OXO Continues

COMSM0086

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Before We Begin

We are almost halfway through the teaching block
Useful to get your feedback on how things are going

Could you please visit the "Blue" website:
https://evaluation.bristol.ac.uk/home/

And complete the questionnaire for this unit

Simon's Monitoring Link:

Extra OXO Features

This week we will continue with the OXO exercise

We will add in some error handling mechanisms

Also add extensions to make game more interesting

Introduce a new process for our development work

Let's look at each of these in turn...

Error Handling

It's likely users will make mistakes during gameplay
Entering 'invalid' cell identifiers into the GUI:

- Invalid Identifier Length: Command is not 2 chars
- Invalid Identifier Character: Row character is not a letter or column character not a numerical digit
- Outside Range: Valid characters, but identifier values are out of range (i.e. too big or too small)
- Already Taken: Cell has previously been claimed

In Java we handle run-time errors using 'Exceptions'

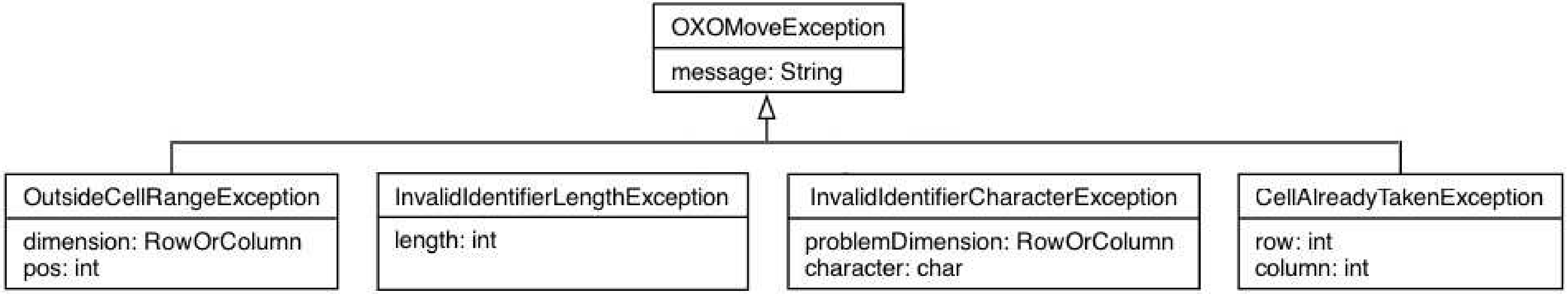
Exceptions Hierarchy

We've provided you with a hierarchy of exceptions

NOTE: Updated class diagram from workbook !

Commonalities are factored out into the superclass

See workbook for examples of how to use these


OXOMoveException
message: String
OutsideCellRangeException
dimension: RowOrColumn
pos: int
InvalidIdentifierLengthException
length: int
InvalidIdentifierCharacterException
problemDimension: RowOrColumn
character: char
CellAlreadyTakenException
row: int
column: int

Adjustable Win Threshold

Win Threshold is the number of cells required to win
More interesting if we can alter this threshold !

OXOGame allows users to set the win threshold
Altered by pressing the `+` and `-` keys
(actually the `=` and `-` keys for convenience)

Controller is then notified through two methods:

```
increaseWinThreshold()   decreaseWinThreshold()
```

You should update threshold in the model state
Then use this value when performing win detection

Greater Number of Players

Traditional number of players in an OXO game is 2
Additional players makes game more interesting !

Add features to support any number of players
(data structures, turn taking, win detection etc.)

Number of players can't be changed using GUI
This can only be done programatically
(A good opportunity for automated testing !)

Source Code Management

Focus of unit is on broader 'Software Development'
As part of this, we CARE about source management

In OTHER units you learn the THEORY of using Git
In THIS unit you get the chance to use it for REAL

Source management is part of assessed exercises !
It would be a good idea to start practicing this now
(get used to the process before it really counts !)

DON'T PANIC

Git is a complex beast...
...but there is no need to use all of it !

`clone / add / commit / push / pull`

Is all you are really going to need

Creating Repositories

I find the easiest way to create a repo

Is to do it via the GitHub website...

Click on the green 'new' button

Name the repo JAVA-CW-2023

Make it private

Add a README file

Then get a local copy using:

```
git clone <url>
```

Adding Projects Resources

The next step is to drag in the maven project
Each project should be kept inside it's own folder
Add the whole folder so that it is tracked by git:

```
git add cw-oxo
```

Make sure you also ADD any new files you create !

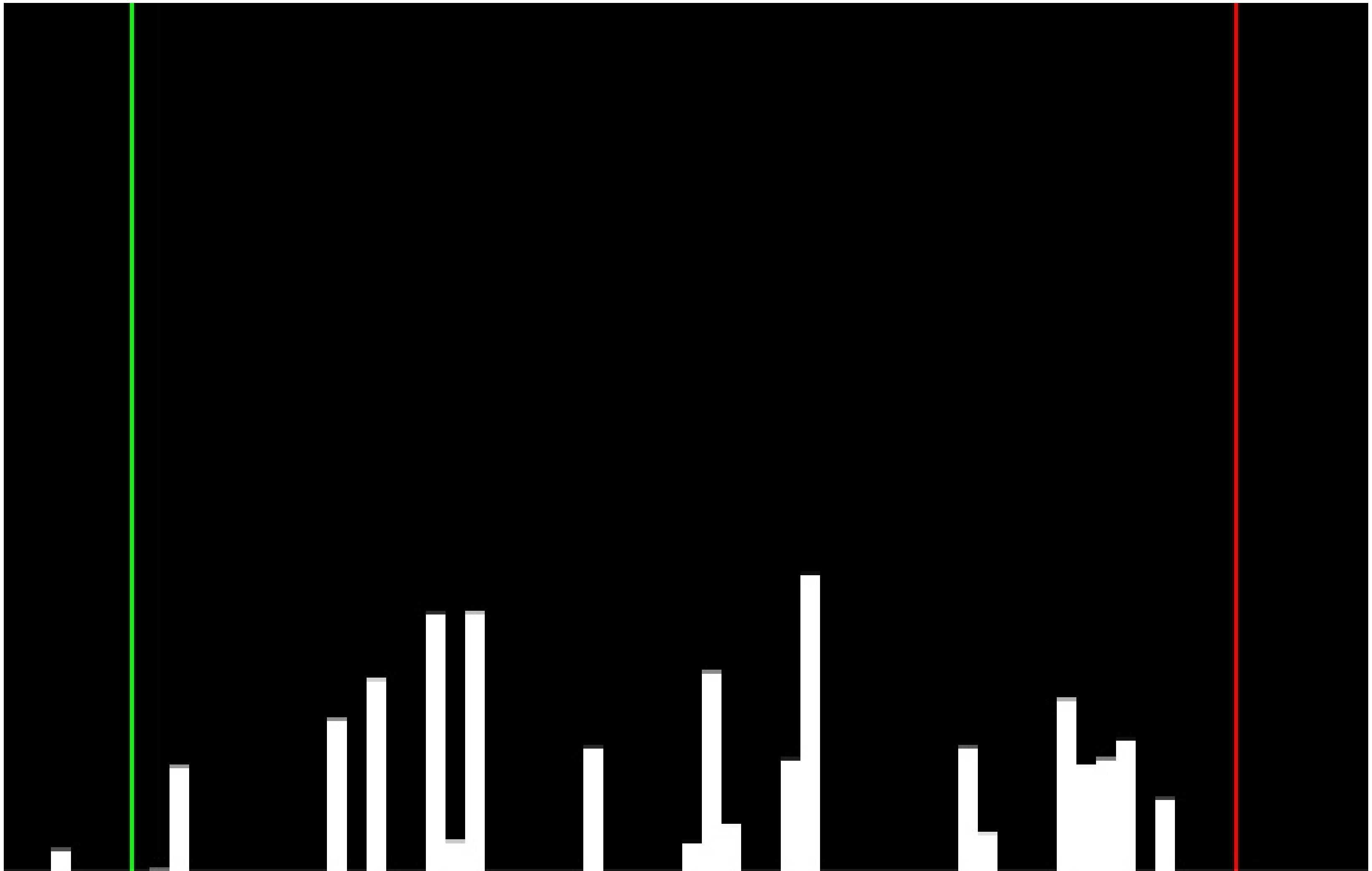
It is important that you only track "suitable" files
(more guidance is provided later in this session)

Committing and Pushing

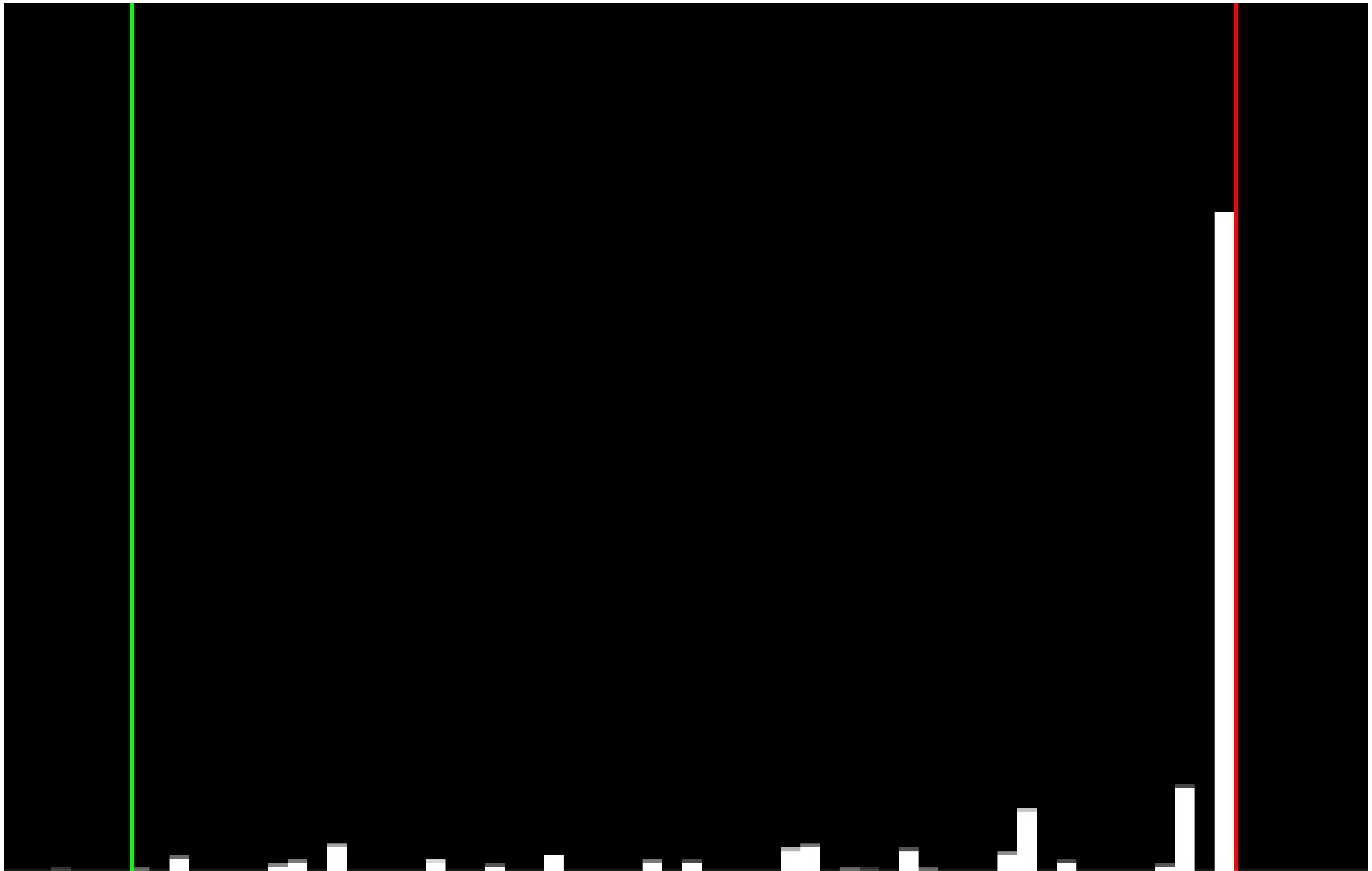
You should COMMIT on regular basis
(every time you feel a sense of achievement)
e.g. when you fix a bug or implement a feature
Makes it easier to write short & simple comments !

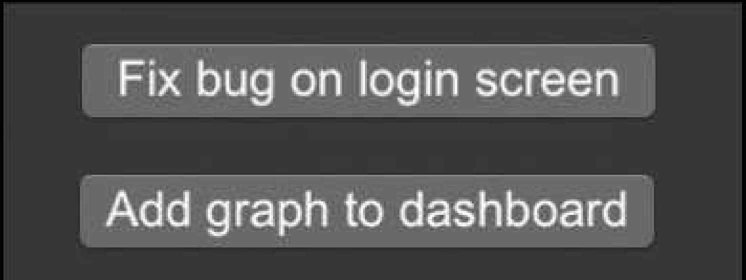
Be sure you PUSH your code to GitHub regularly
Once per day should be a bare minimum
At the end of each coding "session" is sensible
"Before you eat or sleep" is a good principle !

What your commit history should look like



What you should definitely avoid




Fix bug on login screen
Add graph to dashboard

Demonstration

Use a GUI client if you want, but...
It is often simpler to just use the command line

Terminal
ShowRepoFolder

```
nano app.js
git commit -am "Update goodbye message"
git push
nano some-new-file.java
git commit -am "Try a test"
git add some-new-file.java
```

https://github.com/drslock/test/tree/master

Be careful what you push to GitHub

Keep all your files in the correct places...

Source code goes in "src/main" tests in "src/test"

Don't commit *built* or *generated* files

There is no need: they can be re-generated again !

For example .class files and the .idea folder

Make use of .gitignore files to prevent committing...

.gitignore

```
*.class
.idea
.DS_Store
passwords.txt
```

.gitignore file should be in project root folder

Don't expect to see it - the dot makes it hidden !

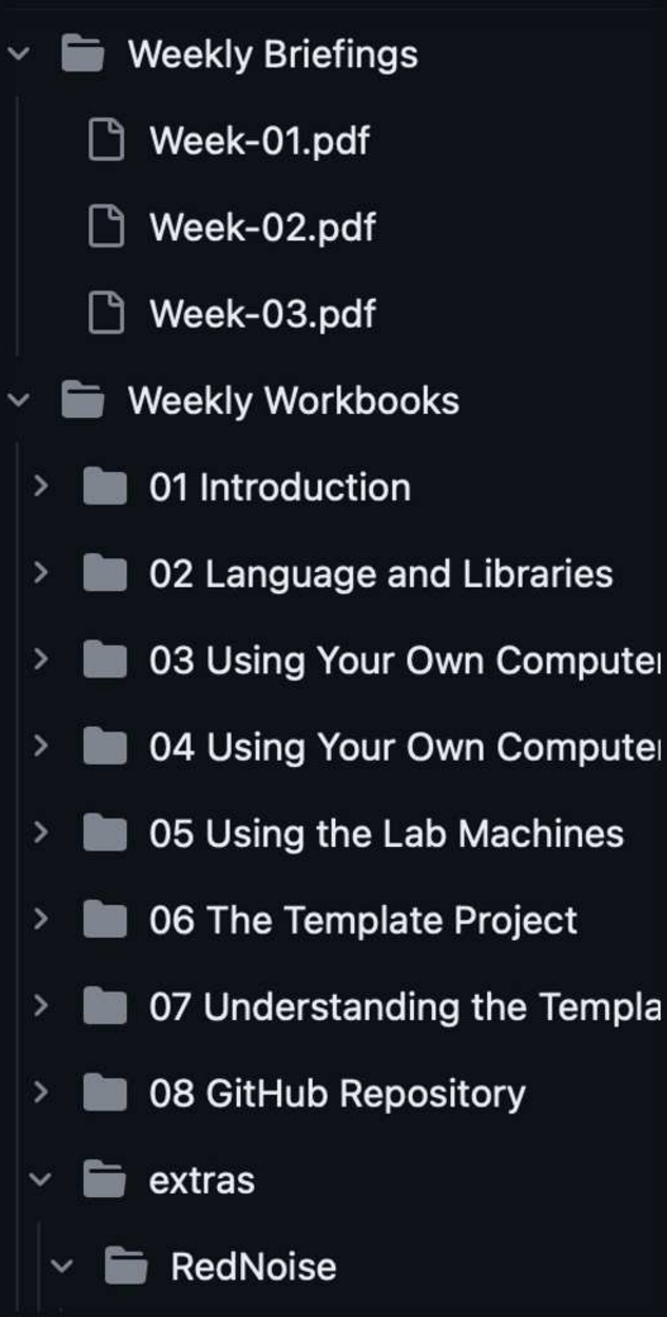
Trust GitHub to do the job

Whole point of GitHub is it maintains a full history
It handles all versioning for you - and does it well !
You don't need hacky ad-hoc version management:

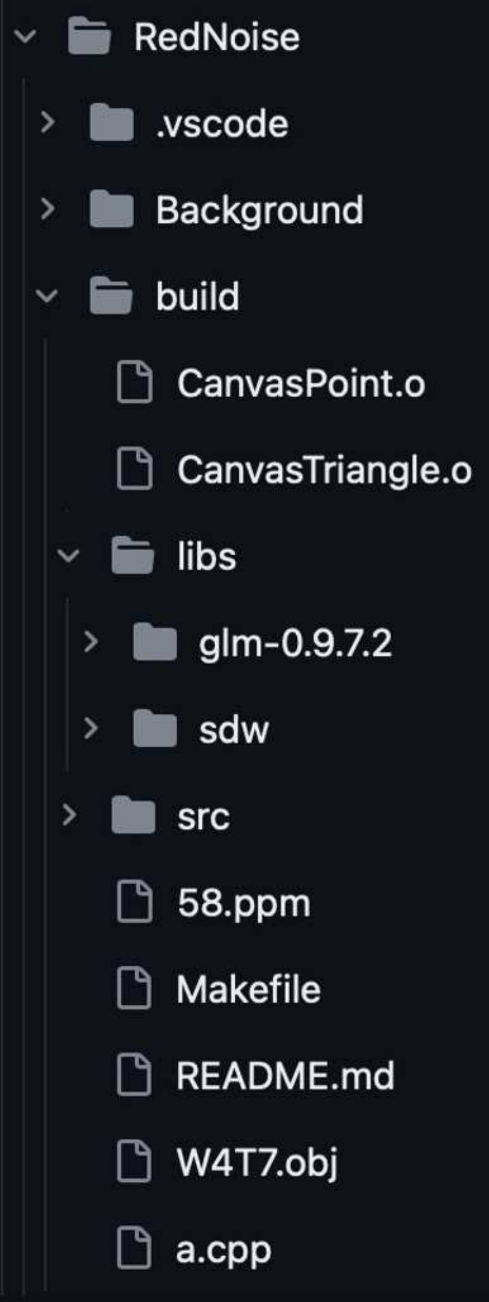
- There should be NO duplicated files in your repo !
- Don't push backups or zip archives to your repo
- Don't create weekly snapshots in your repo structure
- Don't maintain different variants of the same file

Commit history and branches do these all for you !

Things that I have seen...

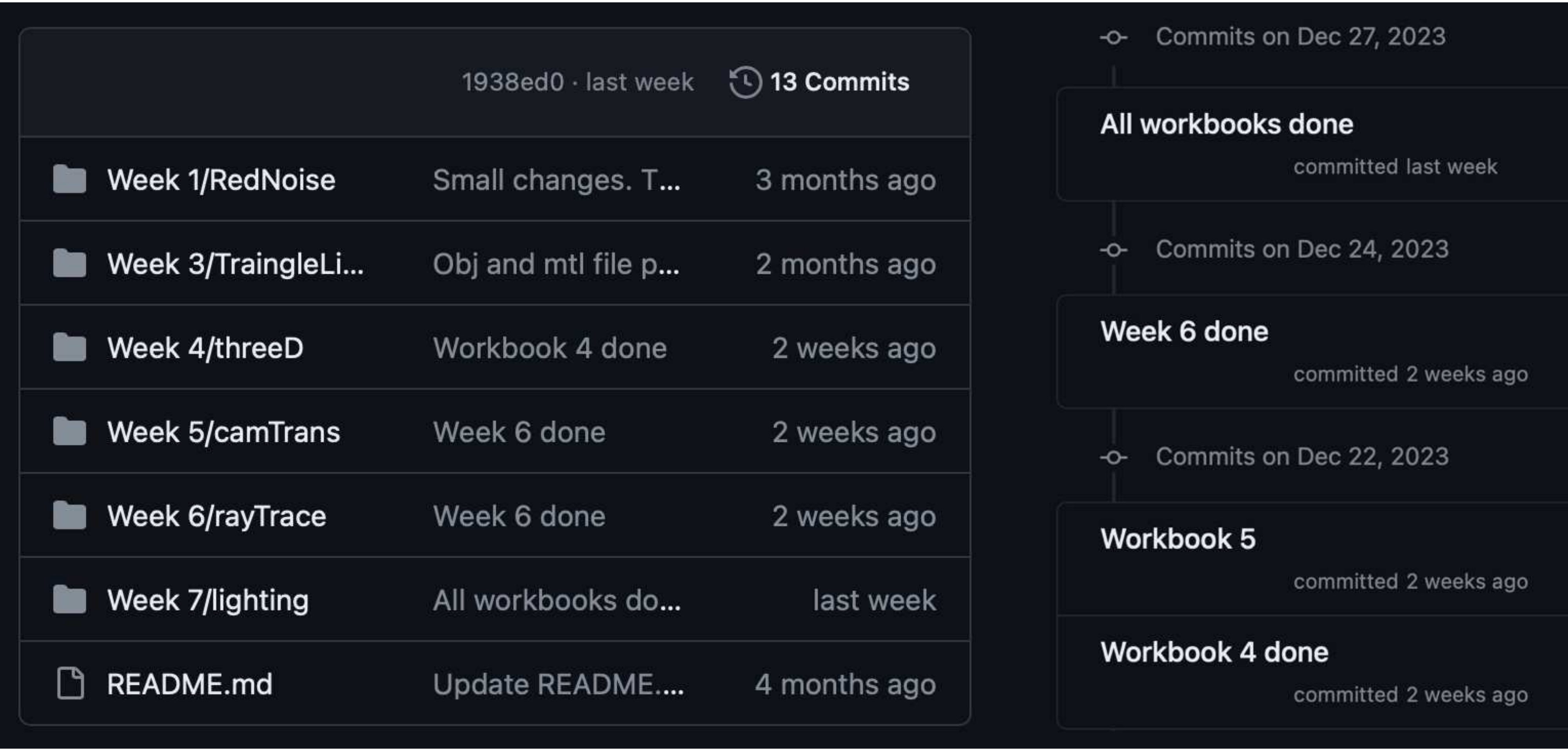


```
⌄ Weekly Briefings
    Week-01.pdf
    Week-02.pdf
    Week-03.pdf
⌄ Weekly Workbooks
  › 01 Introduction
  › 02 Language and Libraries
  › 03 Using Your Own Compute
  › 04 Using Your Own Compute
  › 05 Using the Lab Machines
  › 06 The Template Project
  › 07 Understanding the Templa
  › 08 GitHub Repository
  ⌄ extras
    ⌄ RedNoise
```



```
⌄ RedNoise
  › .vscode
  › Background
  ⌄ build
      CanvasPoint.o
      CanvasTriangle.o
    ⌄ libs
      › glm-0.9.7.2
      › sdw
    › src
      58.ppm
      Makefile
      README.md
      W4T7.obj
      a.cpp
```

This is just one 7 week project



1938ed0 · last week 13 Commits

Week 1/RedNoise	Small changes. T...	3 months ago
Week 3/TraingleLi...	Obj and mtl file p...	2 months ago
Week 4/threeD	Workbook 4 done	2 weeks ago
Week 5/camTrans	Week 6 done	2 weeks ago
Week 6/rayTrace	Week 6 done	2 weeks ago
Week 7/lighting	All workbooks do...	last week
README.md	Update README....	4 months ago

Commits on Dec 27, 2023

All workbooks done
committed last week

Commits on Dec 24, 2023

Week 6 done
committed 2 weeks ago

Commits on Dec 22, 2023

Workbook 5
committed 2 weeks ago

Workbook 4 done
committed 2 weeks ago

Branches

You are welcome to use branches if you wish...
But you don't _have_ to for this particular unit

They are primarily intended for parallel collaboration
But can be useful for individual experimentation
Create branch if you're not sure if the code will work

They shouldn't exist on their own for too long
Merge with master if/when you get features working

Branches are a bit like...

Branch Metaphor

A bit like an operating theatre in a hospital
A place to open up your code & tinker with internals

NOT a place to keep the patient in the long term
You'll want to stitch them up as soon as possible
Then return them to the main ward (master branch)

In collaborative development...
there is another department
waiting to work on the patient

Privacy of Repositories

It's ESSENTIAL you keep your repository private

If you make it public, others will be able to read it

Which is equivalent to publishing it online !

Effectively this would be encouraging plagiarism

Bottom line: Keep your repository private

(we'll ask you to invite us so we can see inside)

During the coursework assignments

You will be assessed on functionality & code quality

But ALSO on the evolution of your repo codebase

A good idea to get practicing now !