Introduction to Git and GitHub

Overview

1. Install git and create a GitHub account
2. What is git?
3. How does git work?
4. What is GitHub?
5. Quick example using git and GitHub

1 Install git and a create GitHub account

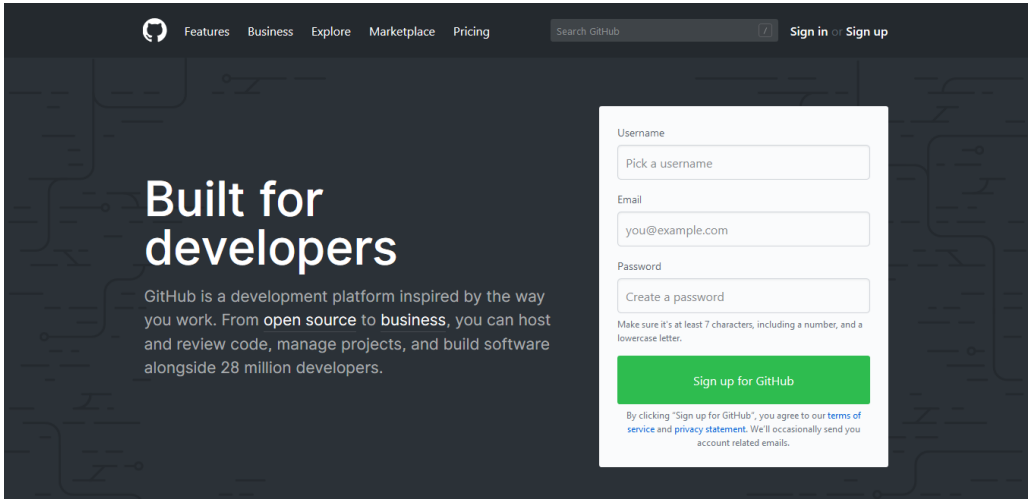
Install Git

- **Linux (Debian)**
  - Command: sudo apt-get install git
- **Linux (Fedora)**
  - Command: sudo yum install git
- **Mac**
  - http://git-scm.com/download/mac
- **Windows**
  - http://git-scm.com/download/win

For detailed instructions, head over to kutt.it/git-prac

Create GitHub account

- www.github.com
- Free for public repositories



What is version control?

- A system that keeps records of your changes
- Allows for collaborative development
- Allows you to know who made what changes and when
- **Allows you to revert any changes and go back to a previous state**

2 What is git?

What is git?

- Distributed version control
- Users keep entire code and history on their local machines
  - Users can make any changes without internet access
  - (Except pushing and pulling changes from a remote server)

What is git?

- Started in 2005
- Created by Linus Torvalds to aid in Linux kernel development

Git icon

What is git?

- Git isn't the only version control system

- But (we think) it's the best

3 How does git work?

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 or verb
  - "I commited code"
  - "I just made a new commit"
- 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 the 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 teams to work together

Key Concepts: *Repositories*

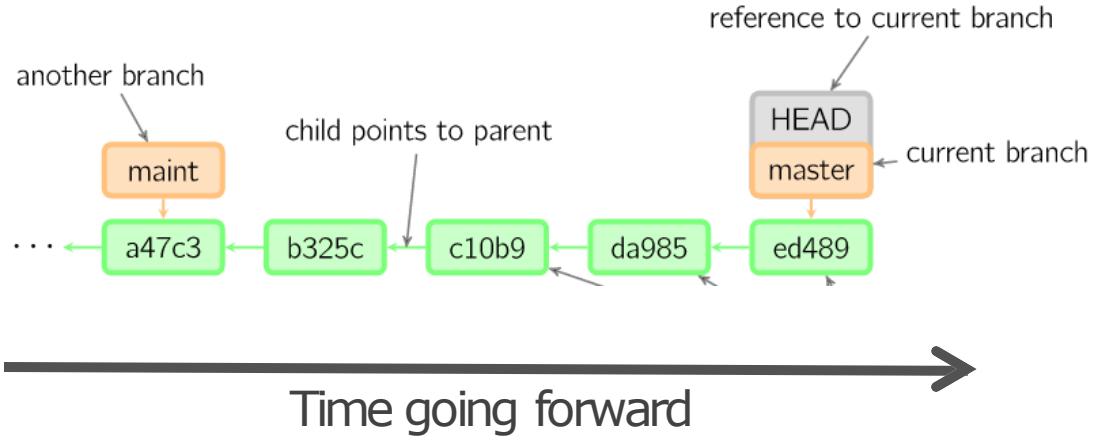
- The process of downloading commits that don't exist on your machine from a remote repository is called pulling changes
- The process of adding your local changes to the remote repository is called pushing changes

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

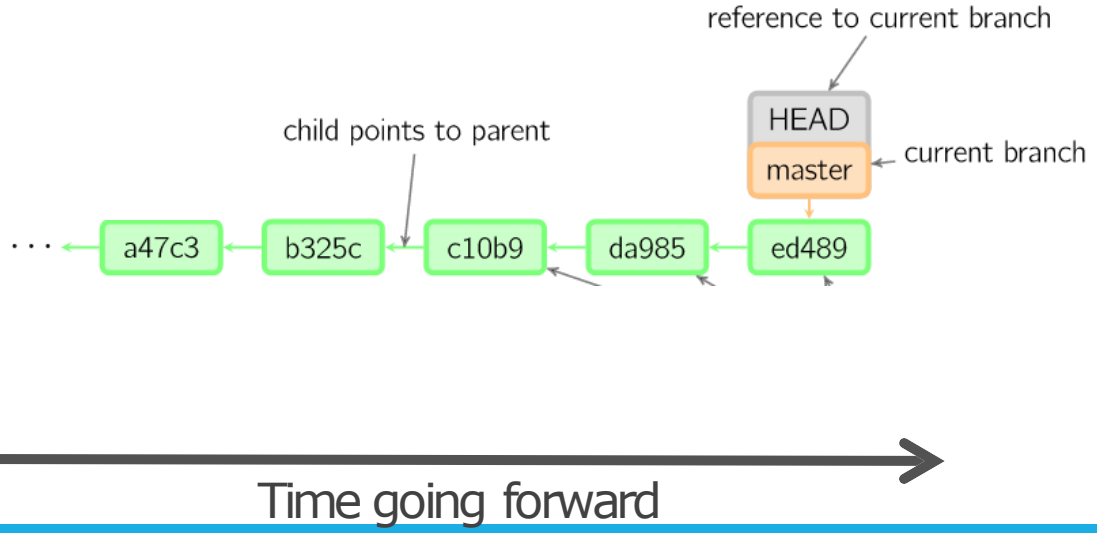
So, what does a typical project look like?

- A bunch of commits linked together that live on some branch, contained in a repository



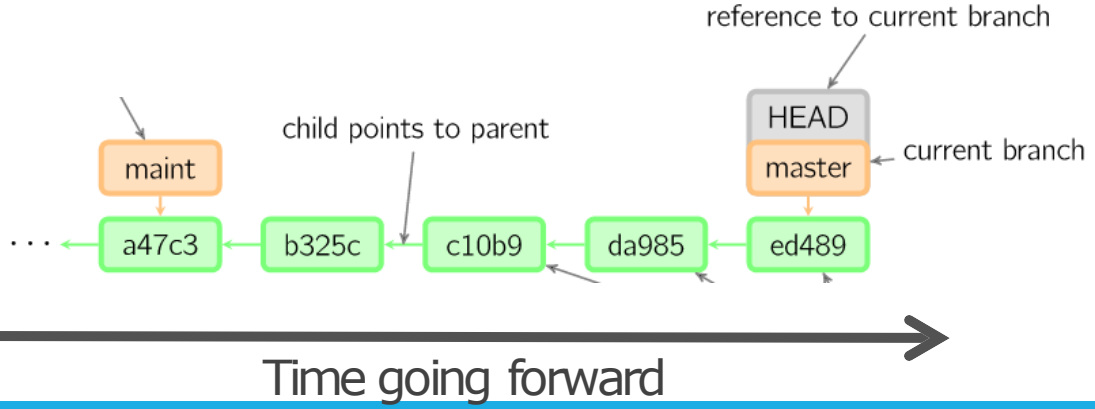
So, what is *HEAD*?

- A reference to the most recent commit



So, what is *MASTER*?

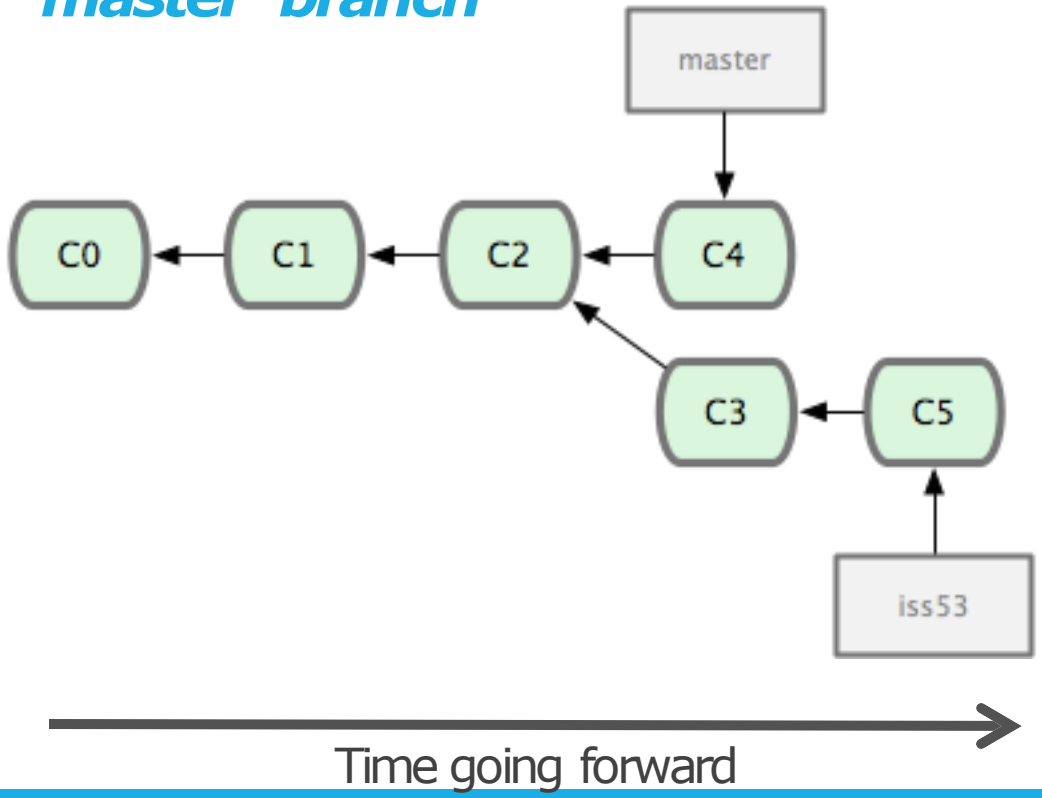
- The main branch in your project
- Doesn't have to be called master, but almost always is!



Key Concepts: *Branching off of the master branch*

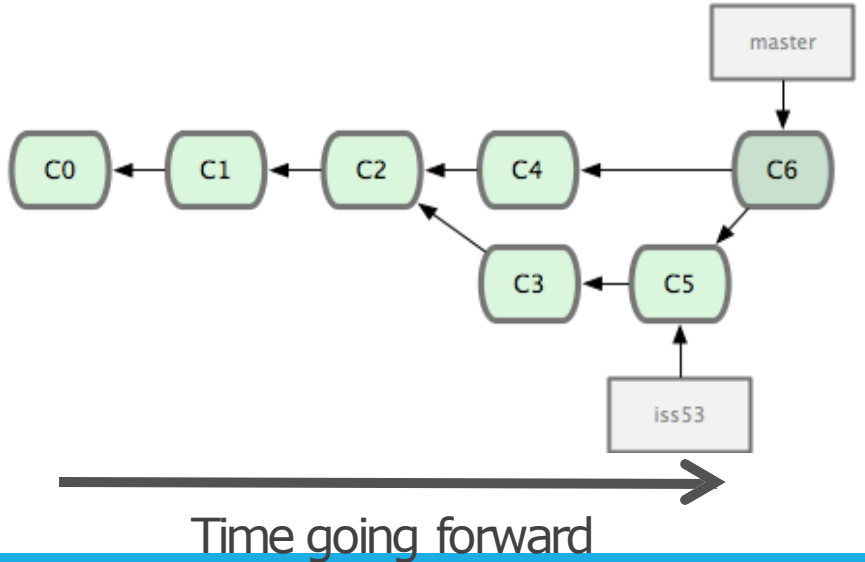
- The start of a branch points to a specific commit
- When you want to make any changes to your project you make a new branch based on a commit

Key Concepts: *Branching off of the master branch*



Key Concepts: *Merging*

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



Key Concepts: *How do you make a commit anyway?*

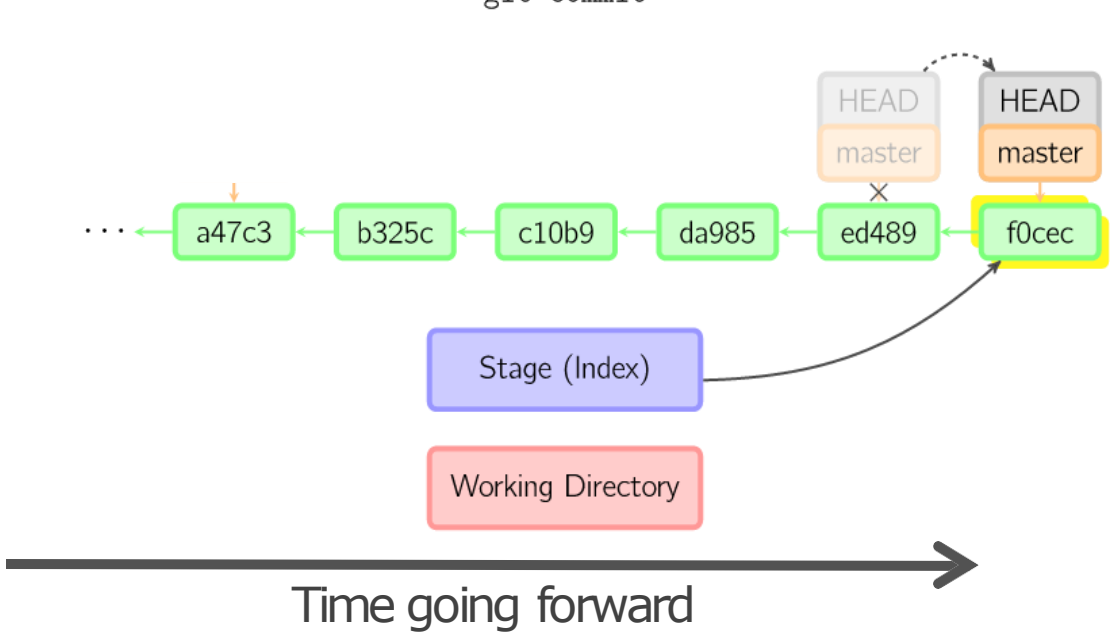
- There are a lot of ‘states’ and ‘places’ a file can be
- Local on your computer: the ‘working directory’
- When a file is ready to be put in a commit you add it onto the ‘index’ or ‘staging area’

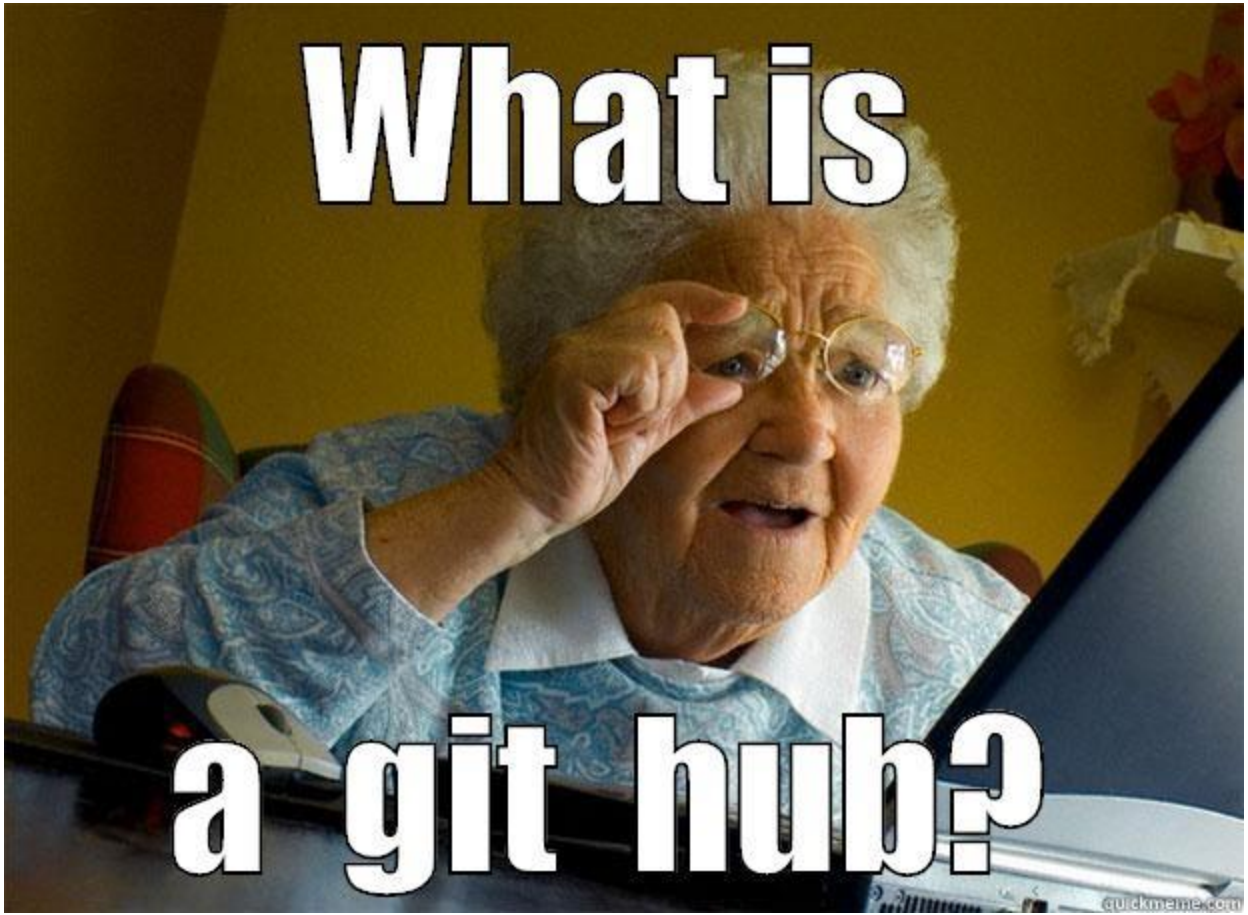
Key Concepts: *How do you make a commit anyway?*

- The process:
  - Make some changes to a file
  - Use the 'git add' command to put the file onto the staging environment
  - Use the 'git commit' command to create a new commit'

Key Concepts: *How do you make a commit anyway?*

Key Concepts: How do you make a commit anyway?




What is
a git hub?
quickmeme.com

4 What is GitHub?

What is GitHub?

Octocat!

- Founded in 2008
- www.github.com
- Largest web-based git repository hosting service
  - Aka, hosts 'remote repositories'
- Allows for code collaboration with anyone online

What is GitHub?

Octocat!

- Adds extra functionality on top of git
  - UI, documentation, bug tracking, feature requests, pull requests, and more!
- Has a student developer pack for university students

  https://education.github.com/pack

Additional Resources

- Code School's tryGit
- TheNewBoston's Git Tutorial
- Github's Github Learning Lab
- Udacity's Git & Github Course
- Udacity's Github Collaboration Course
- Learn Git Branching - An interactive way to learn Git