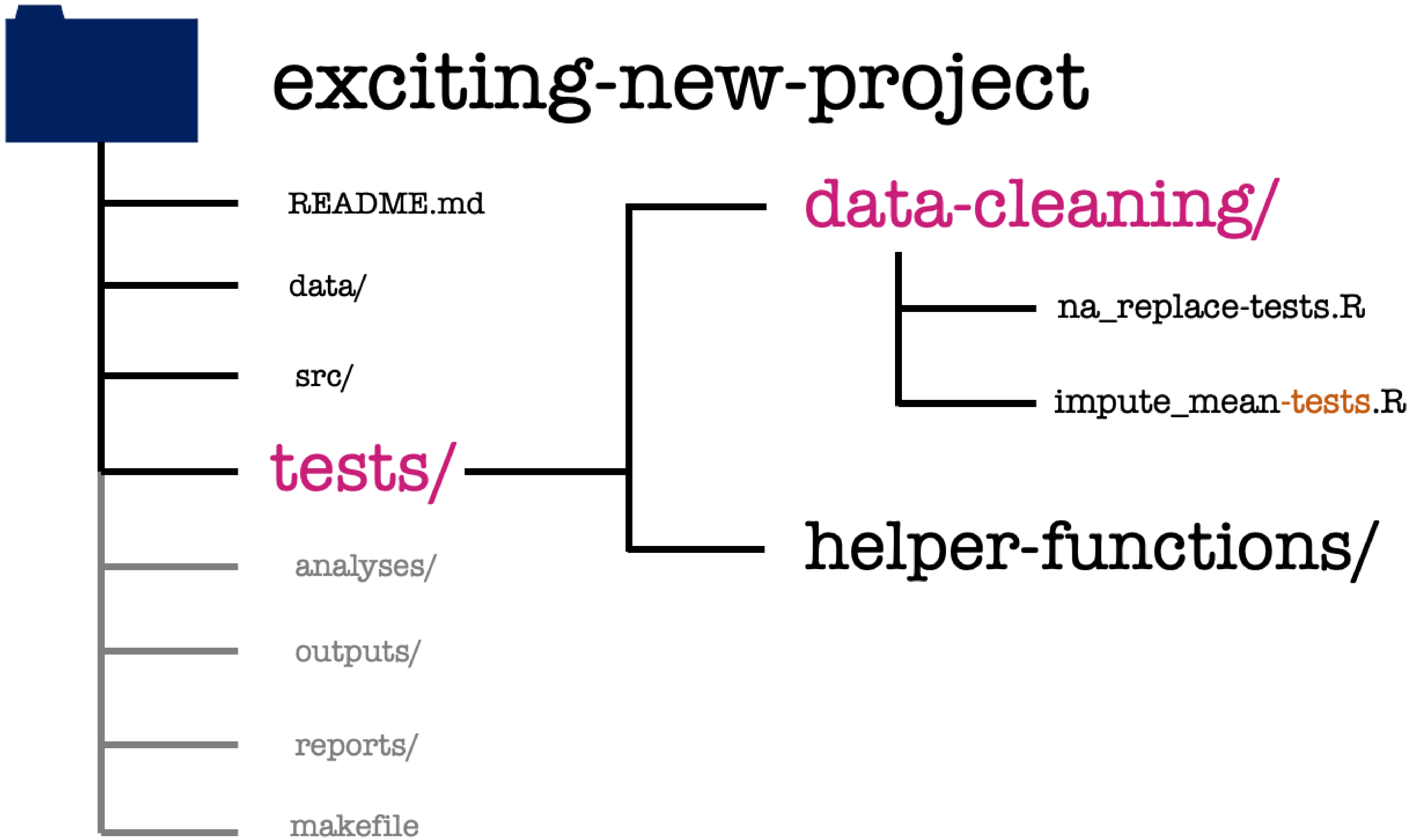

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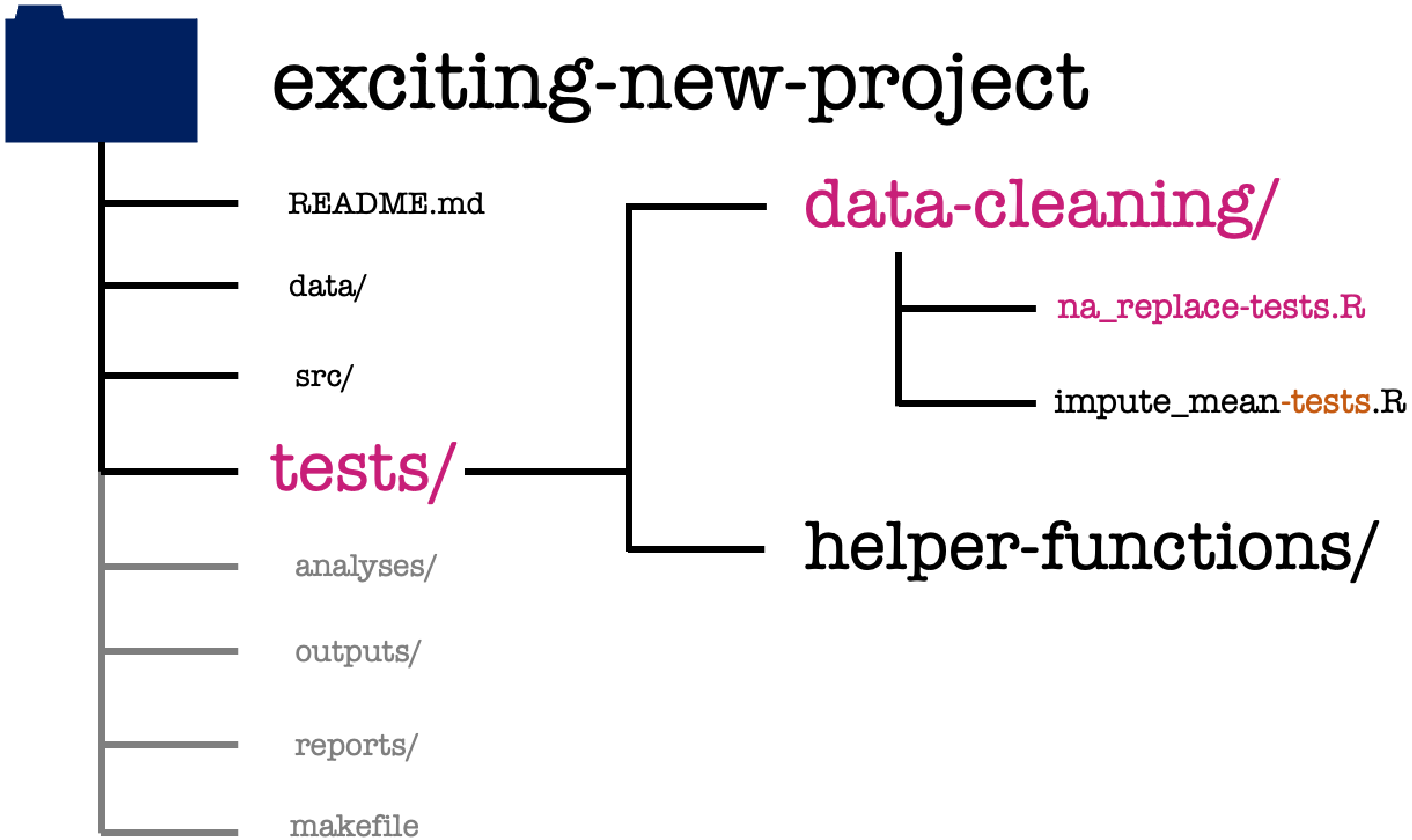

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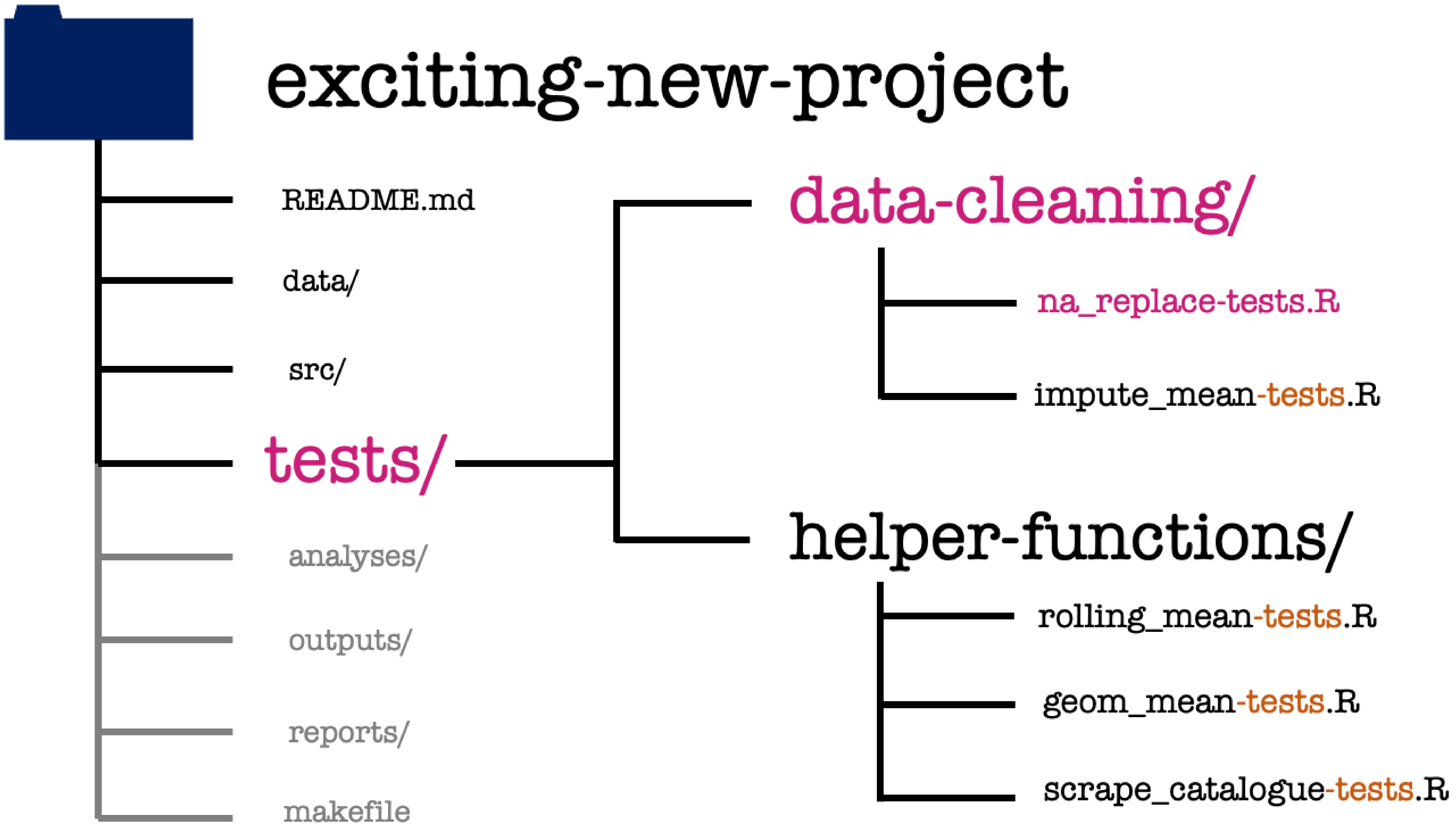

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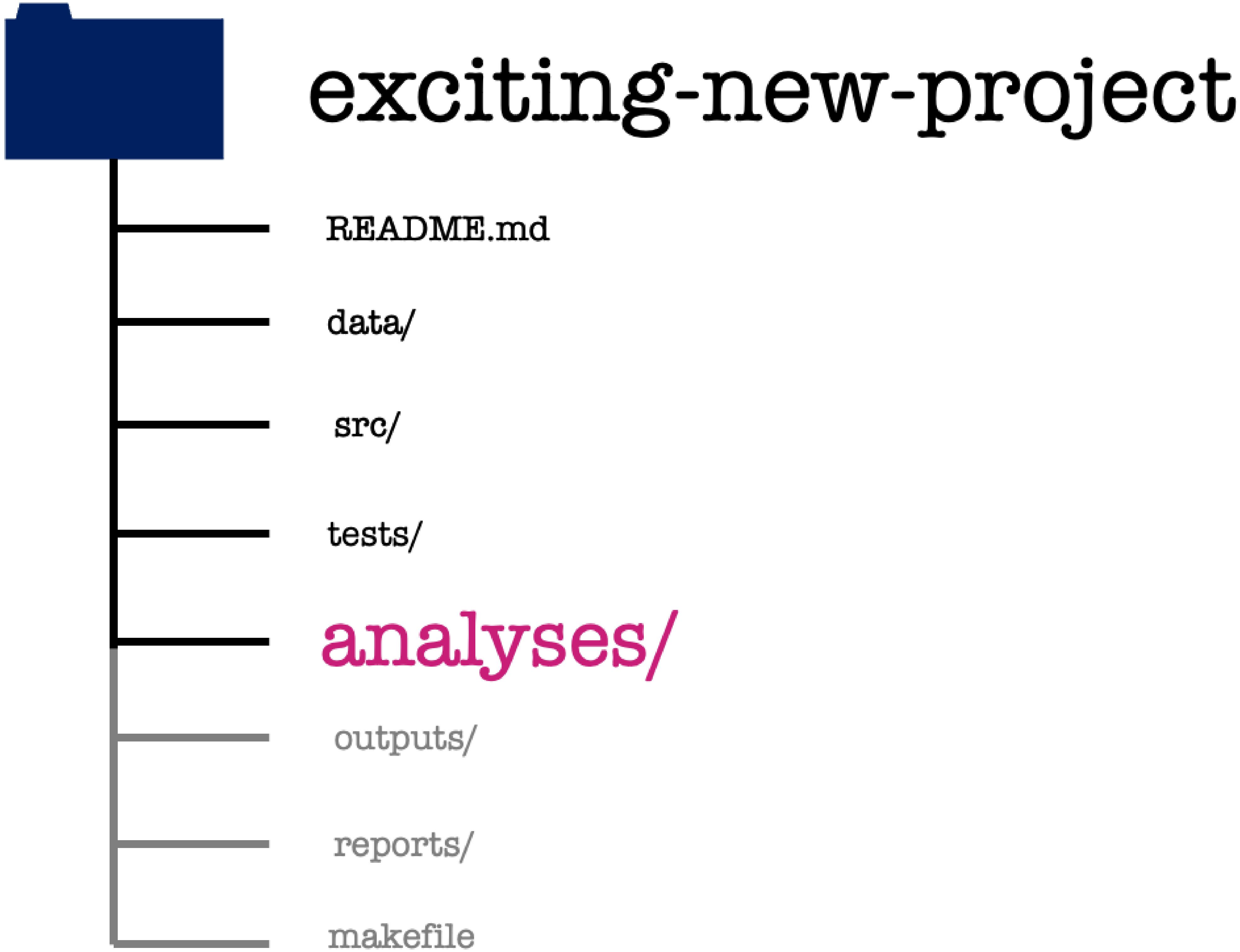

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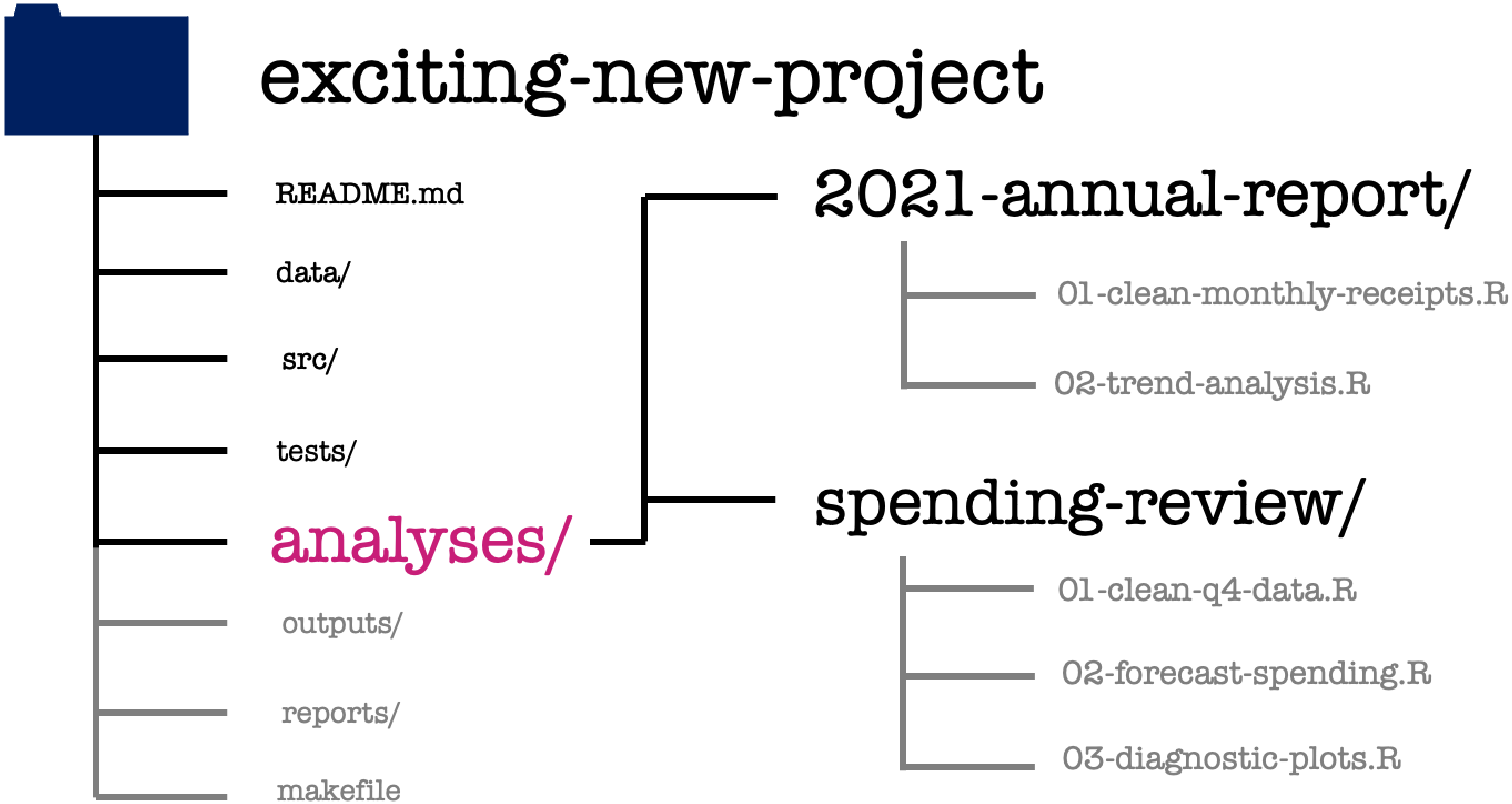

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02-trend-analysis.R

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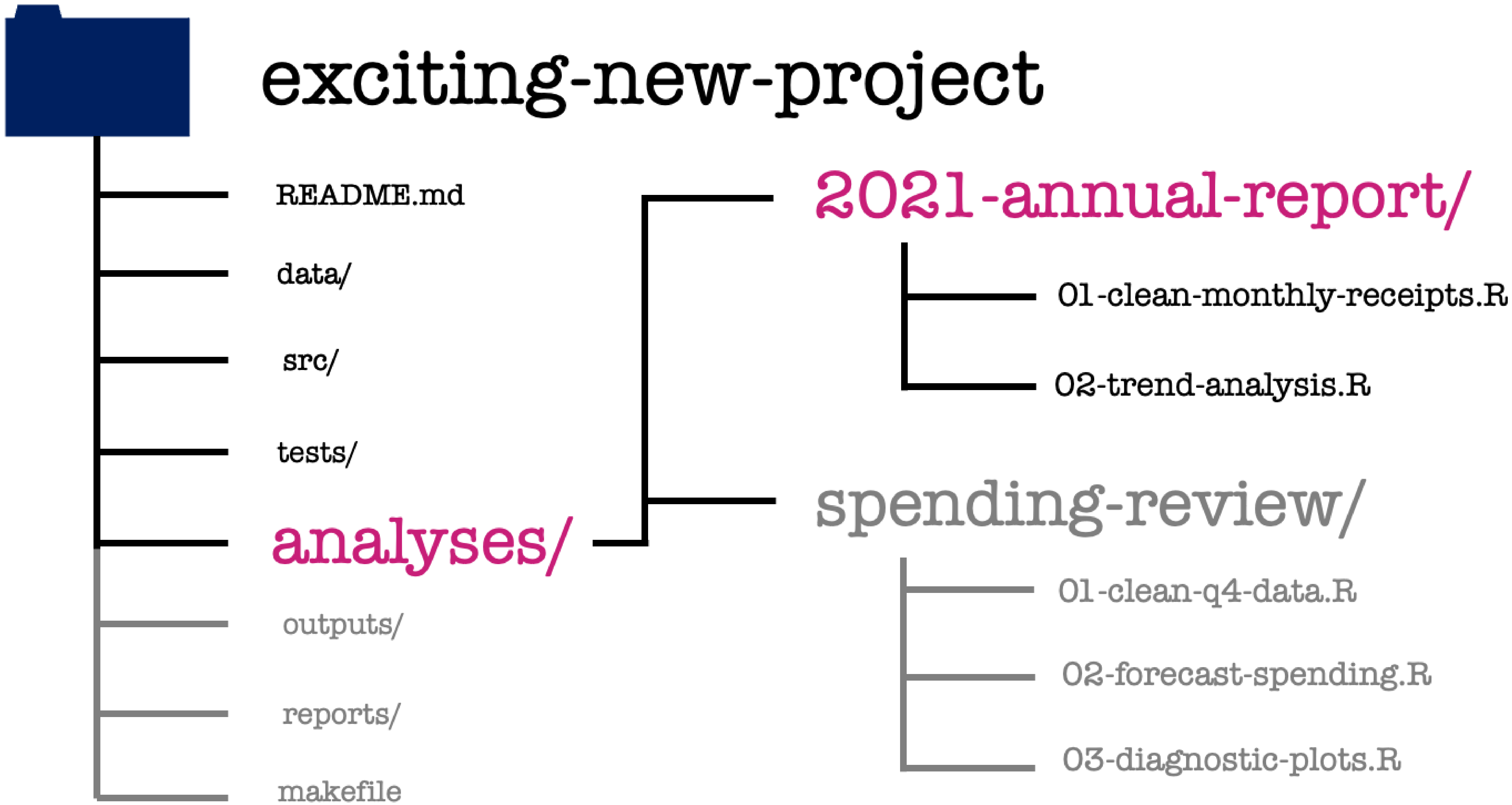
01-clean-q4-data.R

02-forecast-spending.R

03-diagnostic-plots.R



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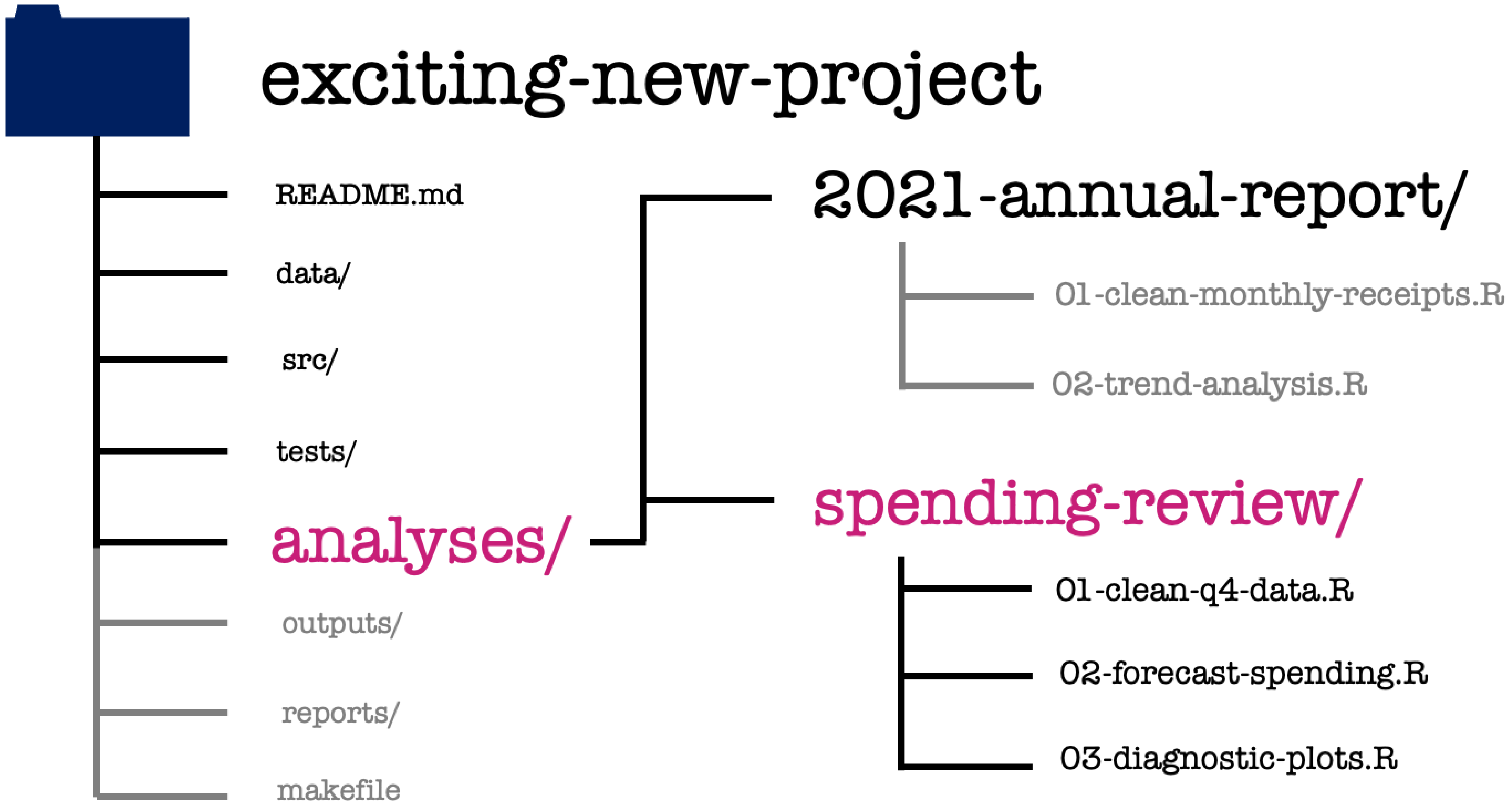

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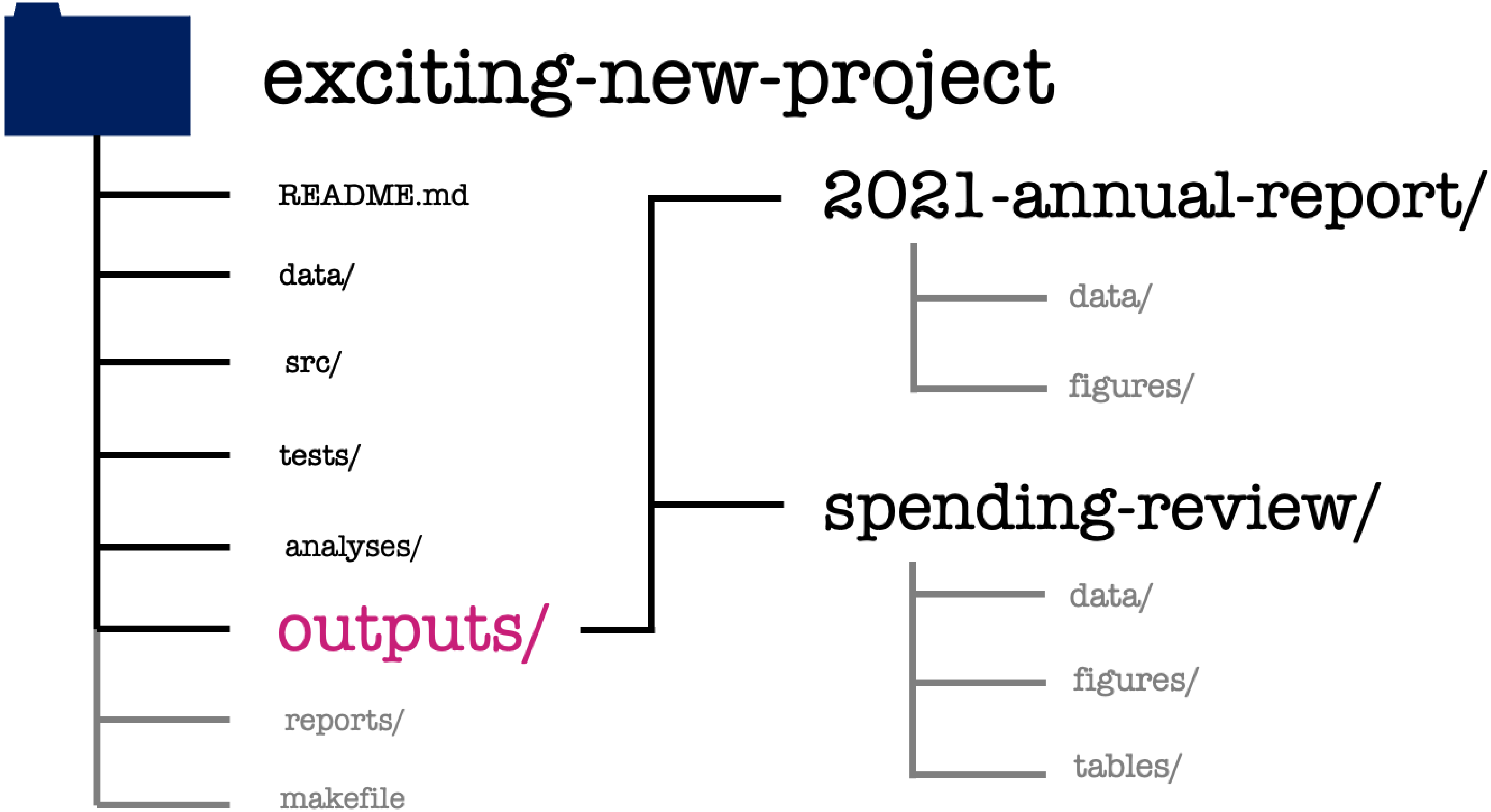
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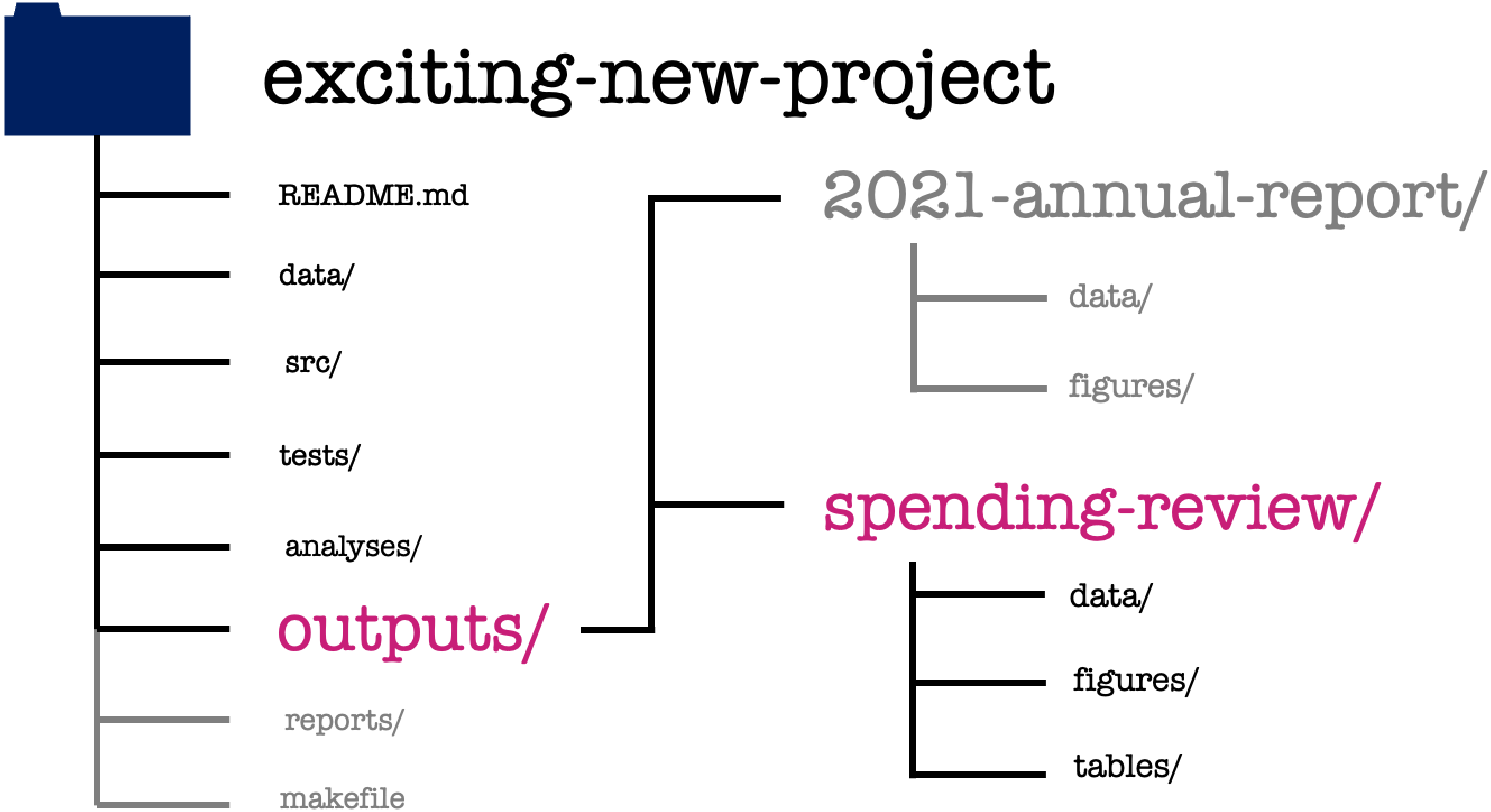

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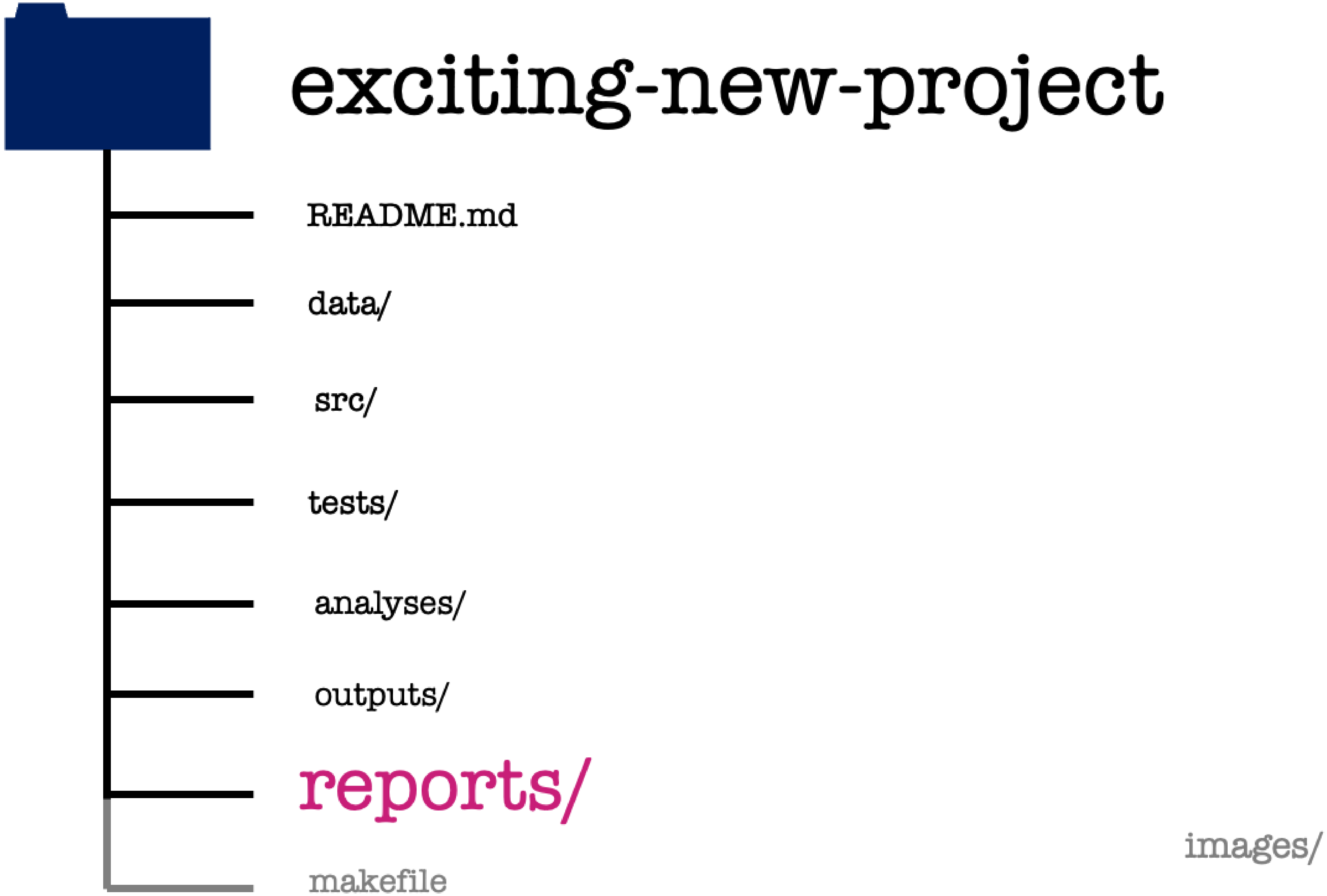

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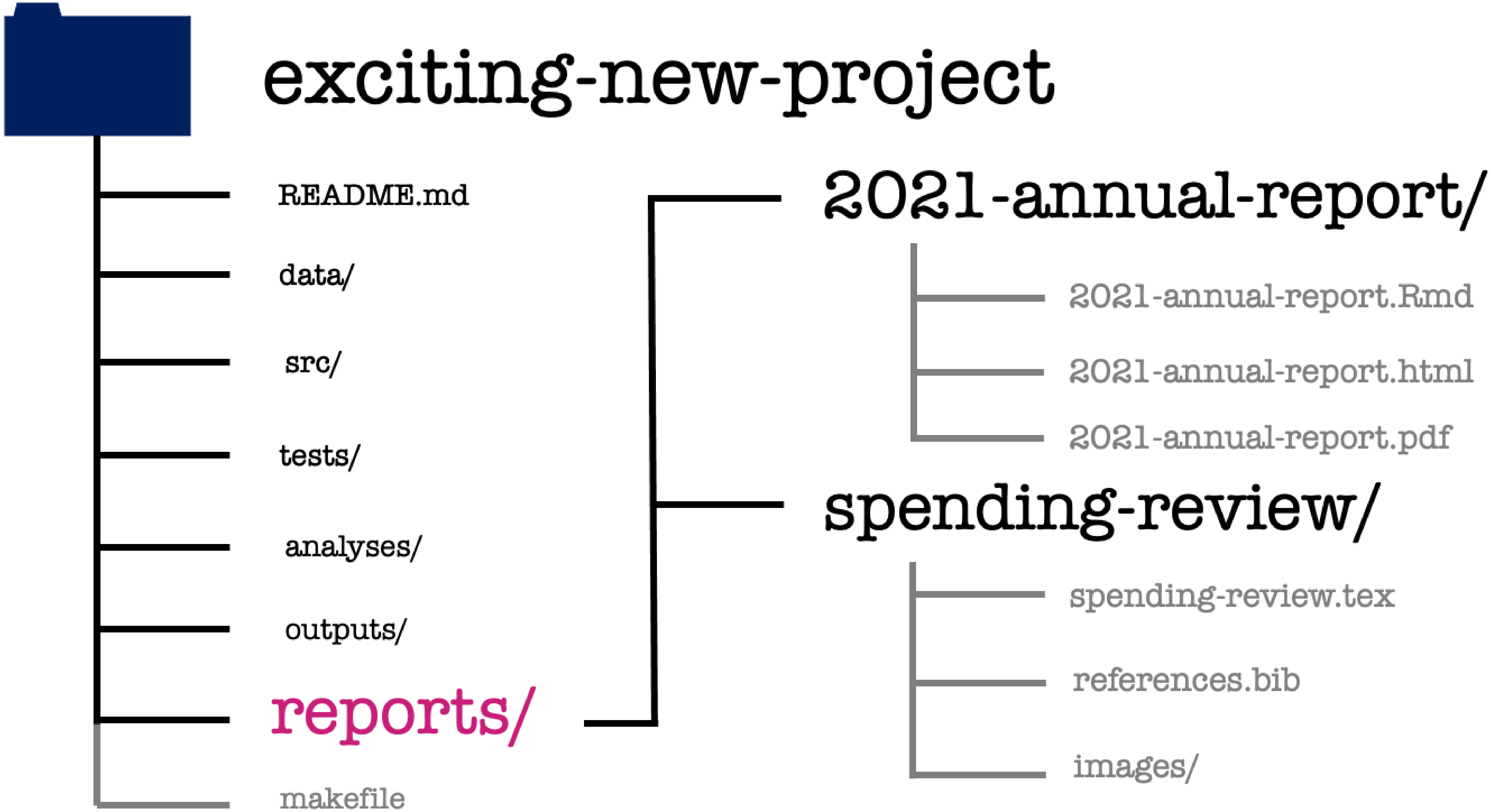

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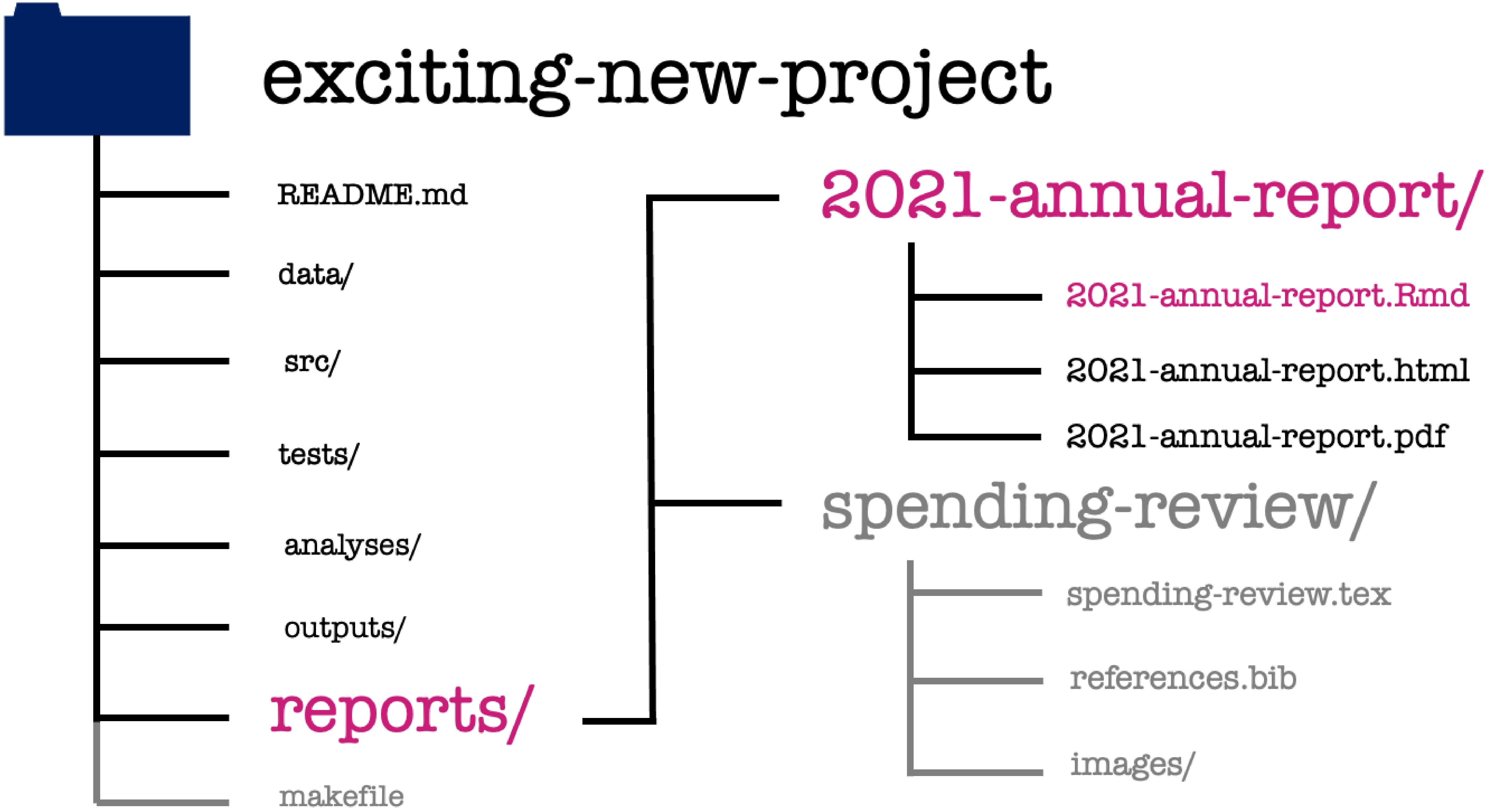

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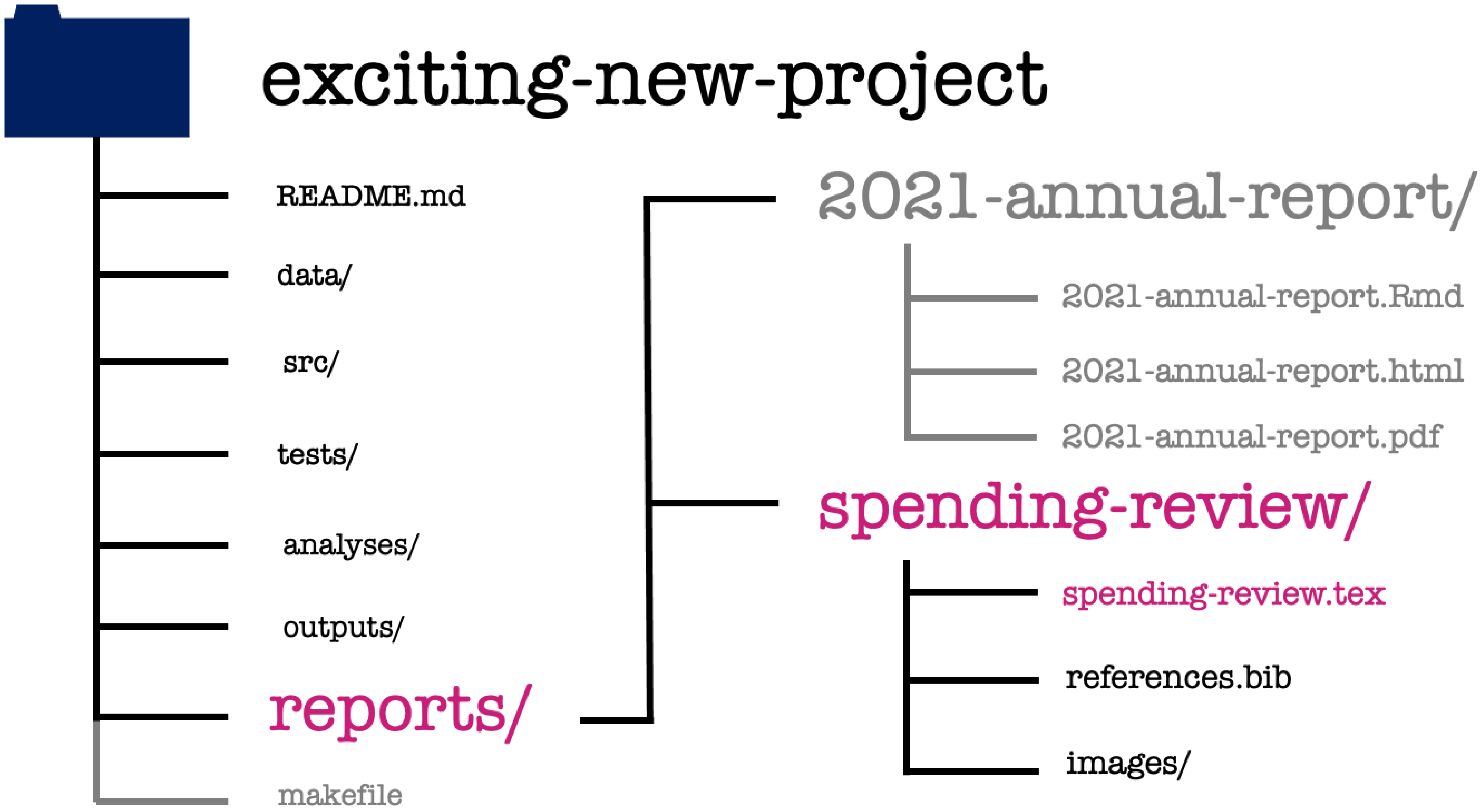

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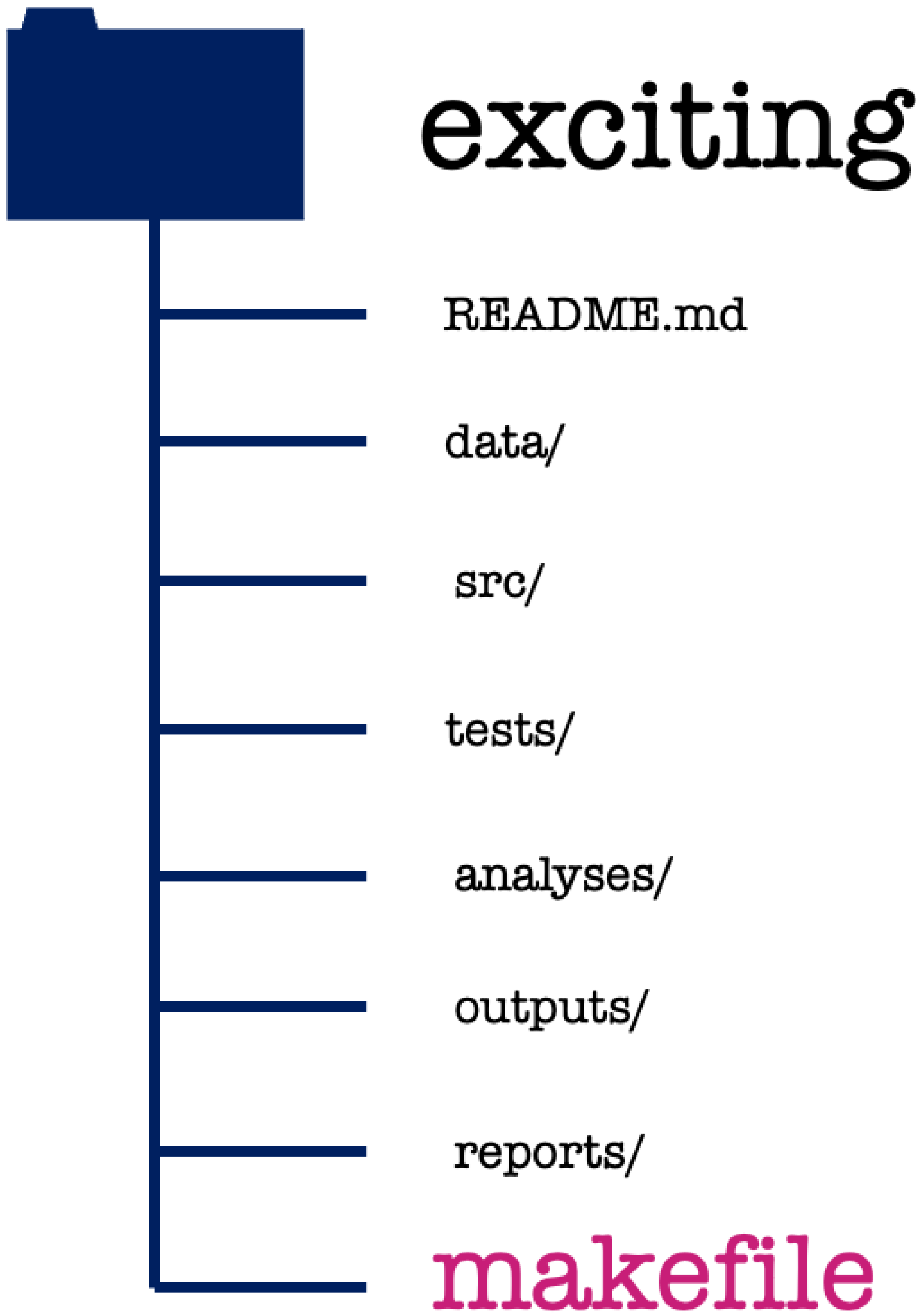

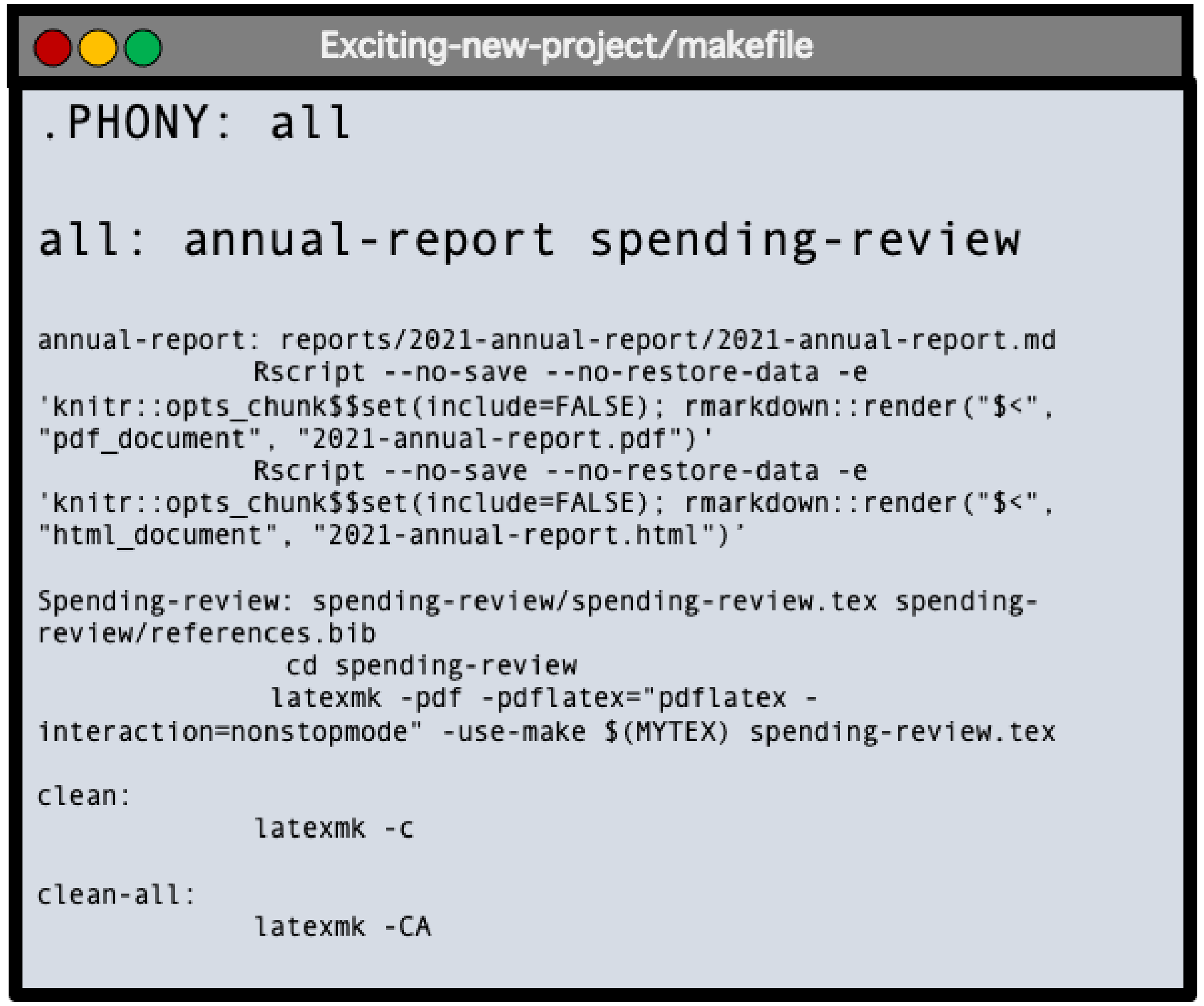

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              Rscript --no-save --no-restore-data -e
'knitr::opts_chunk$$set(include=FALSE); rmarkdown::render("$<",
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Spending-review: spending-review/spending-review.tex spending-
review/references.bib
                cd spending-review
               latexmk -pdf -pdflatex="pdflatex -
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clean:
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clean-all:
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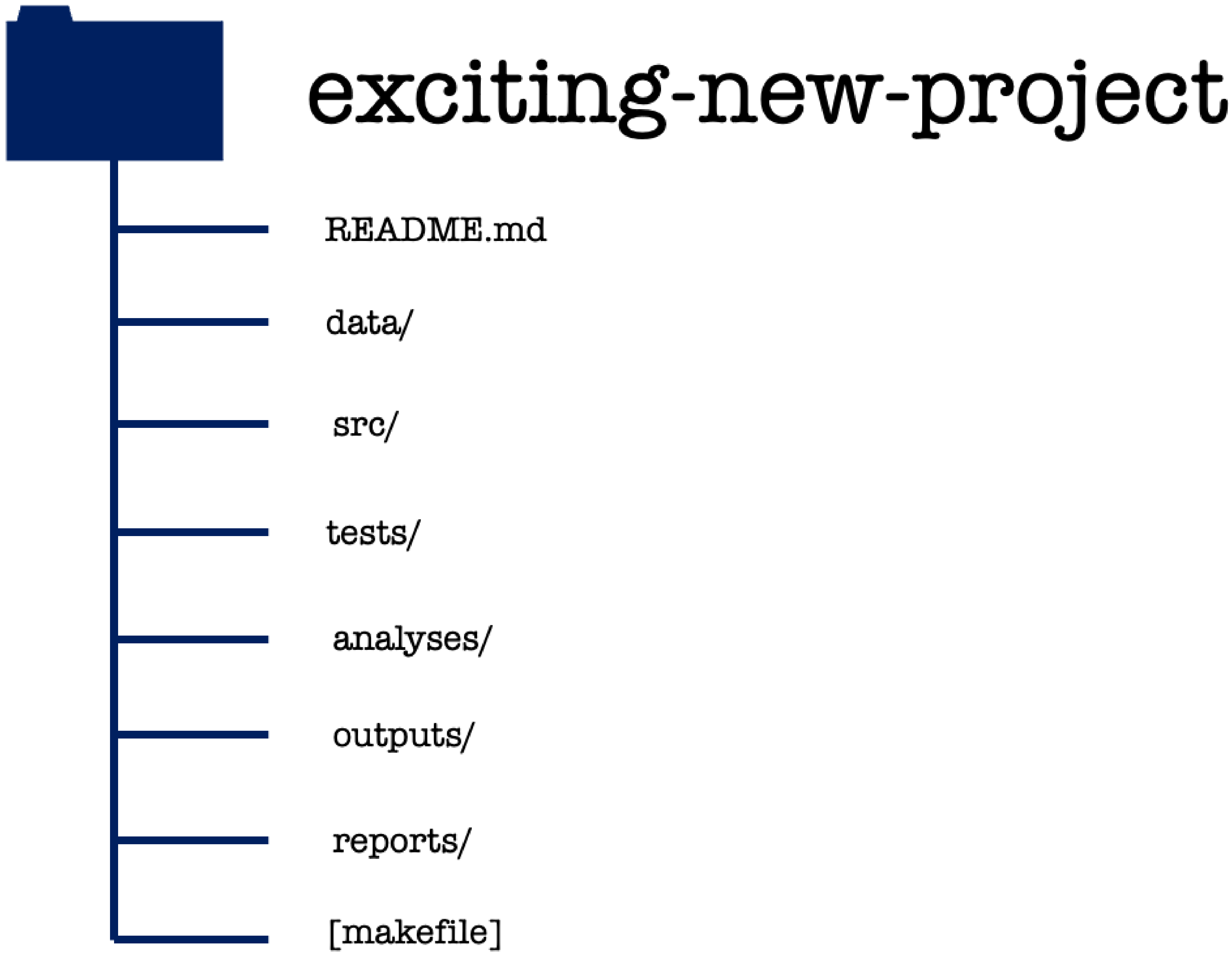

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Summary

- Introduced a standardised project structure;

- Good starting point for most data science projects;

- Exceptions are **apps** and **packages**.

References

Broman, Karl, Mine Cetinkaya-Rundel, Amy Nussbaum, Christopher Paciorek, Roger Peng, Daniel Turek, and Hadley Wickham. 2017. “Recommendations to Funding Agencies for Supporting Reproducible Research.” In **American Statistical Association**, 2:1–4.