# Git and GitHub training for Beginners

OUCRU Stat & Modelling teams

Slides inspired by Meghan Nelson intro to git and GitHub

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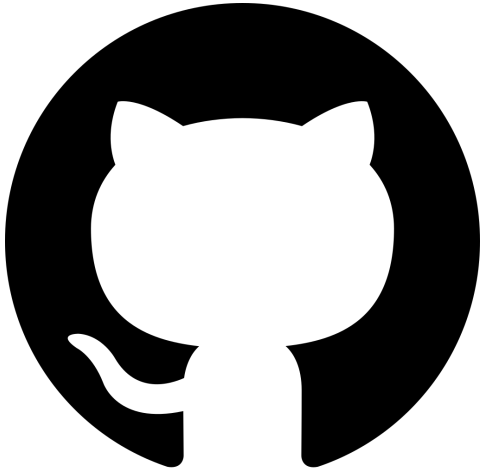
# Overview

1. What is git ?
2. How does git work ?
3. What is Github ?
4. Using git through RStudio ?



# What is version control ?

- A system that keeps records of your changes
- Allows for collaborative development
  - without interfering or code loss
- Allows you to know who made what changes and when

# What is version control ?

- **Allows you to revert any changes and go back to a previous state**
  - Access to all versions of all files in Git repository at any time
- Users keep entire code and history on their location machines
  - Users can make any changes without internet access
  - (Except pushing and pulling changes from a remote server)

# What is git ?


- Most famous version control system (the best ?)
- Not the only one
  - Subversion
  - Mercurial
  - Bazaar
  - ...


mercurial

# How does git work ?

- Can be complicated at first, but there are a few key concepts
- Important git terminology in following slides are blue

# Key Concepts : Snapshots

- The way git keeps track of your code history
- Essentially records what all your files look like at a given point in time
- You decide when to take a snapshot, and of what files
- Have the ability to go back to visit any snapshot
  - Your snapshots from later on will stay around, too

# Key Concepts : Commit

- The act of creating a snapshot
- Can be a noun, a verb, some key information
  - “I commited code”
  - “I just made a new commit”
  - “Update RandomModelScript.R 08/08/18”
- Essentially, a project is made up of a bunch of commits

# Key Concepts : Commit

- Commits contain three pieces of information:

1. Information about how the files changed from previously
2. A reference to the commit that came before it
   → Called the “parent commit”
3. A hash code name
   → Will look something like :
   fb2d2ec5069fc6776c80b3ad6b7cbde3cade4e

# Key Concepts : Repositories

- Often shortened to ‘repo’
- A collection of all files and the history of those files
  - Consists of all your commits
  - Place where all your hard work is stored

# Key Concepts : Repositories

- Can live on a local machine or on a remote server (GitHub ! )
- The act of copying a repository from a remote server is called cloning
- Cloning from a remote server allows team to work together

# Key Concepts : Repositories

- The process of downloading commits that don’t exist on your machine from a remote repository is called pulling changes
- The process of adding your local changes to the remote repository is called pushing changes

# Key Concepts : Branches

- All commits in git live on some branch
- But there can be many, many branches
- The main branch in a project is called the master branch

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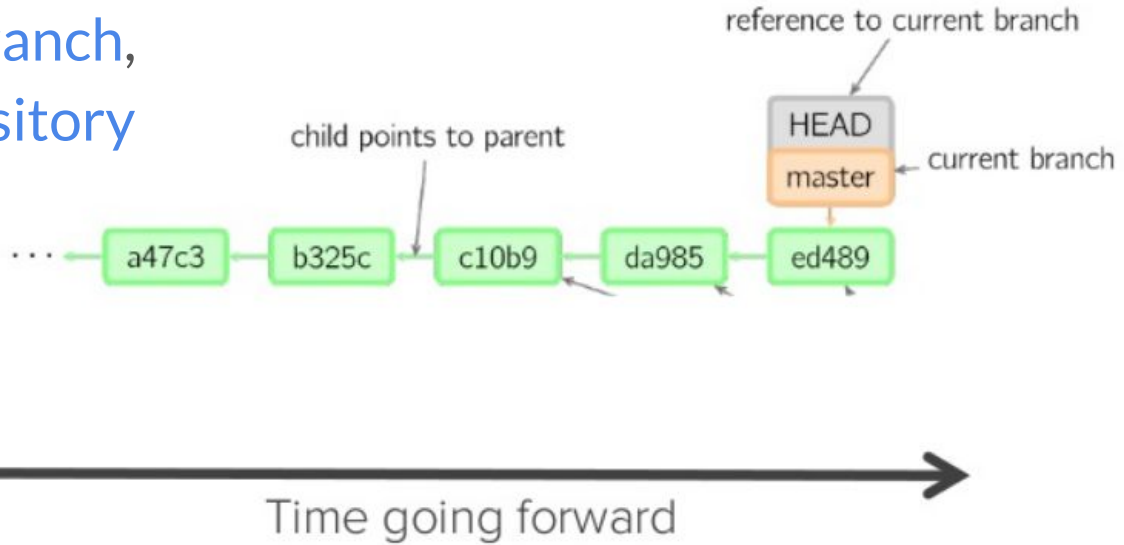
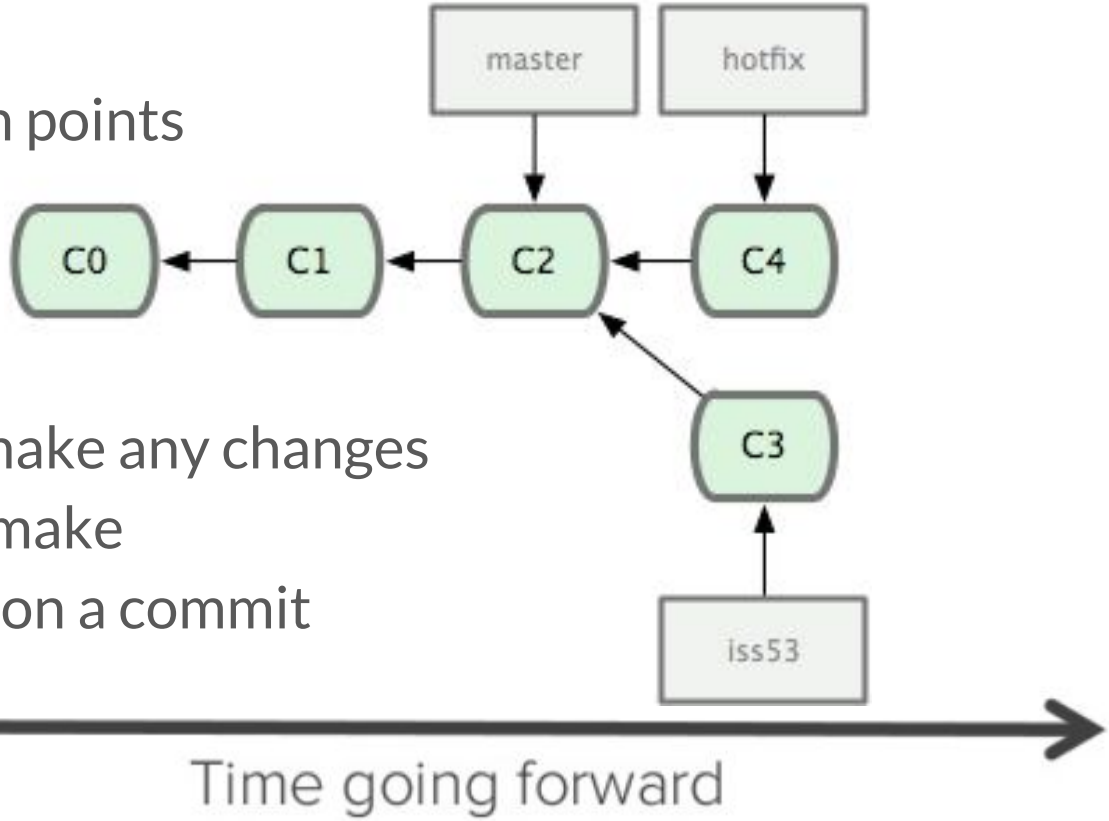


# Key Concepts : Branching off of the master branch

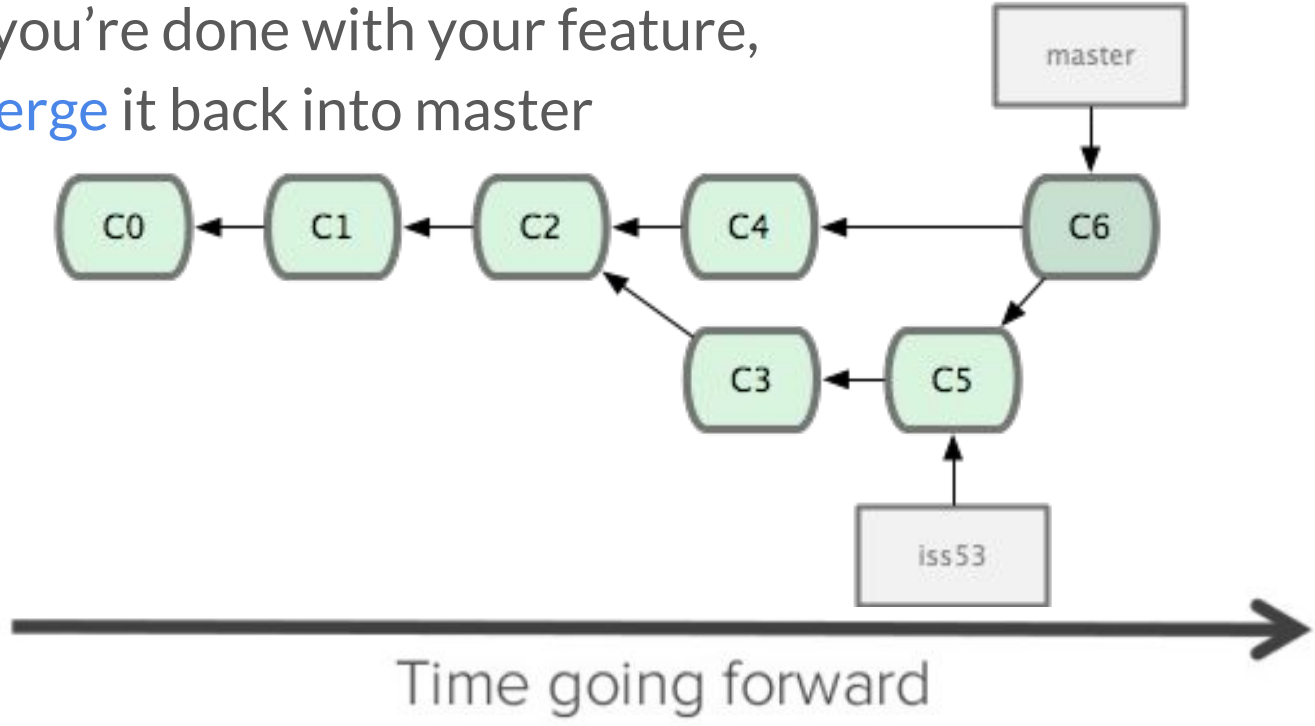
- The start of a branch points to a specific commit




- When you want to make any changes to your project you make a new branch based on a commit

# Key Concepts : Merging

- Once you're done with your feature, you merge it back into master



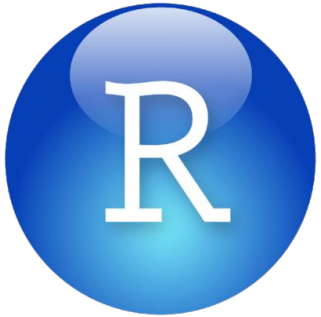
# What is GitHub ?

- Largest web-based git repository hosting service
  - Aka, hosts ‘remote repositories’
- Allows for code collaboration with anyone online
- www.github.com
- Adds extra functionality on top of git
  - UI, documentation, bug tracking, feature requests, pull requests, and more !

# What is GitHub ?

- Founded in 2008
- Open source service
- Also has an Enterprise edition for businesses
- You can pay to have private repositories
- Microsoft buys GitHub platform for $ 7.5 billion in 2018 (Goodbye open source ?)

# Using git through RStudio?



- RStudio: a git graphical interface
- Simple git commands are native in RStudio
- Avoid using command line in a terminal

Thanks for your attention

Let’s practice ! →