



# 浙江大学爱丁堡大学联合学院 ZJU-UoE Institute

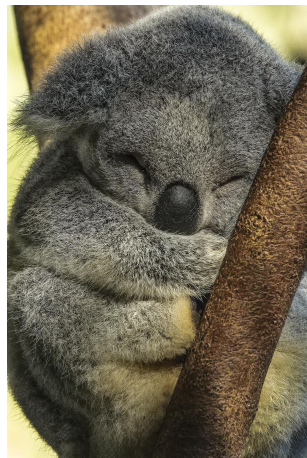
## Introduction to version control

IBI 1, Lecture 4.1

Melanie Stefan - [melanie.stefan@ed.ac.uk](mailto:melanie.stefan@ed.ac.uk)

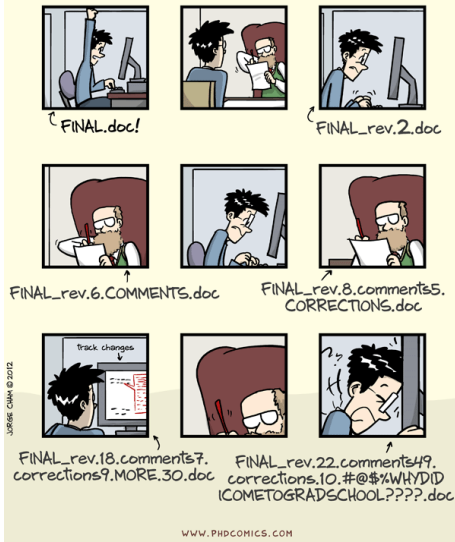
Semester 2, 2019/20

The lecture recording pauses at various points to ask you questions that you should think about. Providing the answers beforehand would defeat that purpose. Therefore, if you look at the slides before listening to the lecture recording, look at this version. A complete version will also be uploaded to Learn. In the meantime, here is a picture of an adorable baby koala.



By Sheba\_Also 43,000 photos [CC BY-SA 2.0 (<https://creativecommons.org/licenses/by-sa/2.0/>)], via Wikimedia Commons

# "FINAL".doc



"Piled Higher and Deeper" by Jorge Cham, [www.phdcomics.com](http://www.phdcomics.com)

# Is there a better way to do this?

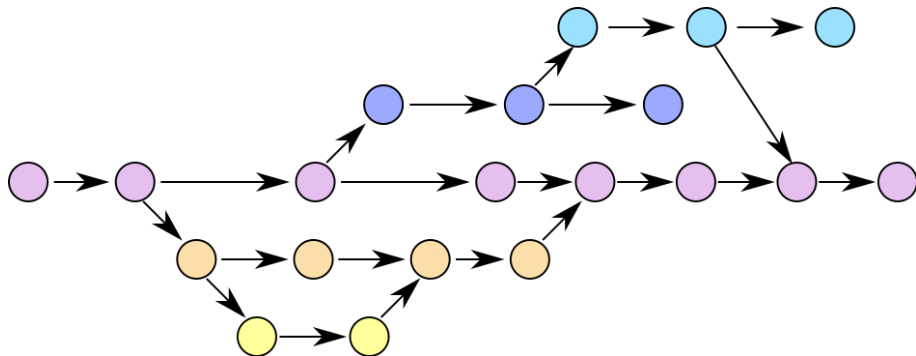
# Is there a better way to do this?

Why yes, there is. And this is what this lecture is about.

# Learning Objective

After this lecture, you should be able to ...

Explain the principles of version control



# Outline

- 1 Idea behind version control
- 2 Basic concepts of version control
- 3 Version control in this course

A *version-control software* keeps track of versions of your project. You only work on one file, but there is a system that keeps track of changes and allows you to *undo changes*, *go back* to previous versions, *keep some changes and discard others*, and *work simultaneously with other people*.



# Idea behind version control

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# Idea behind version control

A *version-control software* keeps track of versions of your project. You only work on one file, but there is a system that keeps track of changes and allows you to *undo changes*, *go back* to previous versions, *keep some changes and discard others*, and *work simultaneously with other people*. Have you seen something similar?

# What should a good version control system provide?

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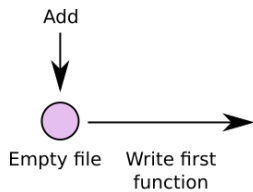


Add



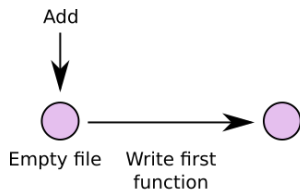
Empty file

# Commit

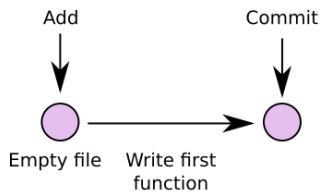




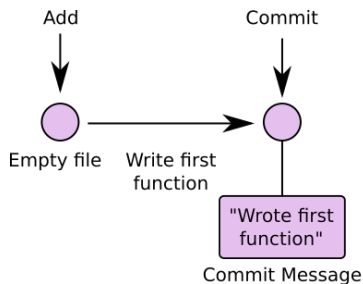
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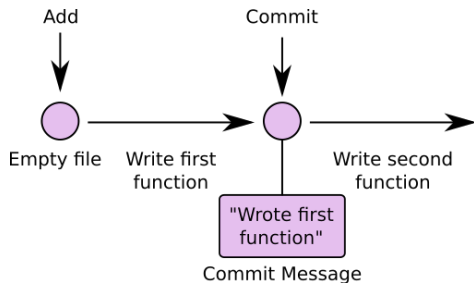
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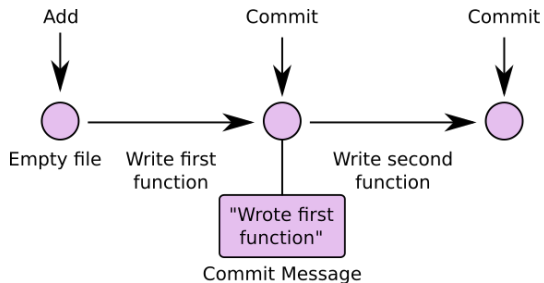
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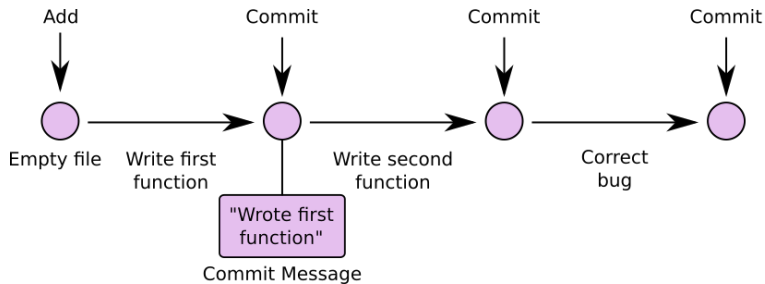
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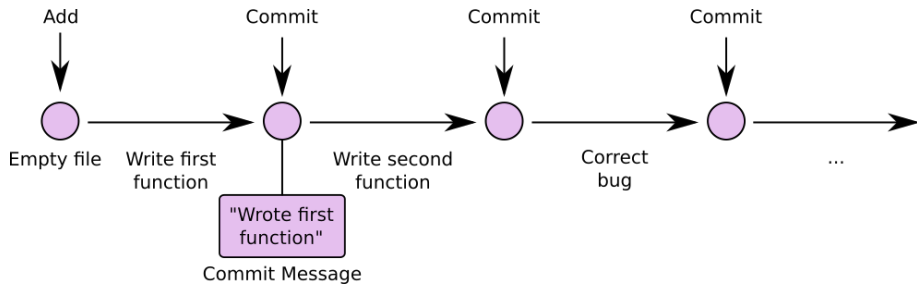
# Commit



# Commit

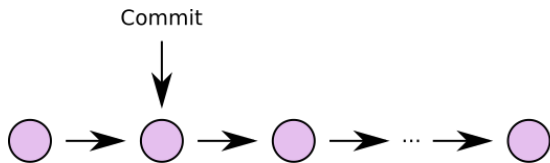


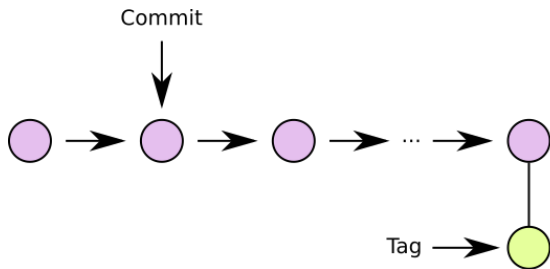
# Commit



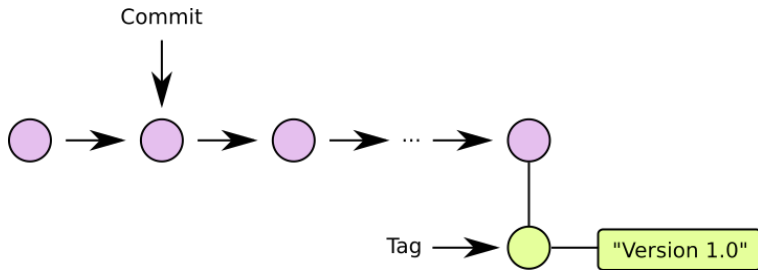




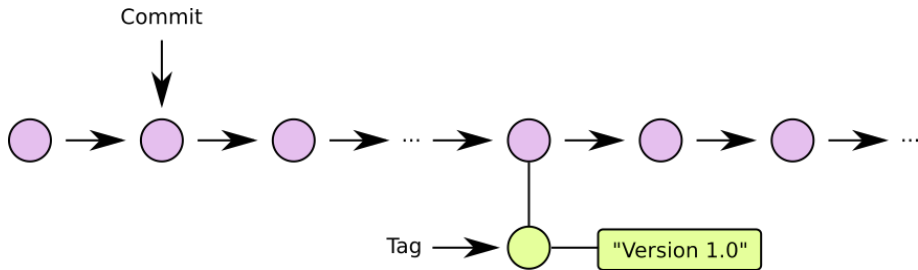


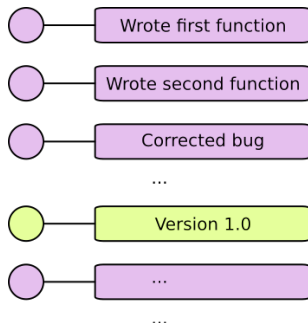


# Tag



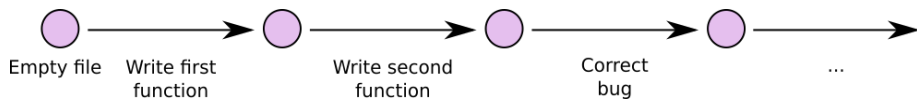
# Tag



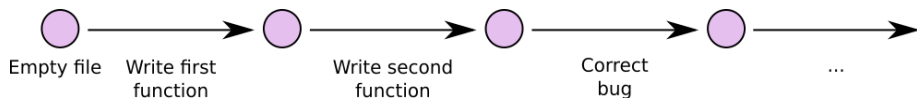


- The log shows the history of the file
- Includes info about previous commits/tags
- Includes commit messages
- Additional info: commit number, author, date

# Revert

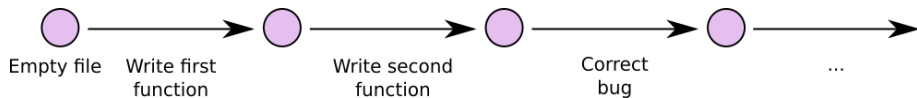


# Revert



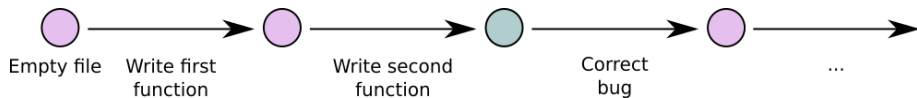
“The second function was fine, but when I thought I fixed the bug, I broke something.”

# Revert

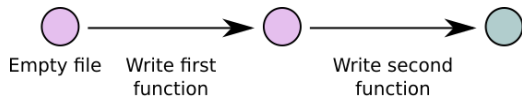




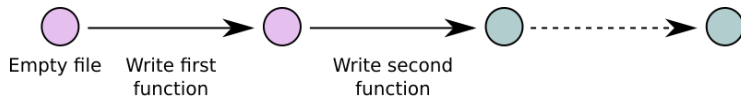
# Revert



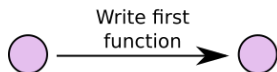
# Revert

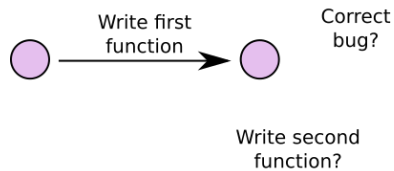


# Revert

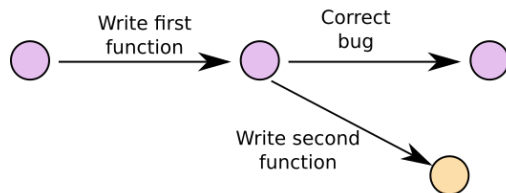




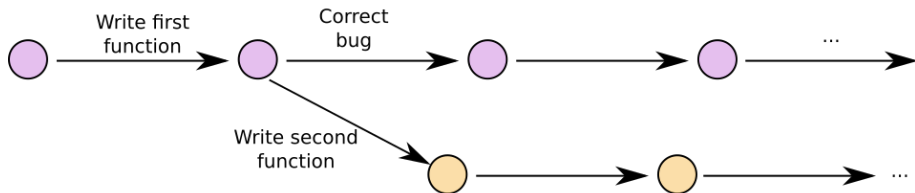




# Branch

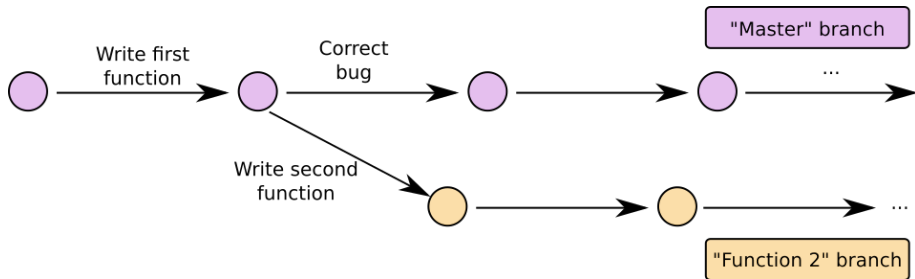


# Branch



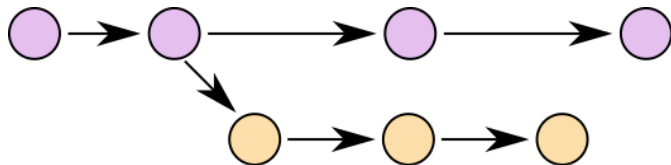


# Branch

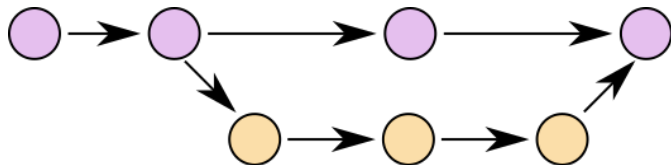


# Merge

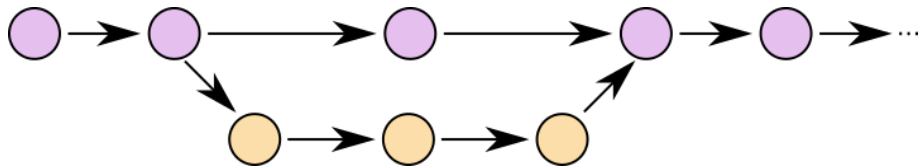
# Merge



# Merge

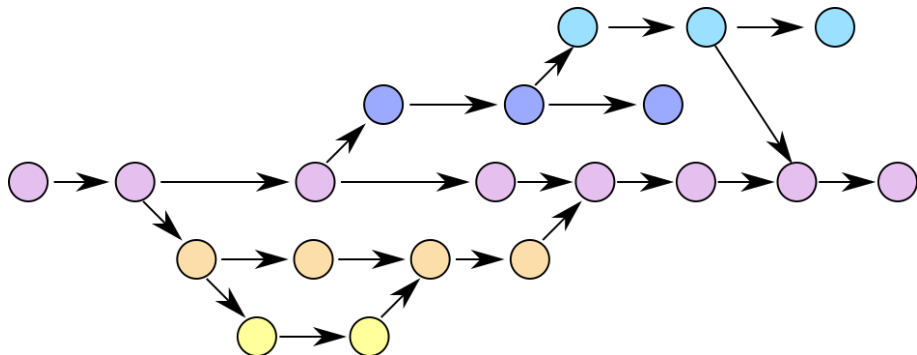


# Merge



# What happened here?

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# Advantages of version control

What are the advantages of using version control systems?



# Advantages of version control

What are the advantages of using version control systems?

- 1 Idea behind version control
- 2 Basic concepts of version control
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# Why do we use version control in this course?

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# How do we use version control in this course?

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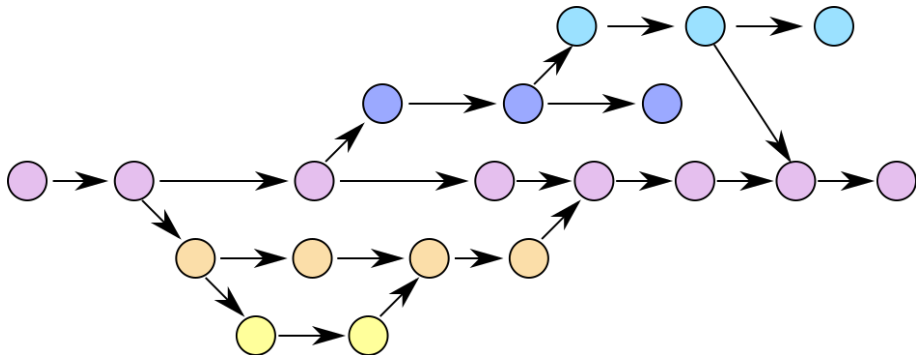
## GitHub repository for practical work

The screenshot shows the GitHub interface for the repository `WenwenHuang-ZJU / IBI1_2019-20`. The browser address bar shows the URL `https://github.com/WenwenHuang-ZJU/IBI1_2019-20`. The repository page includes a navigation bar with links for `Code`, `Issues`, `Pull requests`, `Actions`, `Projects`, `Wiki`, `Security`, and `Insights`. Below the navigation bar, there is a section for repository statistics: `3 commits`, `1 branch`, `0 packages`, `0 releases`, and `1 contributor`. A table of commits is displayed, showing the latest commit `606918f` 10 days ago, which updates `index.md`. The repository also contains a `README.md` file, which is shown in a preview at the bottom of the page. The preview displays the text `IBI1_2019-20`.

# Review

Now, you should be able to ...

## Explain the principles of version control

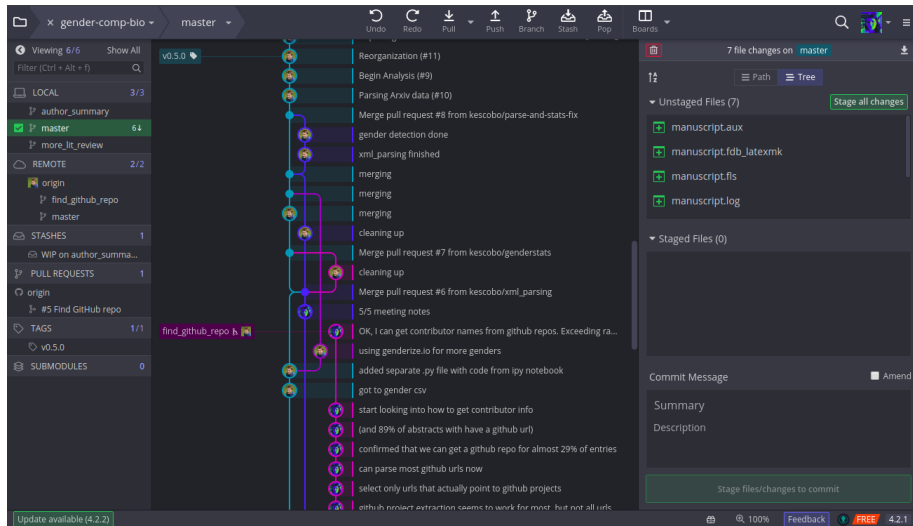


# Next ...



# Next ...

## How to actually do it



- Collaborative work on a text file, with edits from different authors shown in different colours. My own screenshot, 2019. The document is an early draft of Stefan *et al.*, PLoS Comput Biol, 2015.
- Diagrams of version control processes. My own work, CC BY-SA 4.0, 2019.
- "Final".doc (2012). From "Piled Higher and Deeper" by Jorge Cham. [www.phdcomics.com](http://www.phdcomics.com) With permission.
- Screenshot from a project with the Gitkraken software, 2019.
- Screenshot of IBI1 GitHub repository, 2020.
- Two students collaborating on their computers. By Yuuki Guzman and Agoston Tyll (Okinawa Institute of Science and Technology), 2015.