Configuring Git

INTRODUCTION TO VERSION CONTROL WITH GIT

George Boorman
Curriculum Manager, DataCamp

datacamp

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

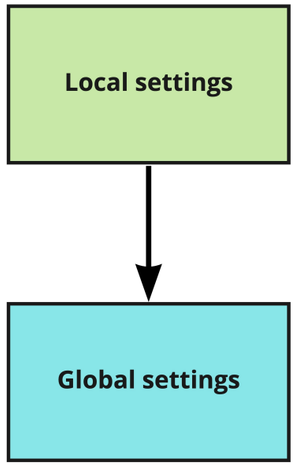
- `git config --list`
- Git has three levels of settings:
  1. `--local` : settings for one specific project
  2. `--global` : settings for all of our projects
  3. `--system` : settings for every users on this computer

Local settings

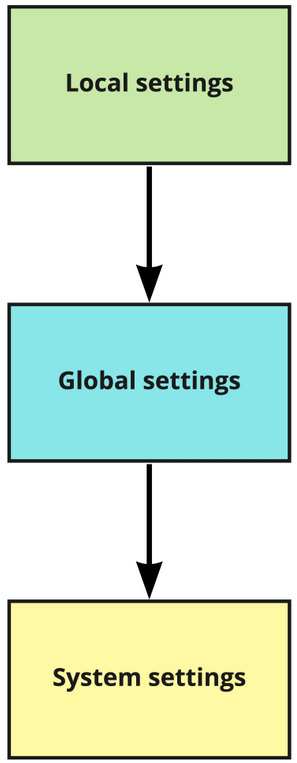
Setting Levels

Global settings

Setting Levels



System settings



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

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

Let's practice!

INTRODUCTION TO VERSION CONTROL WITH GIT

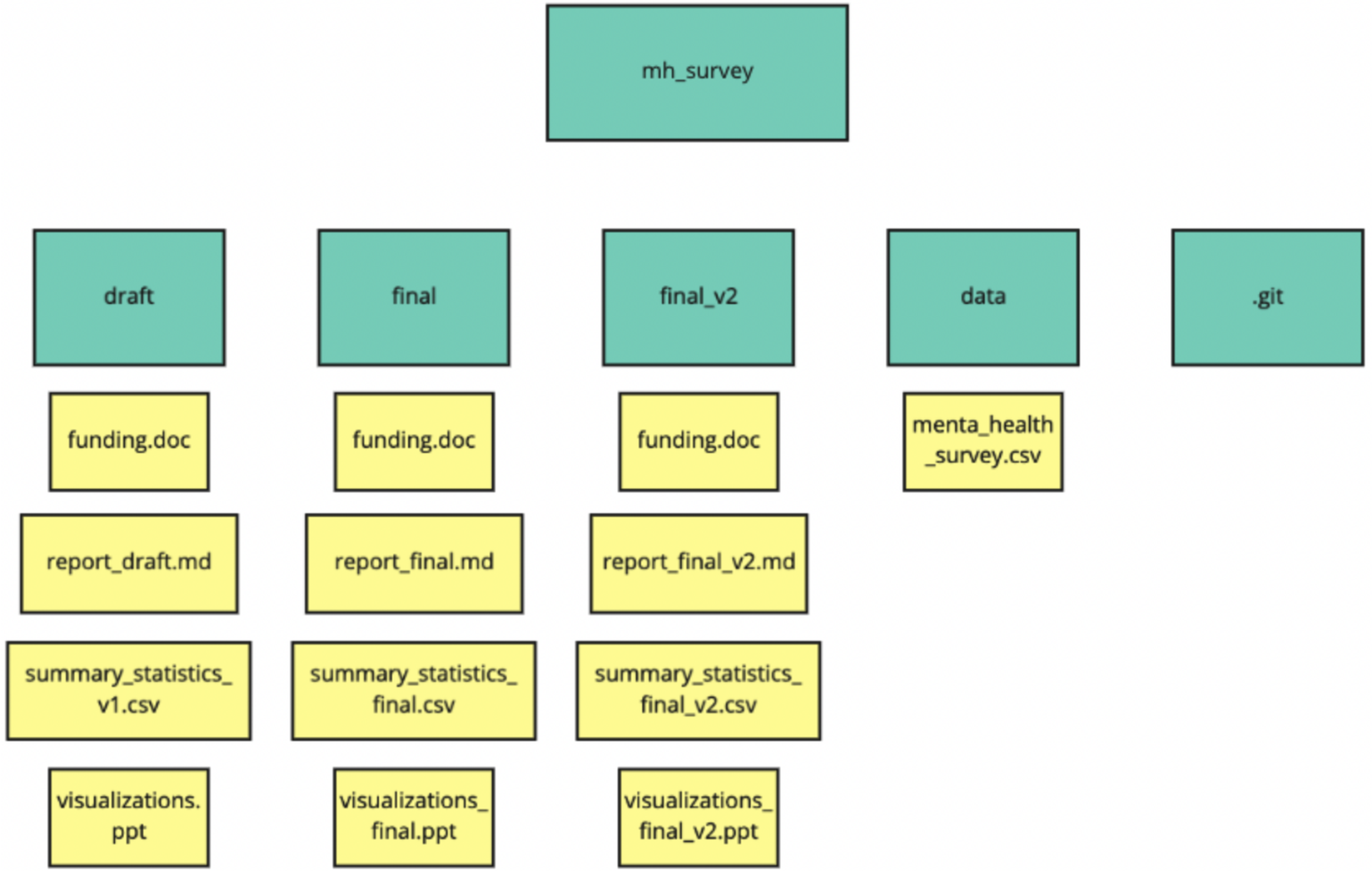
Branches

INTRODUCTION TO VERSION CONTROL WITH GIT

George Boorman
Curriculum Manager, DataCamp

datacamp

Too many subdirectories

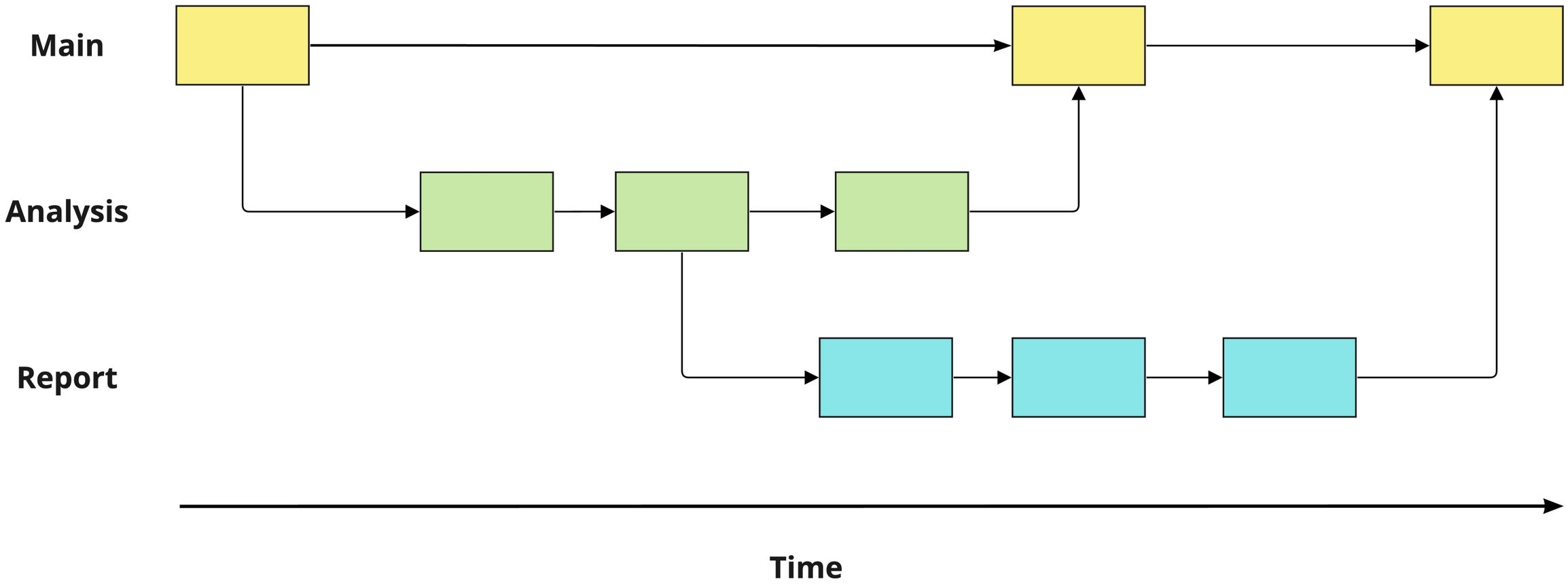


Branches to the rescue!

- 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

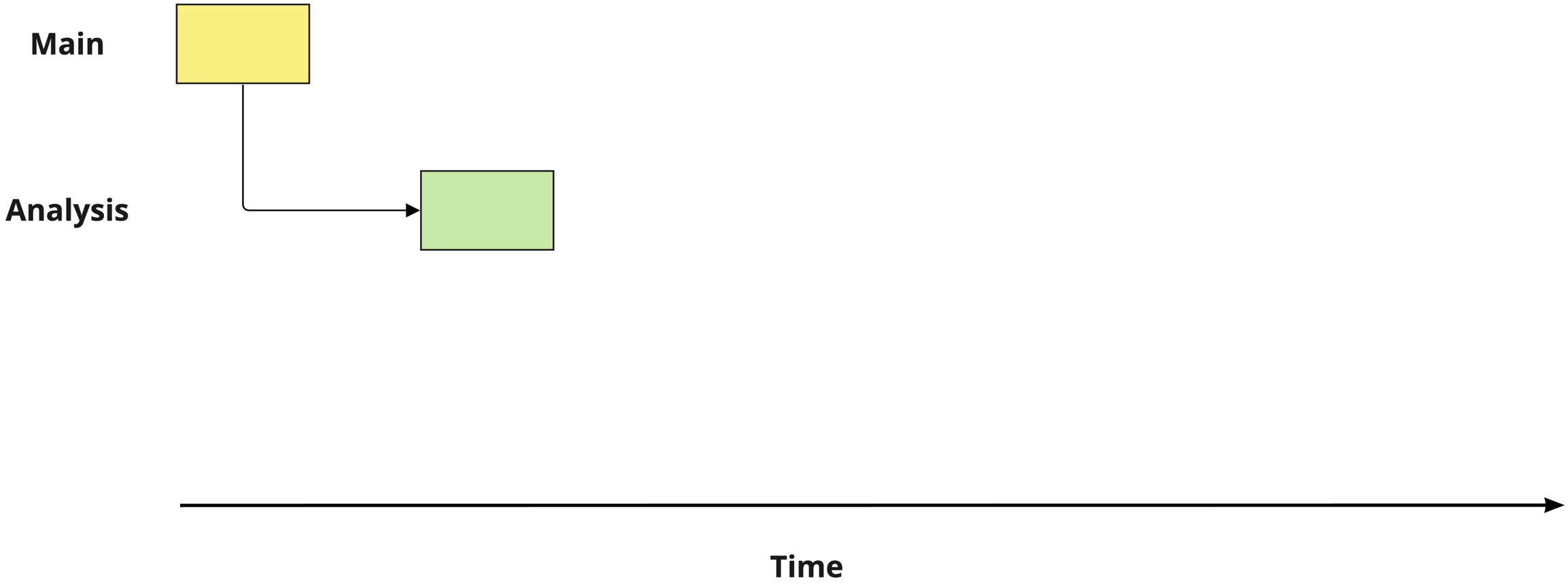


Main branch

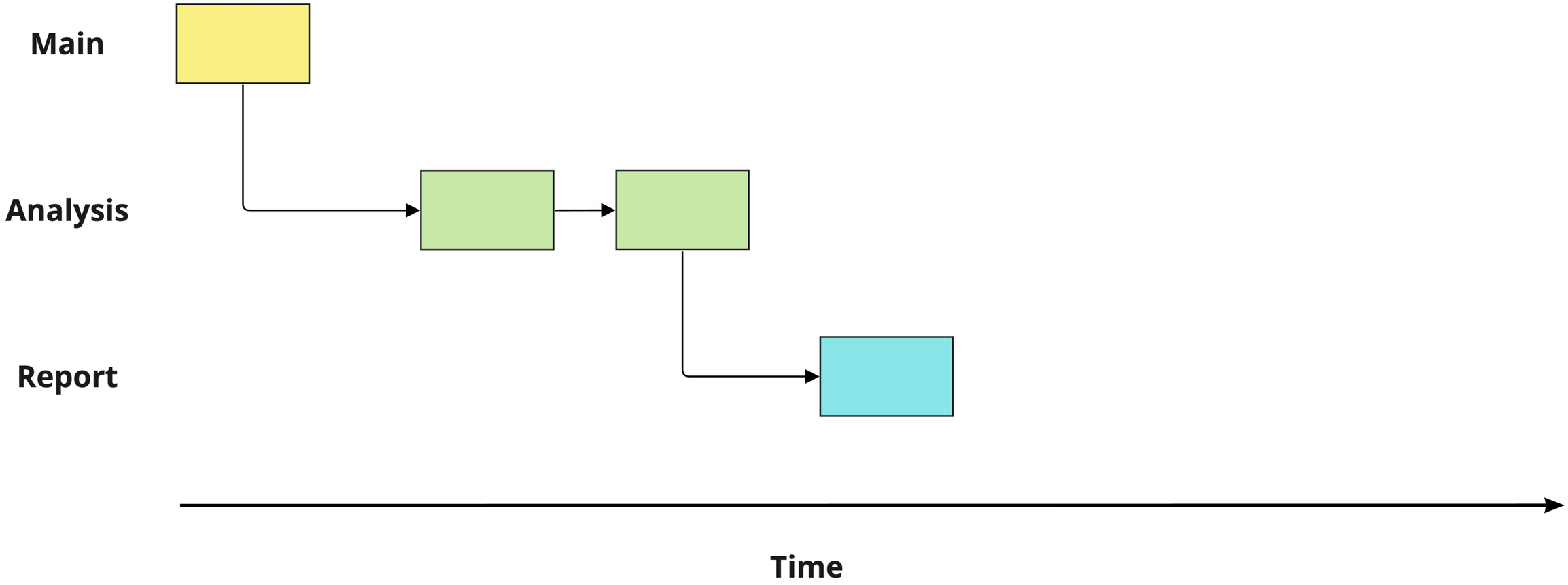
Main

Time

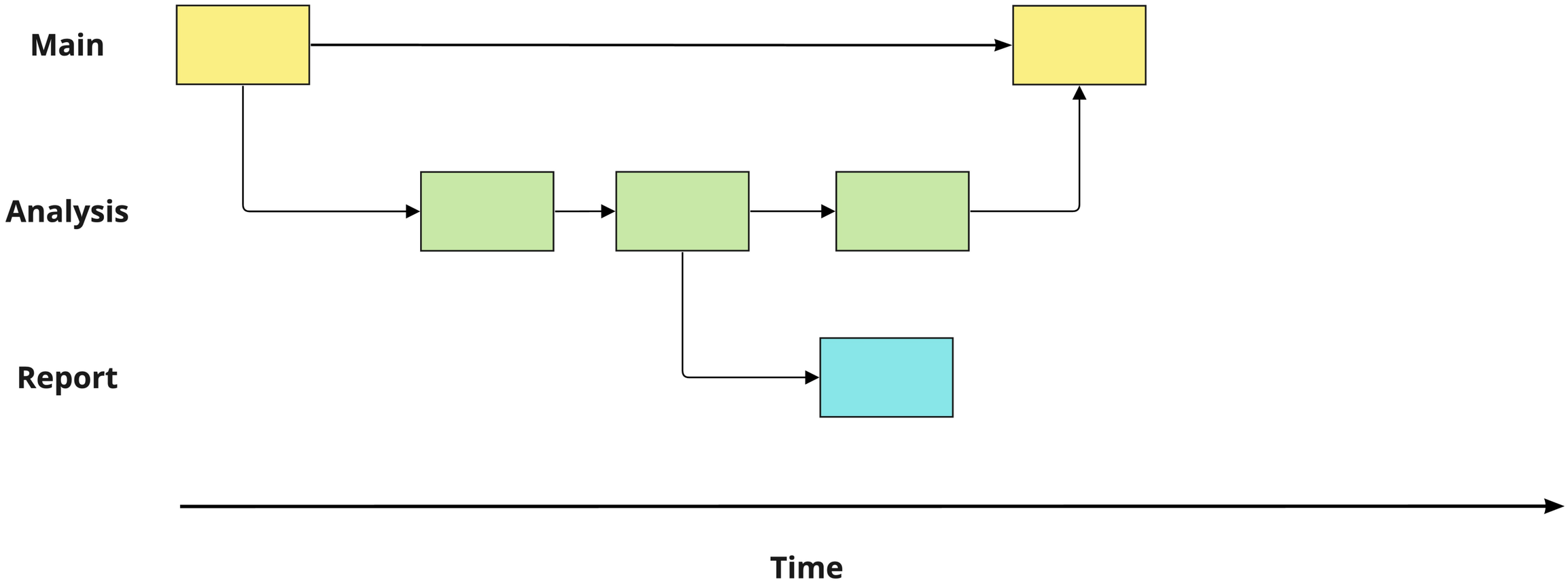
Analysis branch



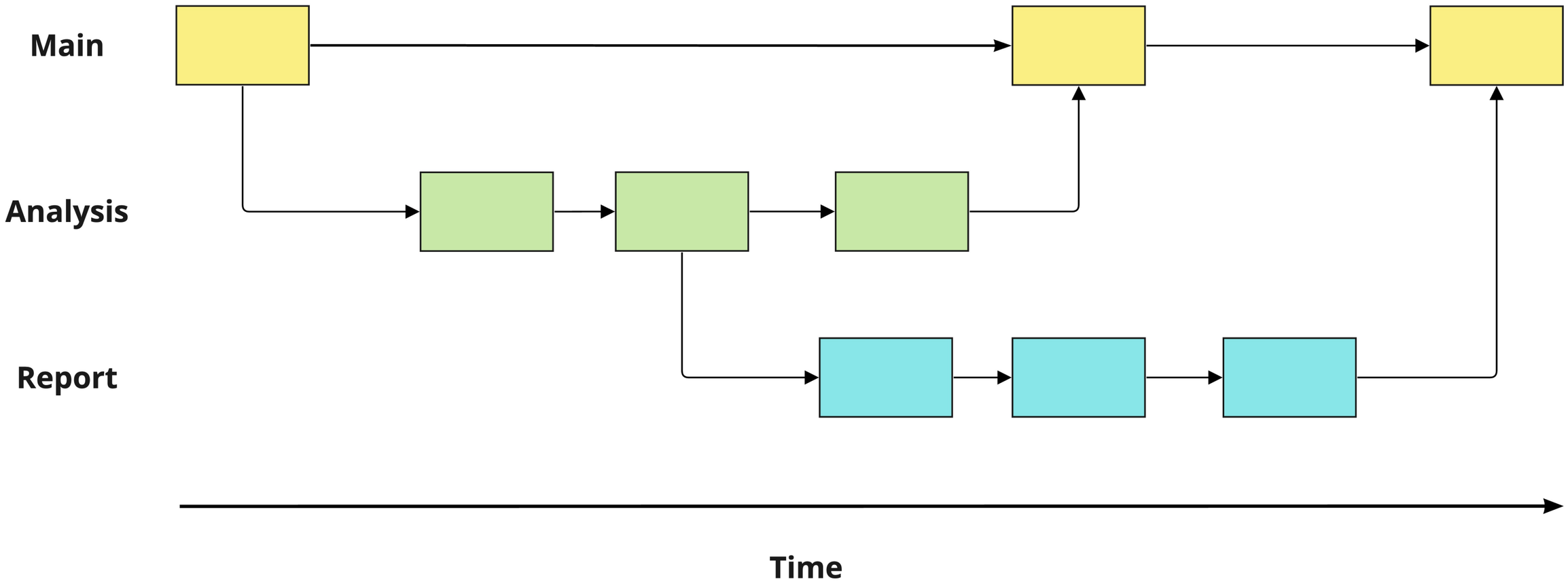
Report branch



Merging analysis into main

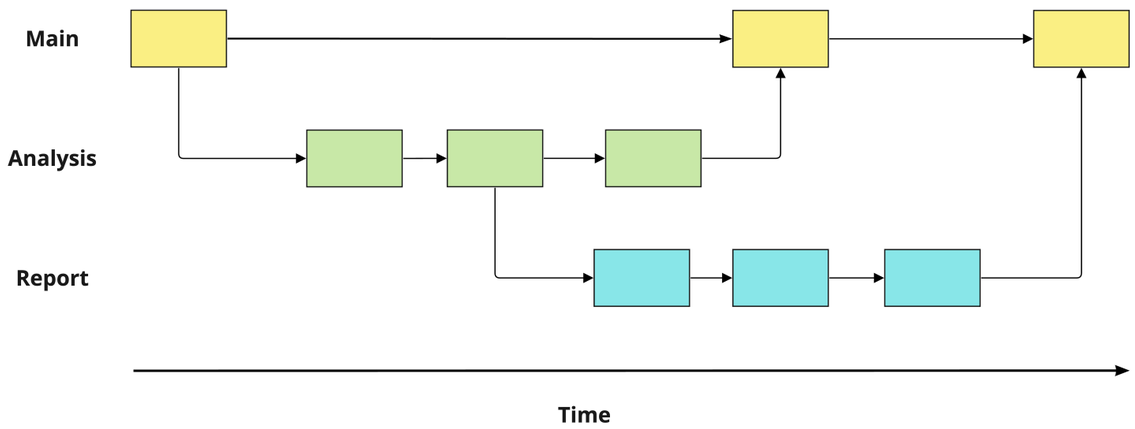


Merging report into main



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 0000000..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!

INTRODUCTION TO VERSION CONTROL WITH GIT

Working with branches

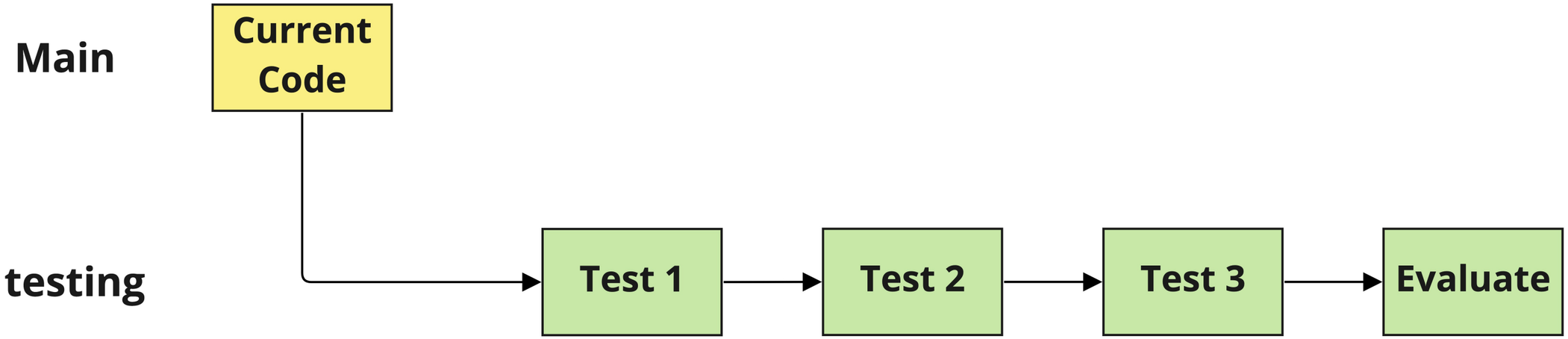
INTRODUCTION TO VERSION CONTROL WITH GIT

George Boorman
Curriculum Manager, DataCamp

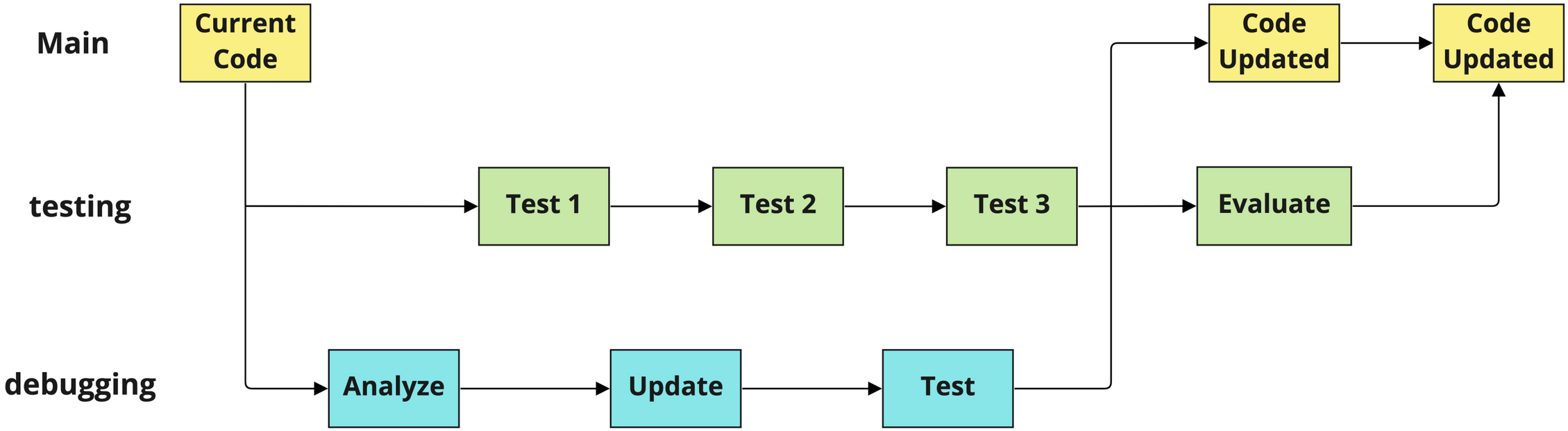
datacamp

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?

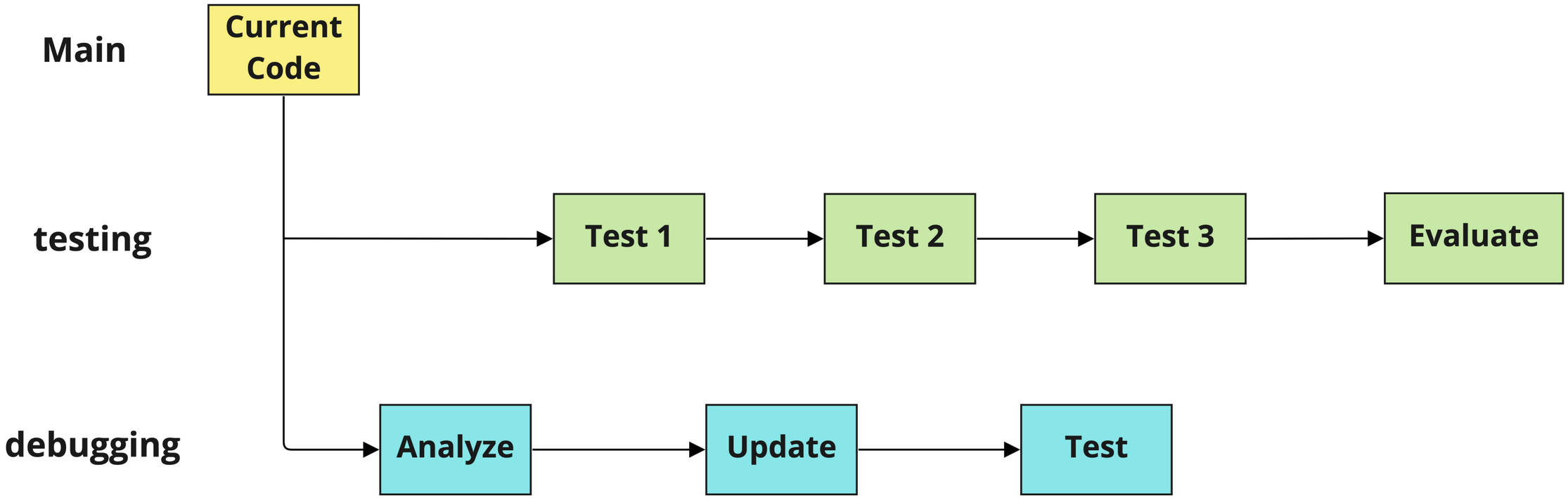
- `git checkout -b new_branch` to create a new branch

```
git checkout debugging
```

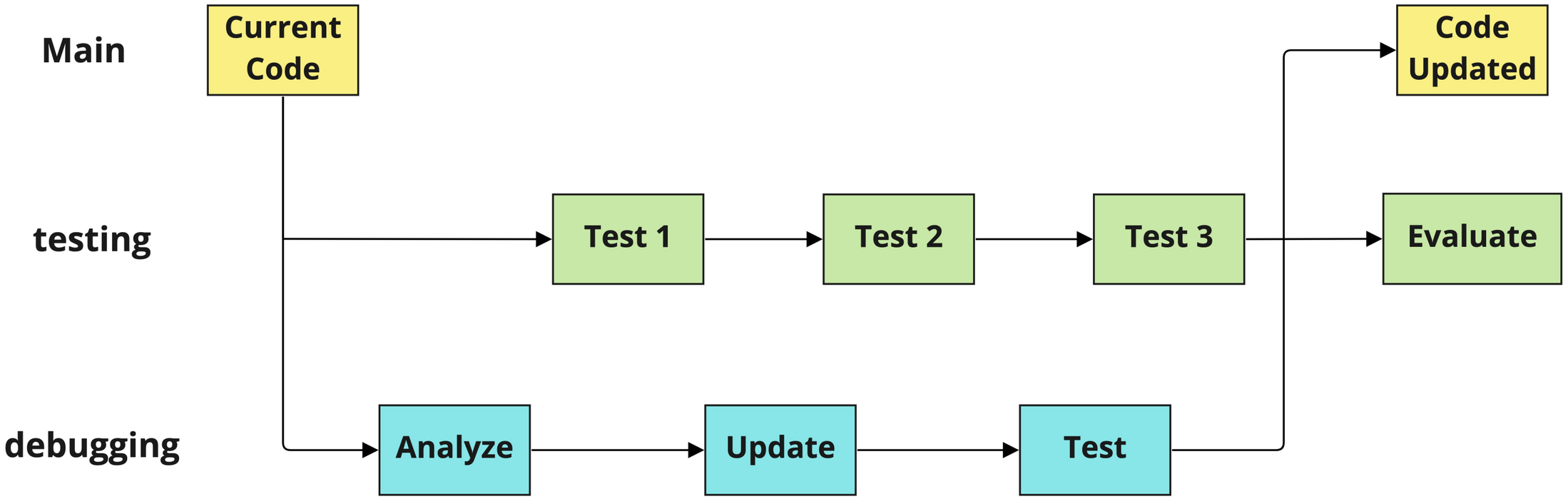
```
git branch
```

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

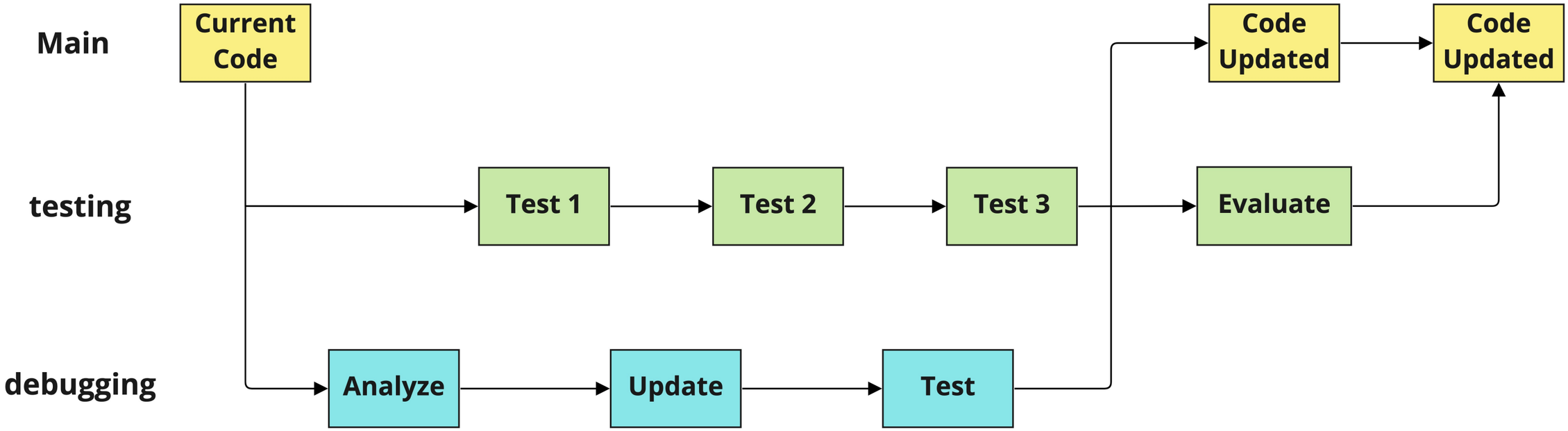
Next step: merge



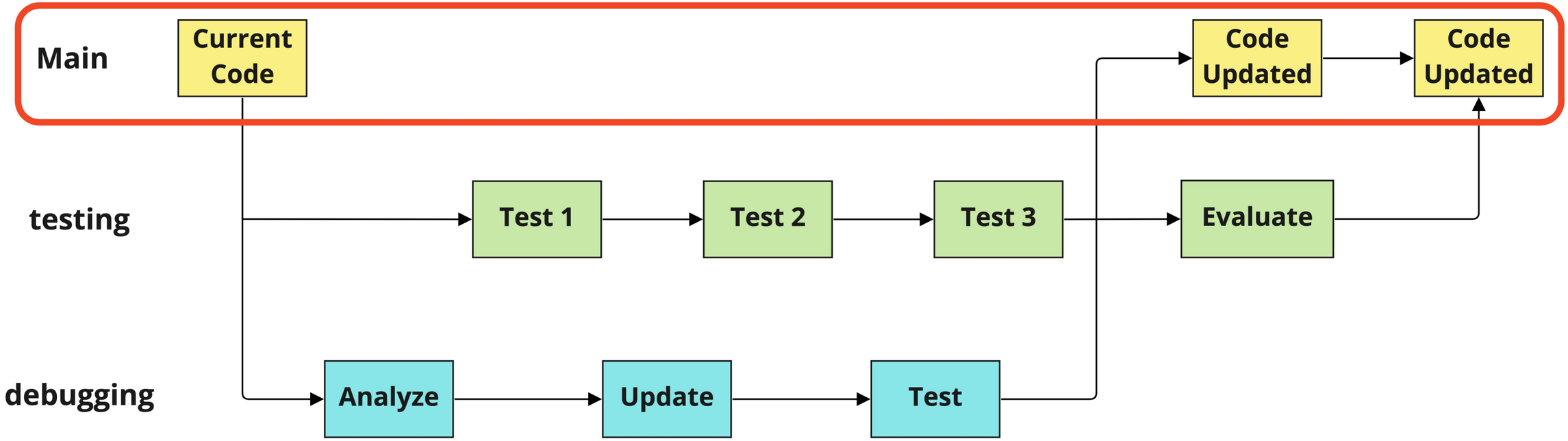
Next step: merge



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

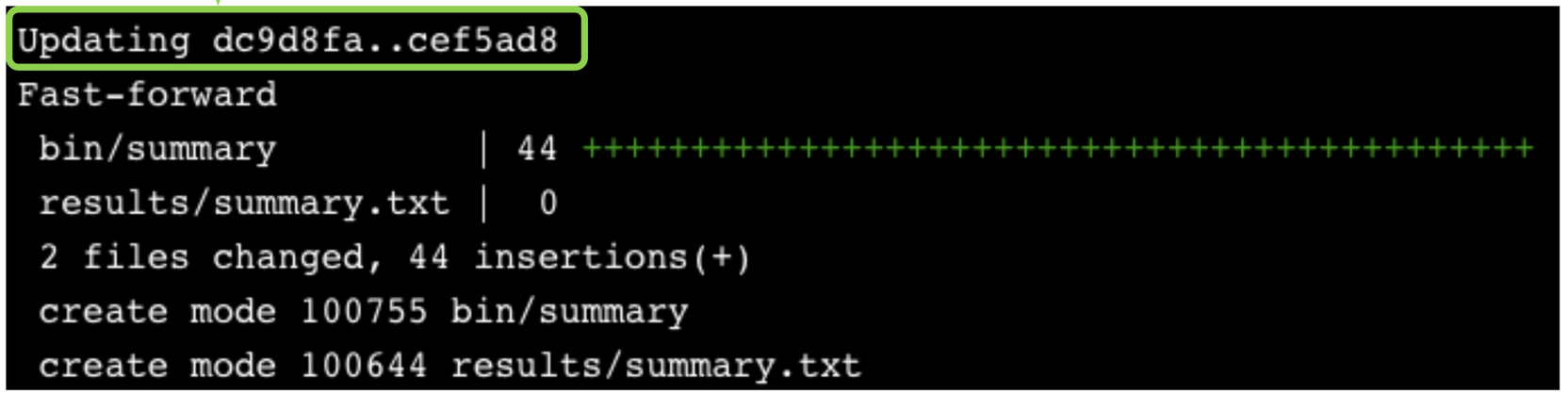
```
git merge source destination
```

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

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

Merge output

Commit hashes

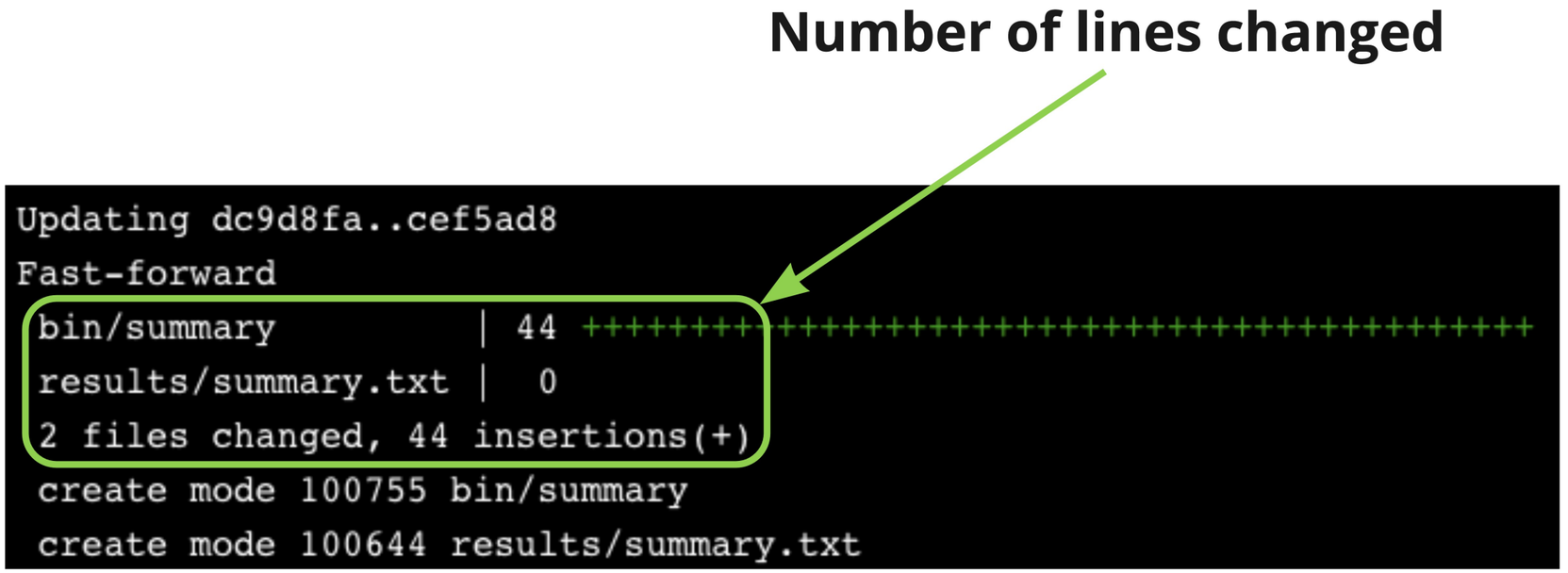


Merge output

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



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!

INTRODUCTION TO VERSION CONTROL WITH GIT

Handling conflict

INTRODUCTION TO VERSION CONTROL WITH GIT

George Boorman
Curriculum Manager, DataCamp

datacamp

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

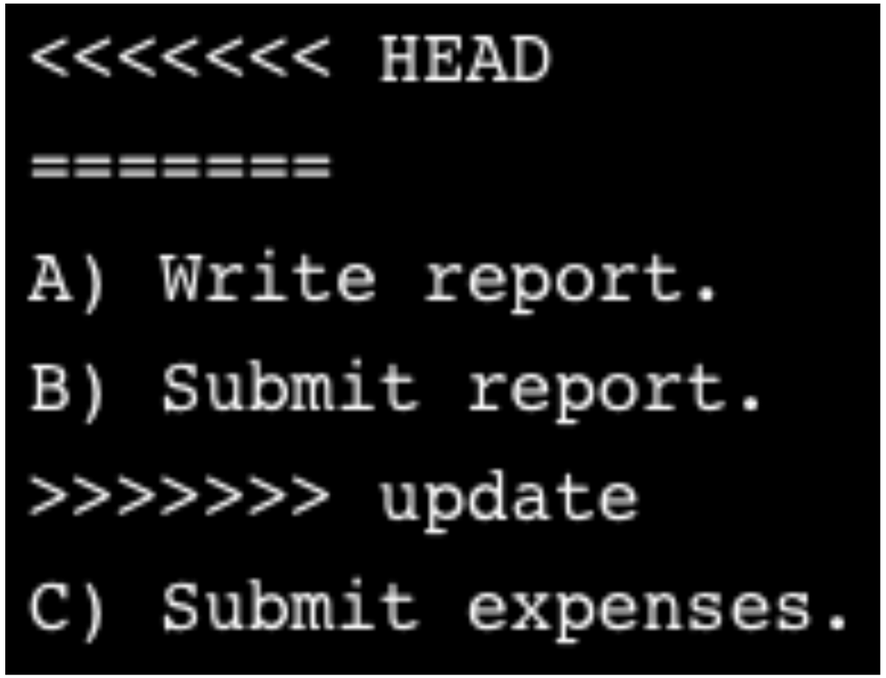
```
nano todo.txt
```

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

Git conflicts

Current branch

Update branch



Conflict web editor

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!

INTRODUCTION TO VERSION CONTROL WITH GIT