

Configuring Git

INTRODUCTION TO GIT



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Why do we need to configure our settings?

- Git has customizable settings to speed up or improve how we work!



¹ Image credit: <https://unsplash.com/@schmaendels>

Levels of settings

- `git config --list`
- Git has three levels of settings:
 1. `--local` : settings for one specific project
 2. `--global` : settings for all of our projects
 3. `--system` : settings for every users on this computer

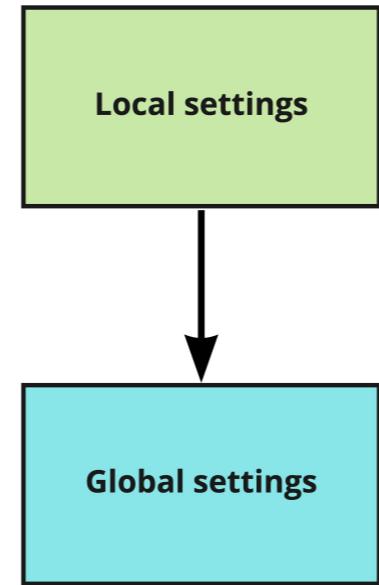
Local settings

Setting Levels

Local settings

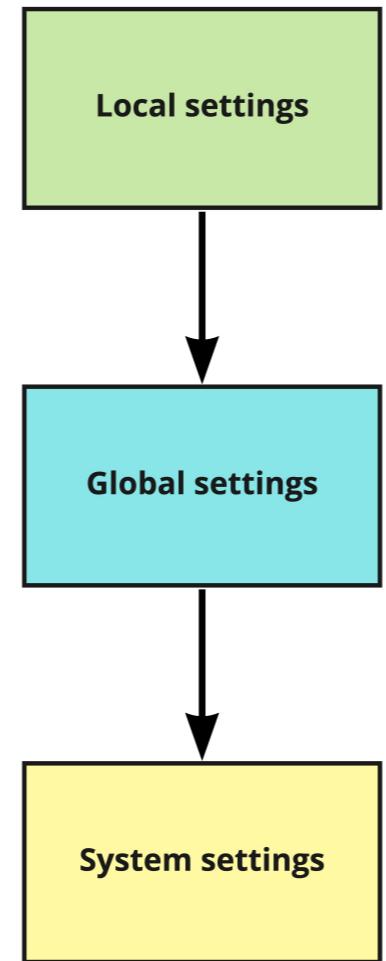
Global settings

Setting Levels



System settings

Setting Levels



What can we configure?

```
git config --list
```

```
user.email=repl@datacamp.com
user.name=Rep Loop
core.editor=nano
core.repositoryformatversion=0
core.filemode=true
core.bare=false
core.logallrefupdates=true
```

- `user.email` and `user.name` are needed by some commands, so setting these saves time!
- `user.email` and `user.name` are **global** settings

Changing our settings

```
git config --global setting value
```

- Change email address to **johnsmith@datacamp.com**:

```
git config --global user.email johnsmith@datacamp.com
```

- Change username to John Smith:

```
git config --global user.name 'John Smith'
```

- If we don't use `' '` and our `user.name` has a space:
 - Git would save `user.name` as `John`

Using an alias

- Set up an alias through global settings
- Typically used to shorten a command
- To create an alias for committing files by executing `ci`:

```
git config --global alias.ci 'commit -m'
```

- Again, we use `''` so Git processes characters after the space
- We can now commit files by executing:

```
git ci
```

Creating a custom alias

- We can create an alias for any command
- If we often unstage files:

```
git config --global alias.unstage 'reset HEAD'
```

- Be careful not to overwrite existing commands!

Tracking aliases

.gitconfig file

```
git config --global --list
```

Output format: alias.aliasname=command

```
alias.ci=commit -m
```

```
alias.unstage=reset HEAD
```

Ignoring specific files

```
nano .gitignore
```

Ignoring specific files

```
*.log
```

```
^G Get Help      ^O WriteOut     ^R Read File     ^Y Prev Pg      ^K Cut Text      ^C Cur Pos
^X Exit          ^J Justify       ^W Where is       ^V Next Pg      ^U UnCut Text    ^T To Spell
```

- * = Wildcard
- Commonly ignored files: APIs, credentials, system files, software dependencies

Let's practice!

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Branches

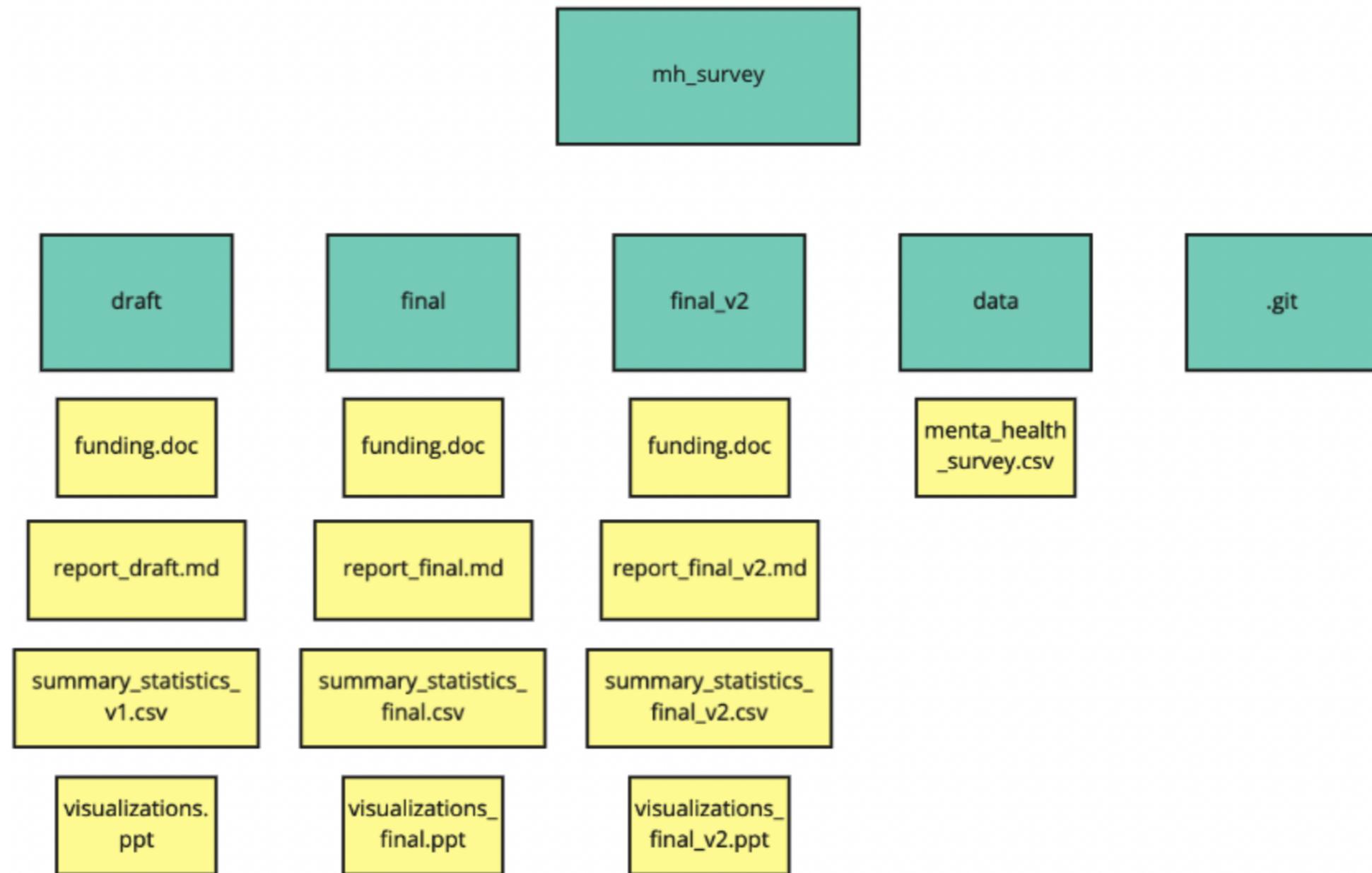
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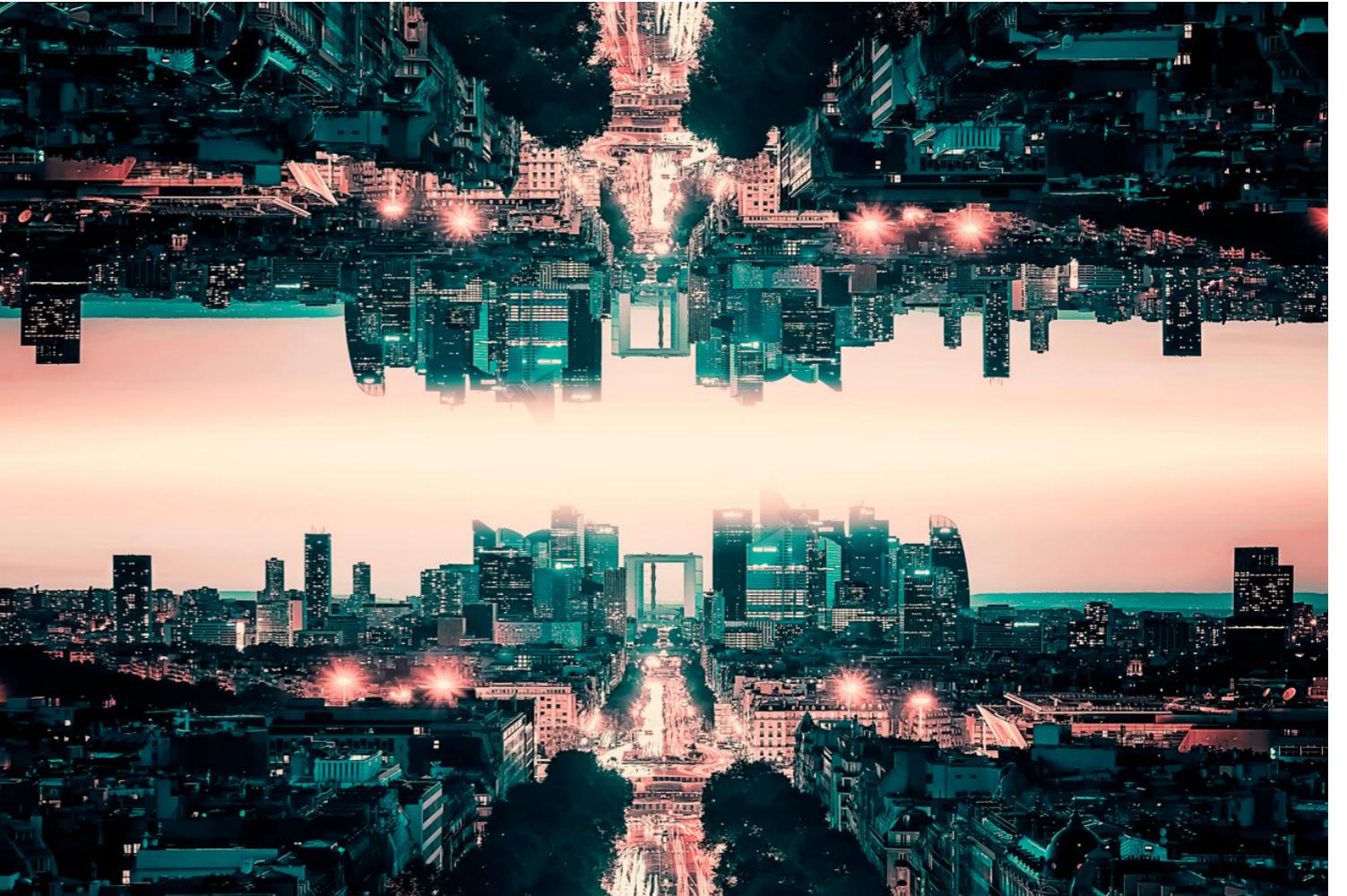
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Too many subdirectories

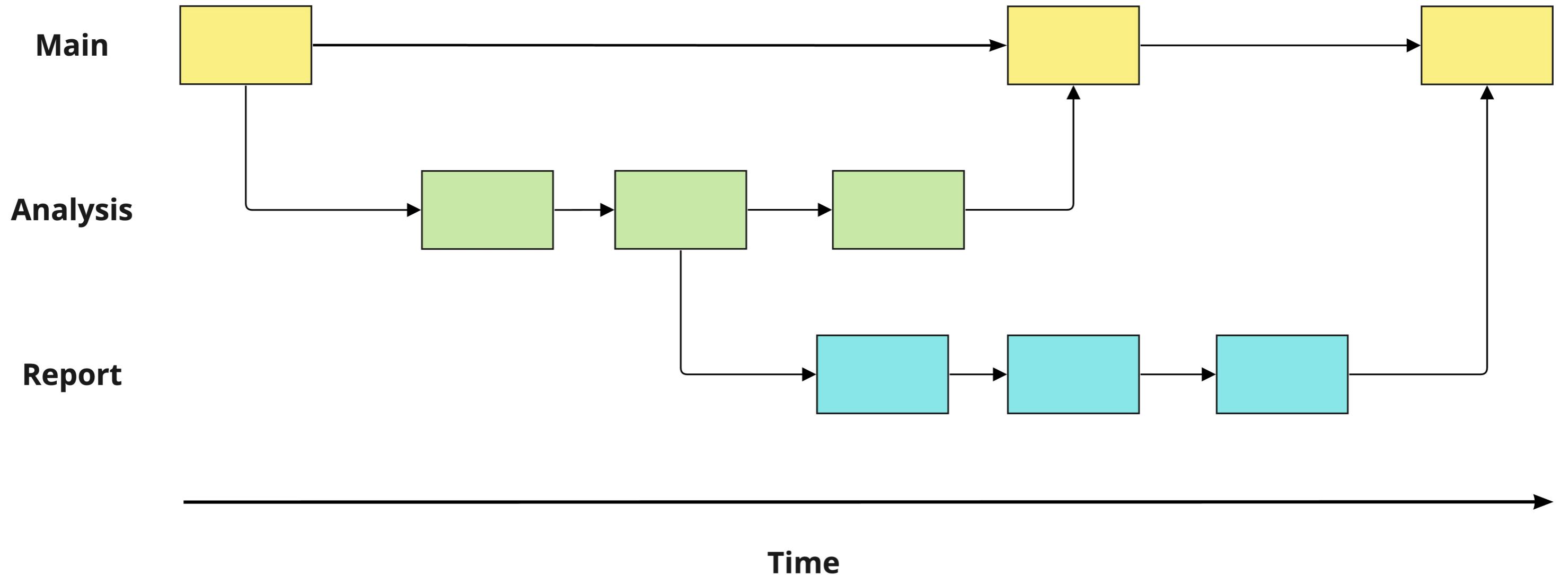


Branches to the rescue!

- Git uses **branches** to systematically track multiple versions of files
- In each branch:
 - Some files might be the same
 - Others might be different
 - Some may not exist at all

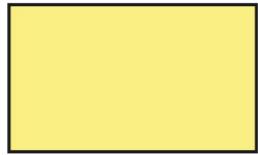


Visualizing branches



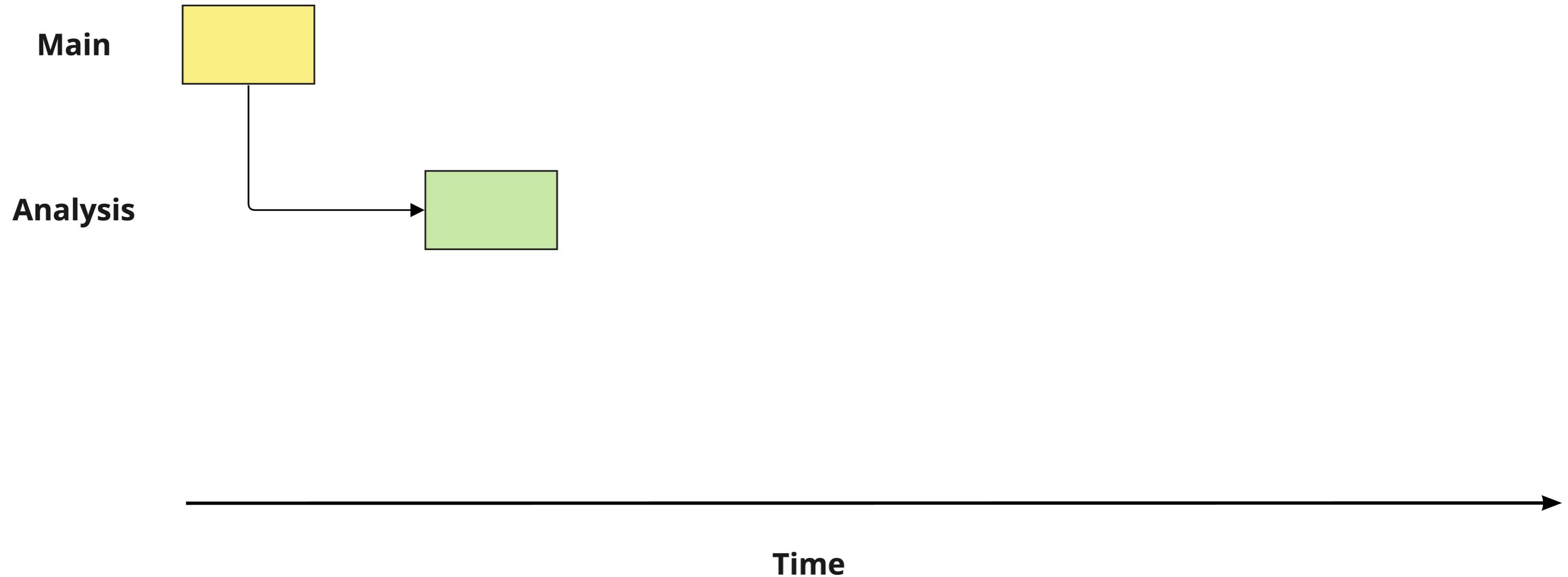
Main branch

Main

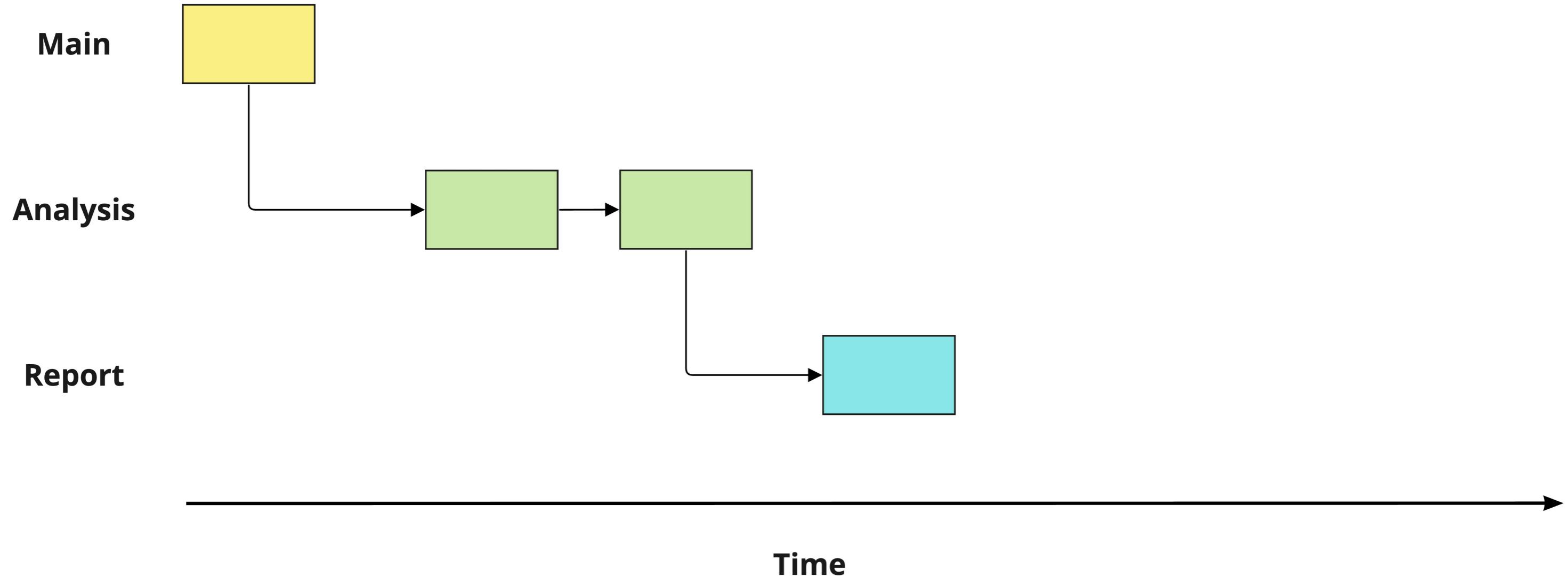


Time

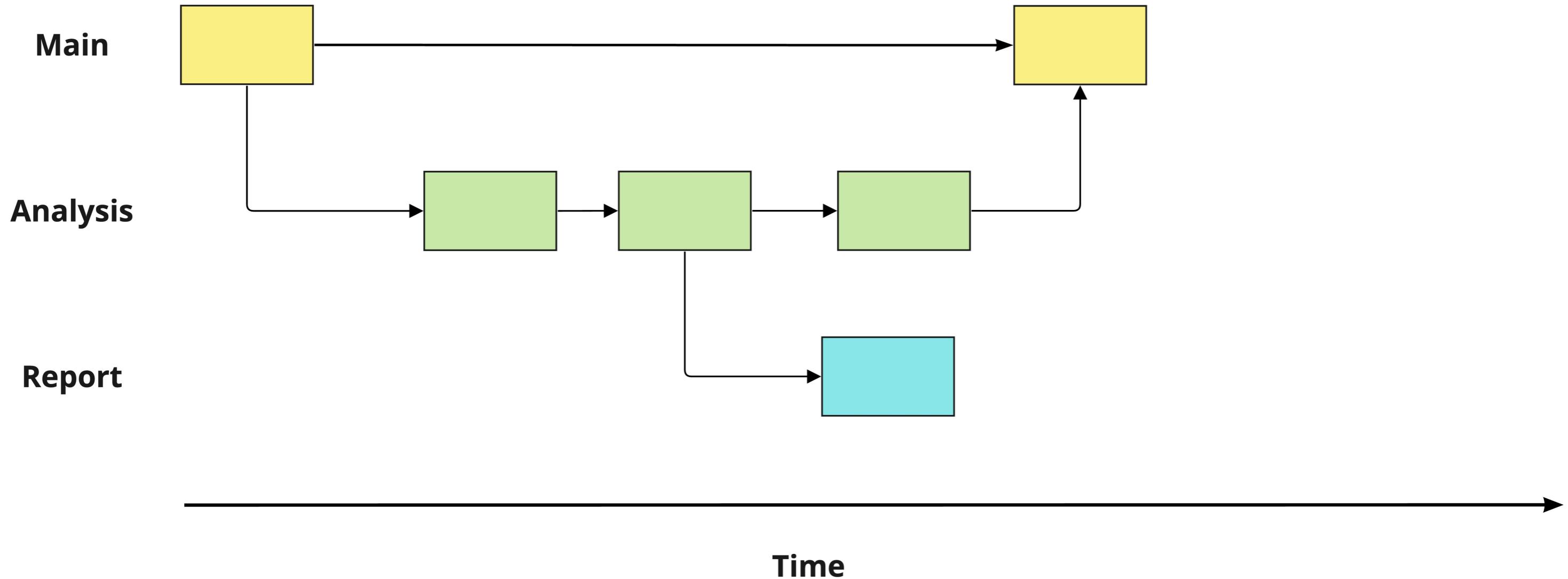
Analysis branch



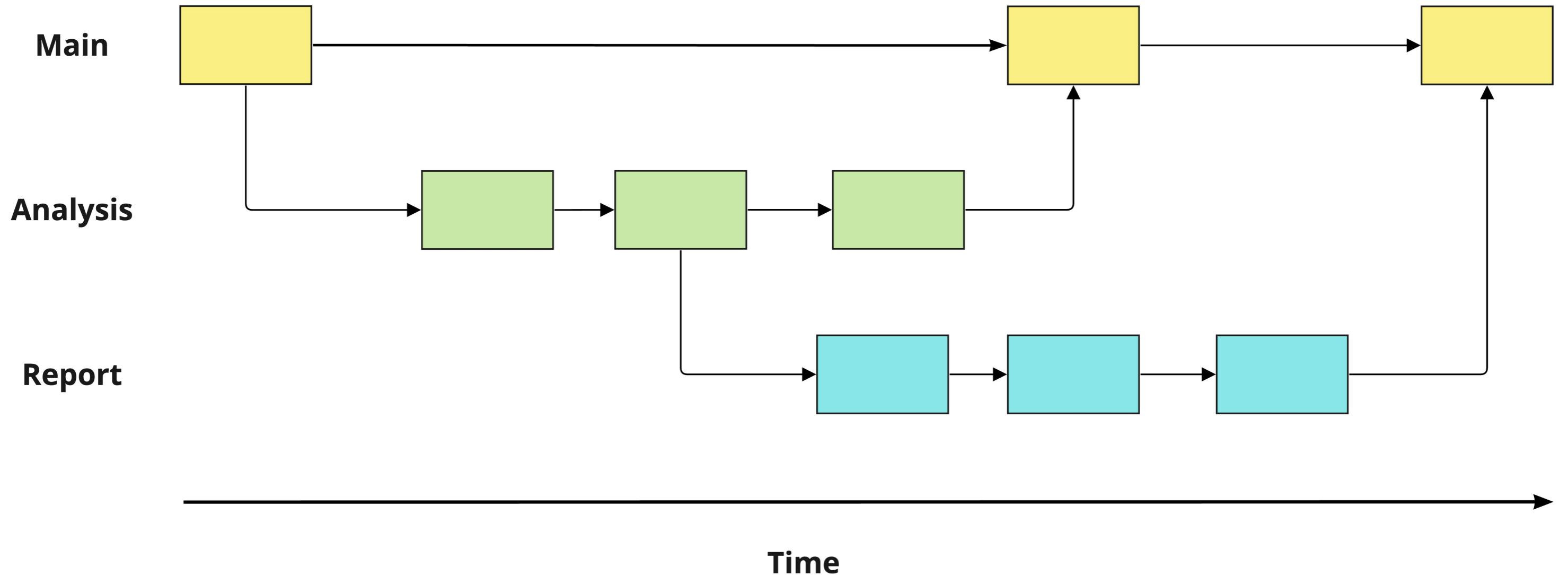
Report branch



Merging analysis into main

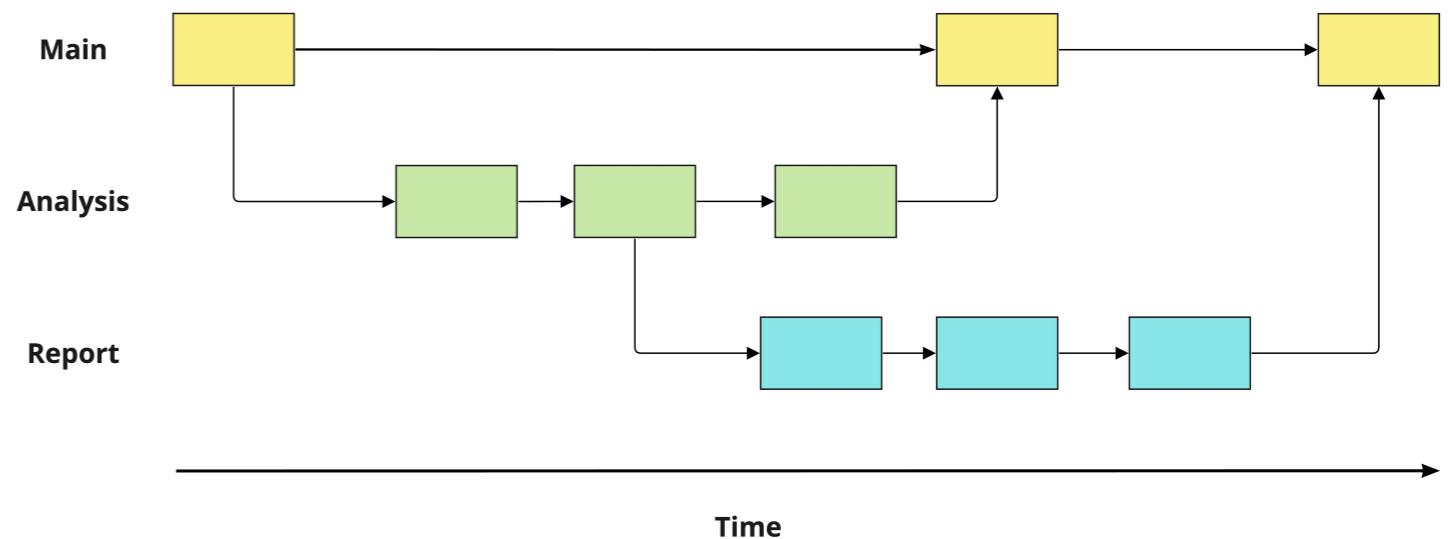


Merging report into main



Source and destination

- When merging two branches:
 - the commits are called parent commits
 - **source** —the branch we want to merge **from**
 - **destination** —the branch we want to merge **into**
- When merging **Analysis** into **Main**:
 - **Analysis** = **source**
 - **Main** = **destination**



Benefits of branches

- Avoiding endless subdirectories
- Multiple users can work simultaneously
- Everything is tracked
- Minimizes the risk of conflicting versions

Identifying branches

```
git branch
```

```
alter-report-title  
main  
* summary-statistics
```

- * = current branch

Creating a new branch

```
git checkout -b report
```

```
Switched to a new branch 'report'
```

```
git branch
```

```
alter-report-title
main
summary-statistics
* report
```

The difference between branches

```
git diff main summary-statistics
```

Comparing branches

```
diff --git a/bin/summary b/bin/summary
new file mode 100755
index 000000..9d6e2fa
--- /dev/null
+++ b/bin/summary
@@ -0,0 +1,44 @@
+Summary statistics
+
+Age:
+count: 49.00
+mean: 31.82
+std: 6.72
+min: 18.00
+25%: 28.00
+50%: 31.00
+75%: 35.00
+max: 46.00
+
```

Let's practice!

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Working with branches

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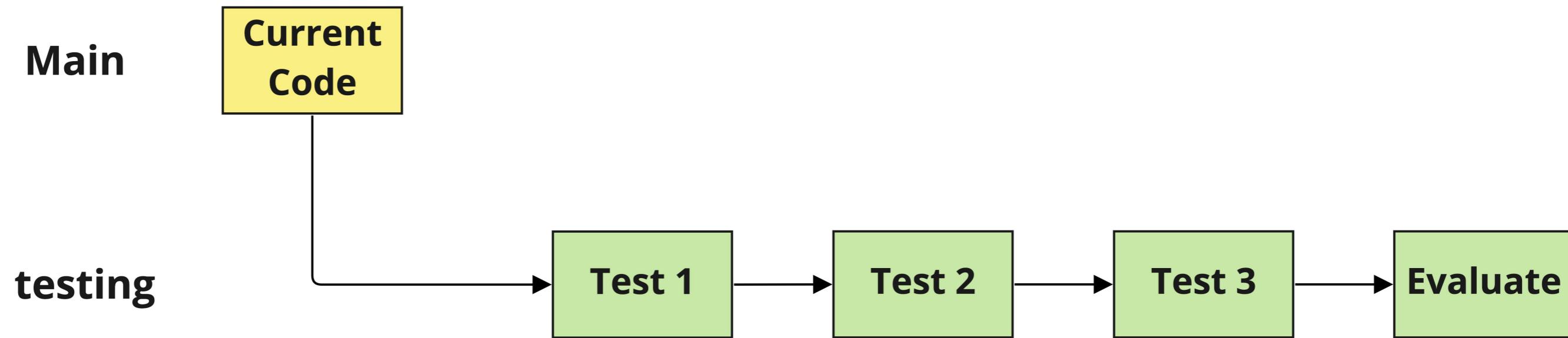


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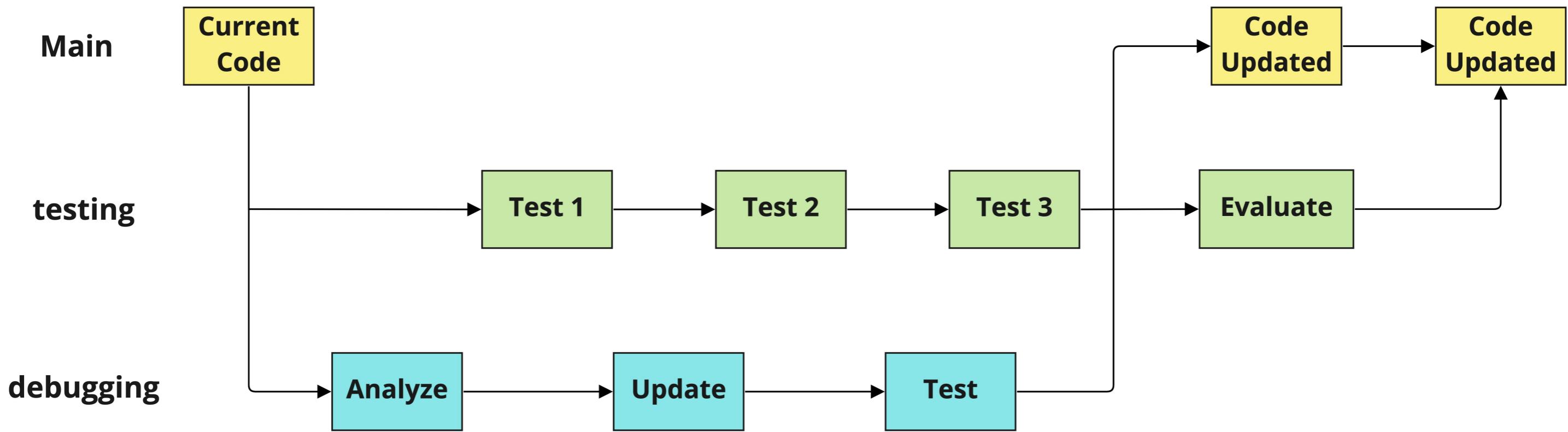
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Why do we need to switch branches?

- Common to work on different components of a project simultaneously
- Branches allow us to keep making progress concurrently



Why do we need to switch branches?



How do we switch branches?

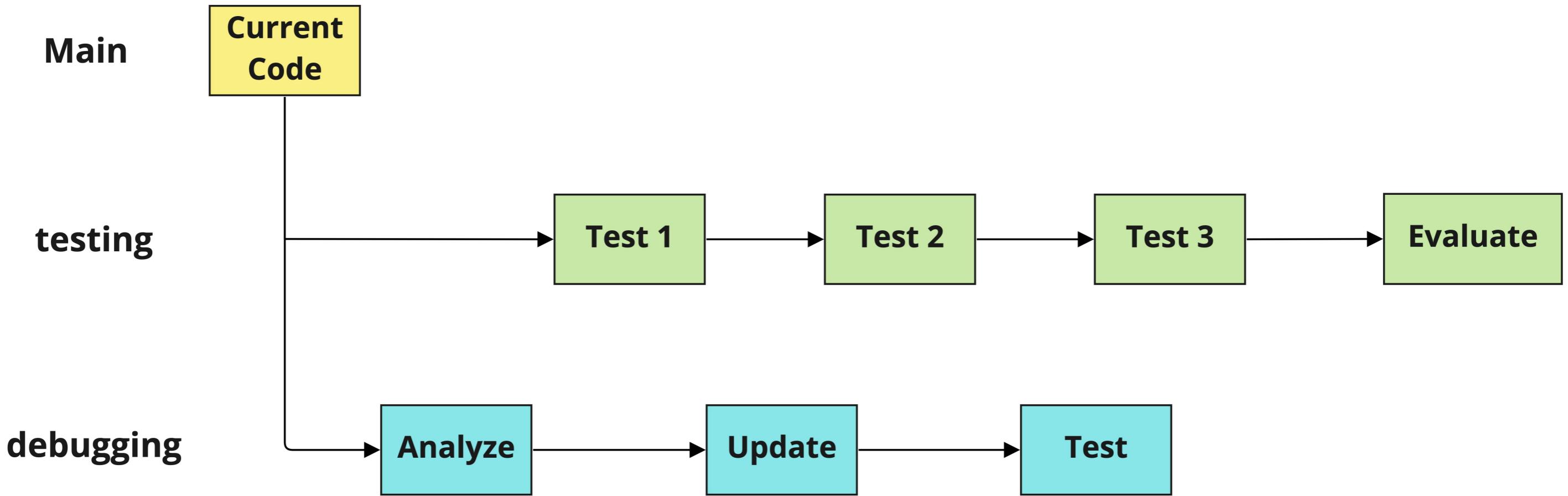
- `git checkout -b new_branch` to create a new branch

```
git checkout debugging
```

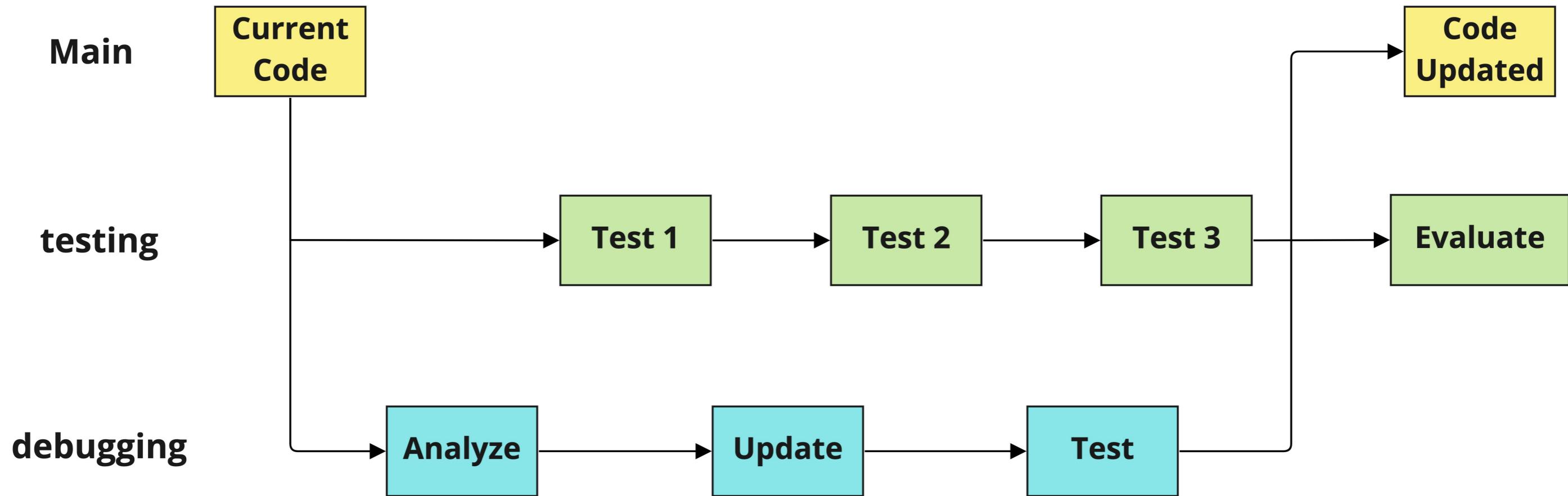
```
git branch
```

```
* debugging  
  main  
  summary-statistics
```

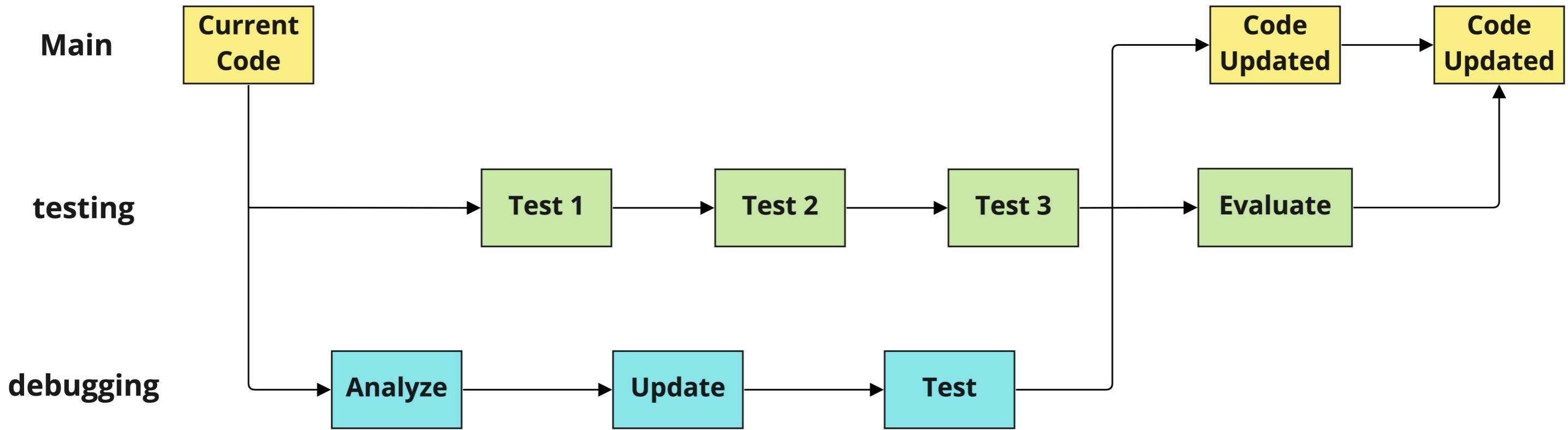
Next step: merge



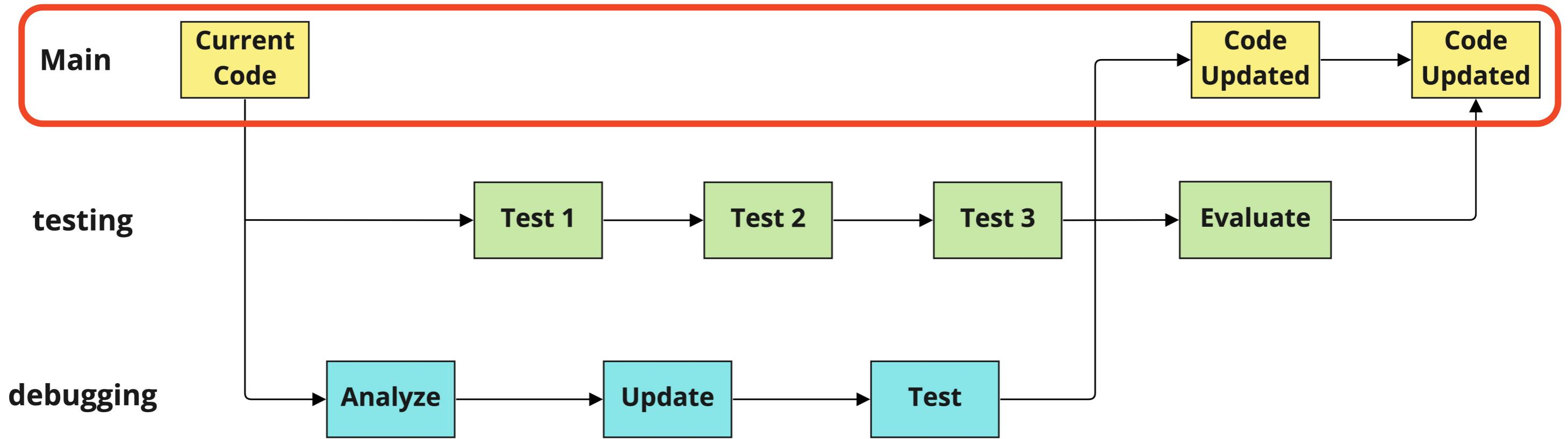
Next step: merge



Next step: merge



Why do we merge branches?



Why do we merge branches?

- `main` = ground truth
- Each branch should be for a specific task
- Once the task is complete we should merge our changes into `main`
 - to keep it up to date and accurate

Merging branches

```
git merge source destination
```

- To merge `summary-statistics` into `main`

```
git merge summary-statistics main
```

Merge output

Commit hashes



```
Updating dc9d8fa..cef5ad8
Fast-forward
  bin/summary      | 44 ++++++=====
  results/summary.txt | 0
  2 files changed, 44 insertions(+)
  create mode 100755 bin/summary
  create mode 100644 results/summary.txt
```

Merge output

Type of merge →

```
Updating dc9d8fa..cef5ad8
Fast-forward
  bin/summary      | 44 ++++++=====
  results/summary.txt | 0
  2 files changed, 44 insertions(+)
  create mode 100755 bin/summary
  create mode 100644 results/summary.txt
```

Merge output

Number of lines changed

```
Updating dc9d8fa..cef5ad8
Fast-forward
  bin/summary      | 44 ++++++++|||||||||||||||||||||+
  results/summary.txt | 0
  2 files changed, 44 insertions(+)
  create mode 100755 bin/summary
  create mode 100644 results/summary.txt
```

Merge output

Files modified →

```
Updating dc9d8fa..cef5ad8
Fast-forward
  bin/summary      | 44 ++++++=====
  results/summary.txt | 0
  2 files changed, 44 insertions(+)
create mode 100755 bin/summary
create mode 100644 results/summary.txt
```

Let's practice!

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Handling conflict

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What is a conflict?

- A) Write report.
- B) Submit report.

```
git add todo.txt
```

```
git commit -m "Add todo list"
```

```
git checkout -b update
```

- A) Write report.
- B) Submit report.
- C) Submit expenses.

What is a conflict?

```
git add todo.txt  
git commit -m "Reminder to submit expenses"  
git checkout main
```

c) Submit expenses.

Conflict

Main branch todo.txt

c) Submit expenses.

Update branch todo.txt

A) Write report.
B) Submit report.
C) Submit expenses.

Attempting to merge a conflict

```
git merge update main
```

```
CONFLICT (add/add): Merge conflict in todo.txt
```

```
Auto-merging todo.txt
```

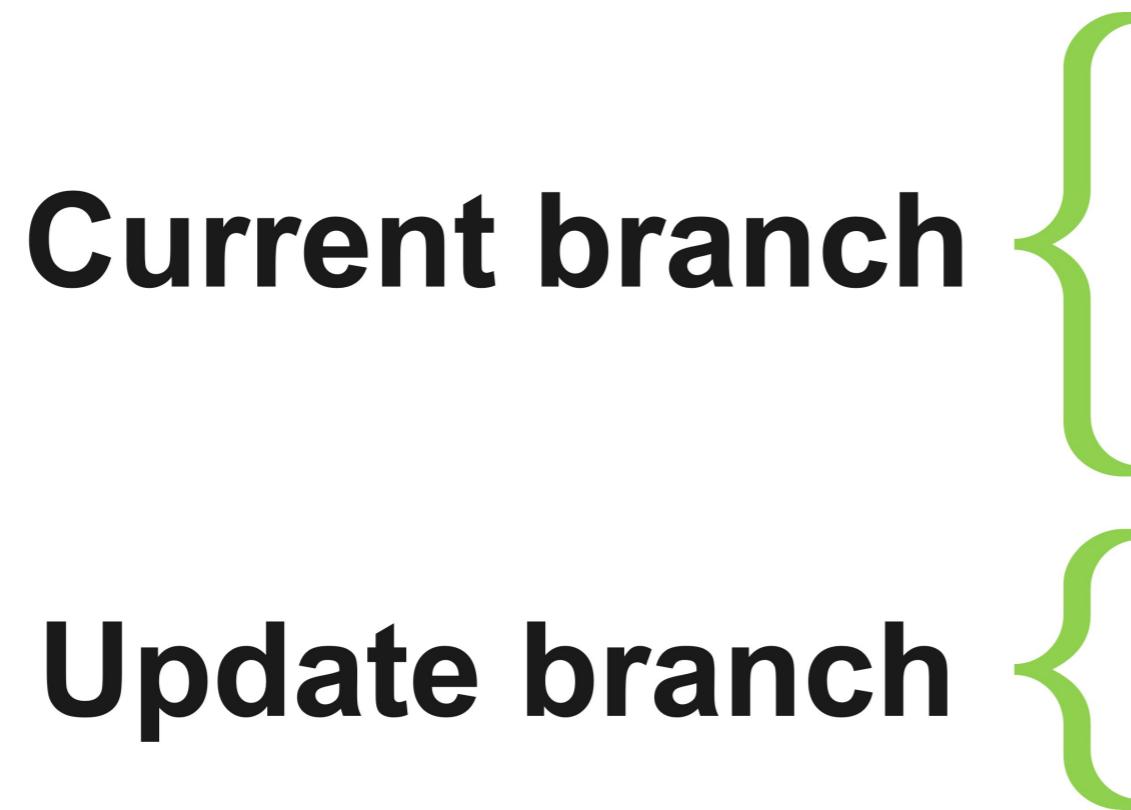
```
Automatic merge failed; fix conflicts and then commit the result.
```

Git conflicts

```
nano todo.txt
```

```
<<<<< HEAD
=====
A) Write report.
B) Submit report.
>>>>> update
C) Submit expenses.
```

Git conflicts



```
<<<<<< HEAD  
=====  
A) Write report.  
B) Submit report.  
>>>>> update  
C) Submit expenses.
```

Conflict web editor

```
<<<<< HEAD  
=====  
A) Write report.  
B) Submit report.  
>>>>> update  
C) Submit expenses.
```

^G Get Help **^O** Write Out **^W** Where Is **^K** Cut Text **^J** Justify
^X Exit **^R** Read File **^V** Replace **^U** Uncut Text **^T** To Spell

Merging the branches

```
git add todo.txt
```

```
git commit -m "Resolving todo.txt conflict"
```

```
git merge update main
```

```
Already up to date.
```

- Large conflicts can be quite intimidating!

How do we avoid conflicts?

- Prevention is better than cure!
- Use each branch for a specific task
- Avoid editing a file in multiple branches
- Doesn't guarantee we'll avoid conflicts
 - but it does reduce the risk

Let's practice!

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