UNIVERSITY of WASHINGTON

Data Science UW Methods for Data Analysis

Git and Github
Extra Topics
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1. git commit

2. git push

3. git out

What is Git and why do we need it?

- Git is system that allows you and others to:
  - Simultaneously work on the same project.
  - Version control.
  - Backup all history of changes.
  - Share code.
  - Create different branches of your code: Main Branch, feature branches, development branch, research branch, …
- Scenarios that are useful:
  - If your computer died overnight, how soon could you get back to work?
  - If a malicious employee changes code or a bug is introduced, git can restore to prior points.
  - If a colleague wants to use your code, share your code, or do code review, git easily allows them do to that.

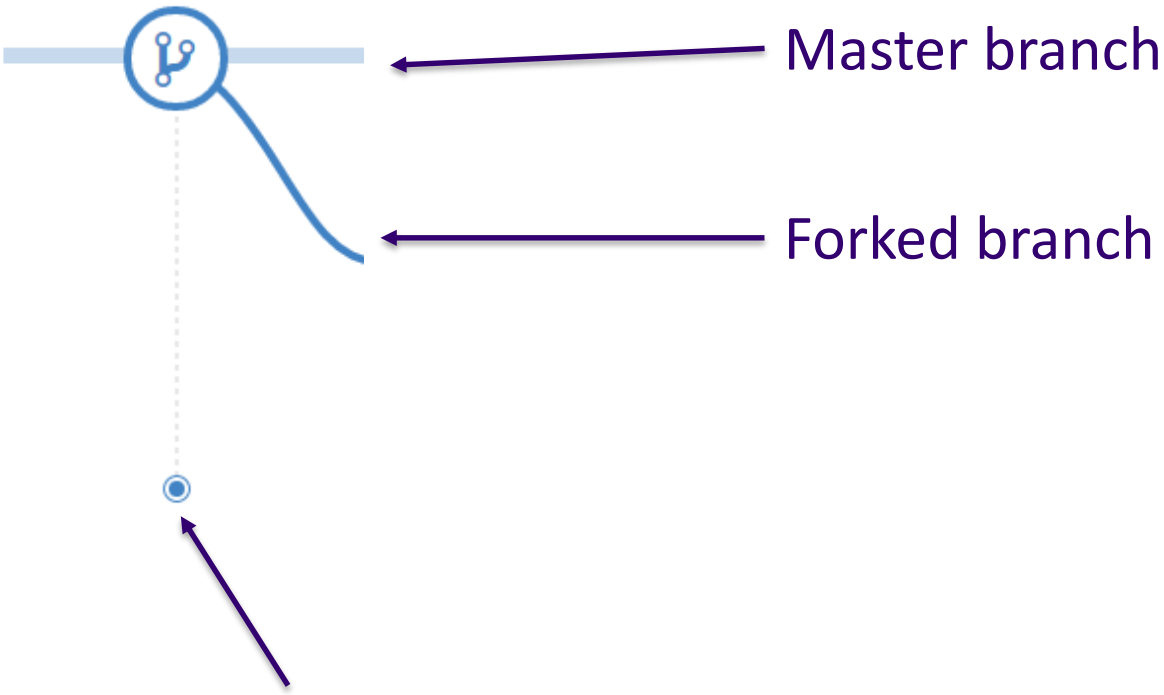
Git vs Github

- Git is a system for version control. You can have this system implemented privately, locally, or across networks.
- Github is a free online implementation of git.
  - This provides not only version control, but an online backup of code.

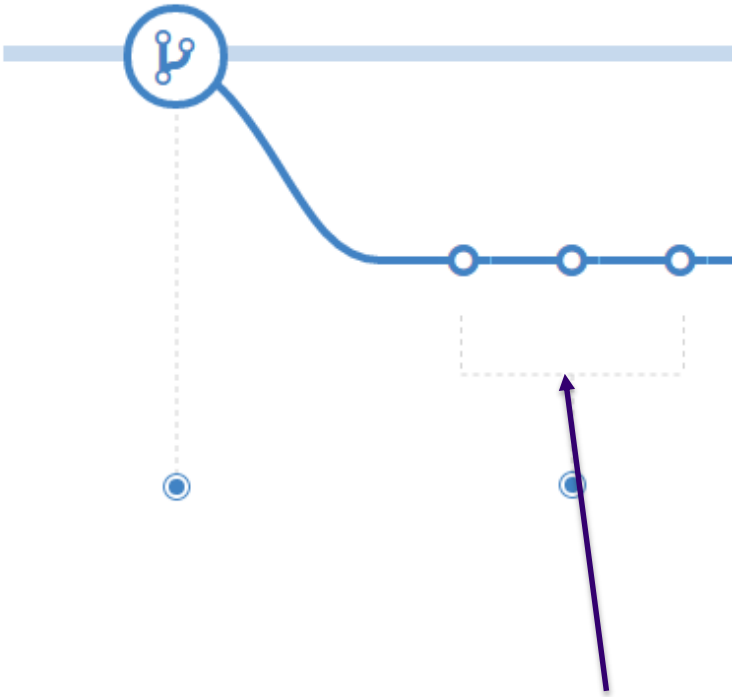
Github Terms

- Creating a Repo: Creating a new repository for work.
- Master branch: This is the final version that everyone will see and use in your repository.
- Creating a branch: Create a branch to try out new ideas without breaking the Master branch on your repo or other repos.
- Pull Request: Request that your branch be reviewed and pulled back (or merged) into the Master branch.
- Adding Commits: Keep track of your progress through commit points.
- Forking a Repo: Creates a copy for you to work on
- Cloning: Downloading a copy of a repo

Github Work Flow

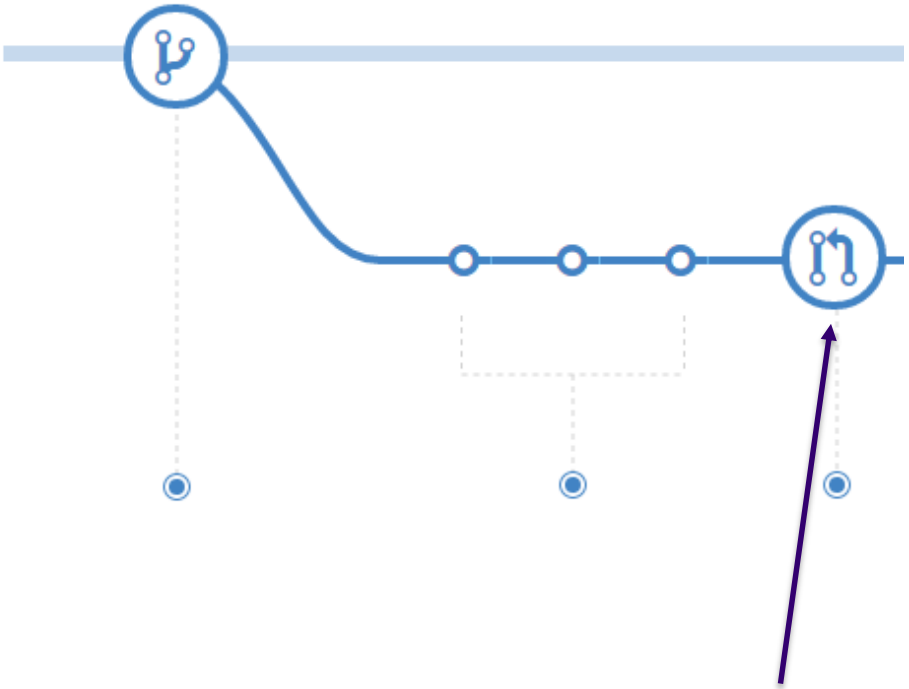


Github Work Flow



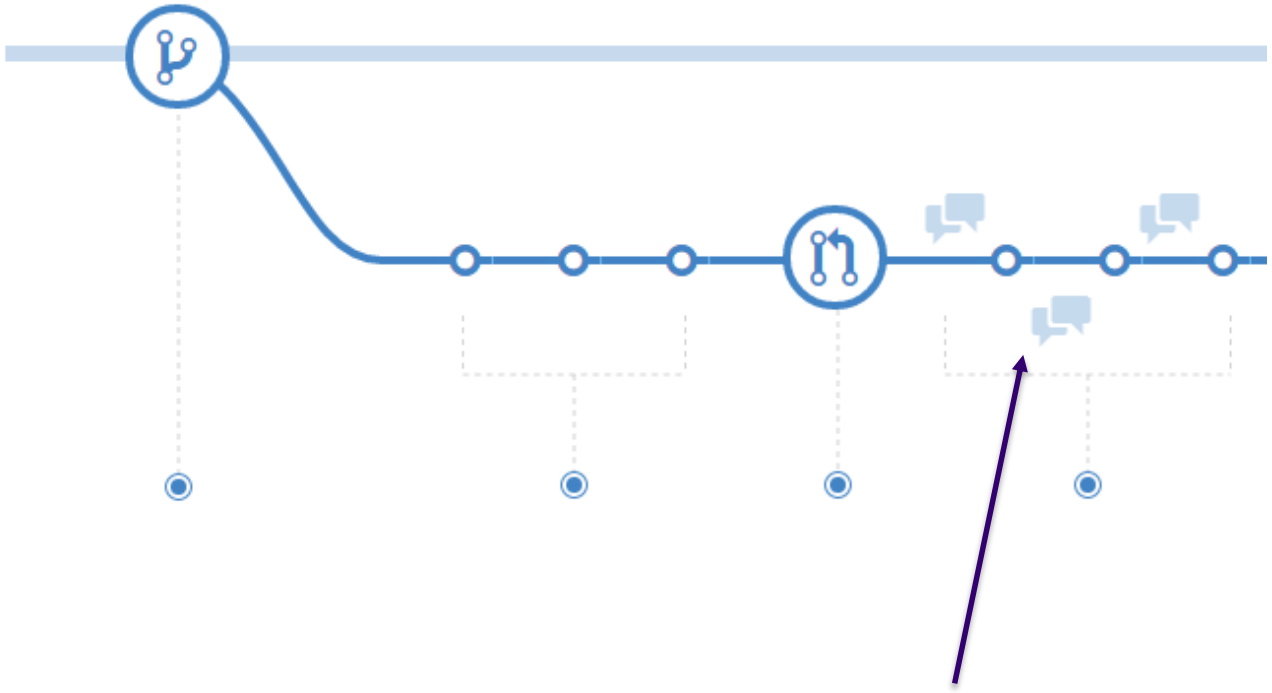
Add commits (changes)

Github Work Flow



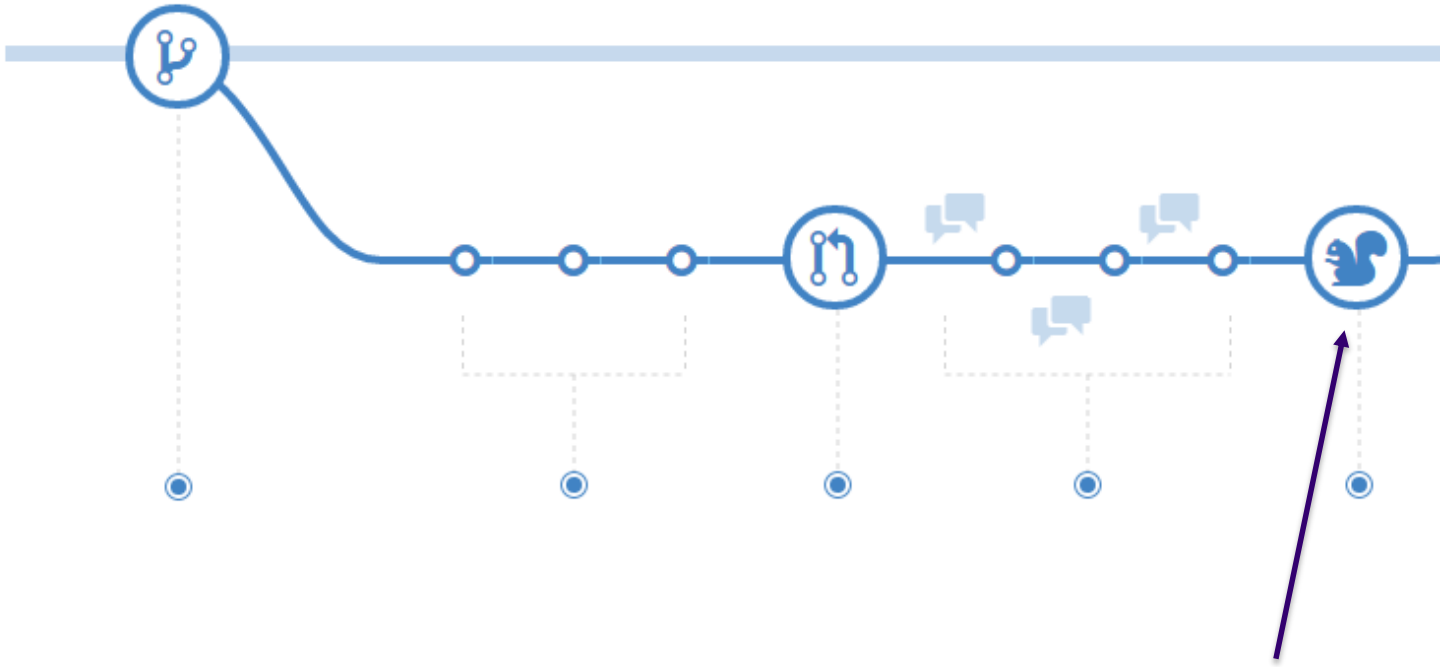
Submit (Open) a pull request

Github Work Flow



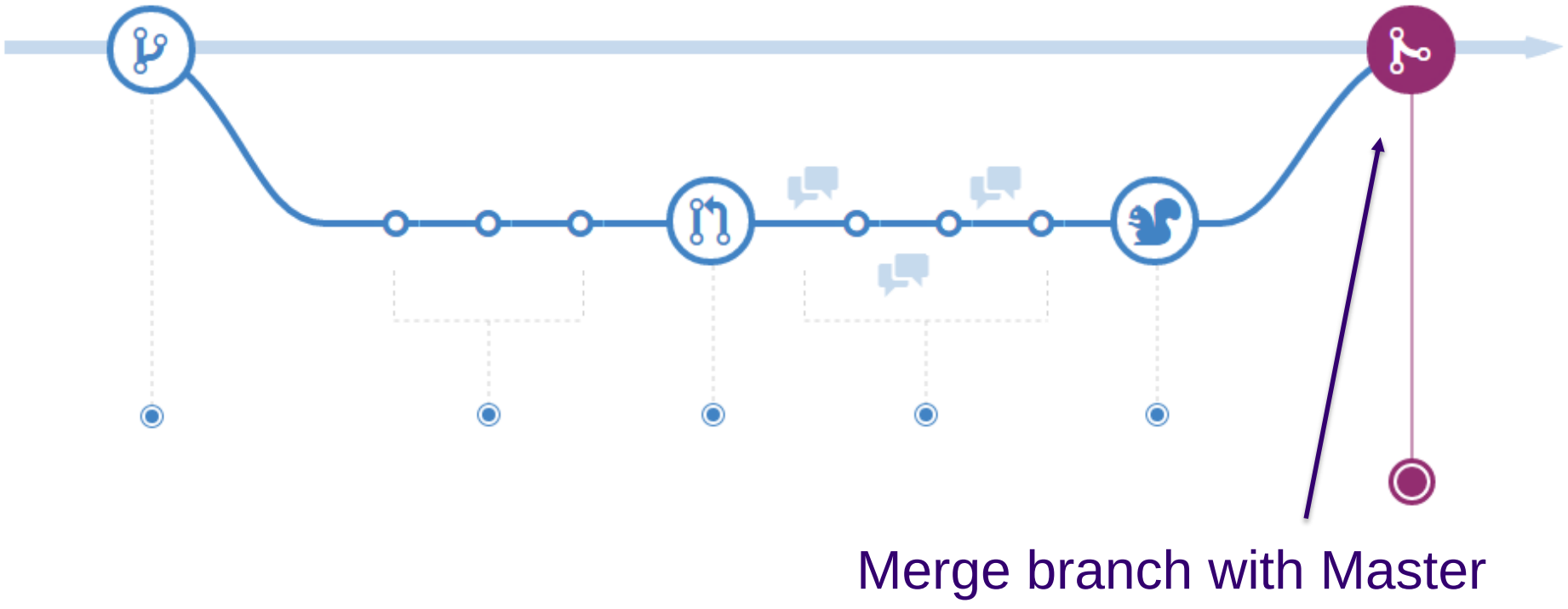
Discuss and review code changes (Diff)

Github Work Flow



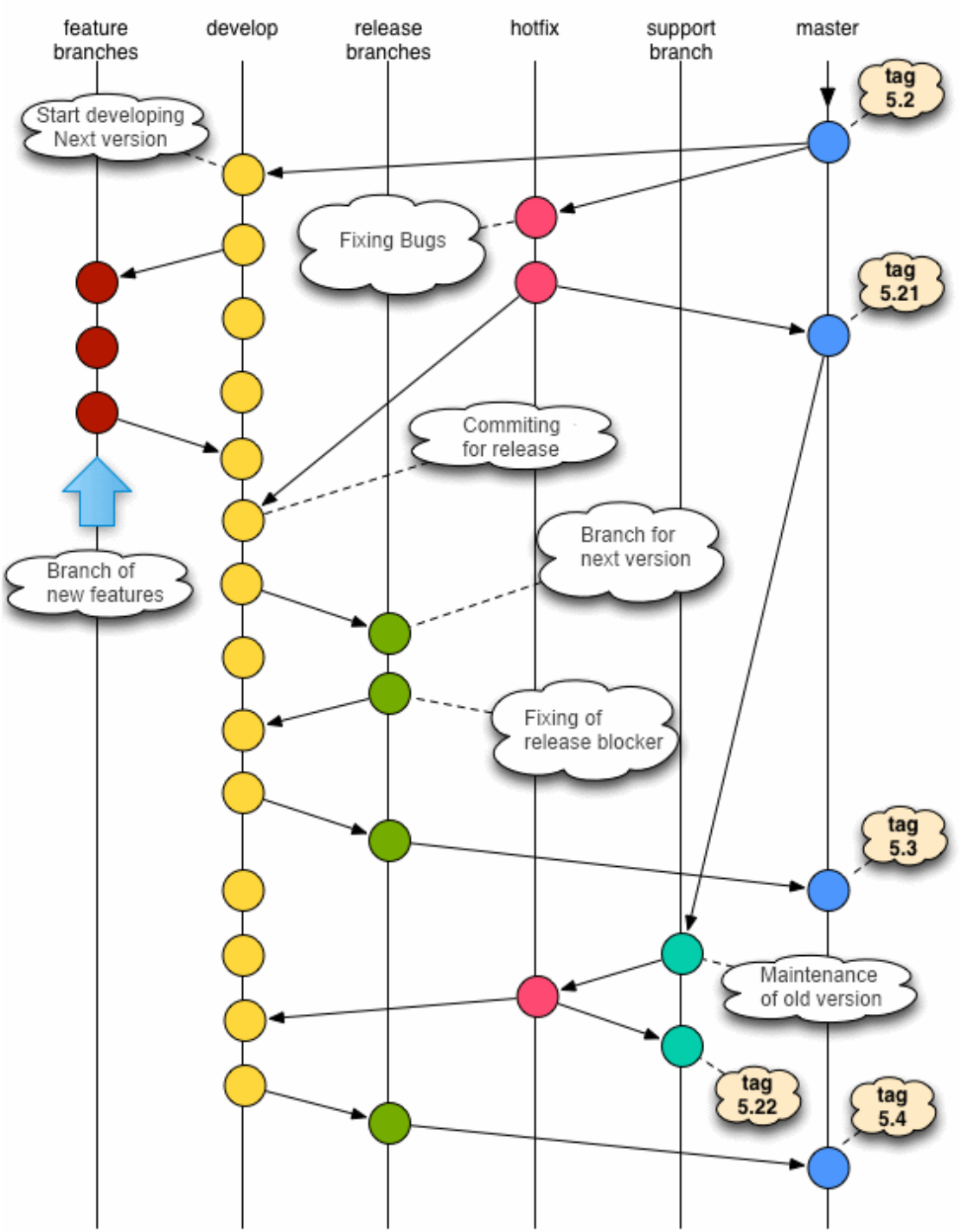
Check unit tests

Github Work Flow



Merge branch with Master

Workflows can get complicated:



Getting Started with Github

- Github makes it nice to start and create Repositories via a user interface.
  - https://desktop.github.com/
- Linux (and Mac) come with git preinstalled.
- When using git on the command line/locally, you must add the github repo as an ‘origin’: (one time command)

```
git remote add origin https://github.com/username/repo.git
```

- Then if we make changes remotely, to sync online:

```
git add .
git commit –m “Updated Lecture 1”
git push origin master
```

Ignoring some Local Files

- Sometimes we don't want to sync some local files or folders:
  - *.Rdata, *.Rhistory, *.pptx, *.ppt, solutions/*,…
- We add these entries to a '.gitignore' file in our git folder locally. Git will then ignore such files.