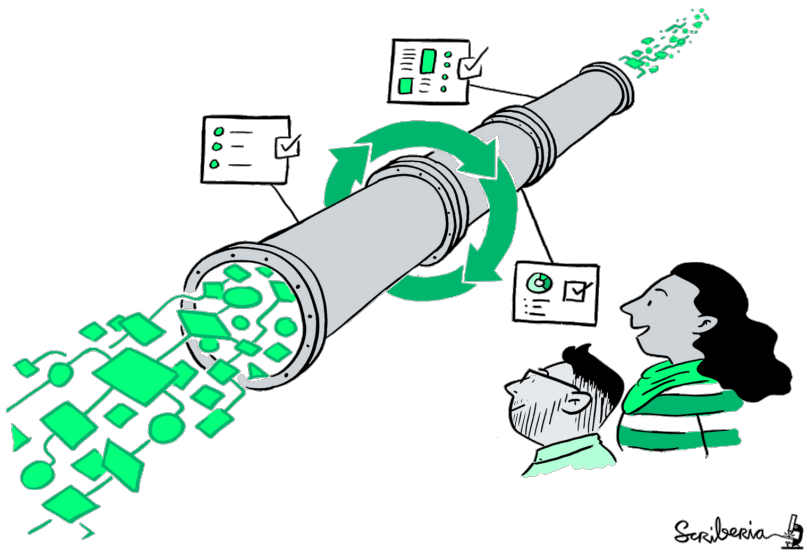
Training on Web Scraping Prices for CPI

How to RAP

Christophe Bontemps & Serge Goussev

Reproducible Analytical Pipeline

- It is a process



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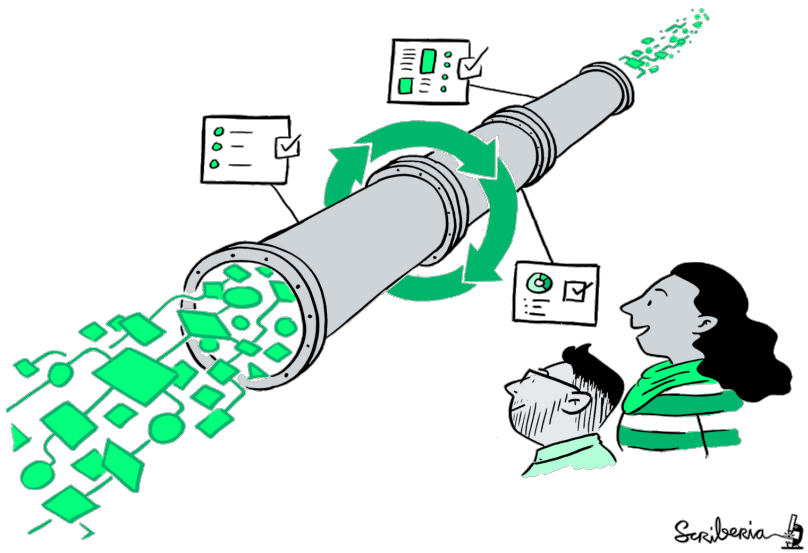

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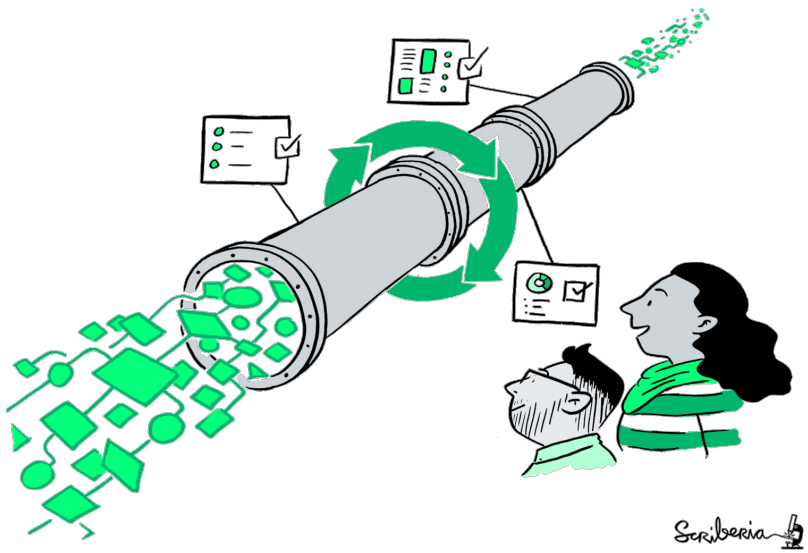

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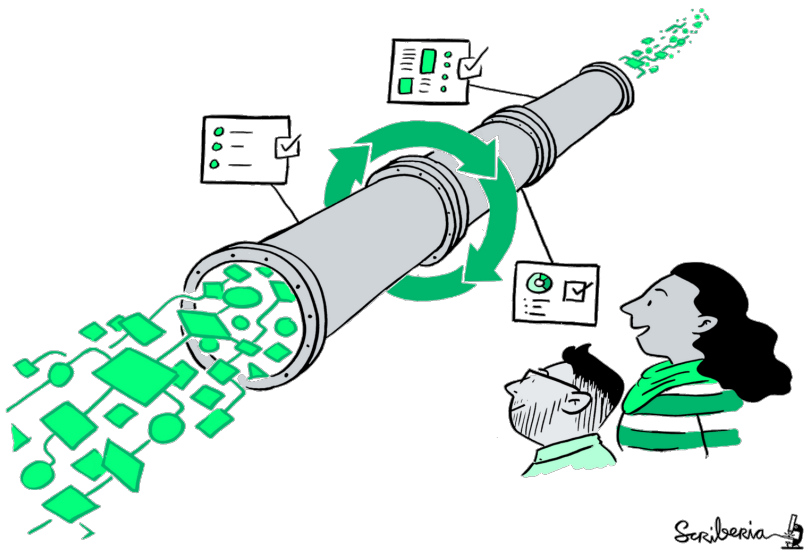

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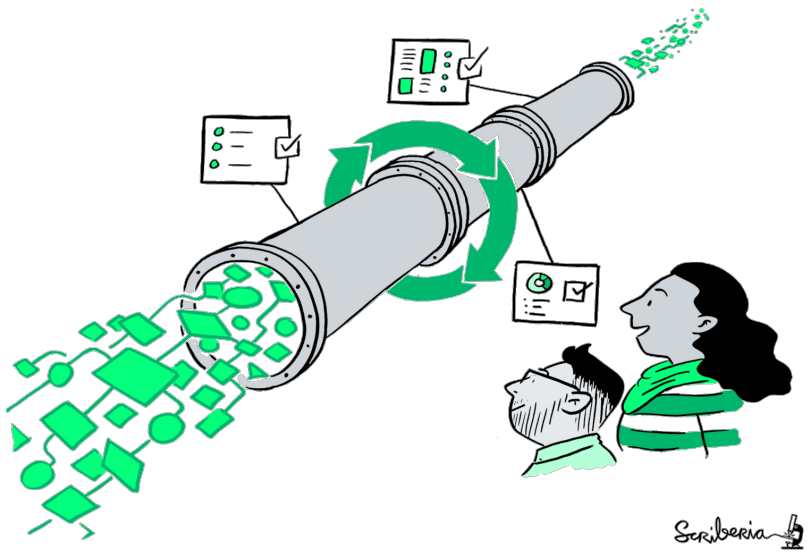

Reproducible Analytical Pipeline

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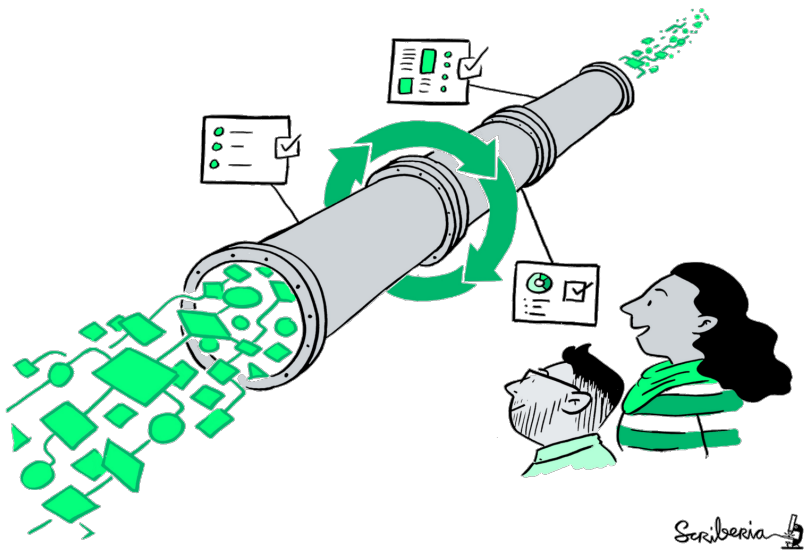
- It leads to fast processes (see Vanuatu Experience)
- It builds trust



What does a RAP look like?

Idealy, Input (website) and output (report) are linked

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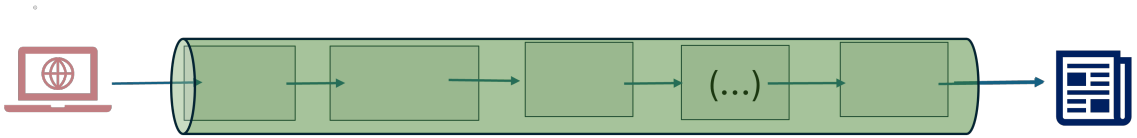
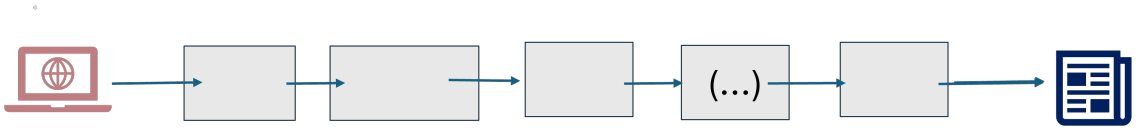


Many steps are needed to create a report

What does a RAP look like?



All steps should be linked in a structured process

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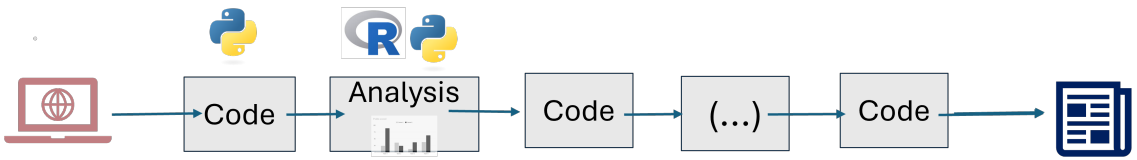

And only through code (Python, R, *Stata*), no copy/paste

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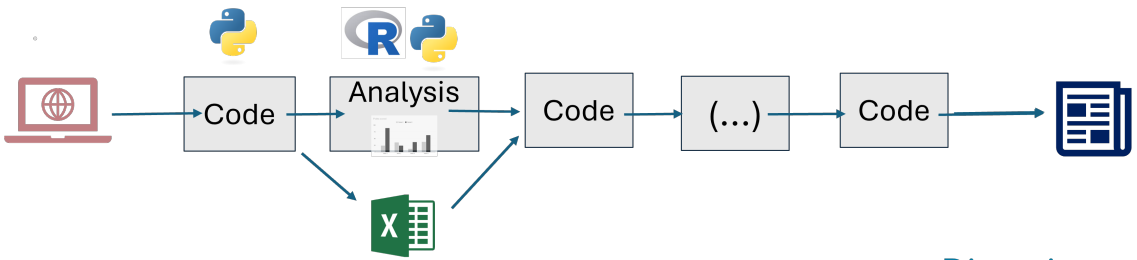

Direct input-output of data

There may be side-products, but with explicit output-input links

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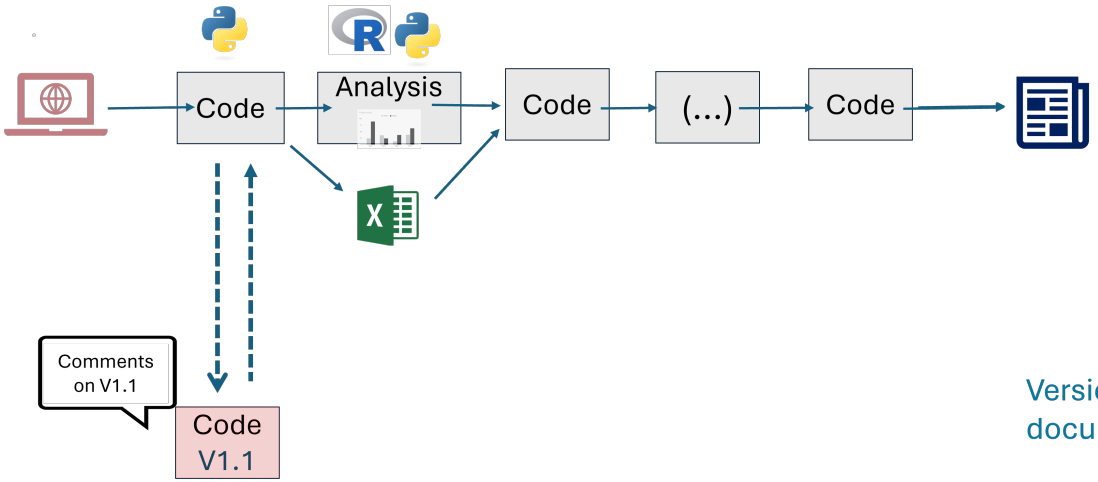

If needed, code can be updated (new versions)

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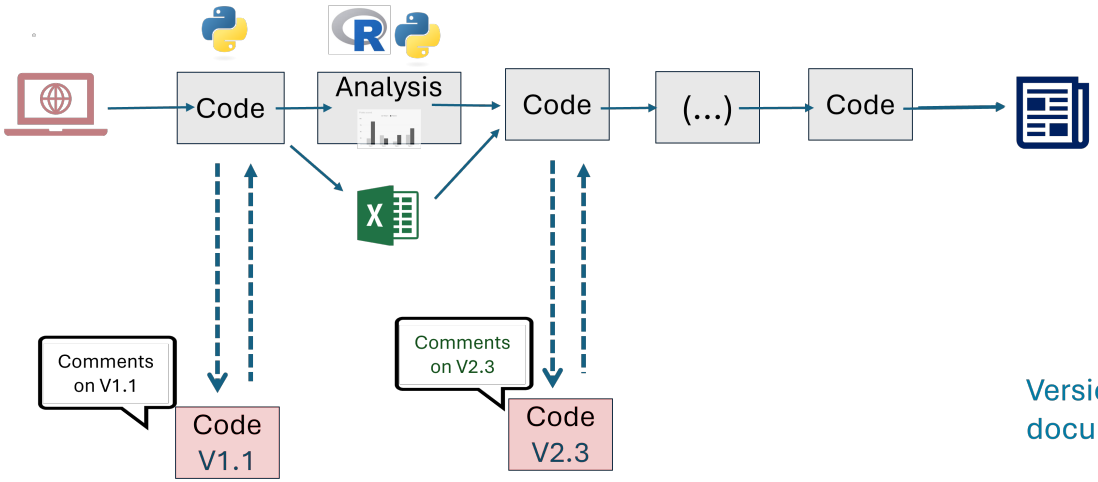

And comments added for each change

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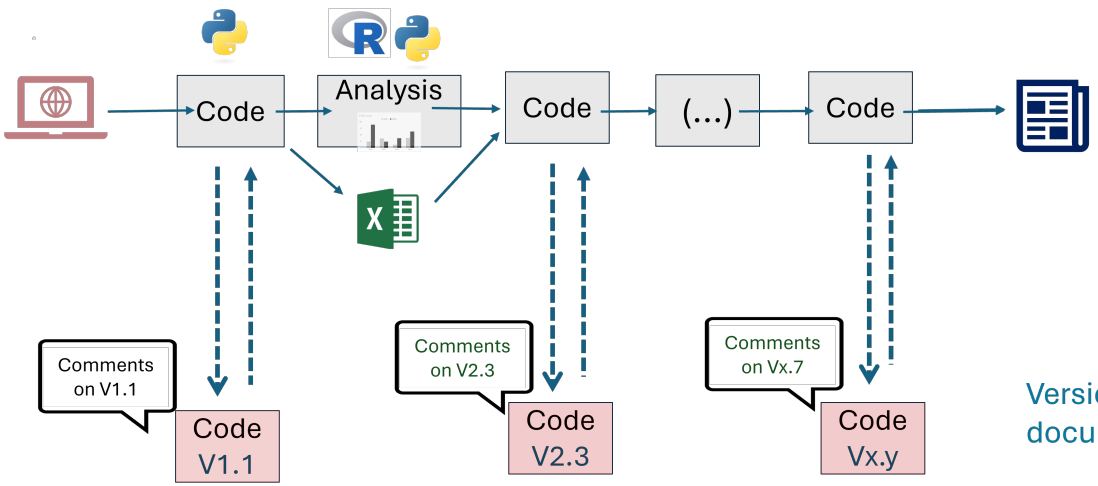

Documentation on the process builds up with code changes

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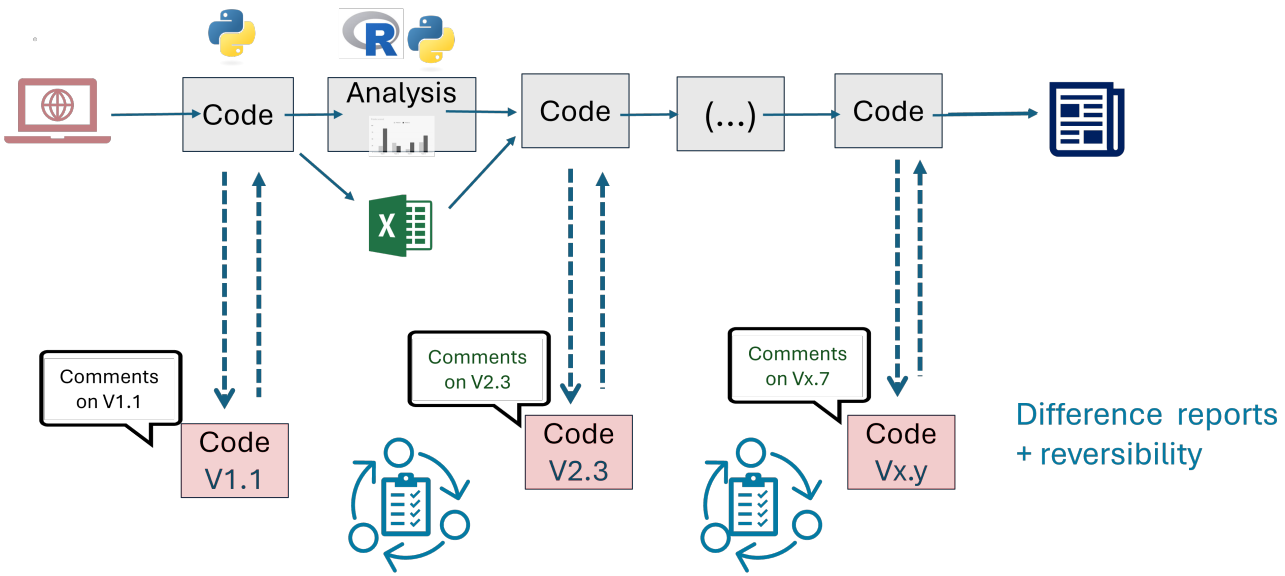

Other contributors are welcome!

3 MAIN PRINCIPLES:

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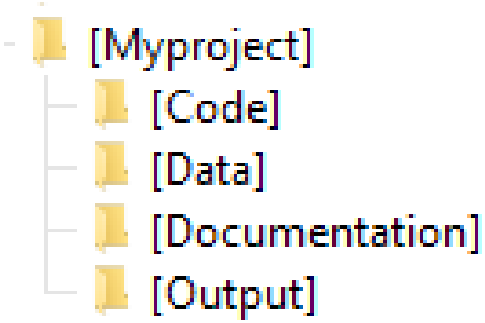
Apply this in context (colleagues, code, software,...)

Organize your work

Organize your work

- Have a clear directory structure



Example of a well-organized directory structure.

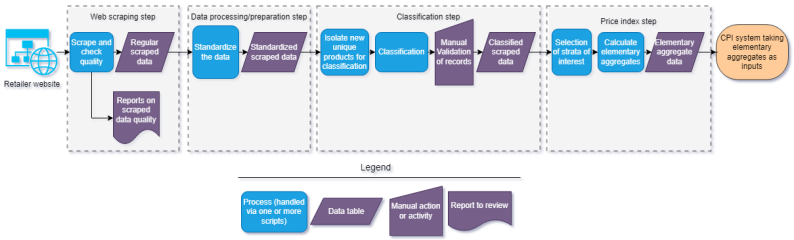
Organize your work

- Have a clear directory structure
- Use naming conventions

```
01_Scraping_data.ipynb
02_Cleaning_data.ipynb
03_Classification.ipynb
04_Stats_Tables.ipynb
04_Price_CPI.ipynb
```

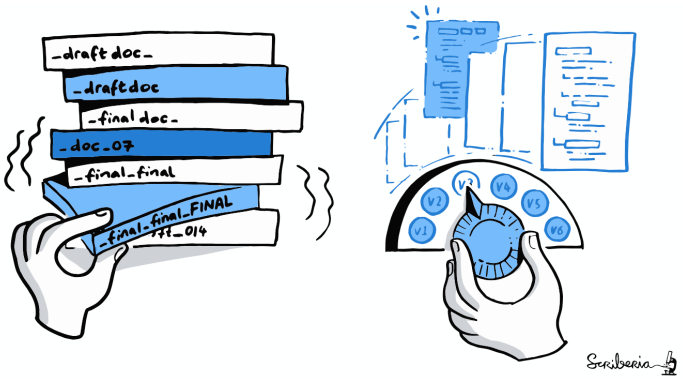
Organize your work

- Have a clear directory structure
- Use naming conventions
- Keep track of the workflow



Organize your work

- Have a clear directory structure
- Use naming conventions
- Keep track of the workflow
- Use a version control system



Code for others

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- Program with style

"(. . .) code is read much more often than it is written"
Guido van Rossum (2013 -PEP8)

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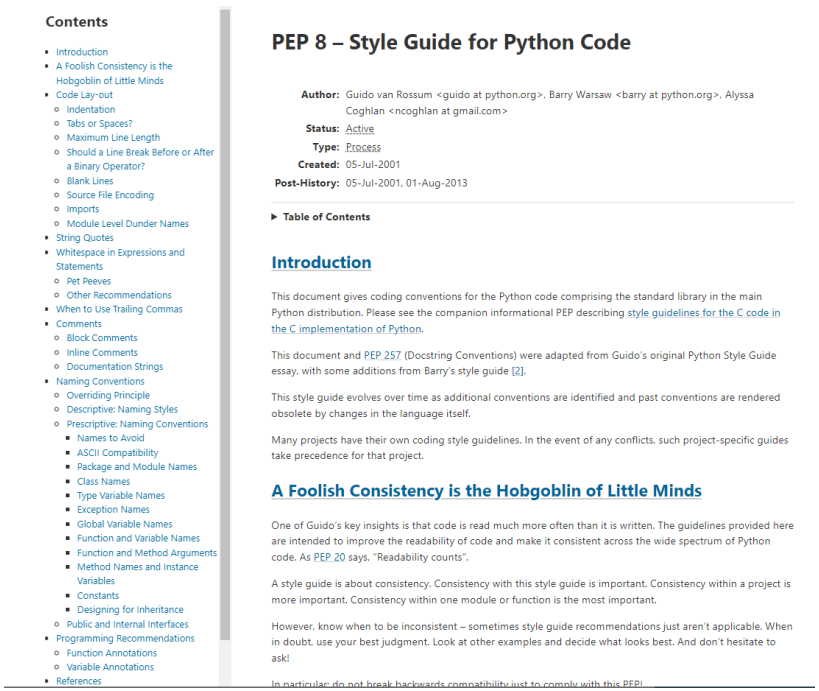
- Use conventions (PEP8)



Contents

PEP 8 – Style Guide for Python Code

Author: Guido van Rossum <guido at python.org>, Barry Warsaw <barry at python.org>, Alyssa Coghlan <ncoghlan at gmail.com>

Status: Active
Type: Process
Created: 05-Jul-2001
Post-History: 05-Jul-2001, 01-Aug-2013

▸ Table of Contents

Introduction

This document gives coding conventions for the Python code comprising the standard library in the main Python distribution. Please see the companion informational PEP describing style guidelines for the C code in the C implementation of Python.

This document and PEP 257 (Docstring Conventions) were adapted from Guido's original Python Style Guide essay, with some additions from Barry's style guide [2].

This style guide evolves over time as additional conventions are identified and past conventions are rendered obsolete by changes in the language itself.

Many projects have their own coding style guidelines. In the event of any conflicts, such project-specific guides take precedence for that project.

A Foolish Consistency is the Hobgoblin of Little Minds

One of Guido's key insights is that code is read much more often than it is written. The guidelines provided here are intended to improve the readability of code and make it consistent across the wide spectrum of Python code. As PEP 20 says, "Readability counts".

A style guide is about consistency. Consistency with this style guide is important. Consistency within a project is more important. Consistency within one module or function is the most important.

However, know when to be inconsistent – sometimes style guide recommendations just aren't applicable. When in doubt, use your best judgment. Look at other examples and decide what looks best. And don't hesitate to ask!

In particular: do not break backwards compatibility just to comply with this PEP!

Code for others

- Program with style
- Use conventions (PEP8)
- Avoid ambiguities

Usual

```
df['sex'] = np.where(df['gender']
== '1001', 1, 2)
```

Better

```
df['female'] =
np.where(df['gender'] == '1001',
1, 0)
df['male'] =
np.where(df['gender'] != '1001',
1, 0)
```

DO NOT REPEAT YOURSELF

DO NOT REPEAT YOURSELF

- Create reusable objects

Usual

```
Current_Data = Mydata[Mydata['year'] == 2023]
```

Better

```
Current_year = 2023
Current_Data= Mydata[Mydata['year'] ==
Current_year]
```

Usual

```
# - Exports for Beef -
data = Mydata[Mydata['export'] == 'Beef']
plt.plot(data['Year'], data['Value'])
plt.title('Export for Beef')
# - Also for Kava -
data = Mydata[Mydata['export'] == 'Kava']
plt.plot(data['Year'], data['Value'])
plt.title('Export for Kava')
# - Also for ...  -
```

DO NOT REPEAT YOURSELF

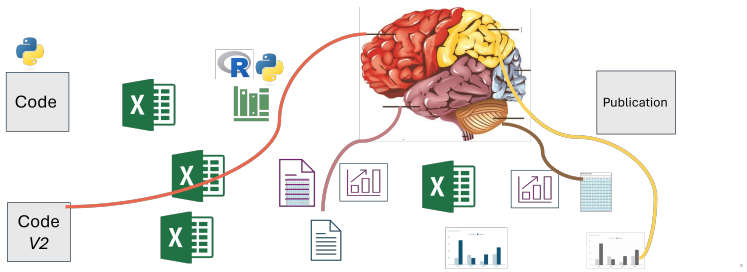
- Create reusable objects
- Avoid repetitions

Better

```
# Defining a generic function
def plot_export(export_type):
 data = Mydata[Mydata['export'] ==
                                    export_type]
 plt.plot(data['Year'], data['Value'])
 plt.title(f'Export for {export_type}')
 plt.show()
# Applying function to several products
plot_export("Beef")
plot_export("Kava")
```

DO NOT REPEAT YOURSELF

- Create reusable objects
- Avoid repetitions
- Automate as much as you can



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Tracking three **W** questions:

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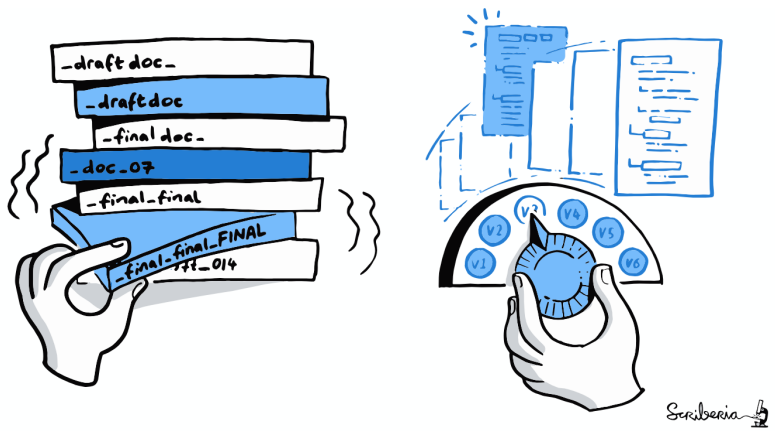

Source: The Turing Way project

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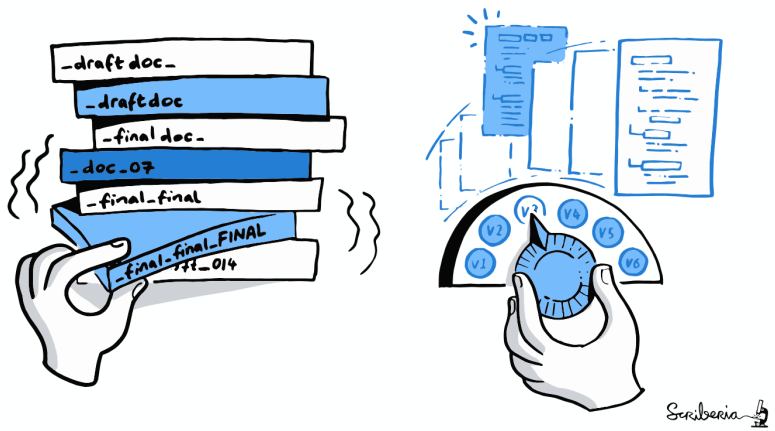

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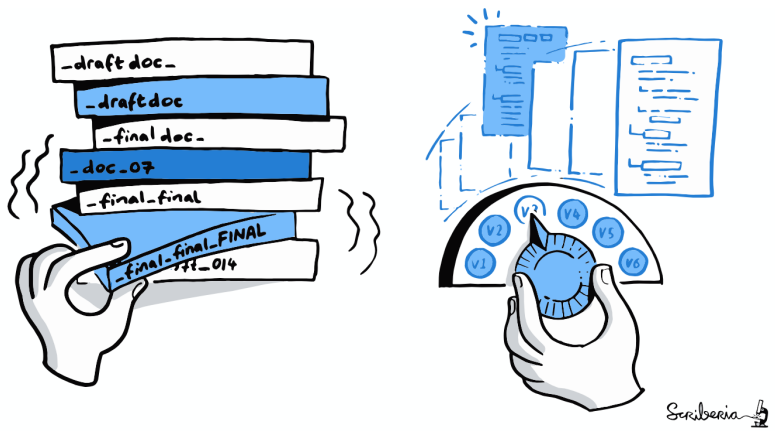

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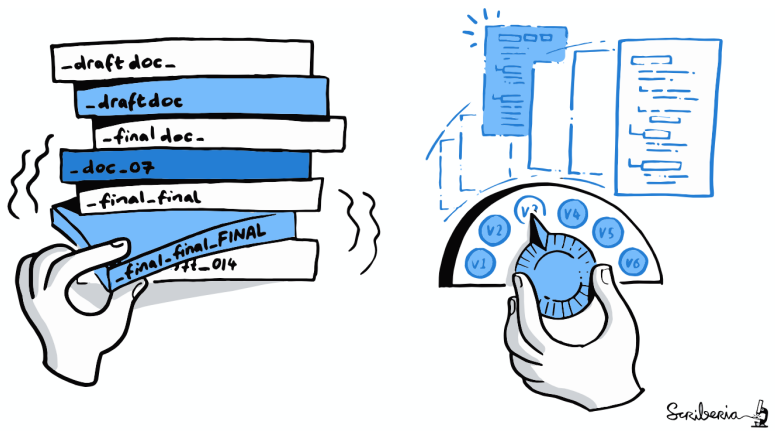

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SETUP

What you'll need to do...

- Download Git

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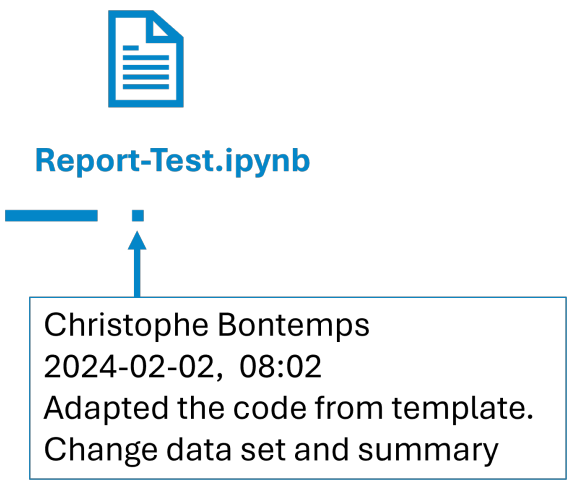
Version Control Main commands

commit for every change!



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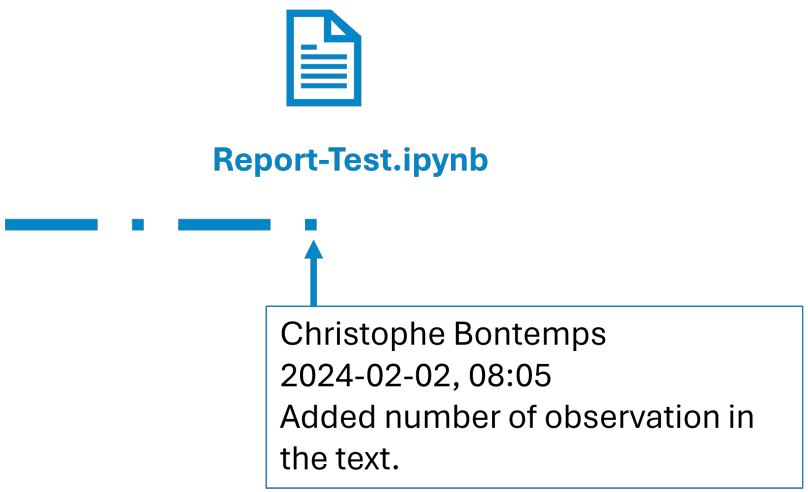

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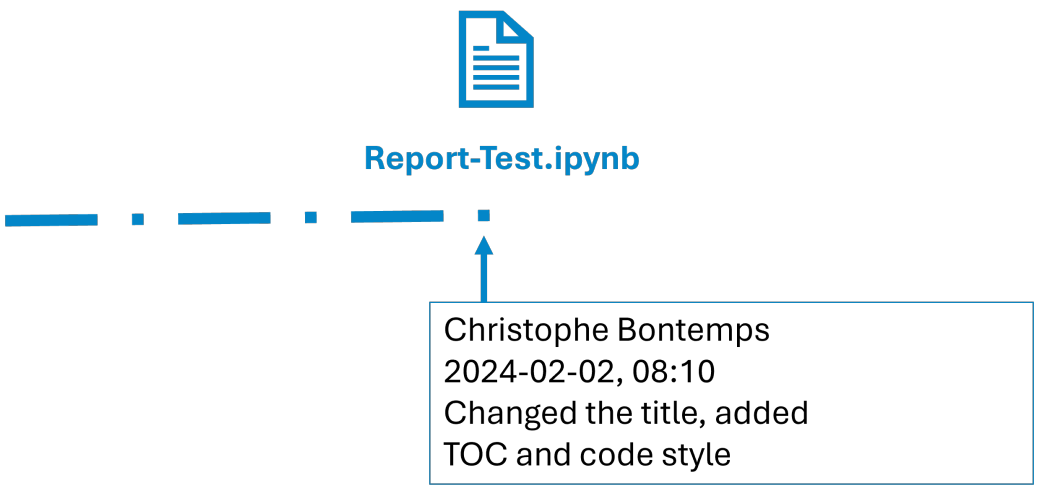

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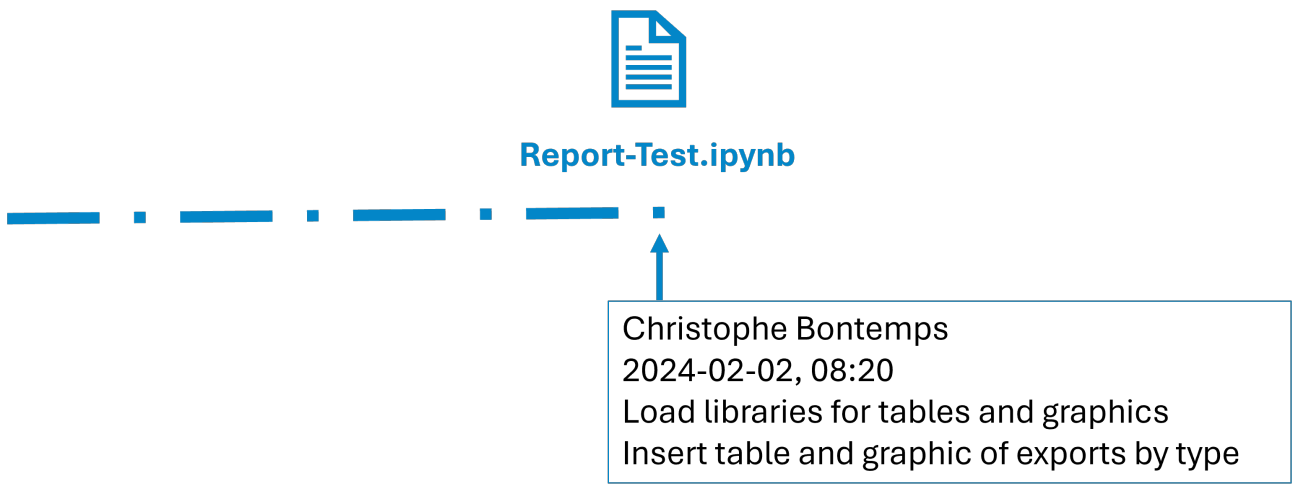

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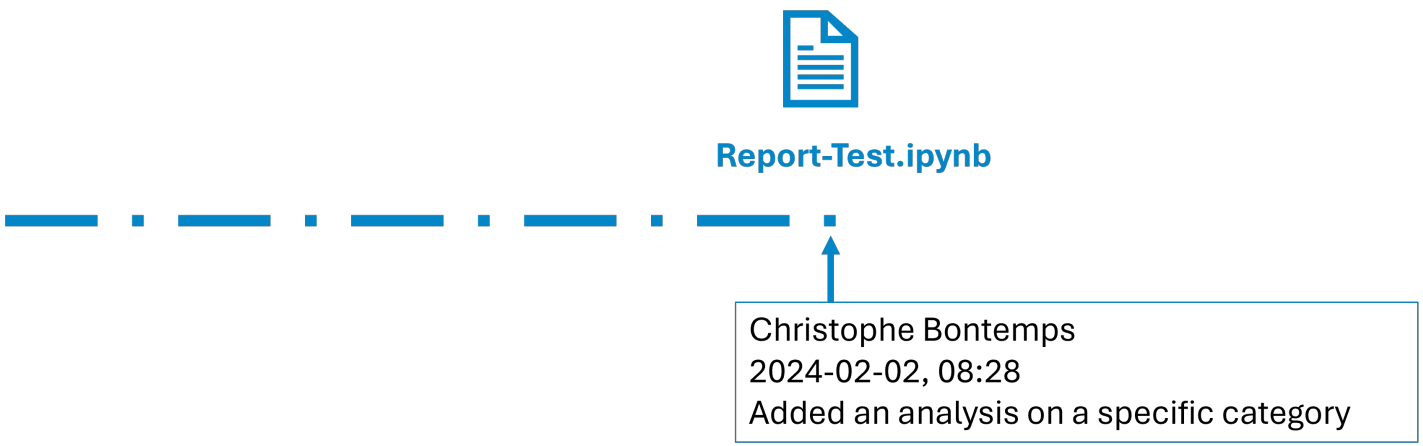

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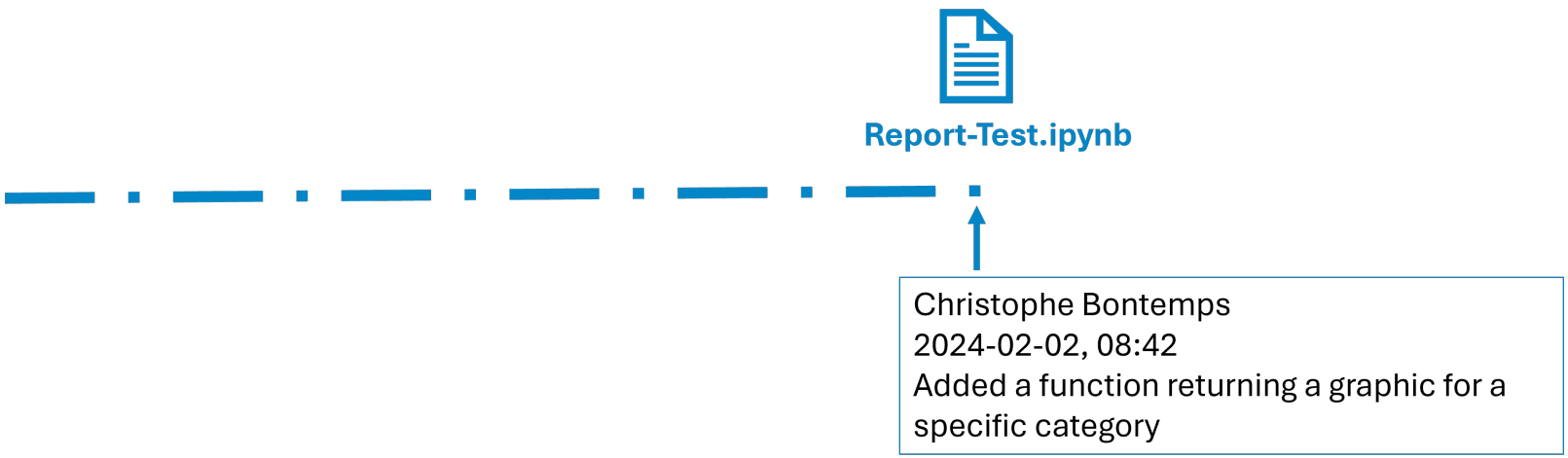

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Each version is documented (with *commits*)

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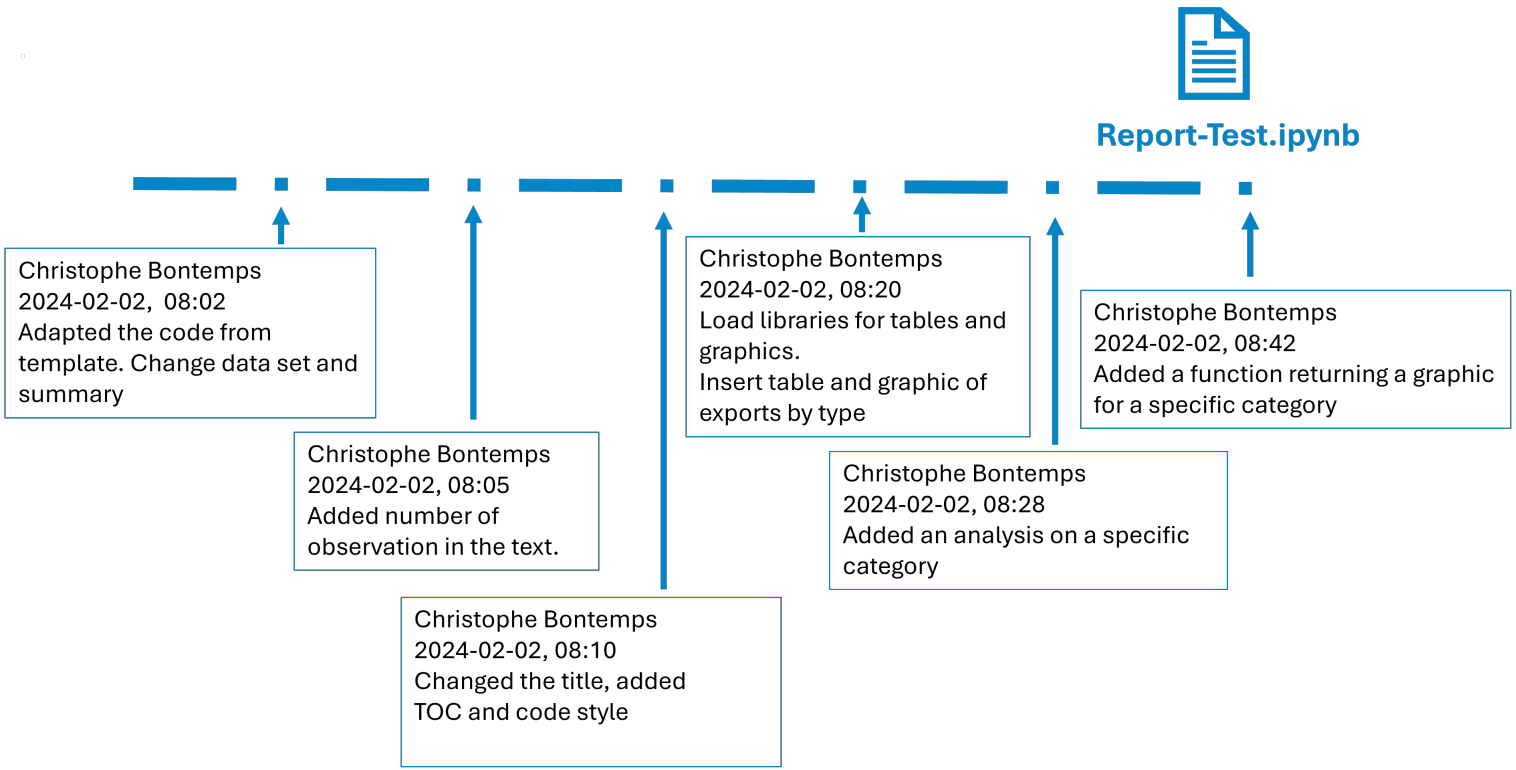
Each version embeds the full history!



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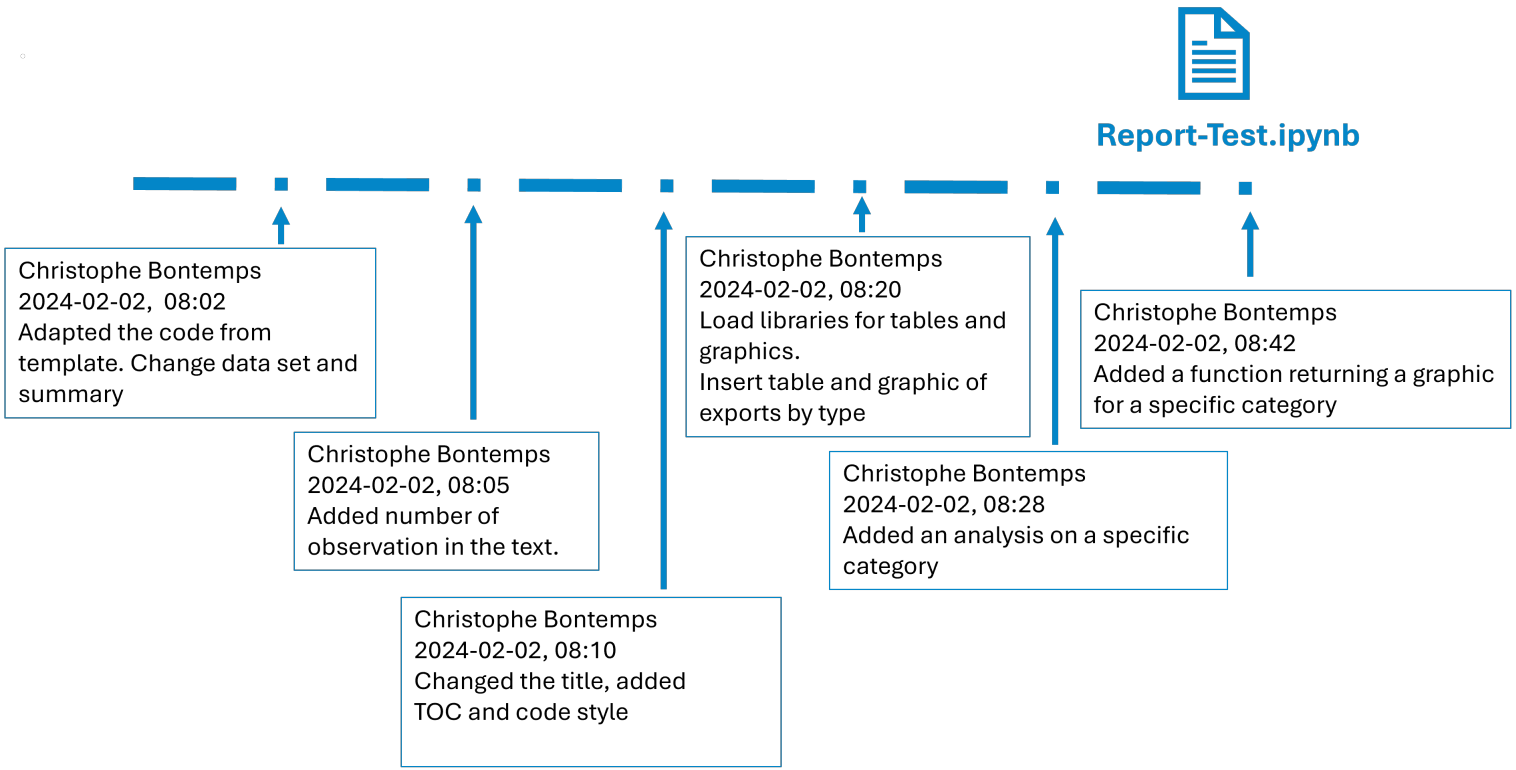

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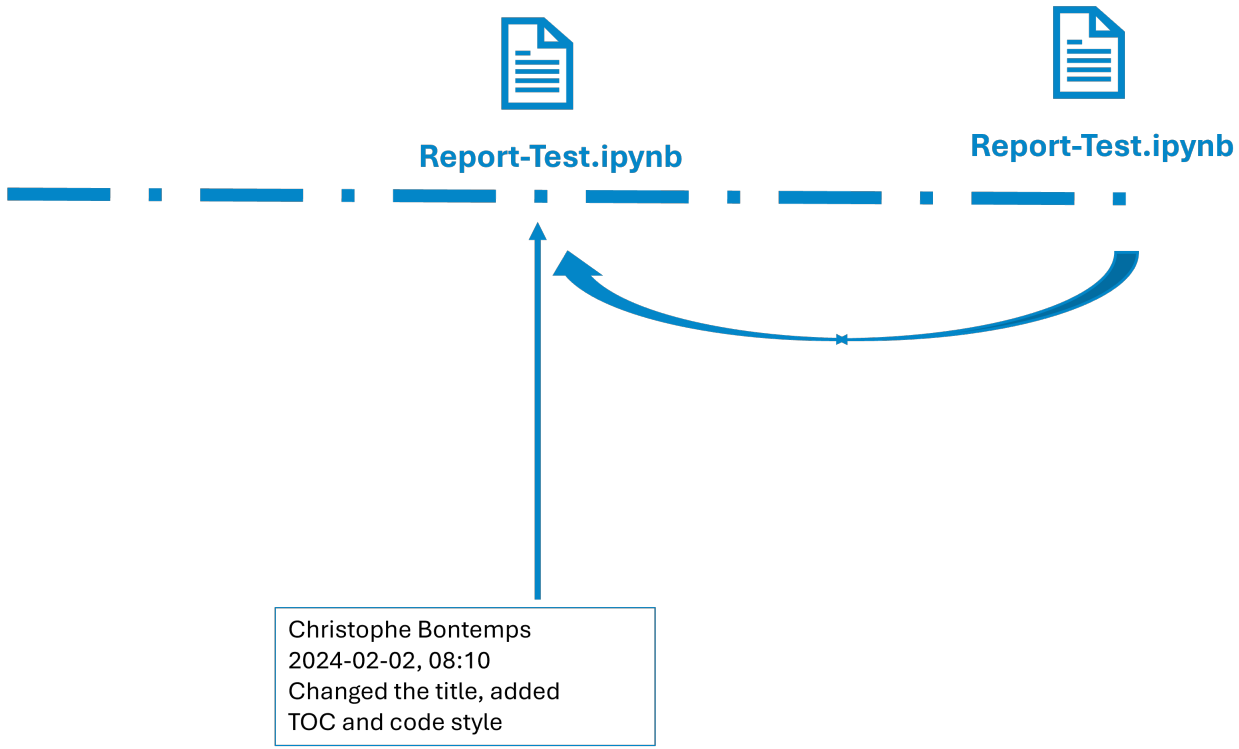
It is possible to review previous version...



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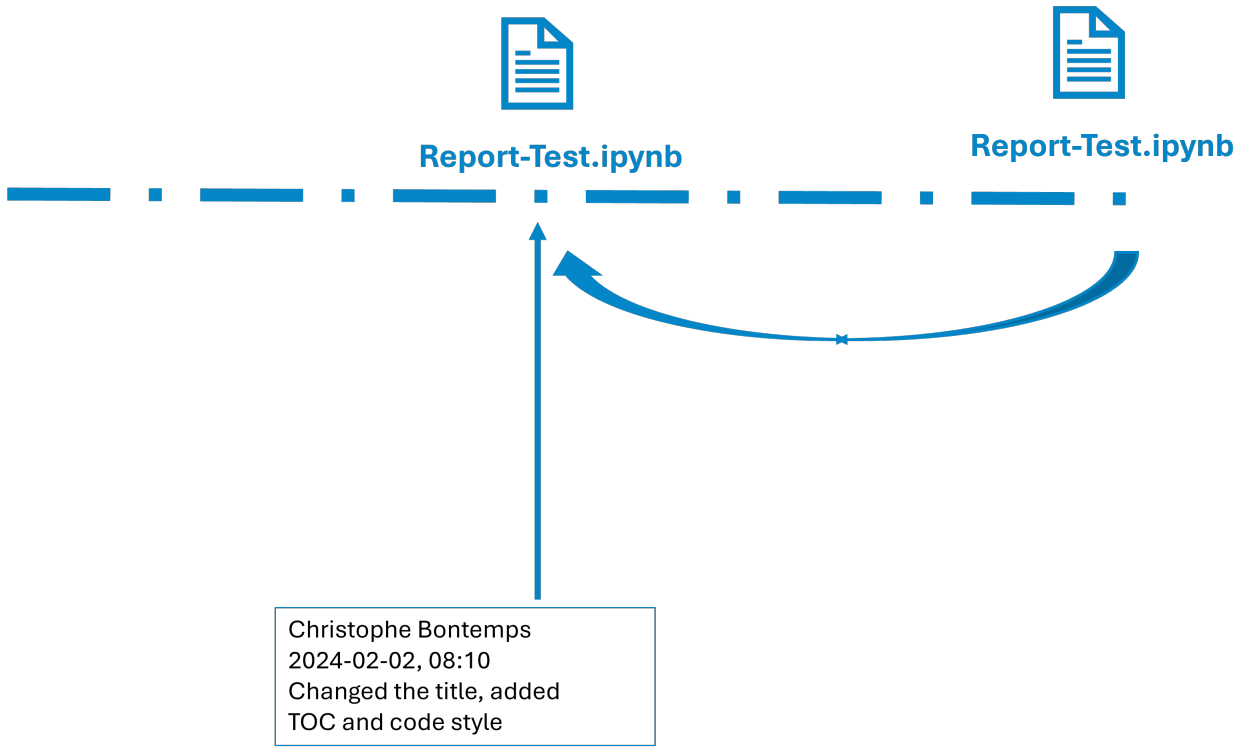

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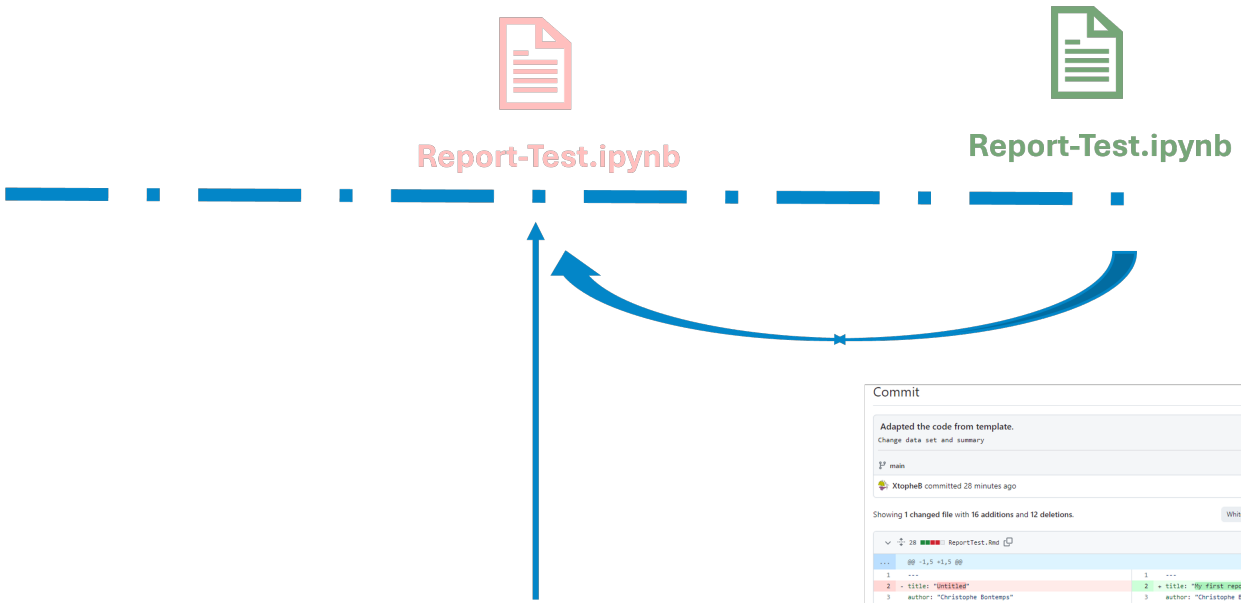

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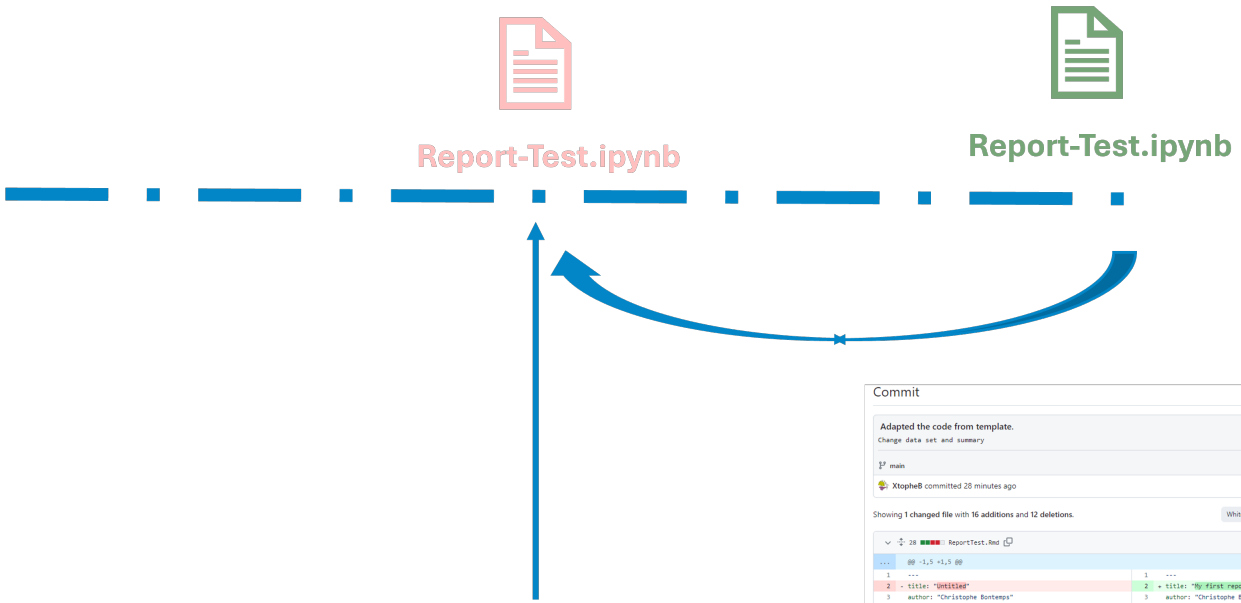

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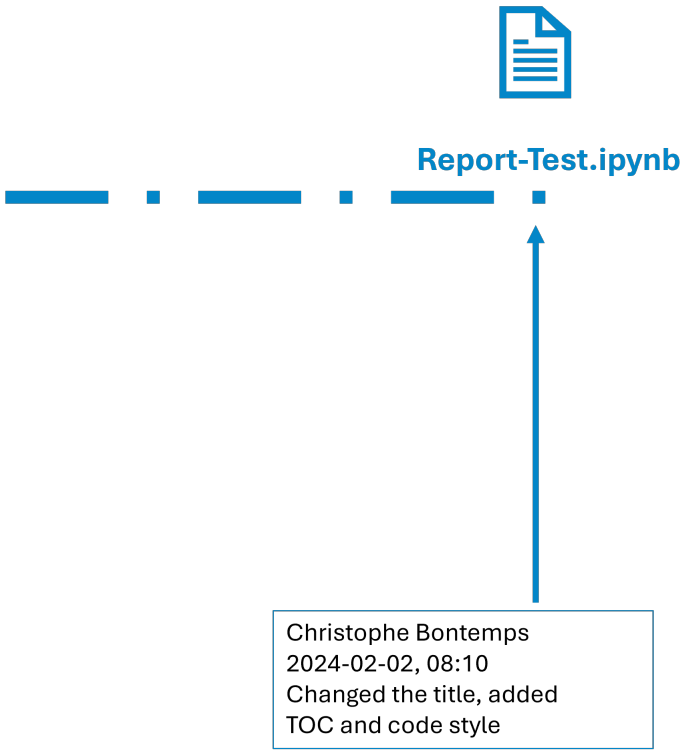

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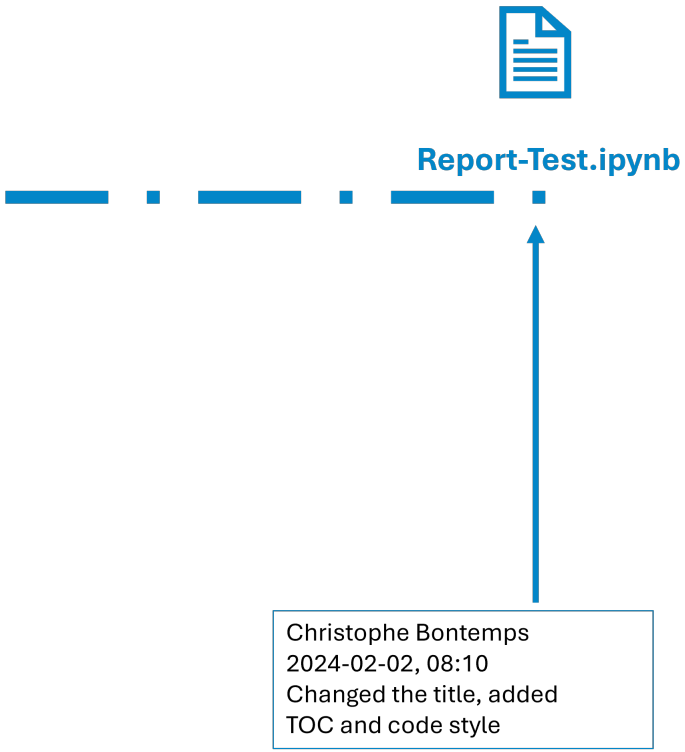

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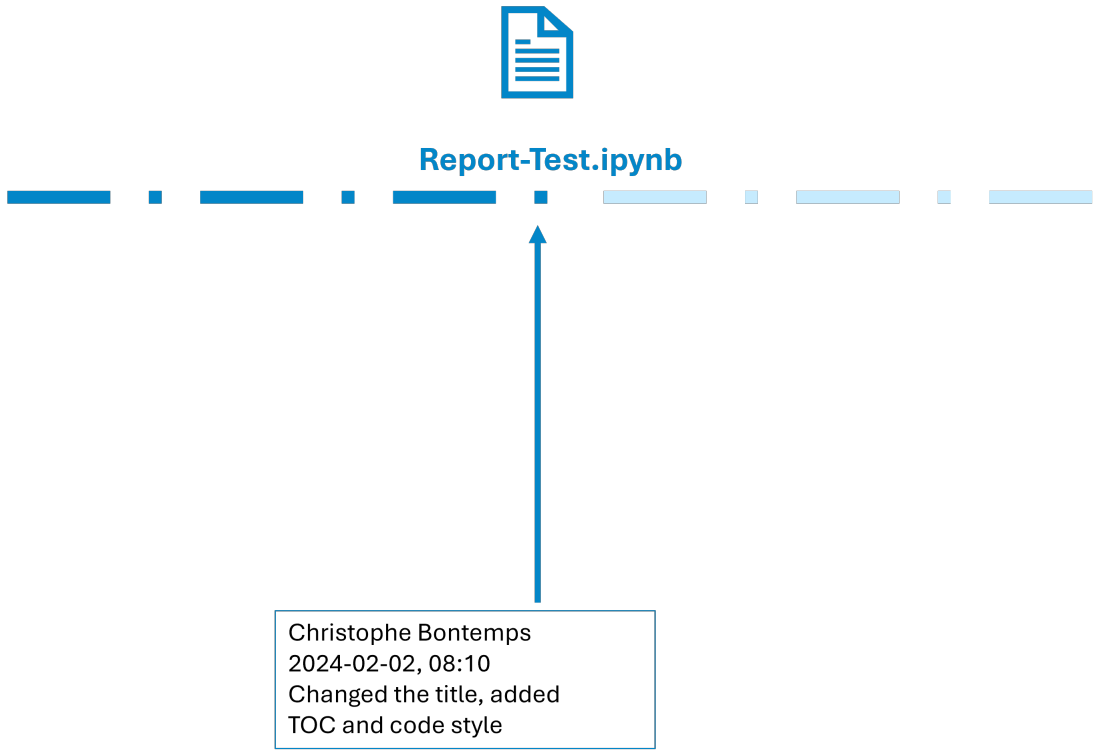

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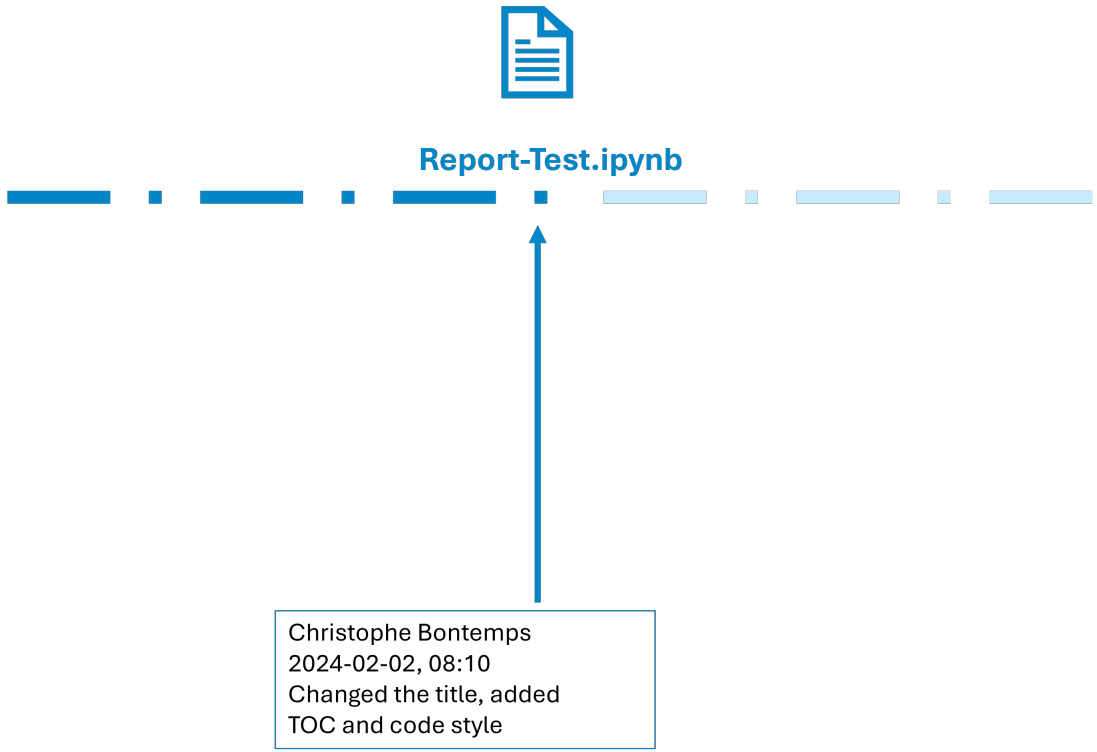

GIT FOR COLLABORATING

Alice and **Bob** work on the same file

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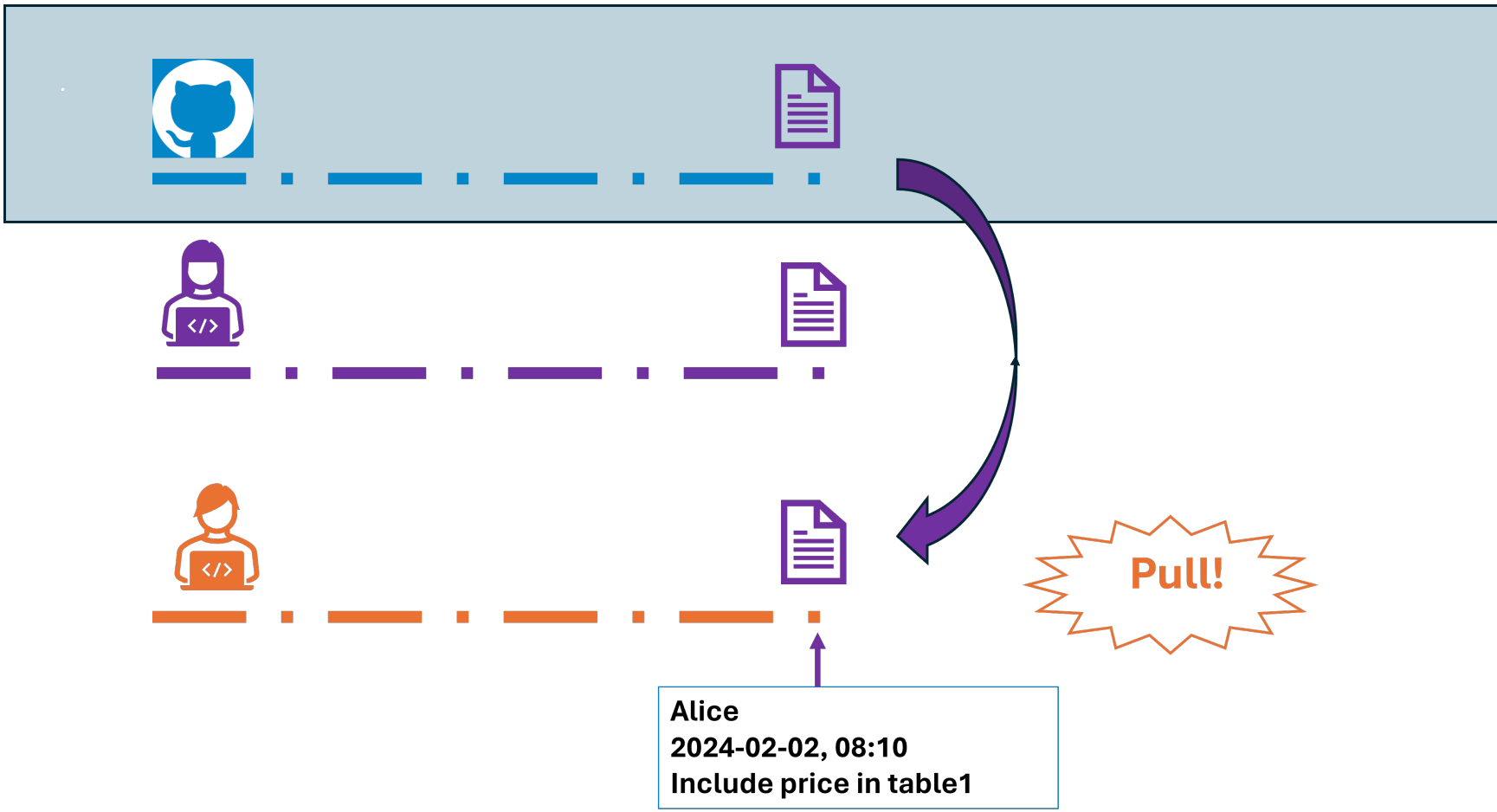

Important notions

Spaces

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Git for collaborating: Details

Alice and **Bob** work on the same file (Details)

GIT FOR COLLABORATING: DETAILS

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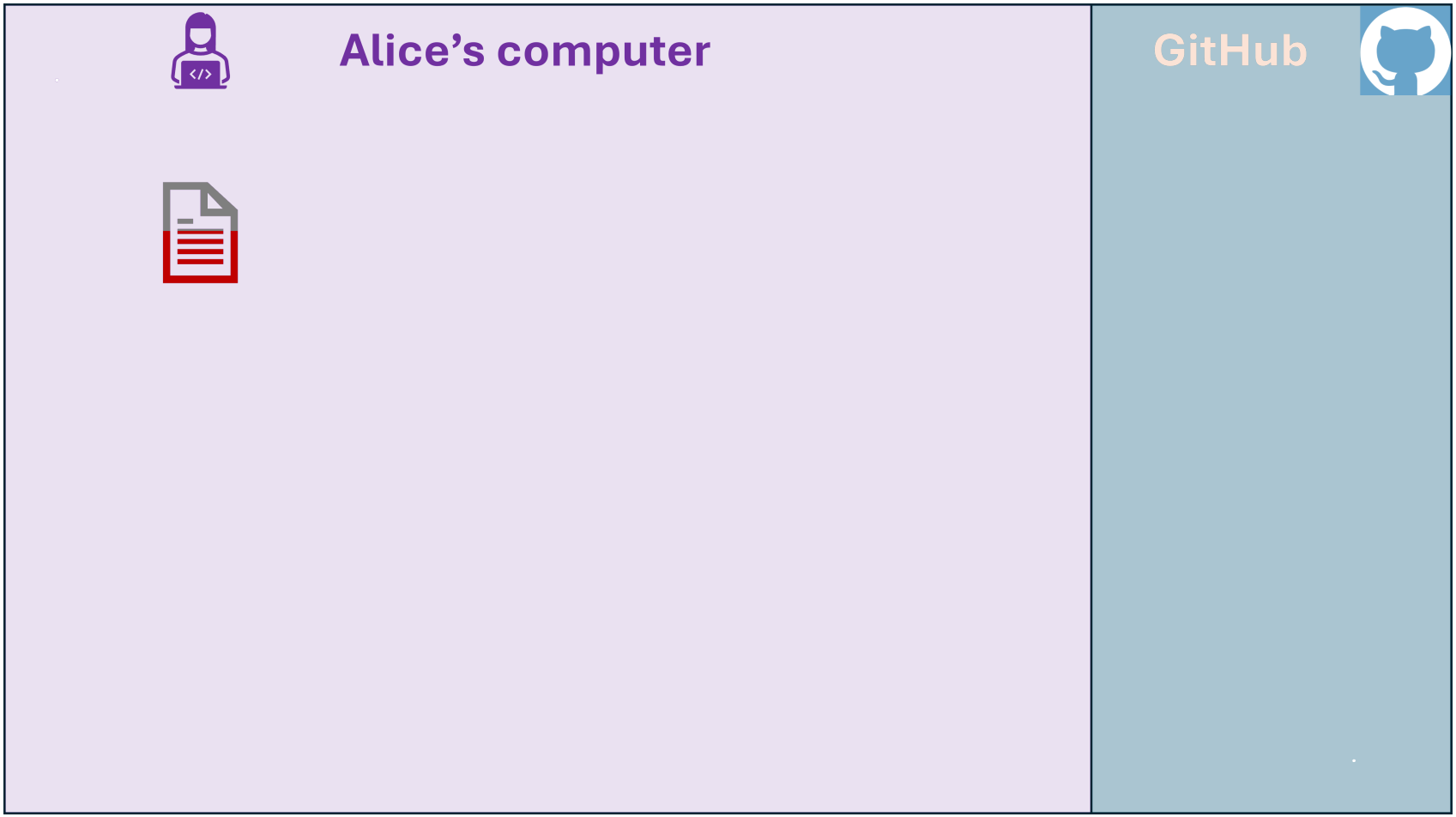

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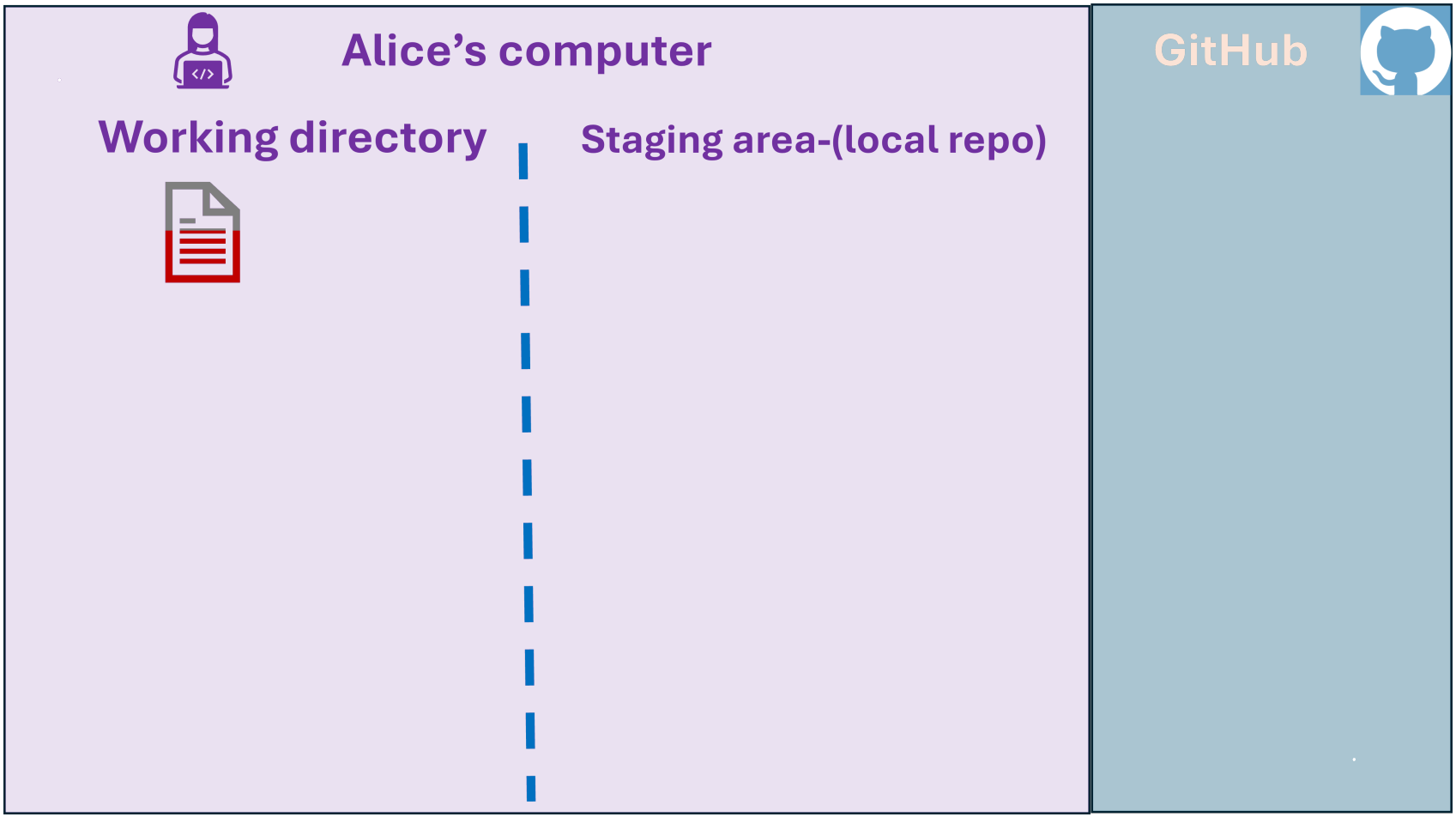

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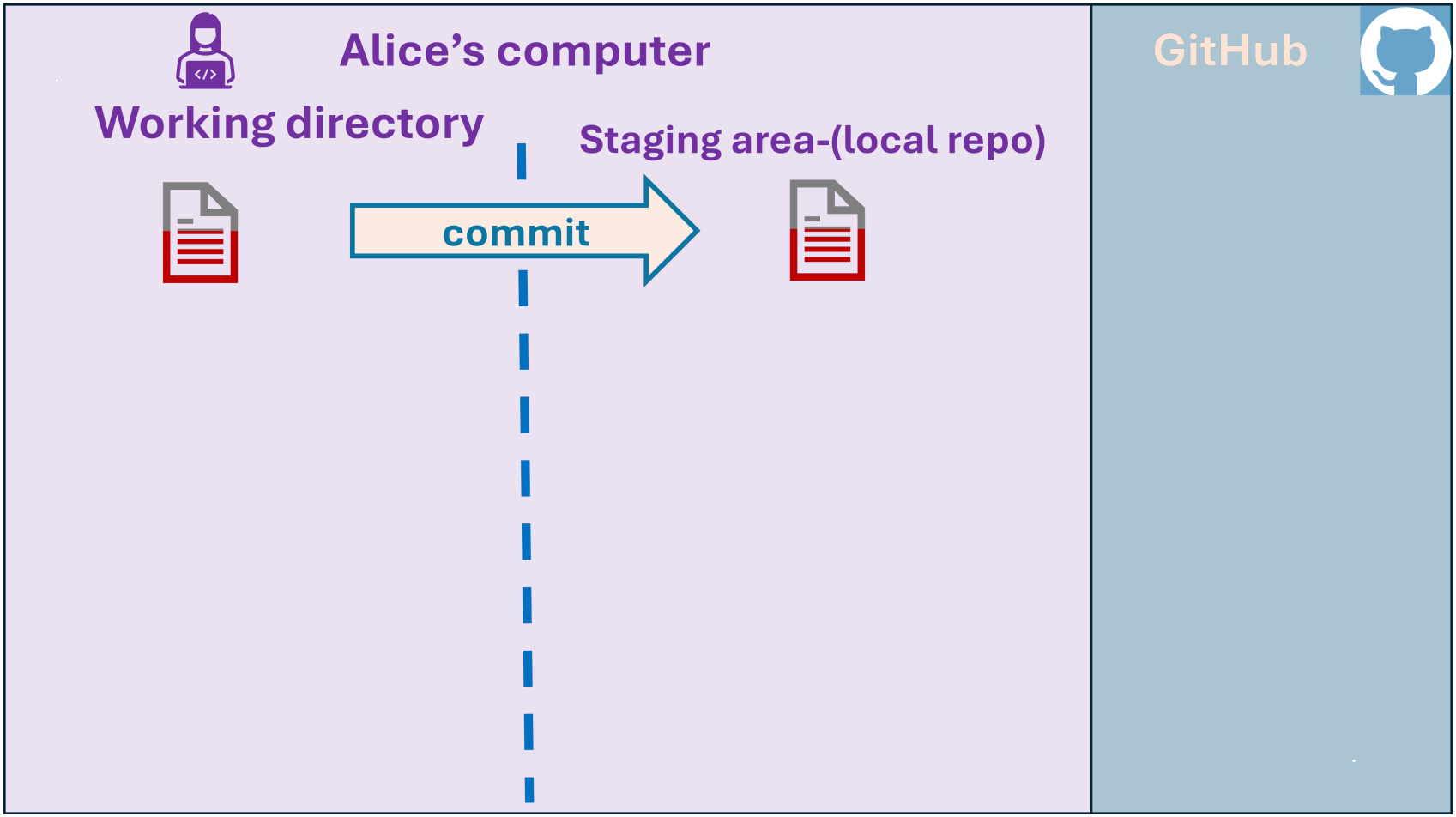

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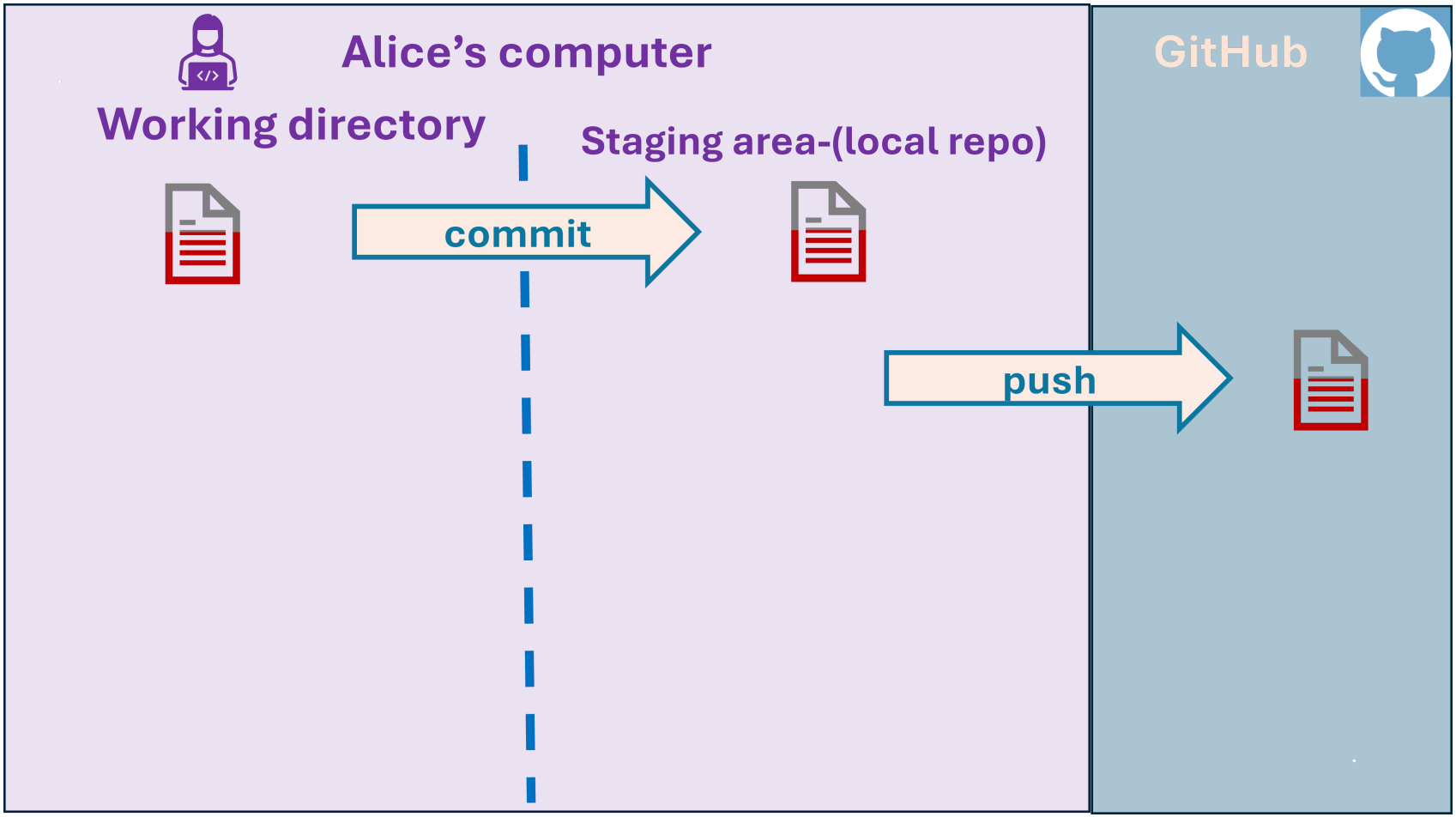

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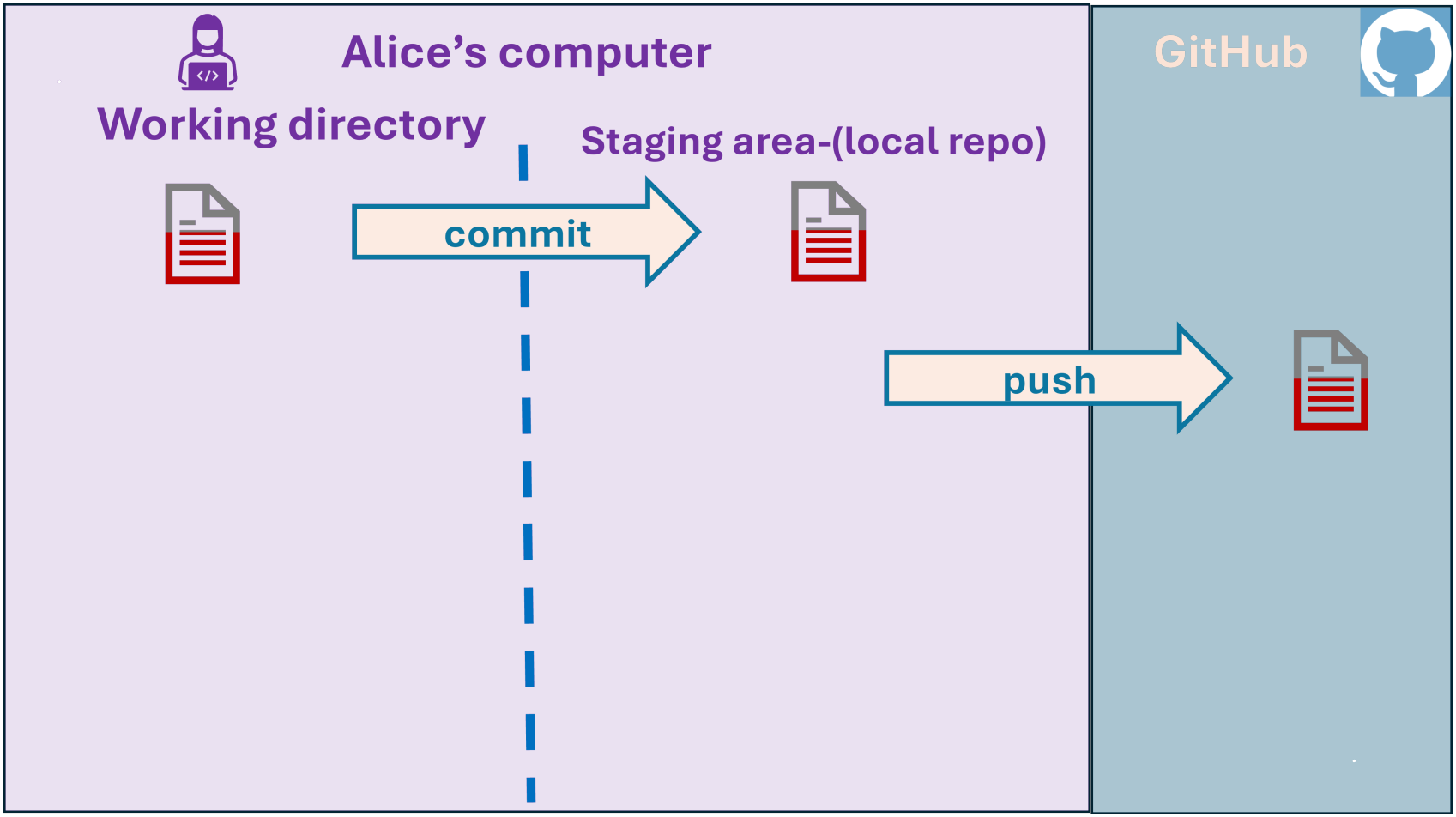

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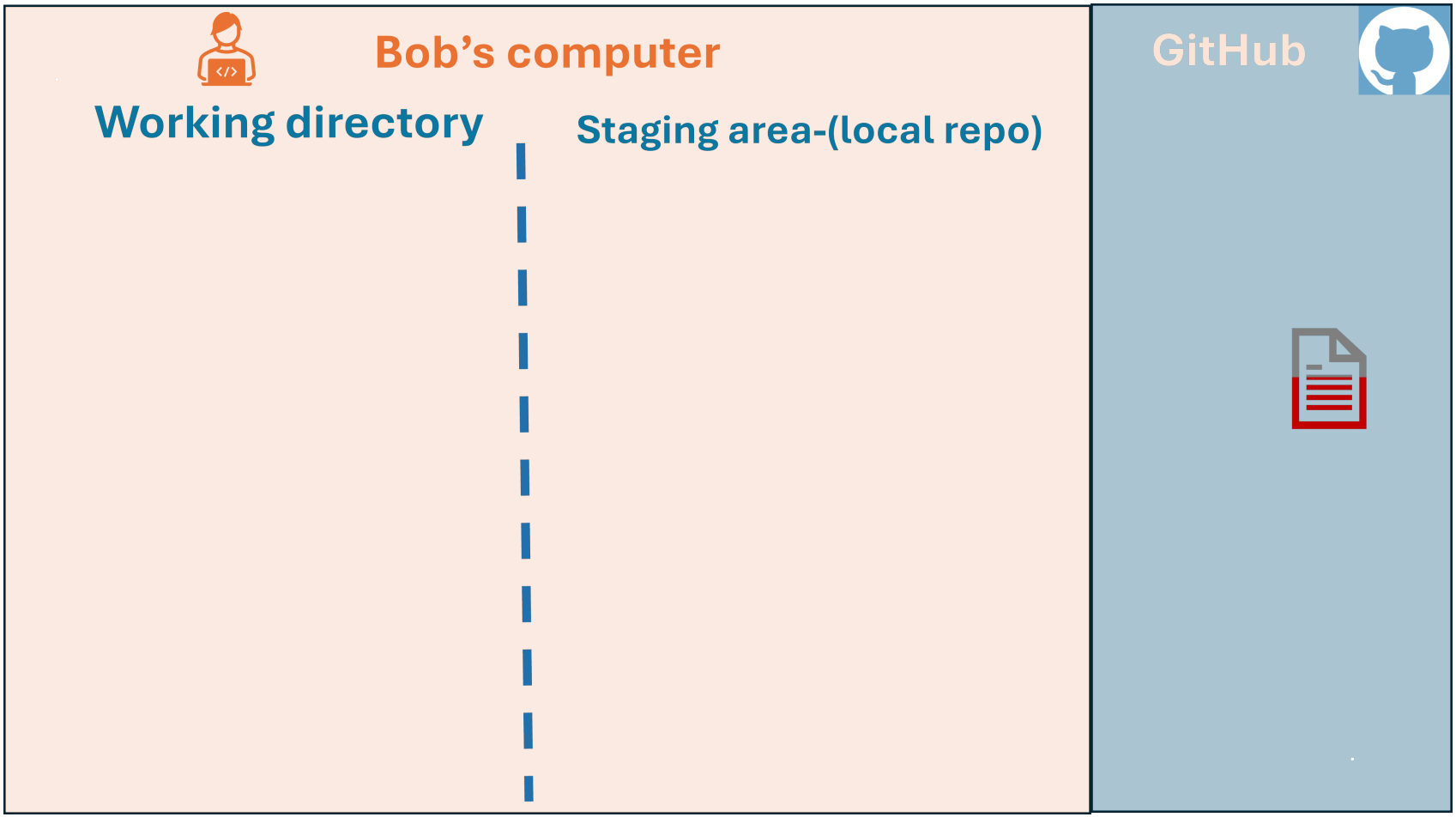

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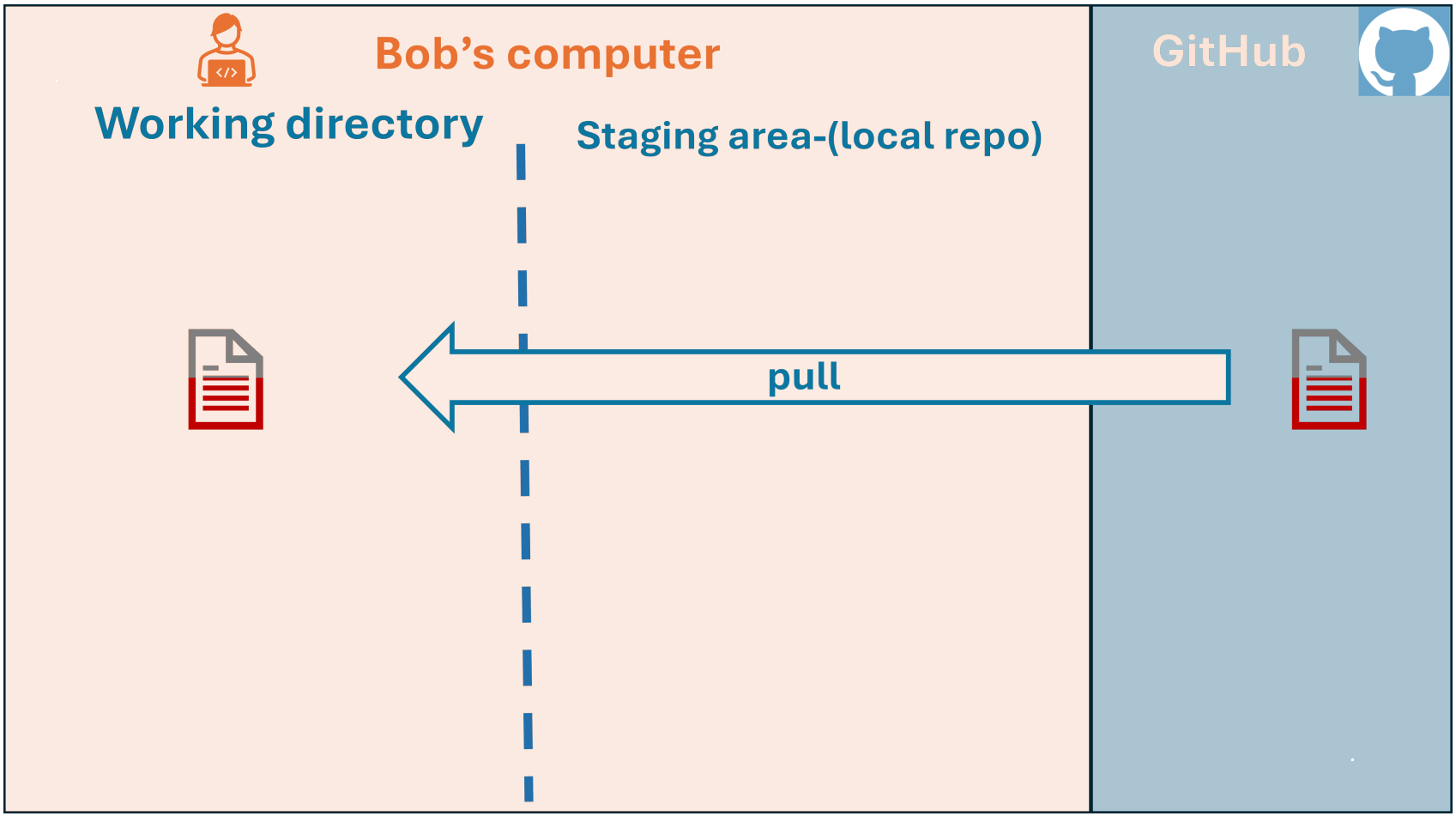

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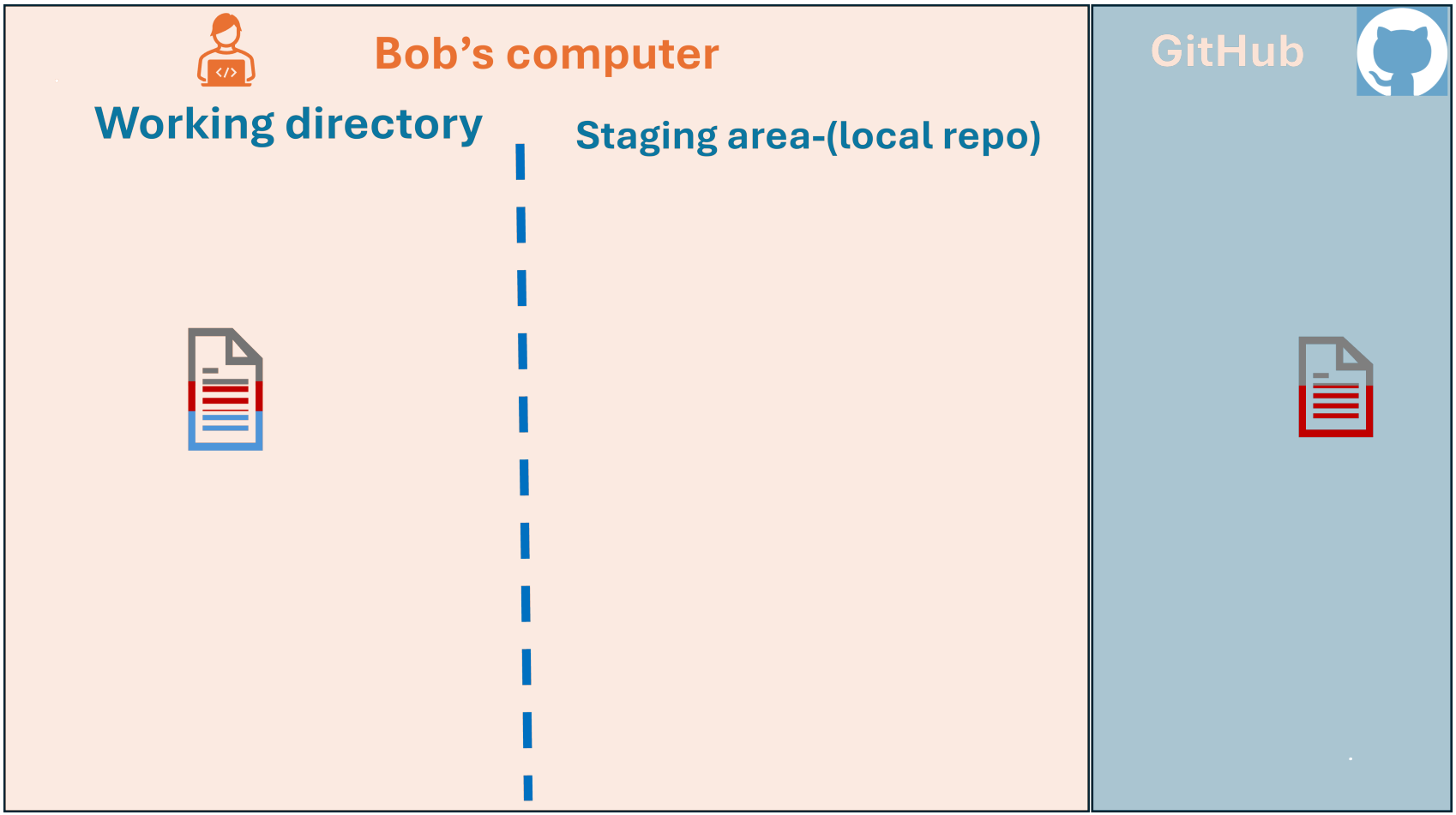

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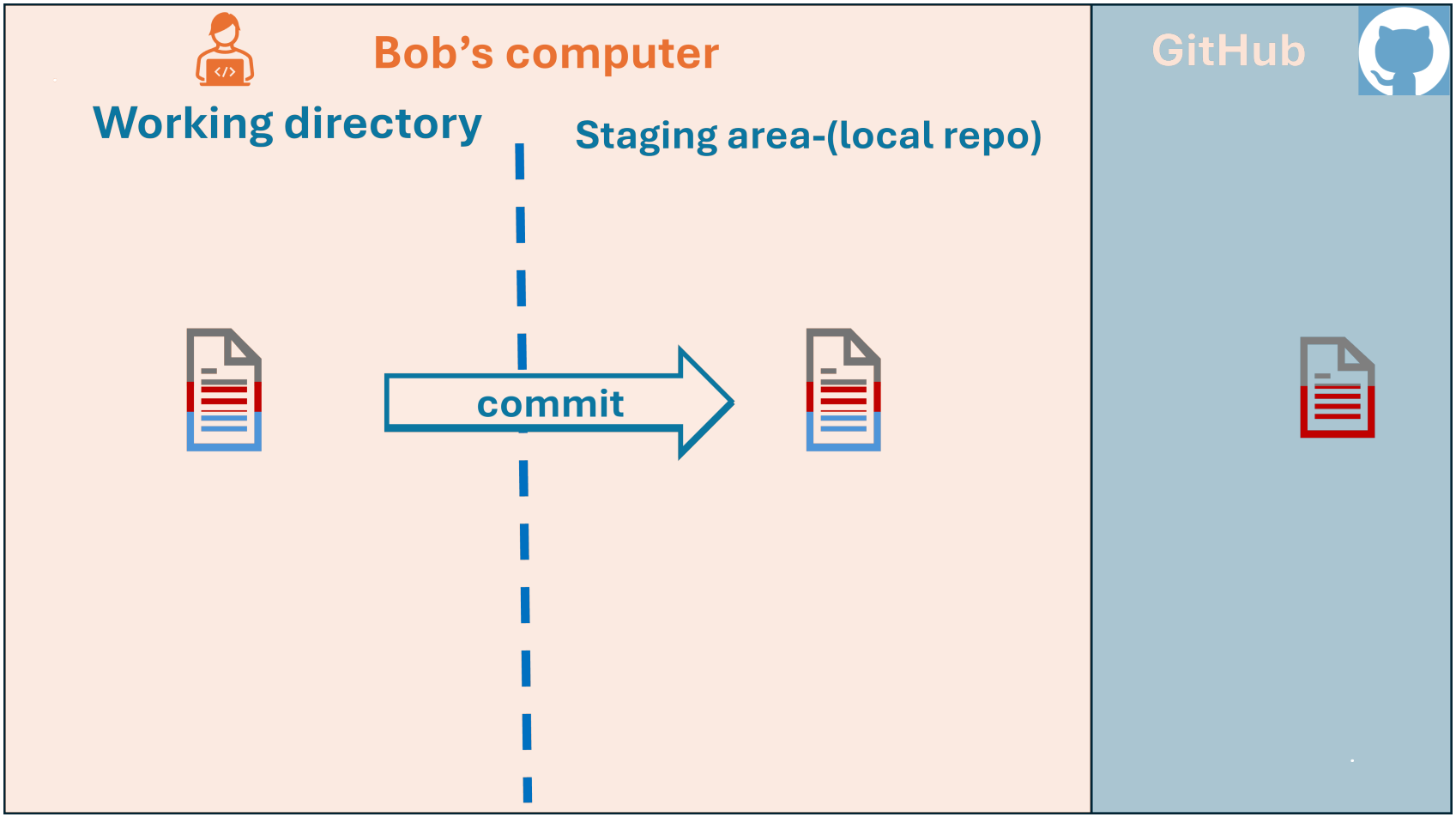

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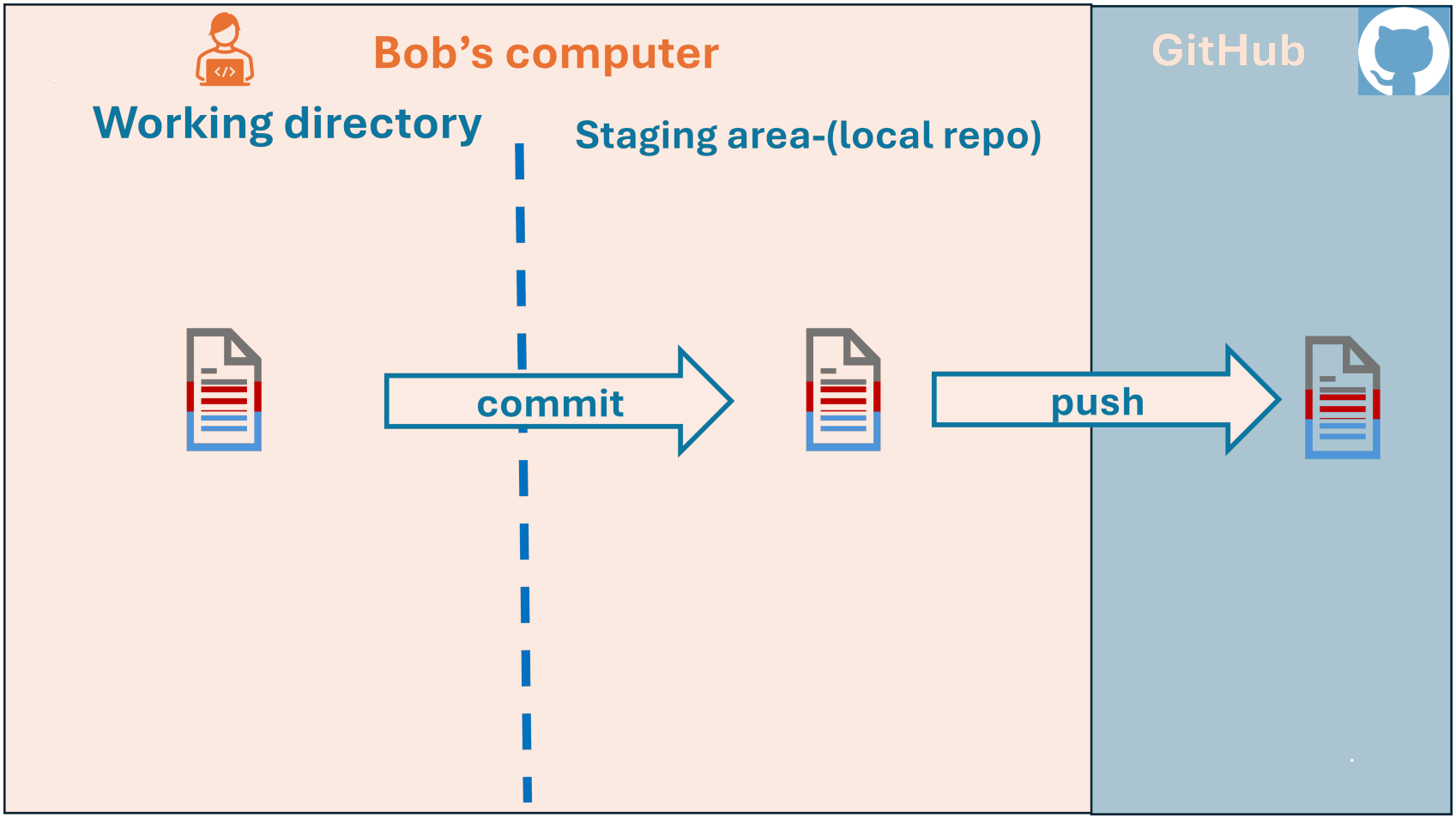

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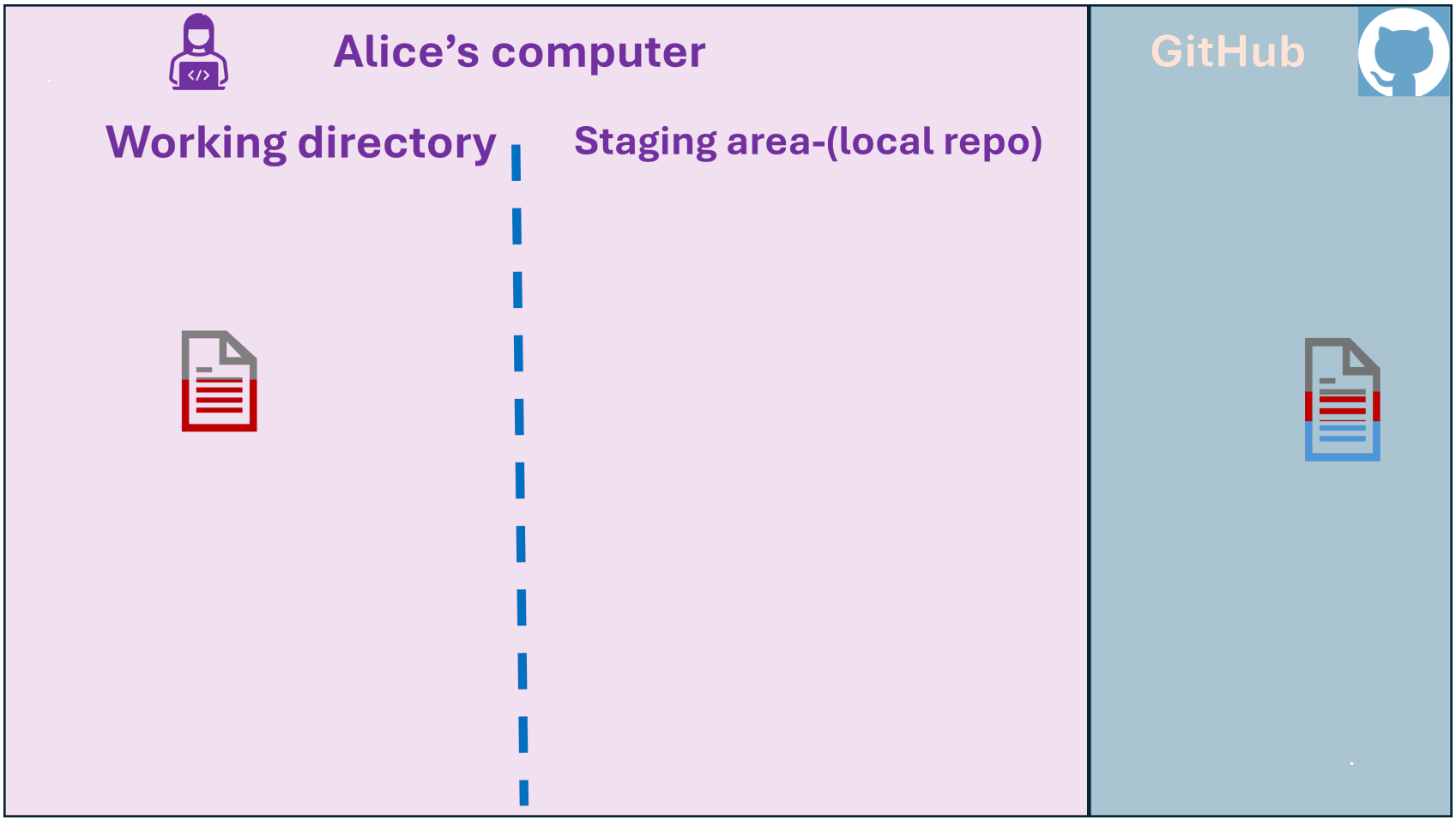

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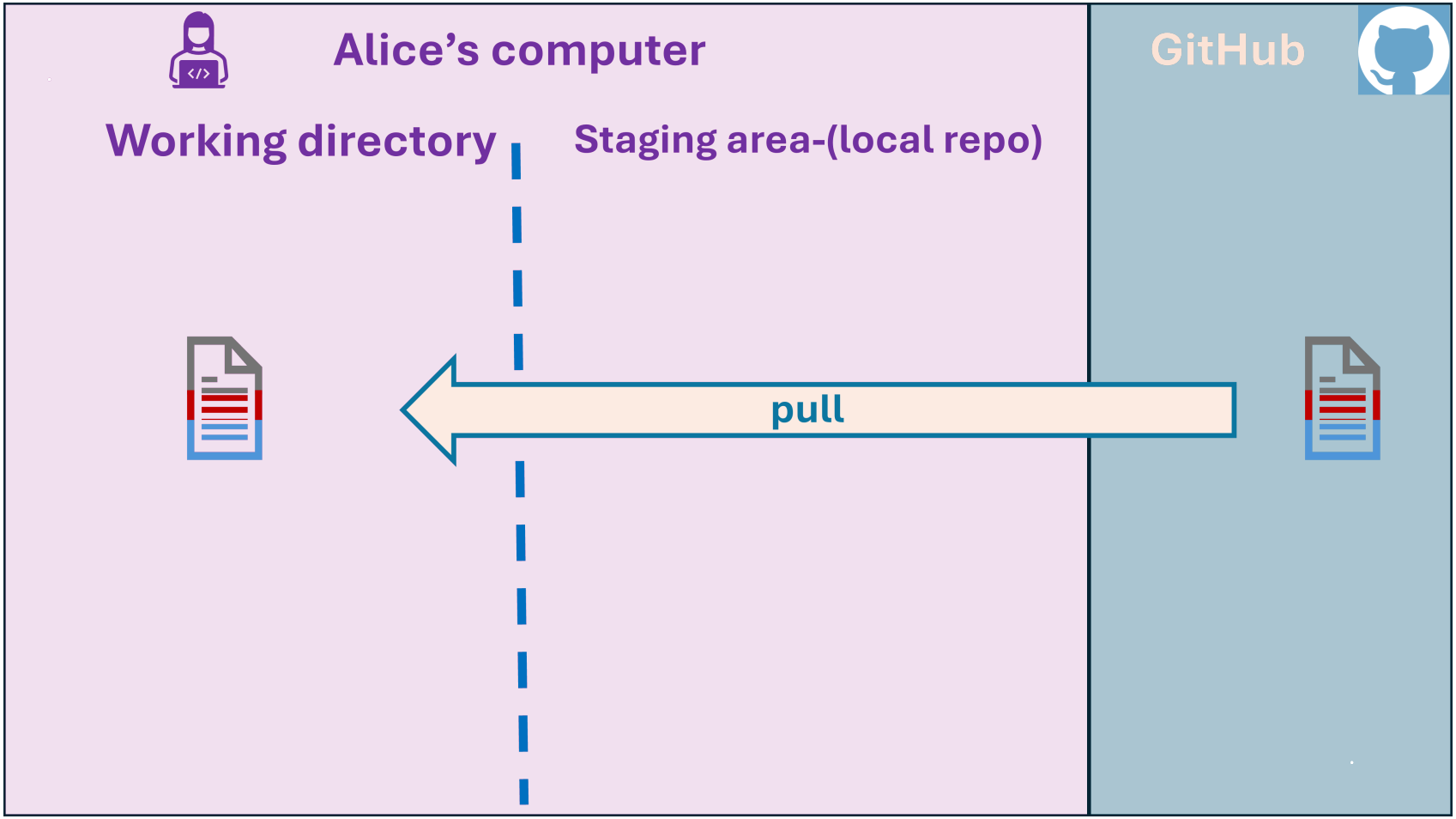

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GIT FOR COLLABORATING: COMPLEX SITUATIONS

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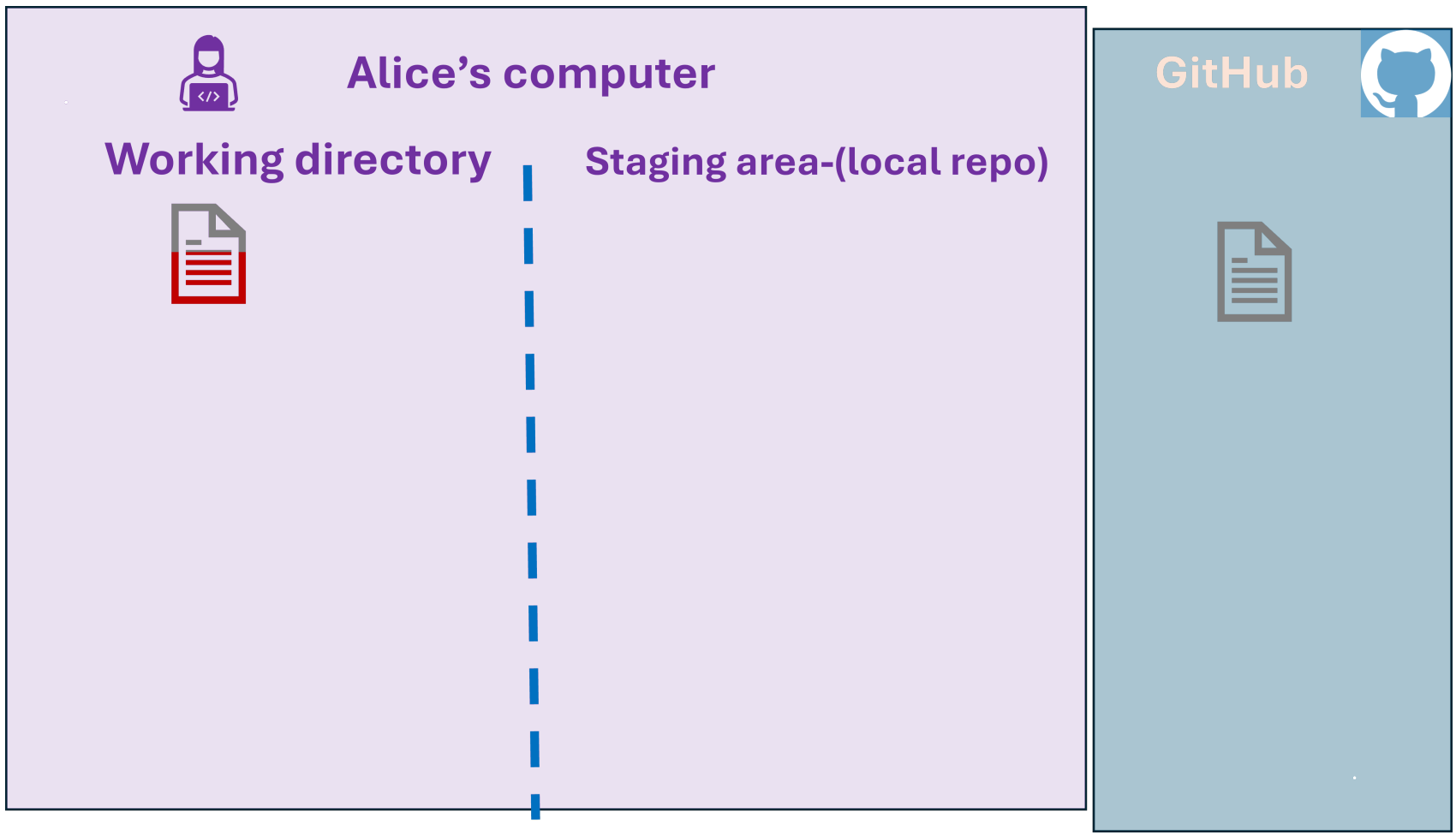

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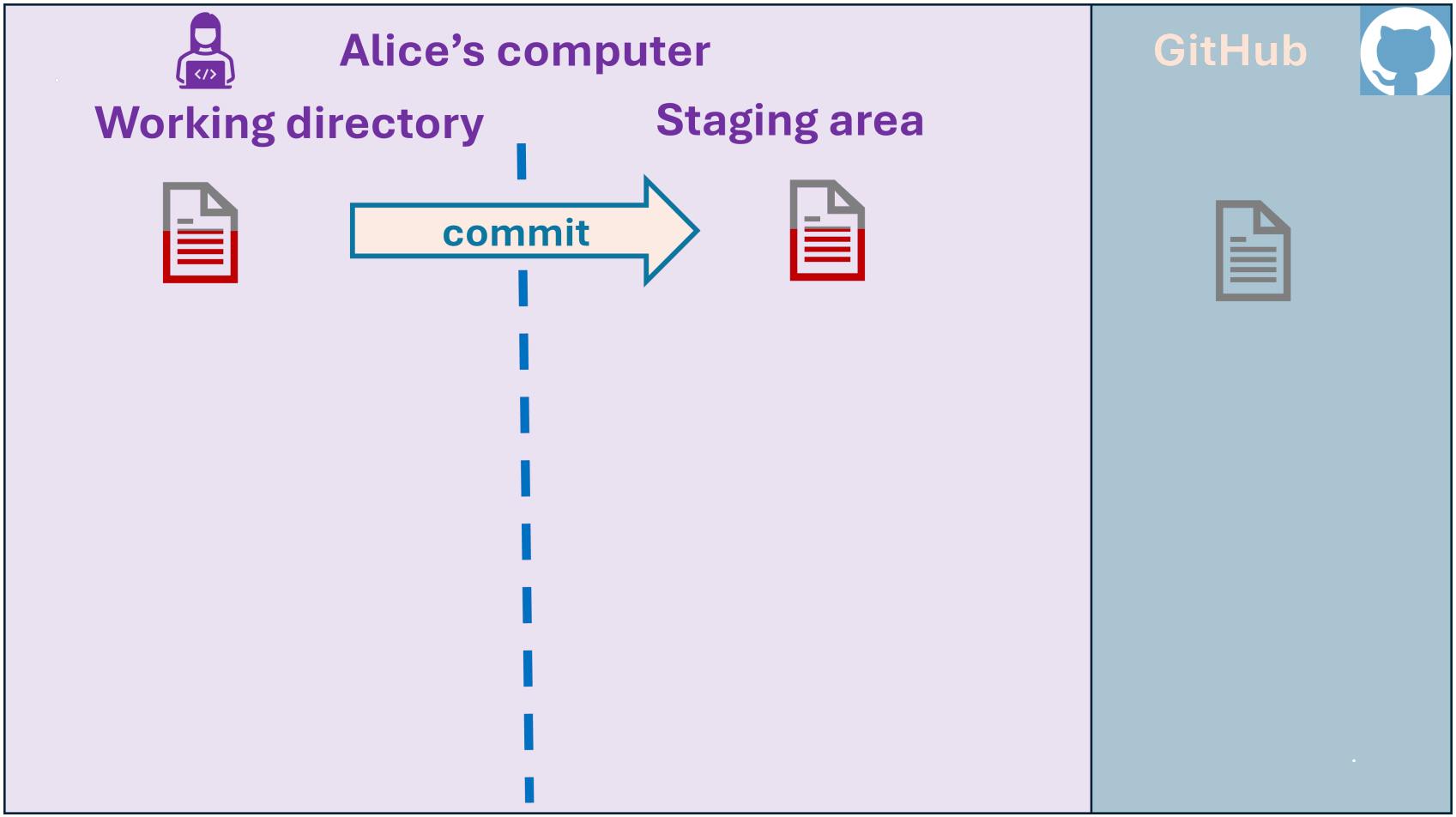

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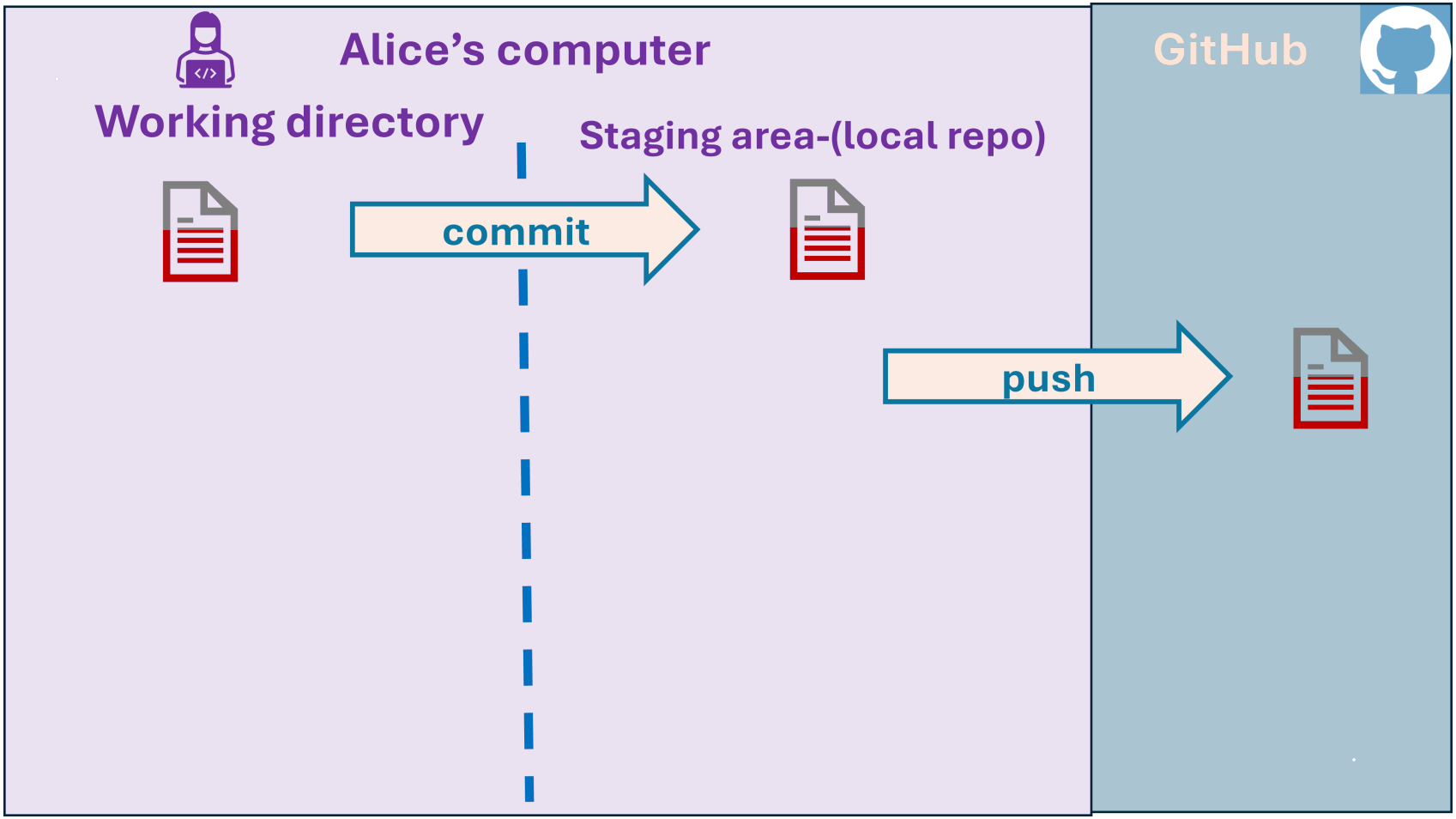

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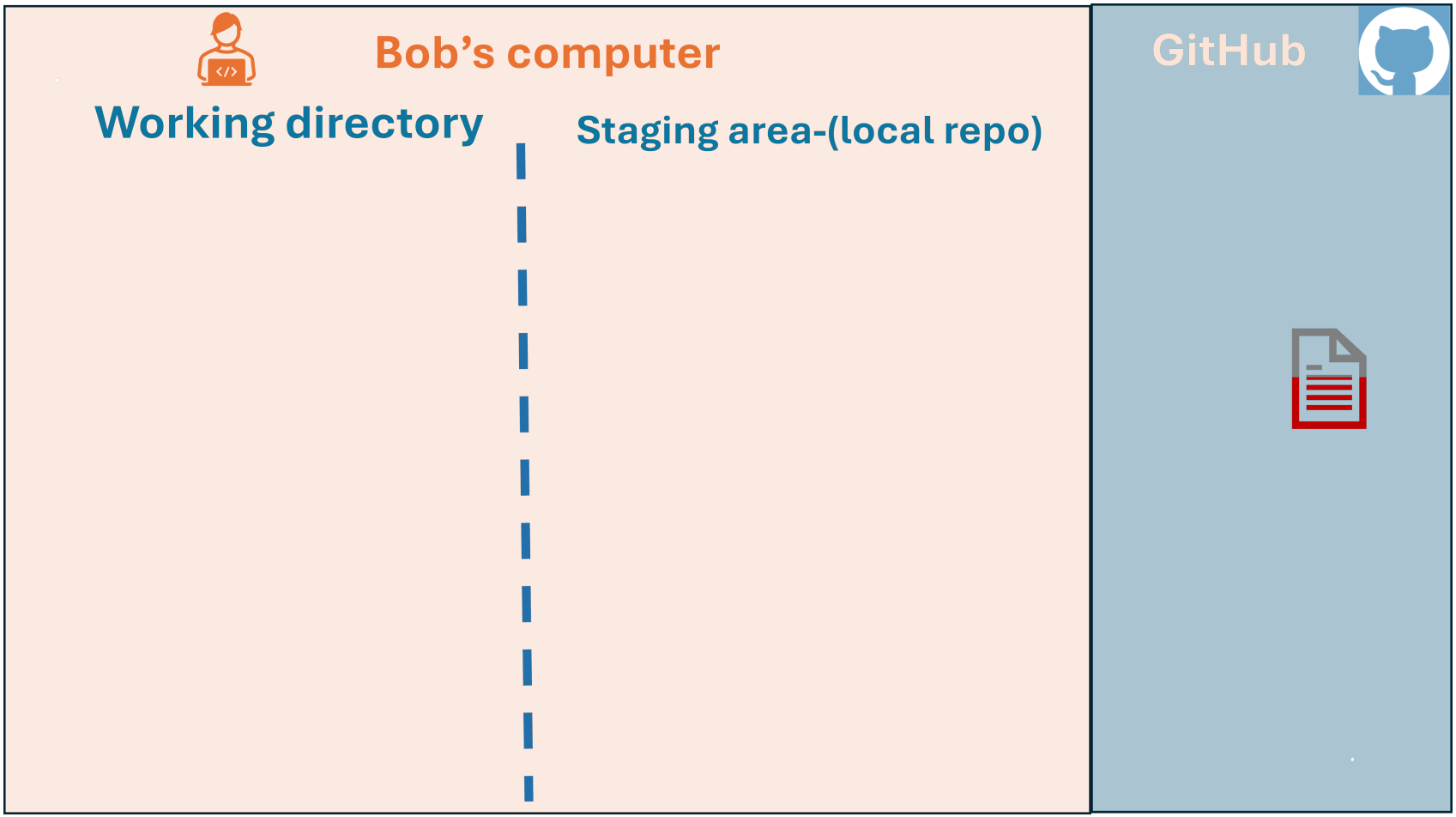

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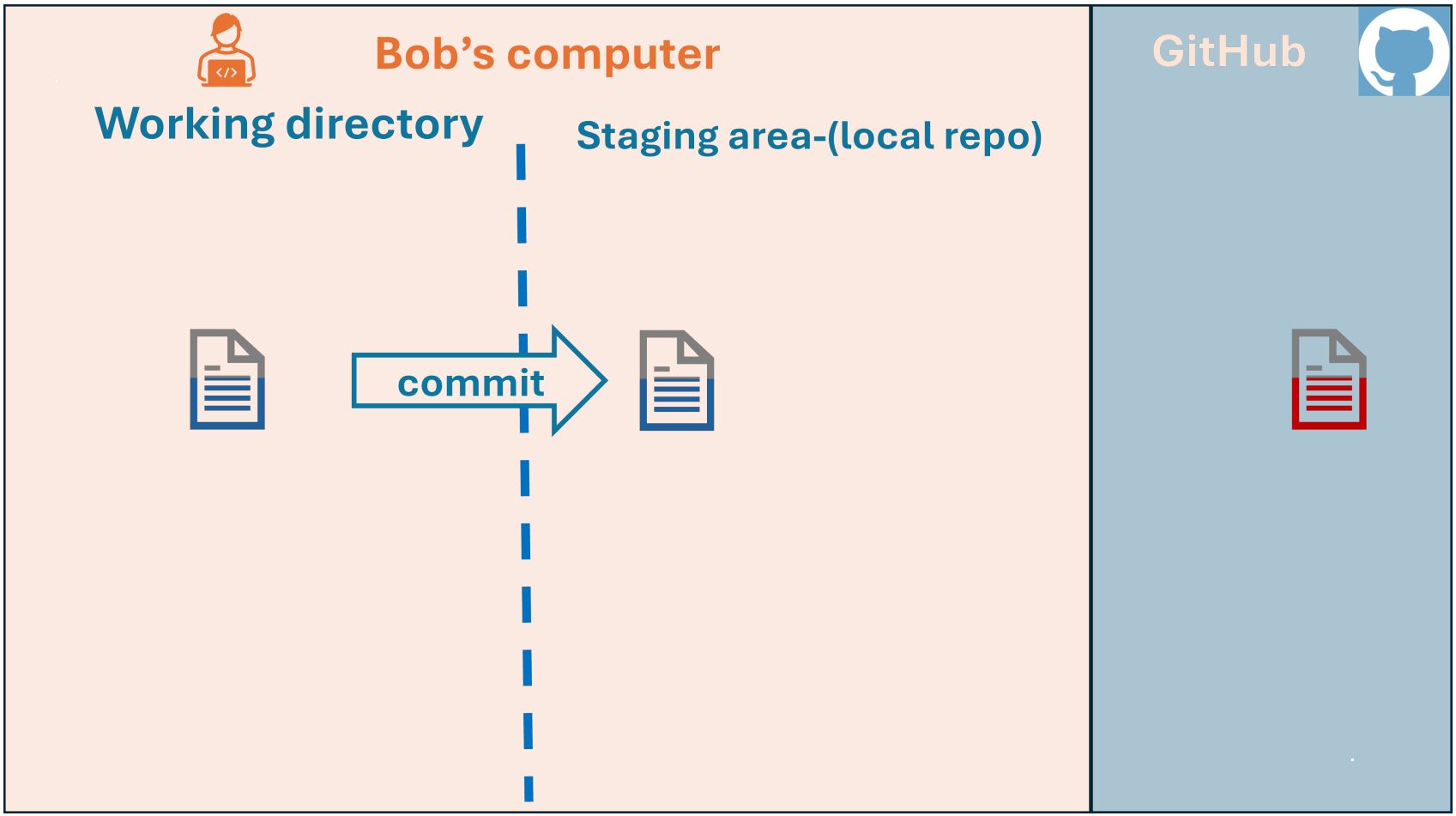

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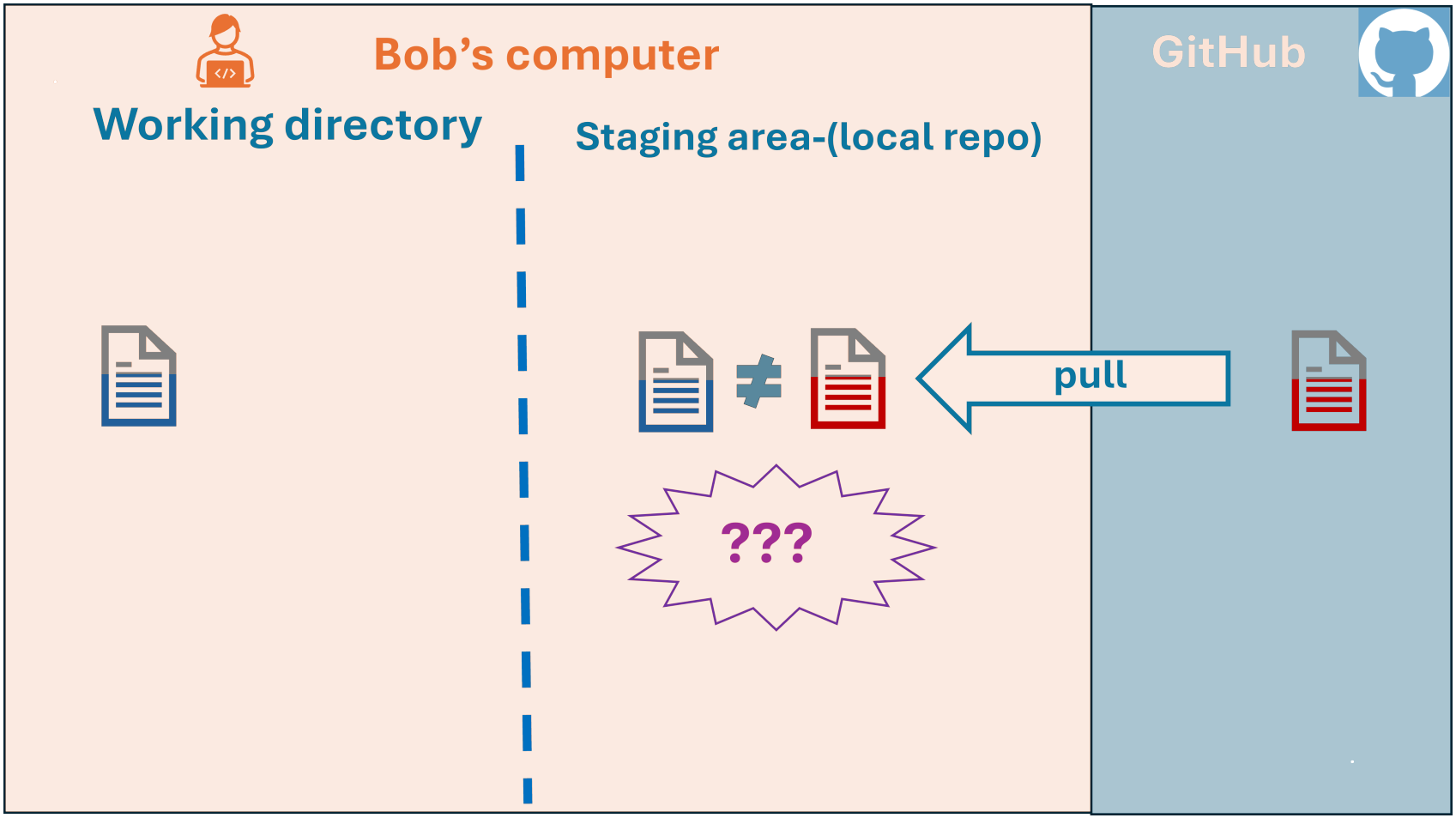

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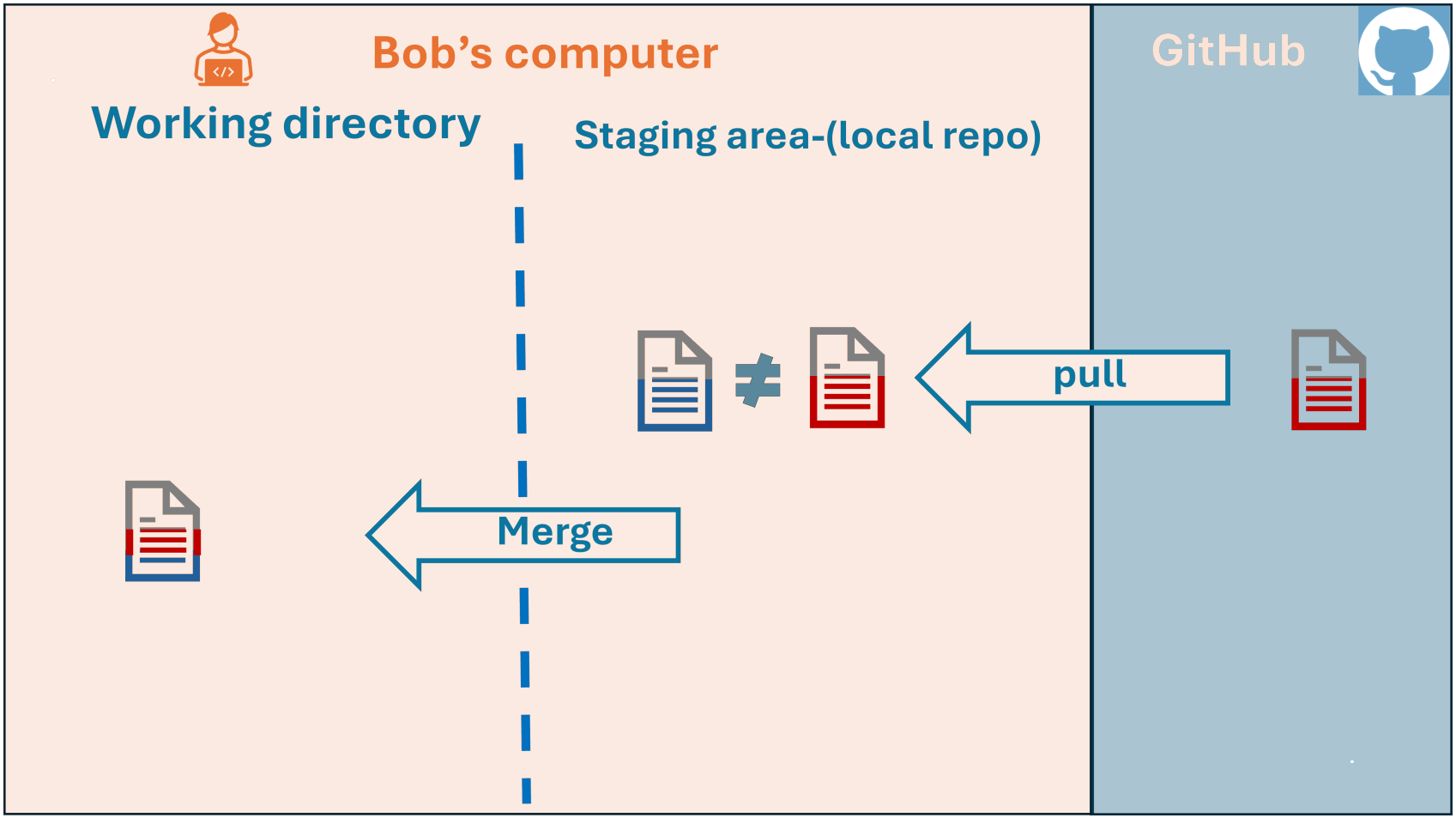

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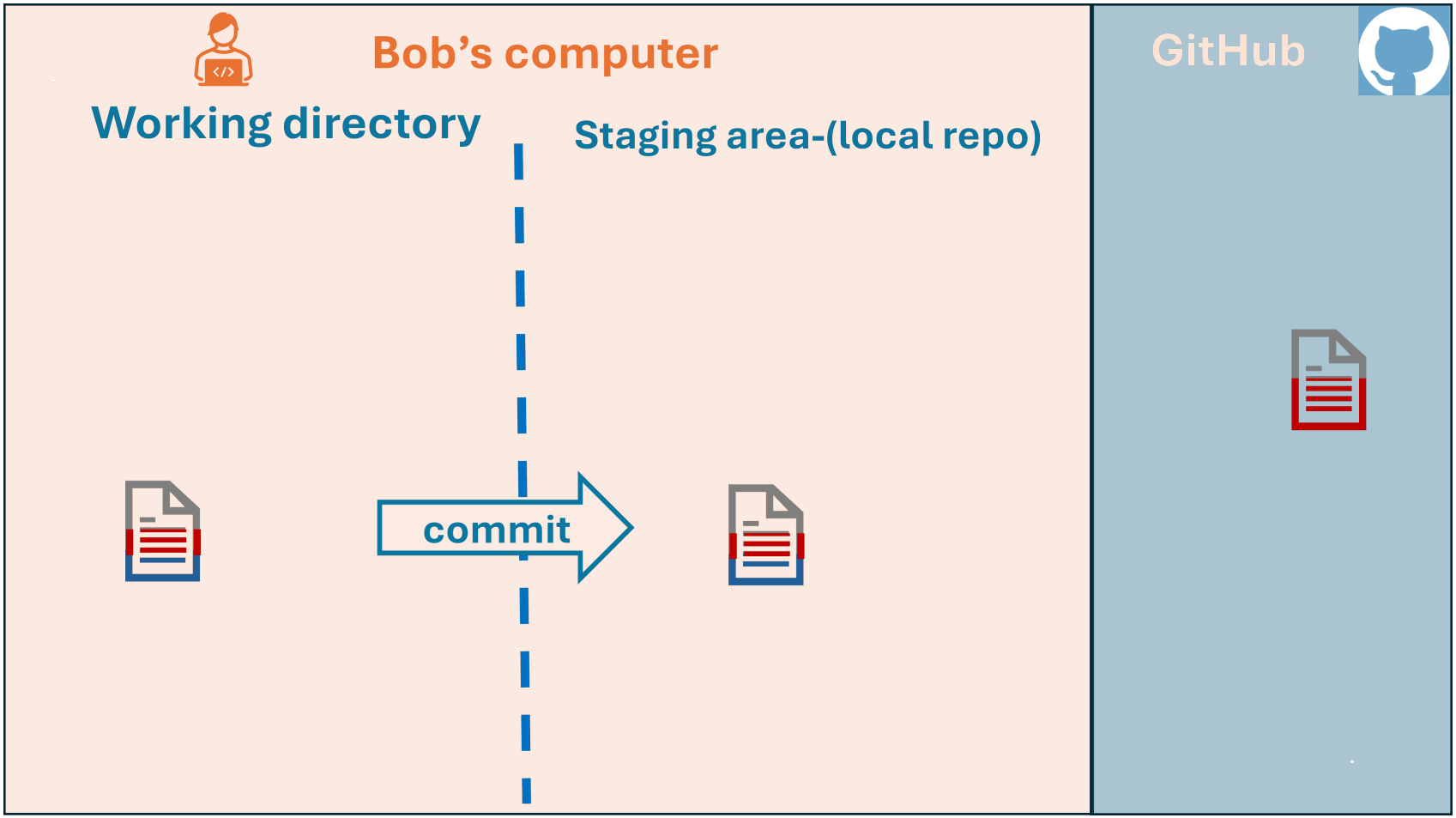

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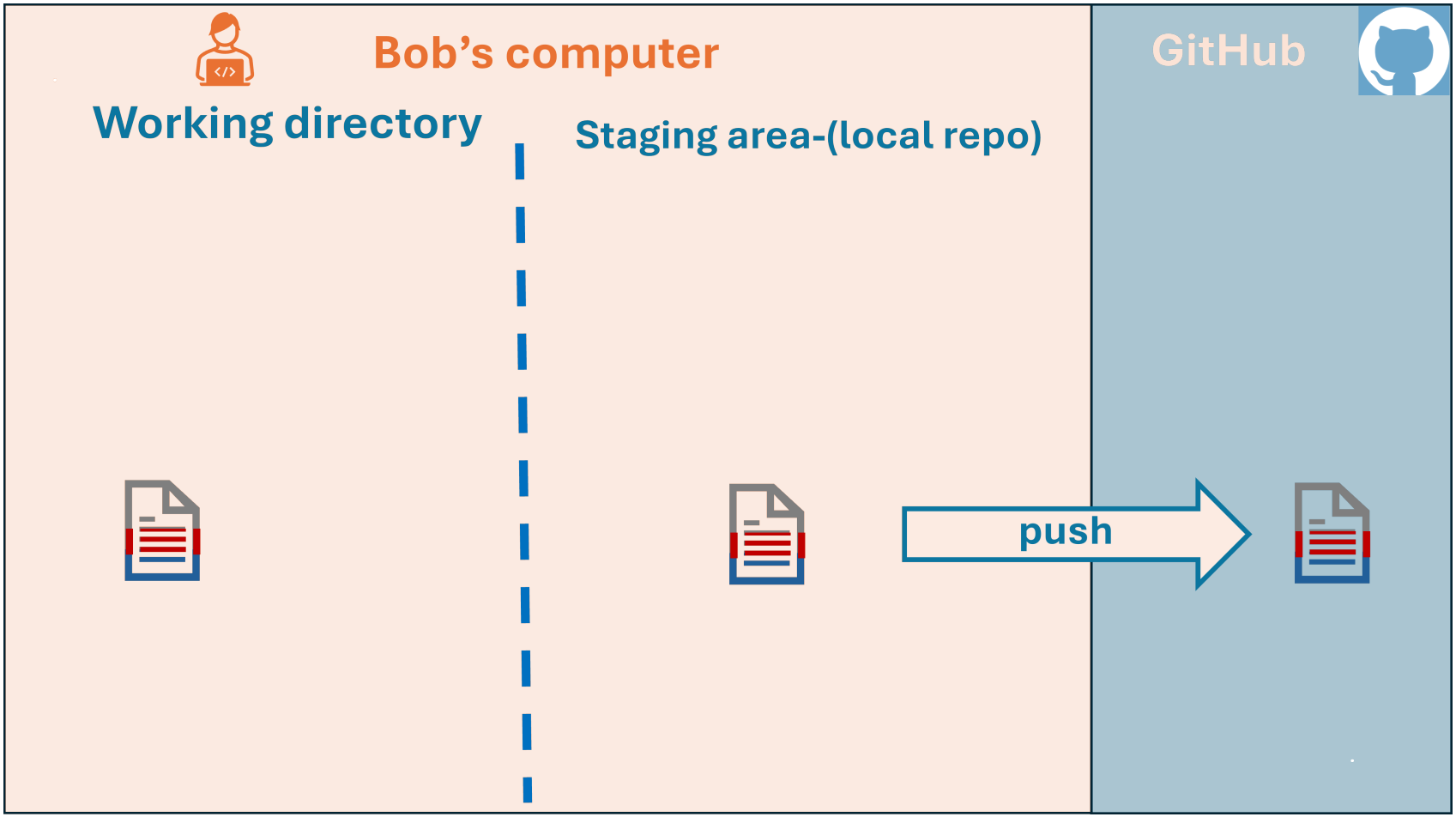

Version Control in a Nutshell

Version control system:

- Allows to travel back in time

GitHub logo

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- Allows reviewing stages of development
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- Backups your work

GitHub logo

Towards a full RAP

- In short,

RAP

=

Reproducible documents

+

Version Control

+

Automation

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- Automation is hard
- Building a RAP is a collective process

Useful resources

- This course website (created by Serge Goussev)
- Vanuatu Bureau of Statistics implementation of RAP
- SIAP's (free) online RAP course
- The UK government RAP website.
- UK best practice documentation.
- A free RAP course to teach you all you need to know.
- How the Data Science Campus sets its coding standards.
- A new open-source book from the Alan Turing institute setting out how to do reproducible data science.