

17-313 Recitation 2: Git and GitHub

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Today's Plan

- ~~❑ Laptop Setup~~
- ❑ What is Git? What is Github?
- ❑ Recitation Activities

Learning Objectives

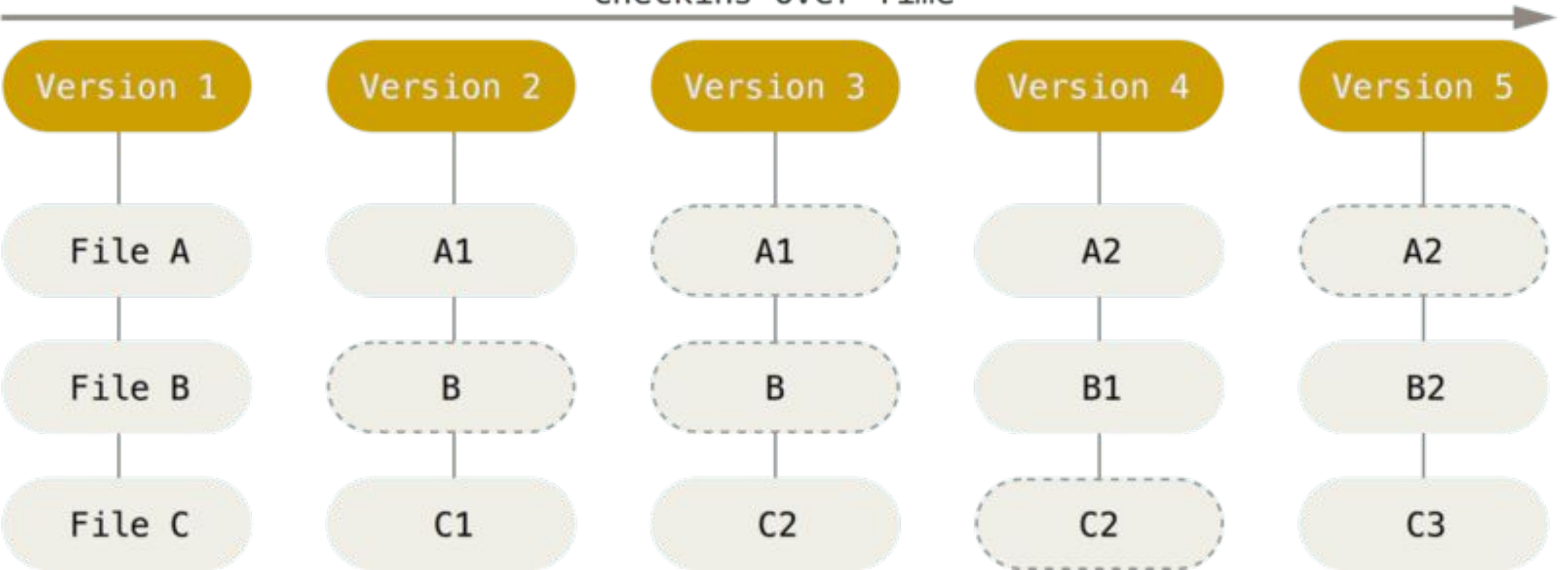
- Learn how to use git and GitHub for your teamwork in this course
- Gitflow & GitHub flow
- How to collaborate with other developers using git



What is a version control system?



Checkins Over Time



Features of Git

- Nearly every operation is local (on your own laptop)
 - does not need to connect to server or wifi
 - stores entire project history in the same repo
- Integrity
 - Everything in Git is checksummed before it is stored and is then referred to by that checksum.
 - Git stores everything in its database not by file name but by the hash value of its contents.

Lifecycle of a File

- **Modified:**

- You have changed the file but have not committed it yet.

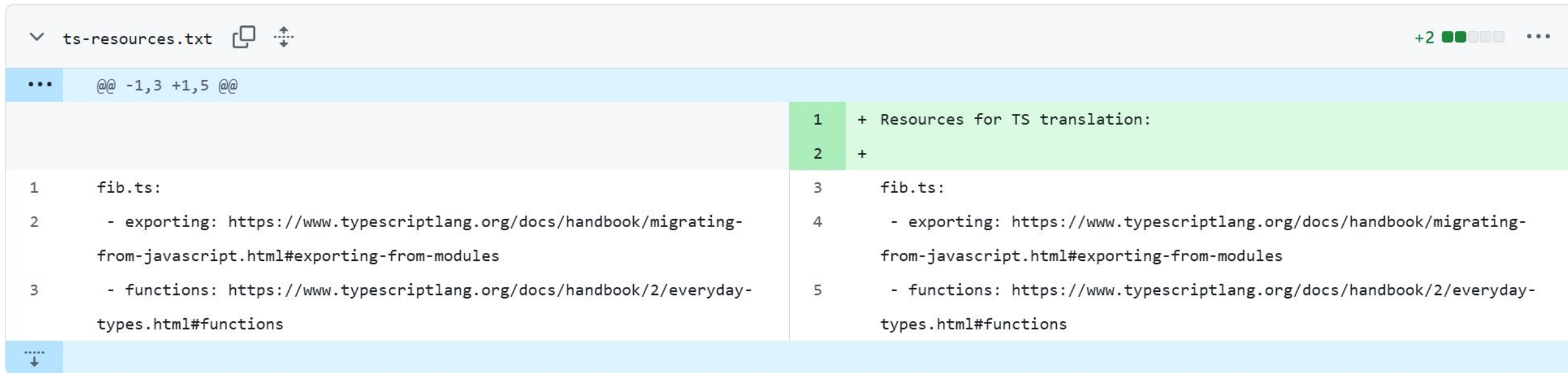
- **Staged:**

- You marked a modified file to go into your next commit.

- **Committed:**

- Means that the data is safely stored in your local database.

Attributes of a Commit: (1) The file Changes



The screenshot shows a diff viewer for a file named `ts-resources.txt`. The interface includes a header with the file name, a copy icon, a diff icon, and a status bar on the right showing `+2` changes. A light blue bar below the header contains the diff range `@@ -1,3 +1,5 @@`. The diff is presented in a split view with a light green background for the added content. The left pane shows the original content (lines 1-3), and the right pane shows the modified content (lines 1-5). The changes include adding a new line at the top and adding a new list item.

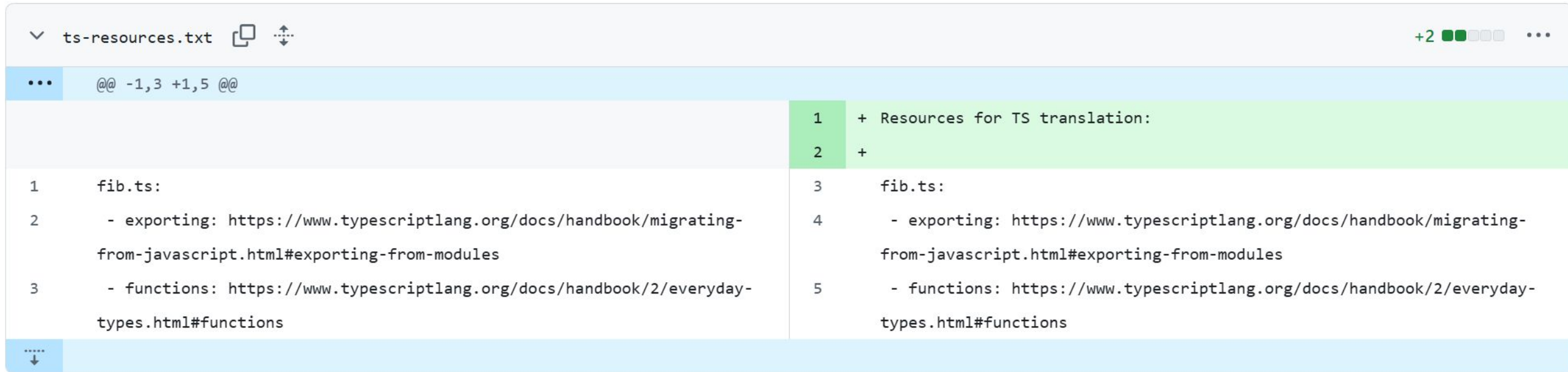
```
1  fib.ts:
2    - exporting: https://www.typescriptlang.org/docs/handbook/migrating-
  from-javascript.html#exporting-from-modules
3    - functions: https://www.typescriptlang.org/docs/handbook/2/everyday-
  types.html#functions

1  + Resources for TS translation:
2  +
3  fib.ts:
4    - exporting: https://www.typescriptlang.org/docs/handbook/migrating-
  from-javascript.html#exporting-from-modules
5    - functions: https://www.typescriptlang.org/docs/handbook/2/everyday-
  types.html#functions
```

Attributes of a Commit: (1) The file Changes

.eslintrc.js		+7 -2	...
↑...	@@ -4,14 +4,19 @@ module.exports = {		
4	node: true,	4	node: true,
5	jest: true,	5	jest: true,
6	},	6	},
7	- extends: ["eslint:recommended", "plugin:@typescript-	7	+ extends: [
8	- eslint/recommended"],	8	+ "eslint:recommended",
		9	+ "plugin:@typescript-eslint/recommended",
		10	+ "plugin:@typescript-eslint/recommended-requiring-type-checking",
		11	+],
		12	+ ignorePatterns: ["*.js", "*.test.ts"],
9		13	
10	overrides: [],	14	overrides: [],
11	parser: "@typescript-eslint/parser",	15	parser: "@typescript-eslint/parser",
12	parserOptions: {	16	parserOptions: {
13	ecmaVersion: "latest",	17	ecmaVersion: "latest",
14	sourceType: "module",	18	sourceType: "module",
		19	+ project: ["tsconfig.json"],
15	},	20	},
16	plugins: ["@typescript-eslint"],	21	plugins: ["@typescript-eslint"],
17	rules: {},	22	rules: {},
...			

Attributes of a Commit: (1) The file Changes



The screenshot shows a diff viewer for the file `ts-resources.txt`. The interface includes a top bar with the file name, icons for file operations, and a status indicator showing `+2` changes. A light blue header bar displays the diff range `@@ -1,3 +1,5 @@`. The diff content is split into two panels. The left panel shows the original file content with line numbers 1 to 3. The right panel shows the modified file content with line numbers 1 to 5. Line 1 in the right panel is highlighted green, indicating a new line. Lines 2 and 3 in the right panel are also highlighted green, indicating they are new or modified. The content of the file is as follows:

Line	Original	Modified
1	fib.ts:	+ Resources for TS translation:
2	- exporting: https://www.typescriptlang.org/docs/handbook/migrating-from-javascript.html#exporting-from-modules	+ - exporting: https://www.typescriptlang.org/docs/handbook/migrating-from-javascript.html#exporting-from-modules
3	- functions: https://www.typescriptlang.org/docs/handbook/2/everyday-types.html#functions	- functions: https://www.typescriptlang.org/docs/handbook/2/everyday-types.html#functions

Attributes of a Commit: (2) Metadata

Message



separates fib function and route



anudaweerasinghe committed on Jan 22, 2023

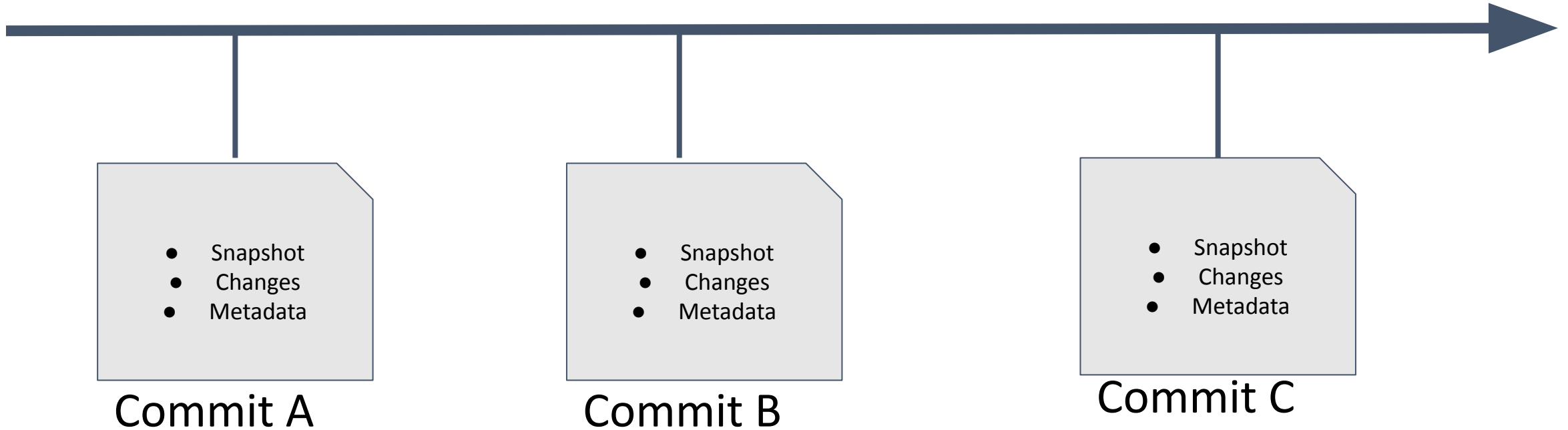
Author



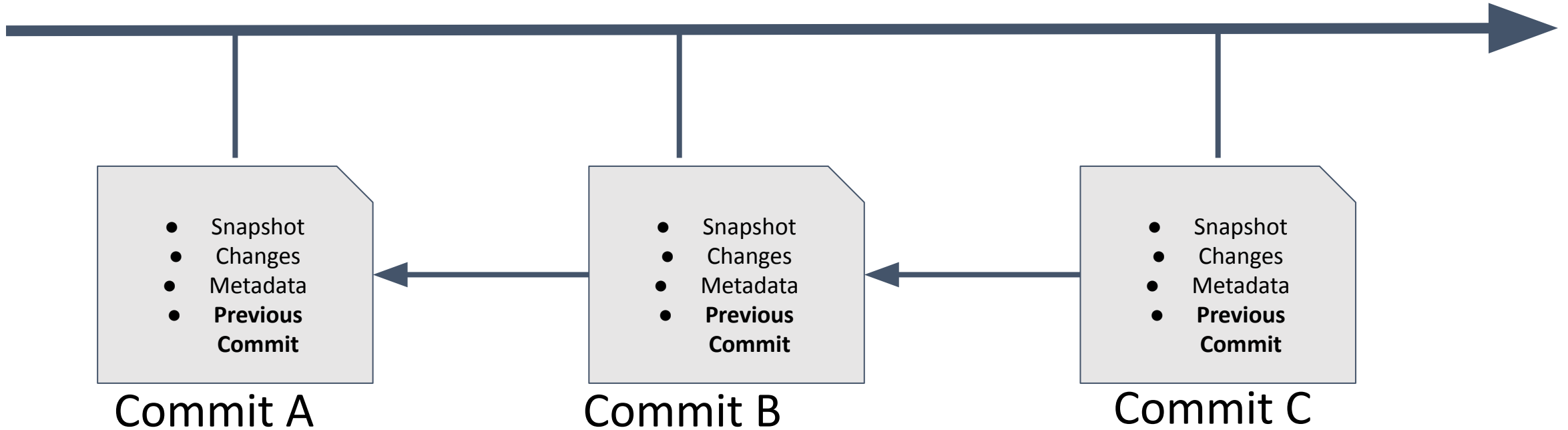
Date



Commit Family Tree

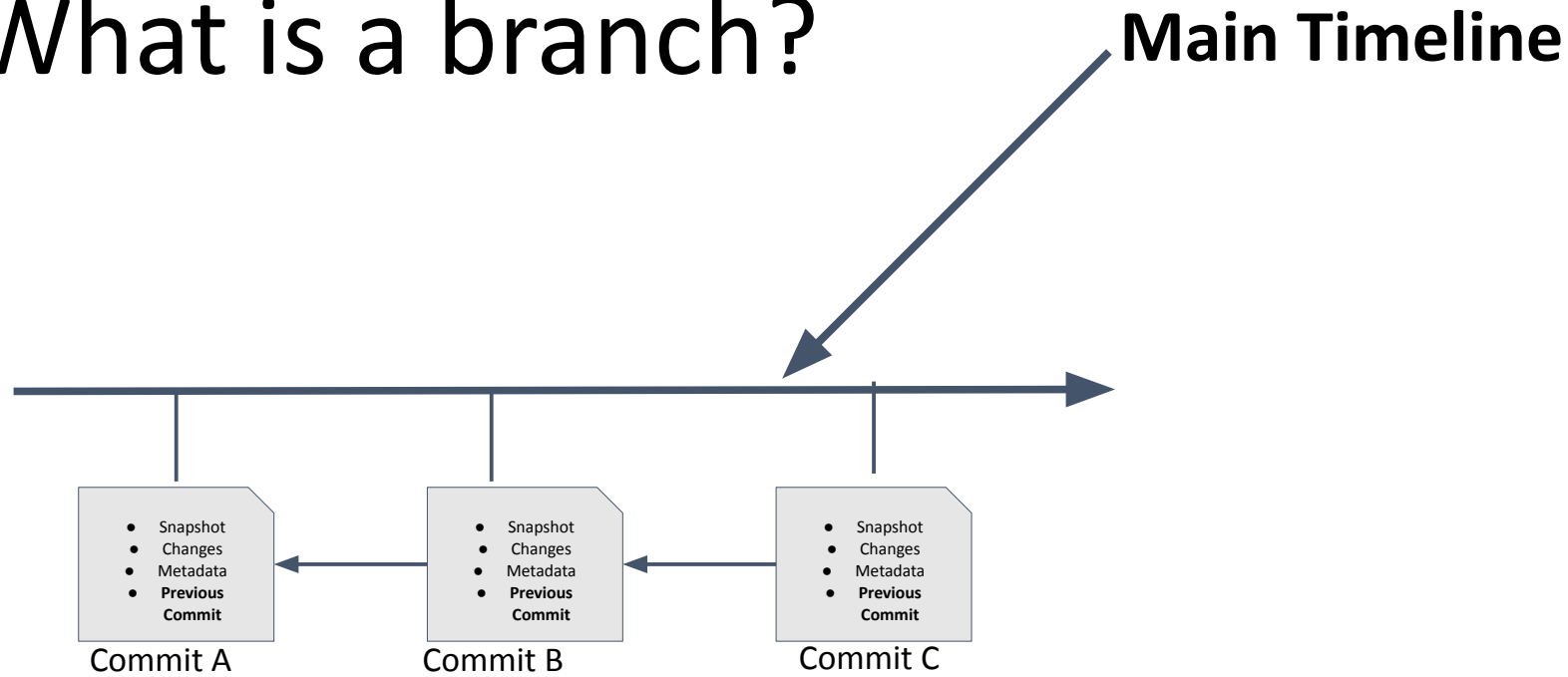


Commit Family Tree



- We can go back (fallback) to any previous commit!

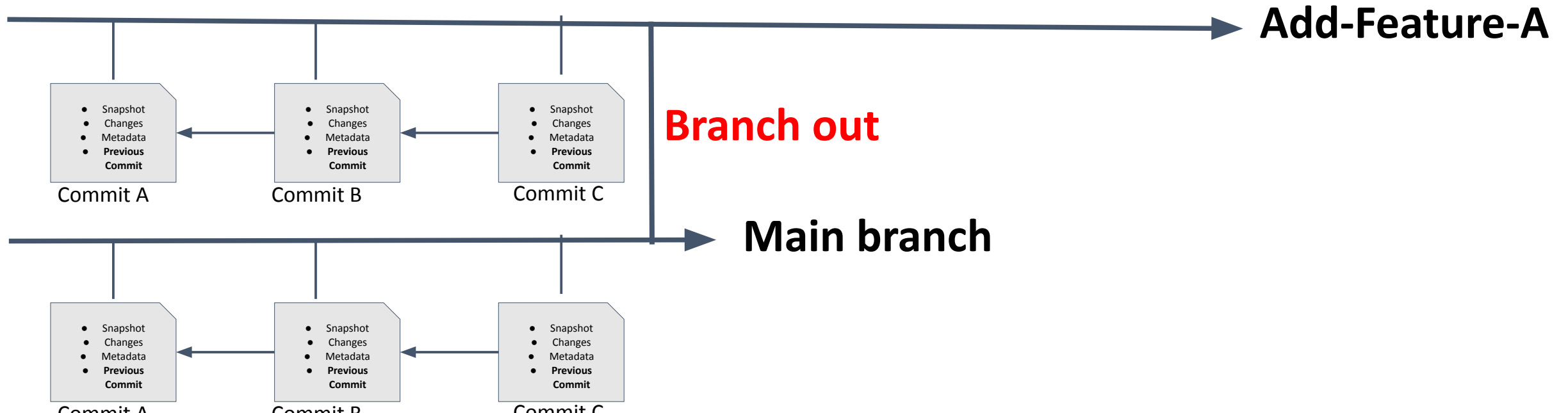
What is a branch?



- It would be useful to create other timelines that ***branch*** out of the main one
- Useful for testing new features / sub-projects without disrupting the rest of the team / organization

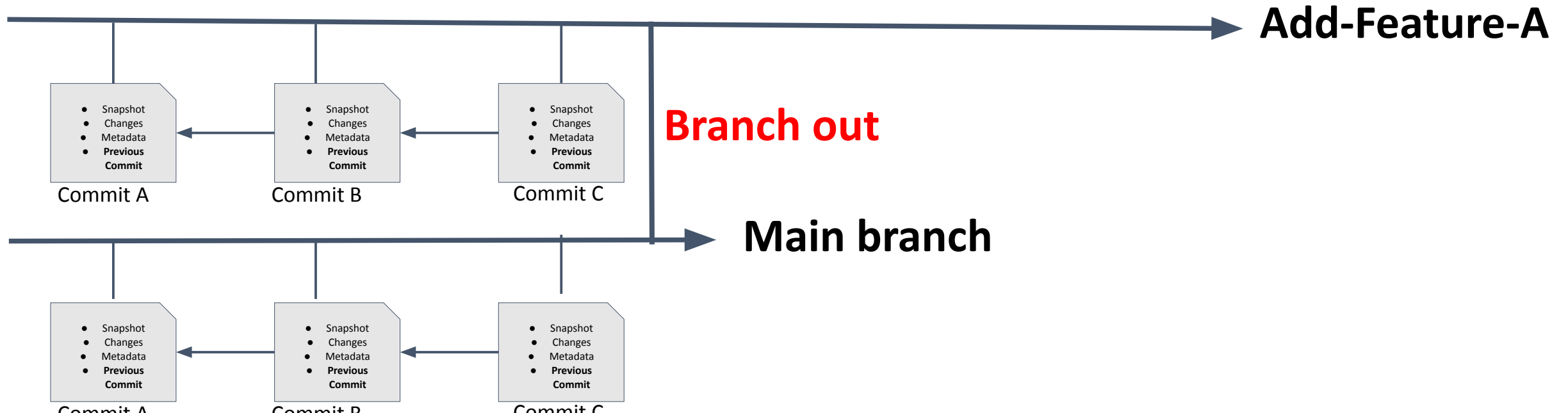
What is a branch?

- Common Scenario: The team decides to add some feature “**Feature A**”
- We create a new branch to add the feature and test it
- The main branch remains unchanged until the feature is tested



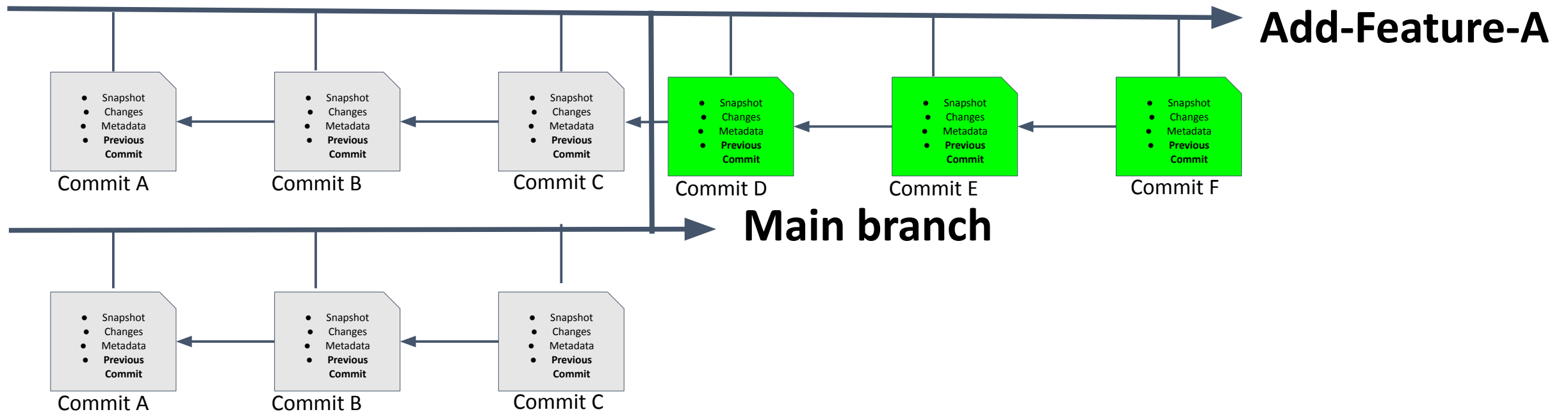
What is a branch?

- Building **Feature A** means adding commit to the “**Add-Feature-A**” branch



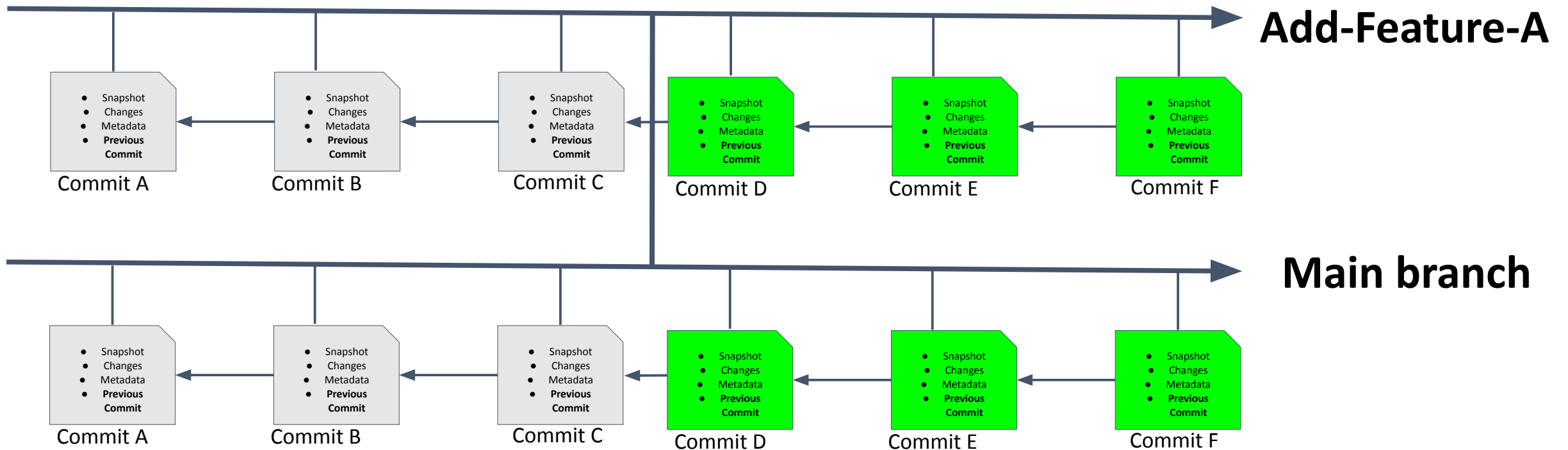
What is a branch?

- Building **Feature A** means adding commit to the “**Add-Feature-A**” branch



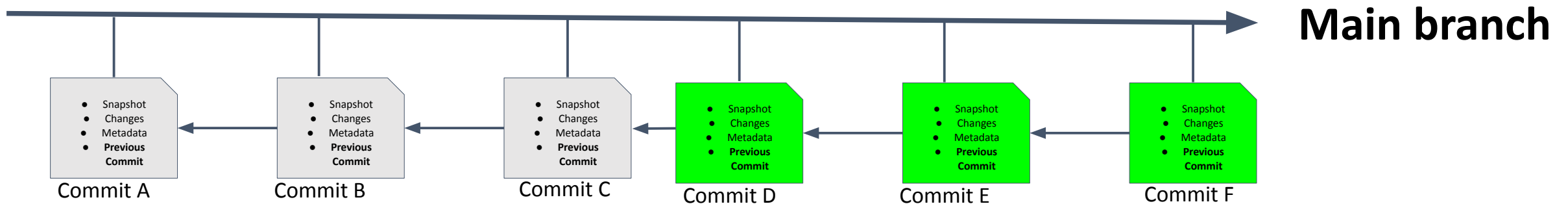
What is a branch?

- Once branch “**Add-Feature-A**” is finalized, it can be *merged* to main



What is a branch?

- Once branch “**Add-Feature-A**” is finalized, it can be *merged* to main
- Branch “**Add-Feature-A**” may then be deleted



Today's Activities

- Work in pairs
- Collaborating on a repo
- Write pull requests
 - Review and Approve your partner's changes
- Resolve Github Actions Failures
 - Translate JavaScript -> TypeScript