

# SE INTRO, VERSION CONTROL

Modularity 

Correctness 

Real-world engineering 

CS-214 W01 SE – 2025-09-10

Clément Pit-Claudiel

# Announcements

## Recursion exercises

Out since Monday

## Lab 1

Out in 1h

... but start with exercises!

(Rooms: All except BC07/08)

## Lab 0

## Welcome poll

Due Friday

## Exam-lab days

Out; exams start next week!

More details soon.

## Extra help sessions??

Mon 13-15... if we can get a room!

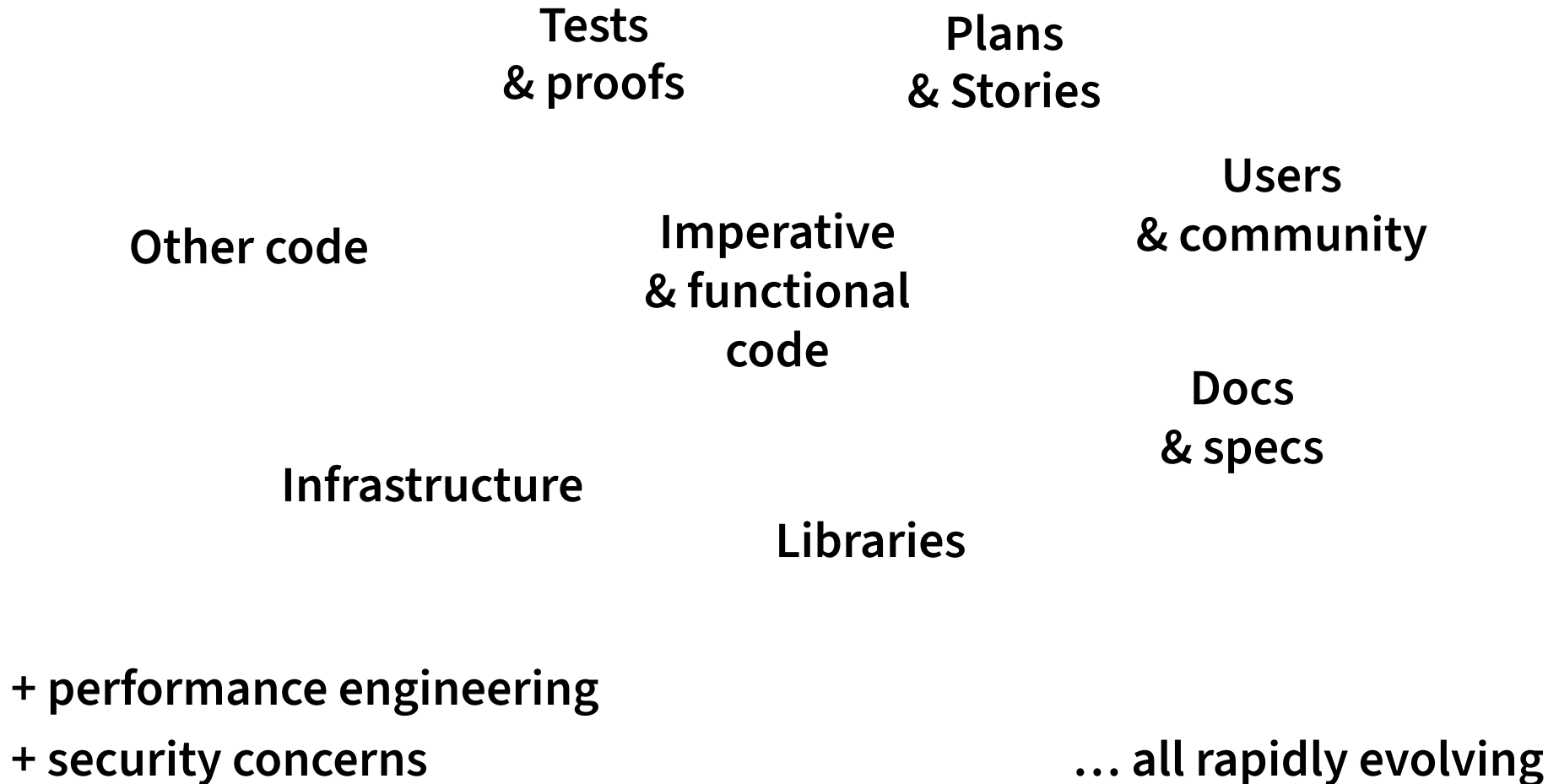
# TRACK 1: FUNCTIONAL PROGRAMMING

A DEEPER UNDERSTANDING OF SOFTWARE CONSTRUCTION

Imperative  
& functional  
code

# TRACK 2: SOFTWARE ENGINEERING

## A BROADER UNDERSTANDING OF SOFTWARE CONSTRUCTION



# WHAT DO GREAT SOFTWARE ENGINEERS AIM FOR?

**I**nsight

**C**uriosity

**E**xperience

**P**recision

**F**lexibility

**L**ife-long Learning

# The plan for CS-214.SE

- Make you (better) software engineers
- Show you how to figure things out

**Versioning and collaboration** 

3 lectures

**Writing correct code** 

4 lectures

**Building apps from scratch** 

3 lectures

+ unguided lab

**Refactoring & code evolution** 

Callbacks

# Today's lecture

- Intro
- A word about SE
- What is a software engineer?
- Git (part 1 of 3)
  - What is a VCS?
  - How do I use Git?
  - A demo

# HOW DO YOU AVOID DATA LOSS?



Think about how you've used these or similar tools to collaborate on code. Did it work? What were the issues?

# PLAIN BACKUPS ARE NOT ENOUGH FOR CODE

- No meaningful changesets
- Too-large or too-small granularity
- Limited history browsing capabilities
- Limited support for asynchronous collaboration

# VCS: LABELED, INCREMENTAL SNAPSHOTS

Version Control Systems (VCSs), or

Source Code Management systems (SCMs) are for:

- Tracking the evolution of text or code ← today
- Versioning, distributed development ← next time

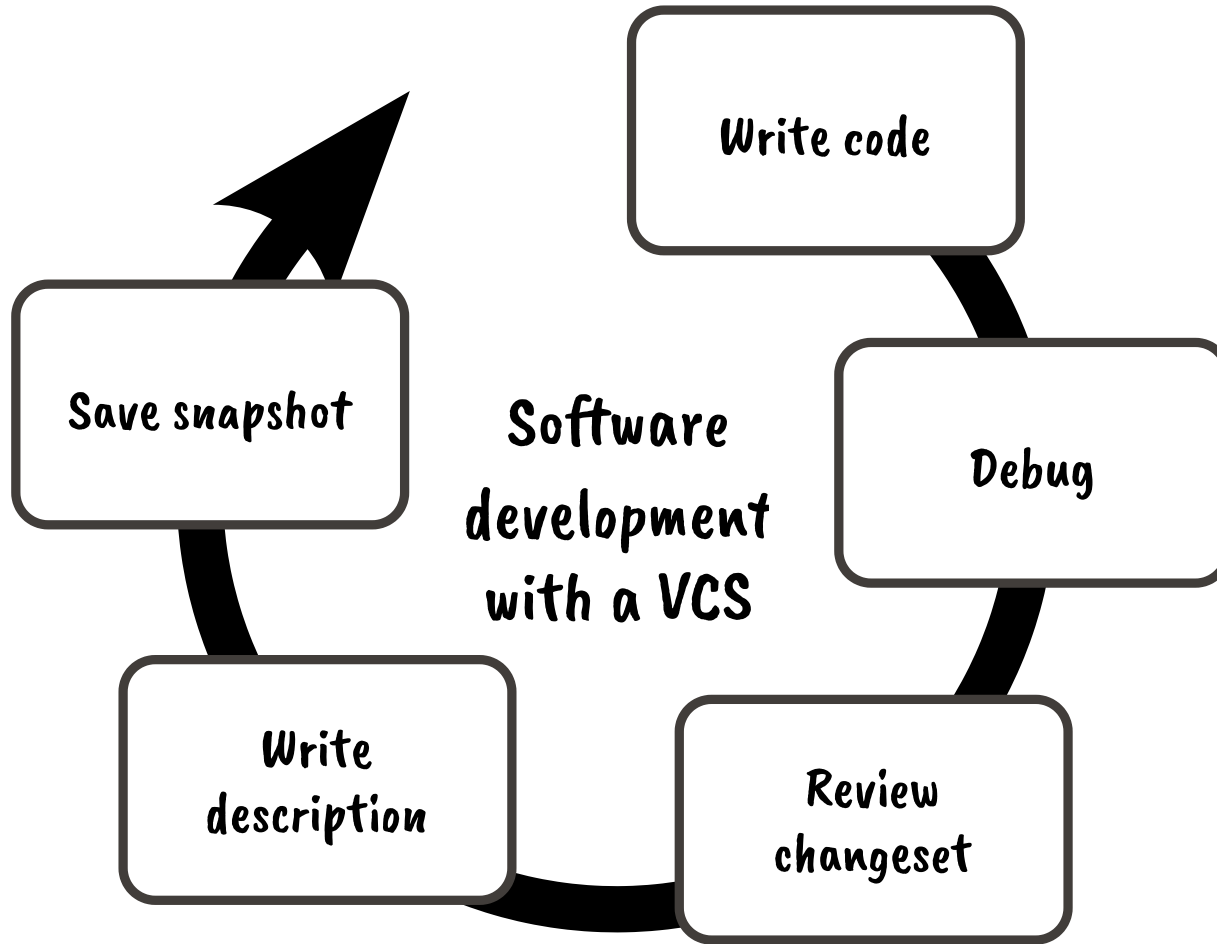
But not directly for:

- Bug tracking, code review, ← next year
- Testing, CI, deployment ← mostly next year

 Git ≠ Github / Gitlab

# SOFTWARE DEVELOPMENT WITH A VCS

RUN END-TO-END TESTS



# THERE ARE MANY VERSION-CONTROL SYSTEMS



git



mercurial

CVS



File Edit View Help

●	readme: Add a Gallery section with links to	Clément Pit-Claudé	2021-03-24 22:04:01
●	readme: Explain how to include custom JS o	Clément Pit-Claudé	2021-03-24 21:40:28
●	recipes: Rebuild output	Clément Pit-Claudé	2021-03-15 20:52:23
●	js: Add support for Cmd/⌘ on Mac	Jade Philipoom <jad	2021-03-15 17:39:33
●	html: Remove mention of panels in HTML head	Clément Pit-Claudé	2021-03-15 20:36:35
●	docutils: Set syntax_highlight and math_out	Clément Pit-Claudé	2021-03-15 20:34:36
●	cli, docutils: Allow additional tags in the	Clément Pit-Claudé	2021-03-15 20:33:20
●	docutils, json: Fix generator banner when t	Clément Pit-Claudé	2021-03-15 20:26:19
●	css: Fix a display priority bug	Clément Pit-Claudé	2021-03-15 20:22:13
●	css: Improve display in standalone and docu	Clément Pit-Claudé	2021-03-15 20:13:51
●	emacs: Add a presentation mode to hide ann	Clément Pit-Claudé	2021-03-15 20:13:19
●	cli: Invoke cogdoc in a temporary directory	Clément Pit-Claudé	2020-12-18 19:21:11
●	cli: Add explicit utf-8 encoding to open()	Clément Pit-Claudé	2020-12-14 21:12:57
●	Merge pull request #13 from palmskoa/write	Clément Pit-Claudé	2020-12-14 21:11:05

SHA1 ID: c7ee51ce16d126f3158bf483dd6c6f5179e804c7 ← → Row 579 / 982

Find ↓ ↑ commit containing: Exact All fields

Search

◆ Diff ◆ Old version ◆ New version Lines of context: 3 ◆ Ignore space change

----- assets/alectryon.js -----

index 09b242f..6a469d0 100644

@@ -74,7 +74,7 @@ var Alectryon;

```

function onkeydown(e) {
    e = e || window.event;
-   if (e.ctrlKey) {
+   if (e.ctrlKey || e.metaKey) {
        if (e.keyCode == keys.ARROW_UP)
            slideshow.previous();
        else if (e.keyCode == keys.ARROW_DOWN)

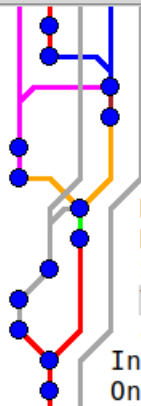
```

◆ Patch ◆ Tree

Comments

alectryon/html.py  
assets/alectryon.js

File Edit View Help



```

Fix slow telemetry module (#193607)
support icons for profiles (#193604)
Merge pull request #193593 from microsoft/tyriar/x
xterm@5.4.0-beta.27
SCM - Add file decorations to history item changes
show notification after downloading successfully (
Merge pull request #193580 from microsoft/joh/profes
Make command center not configurable, avoid confusio
SCM - set of fixes for the SCM Sync View (#193567)
Top padding is wrong on comment view zone (#193569)
accessibility improvements (#193571)
Indicates end of line positions
Only keep one pending comment per location for continu
  
```

Logan Ramos <lramos15@gmail	2023-09-20 21:14:12
Sandeep Somavarapu <sasomava	2023-09-20 20:28:13
Daniel Imms <2193314+Tyriar	2023-09-20 18:32:21
Daniel Imms <2193314+Tyriar	2023-09-20 18:06:58
Ladislau Szomoru <3372902+l	2023-09-20 17:11:15
Sandeep Somavarapu <sasomava	2023-09-20 17:02:36
Johannes Rieken <johannes.r	2023-09-20 16:45:26
Johannes <johannes.rieken@g	2023-09-20 16:15:44
Ladislau Szomoru <3372902+l	2023-09-20 14:57:14
Alex Ross <alros@microsoft.	2023-09-20 14:47:40
Sandeep Somavarapu <sasomava	2023-09-20 14:40:51
Henning Dieterichs <hdieter	2023-09-20 12:00:29
Alex Ross <alros@microsoft.	2023-09-20 10:56:37

SHA1 ID: 5528f93f38672ab788c5ce78251926dce3a59a94 ← → Row 266 / 114079

Find ↓ ↑ commit containing: Exact All fields

Search

◆ Diff ◆ Old version ◆ New version Lines of context: 4 Ignore space

```

Top padding is wrong on comment view zone (#193569)

Fixes #193140

Co-authored-by: Martin Aeschlimann <martinae@microsoft.com>
  
```

```

----- src/vs/workbench/contrib/comments/browser/commentThreadWidget.ts -----
index aff152a1a9c..0b4723b0c50 100644
  
```

```

@@ -199,9 +199,9 @@ export class CommentThreadWidget<T extends IRange | ICellRa
    }

    display(lineHeight: number) {
-       const headHeight = Math.ceil(lineHeight * 1.2);
+       const headHeight = Math.max(23, Math.ceil(lineHeight * 1.2));
        this._header.updateHeight(headHeight);

        this._body.display();
  
```

◆ Patch ◆ Tree

Comments

```

src/vs/workbench/contrib/com
ments/browser/commentThreadW
idget.ts
  
```

DEMO

# Tracking your own code

Set up and use a Git repository to  
keep track of your own projects

```
git help
git config
mkdir
sbt new scala/scala3.g8
git init
git status
git add
git restore
git commit -m
git log
git show
.gitignore
git commit -amend
git tag -m "" v
```

DEMO

# Exploring history

Browse logs to understand  
the history of a software  
project or a piece of code

```
git clone  
git format-patch  
git shortlog -since  
git blame - with a UI!  
git log -L - with a UI!
```

Consult the [command-line transcript](#)  
for the live-coding part of the lecture!