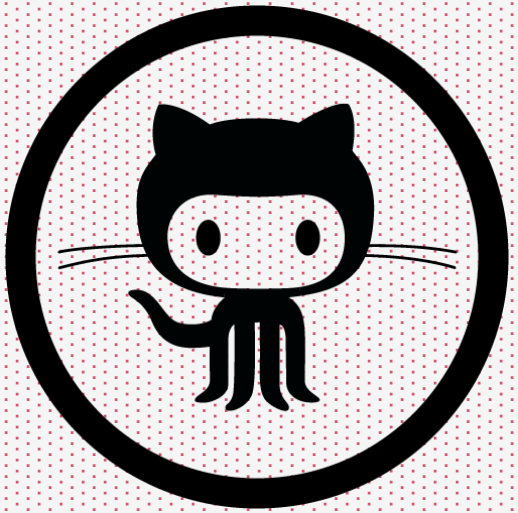
# Git 101:

# Git and GitHub for Beginners

HubSpot



Github icon

# 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

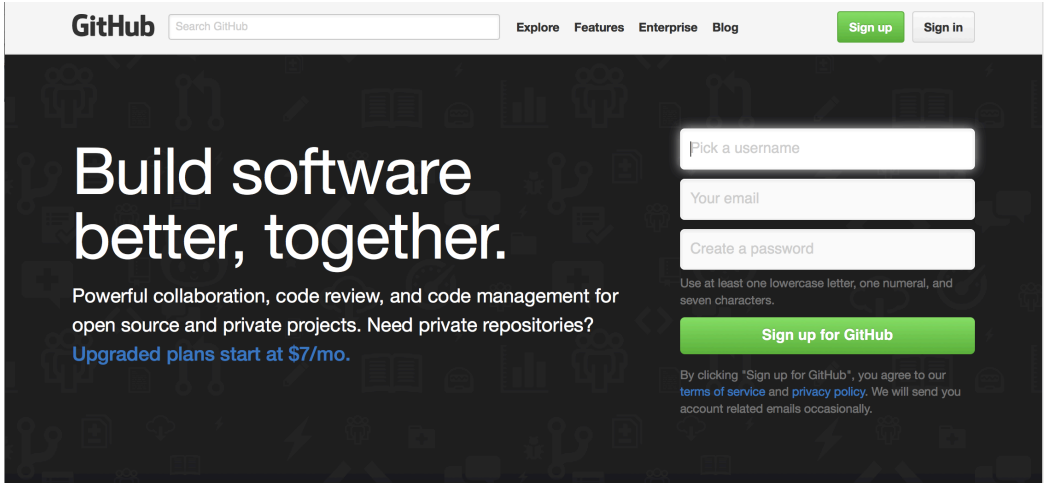
# 1 Install git and a create GitHub account

# 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

# 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 version control?

- Distributed version control
- 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?

- Started in 2005
- Created by Linus Torvald 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

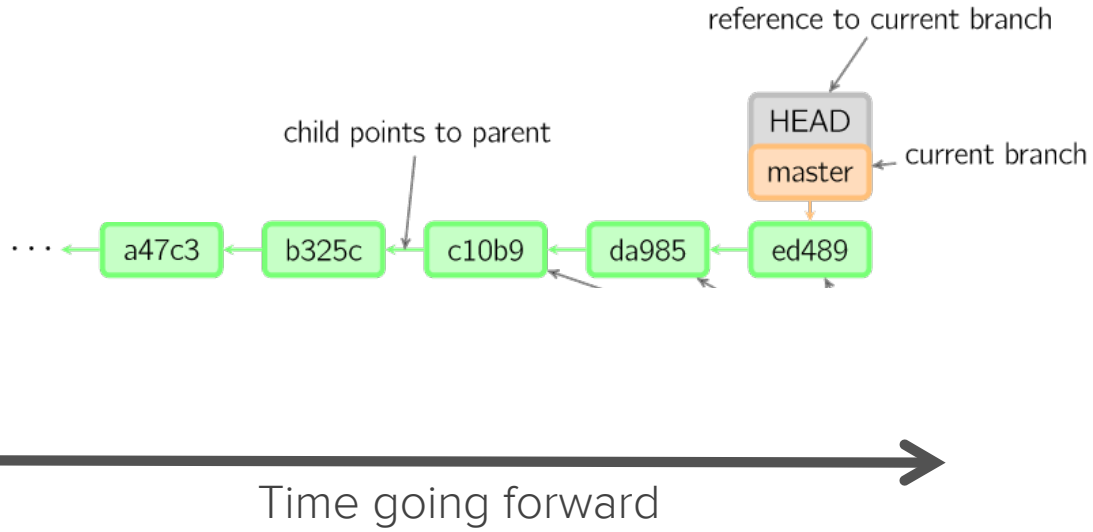
# Key Concepts: Branches

- 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

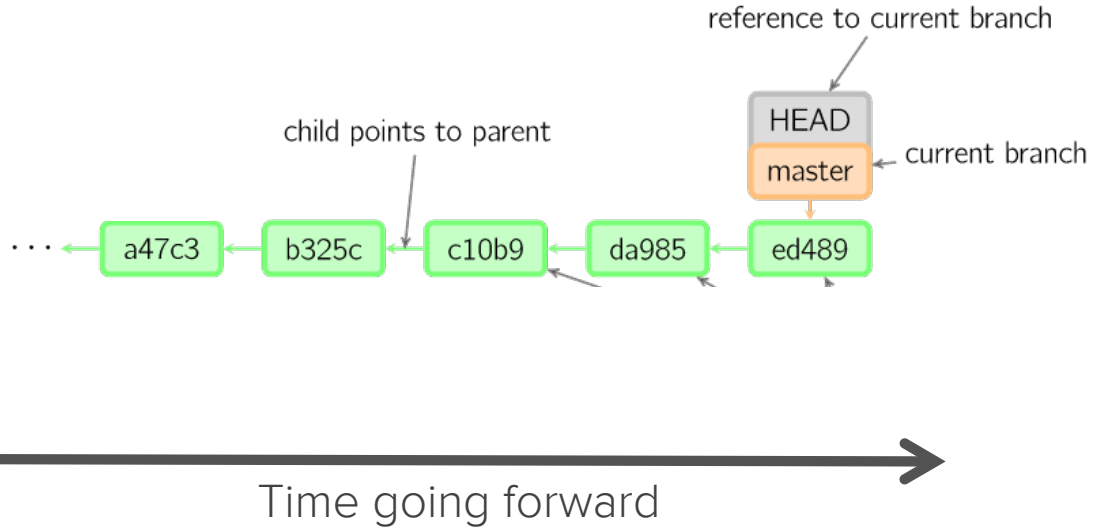
So, what does a typical project look like?

- A bunch of commits linked together that live on some branch, contained in a repository
- Following images taken and modified from:
  - http://marklodato.github.io/visual-git-guide/index-en.html
  - Also a good tutorial!

# So, what does a typical project look like?

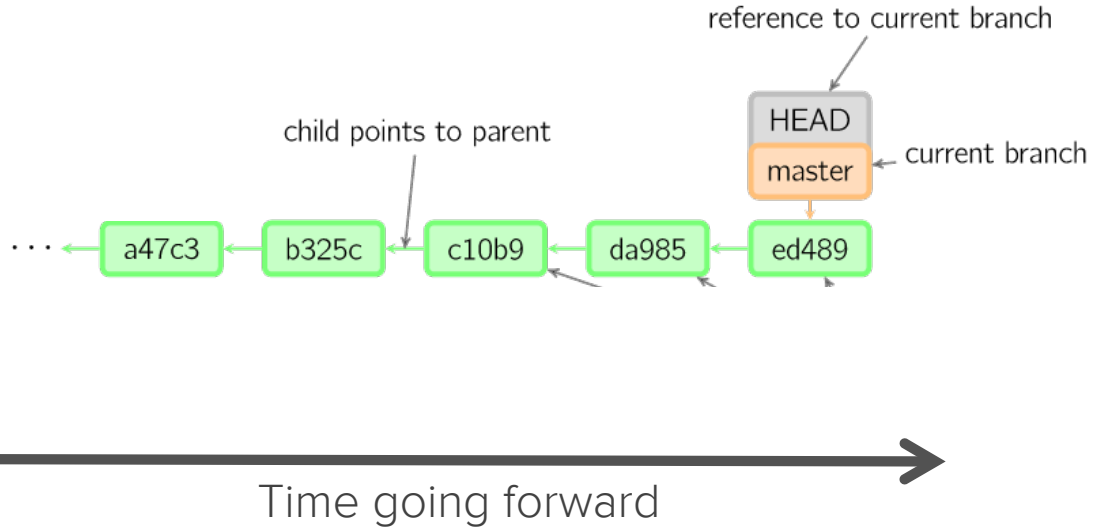


# So, what is HEAD?



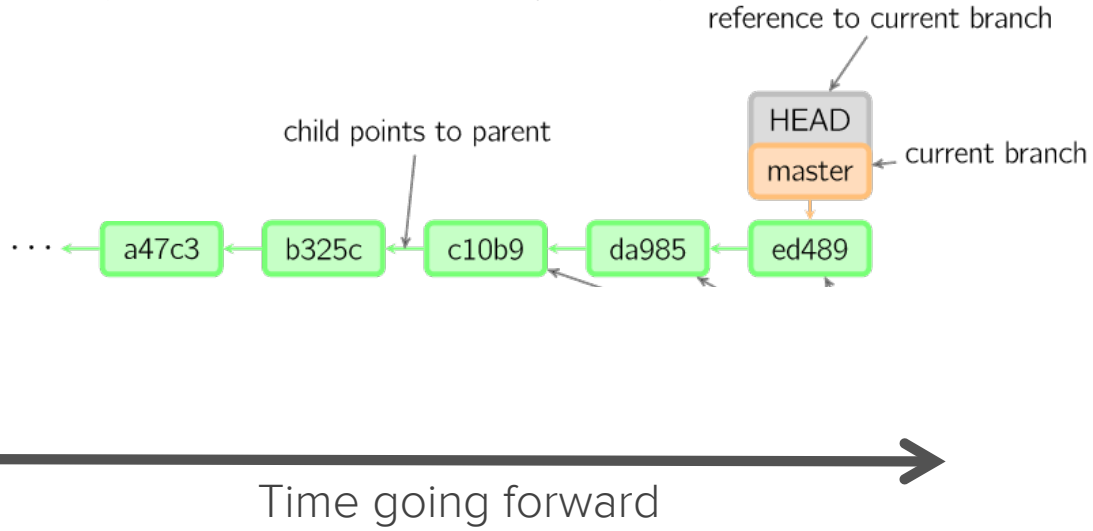
# So, what is HEAD?

- A reference to the most recent commit



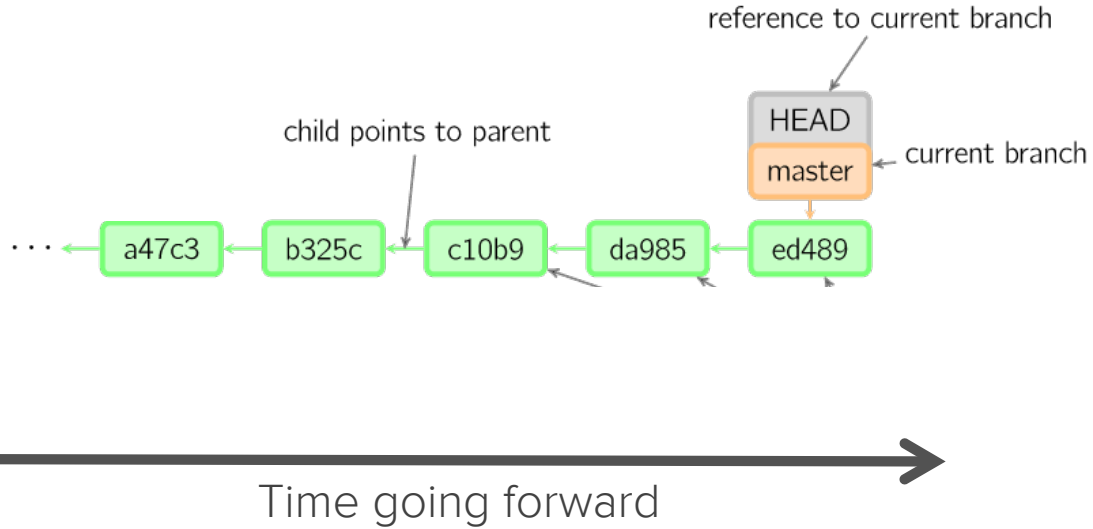
# So, what is HEAD?

- A reference to the most recent commit
  - (in most cases – not always true!)



# So, what is MASTER?

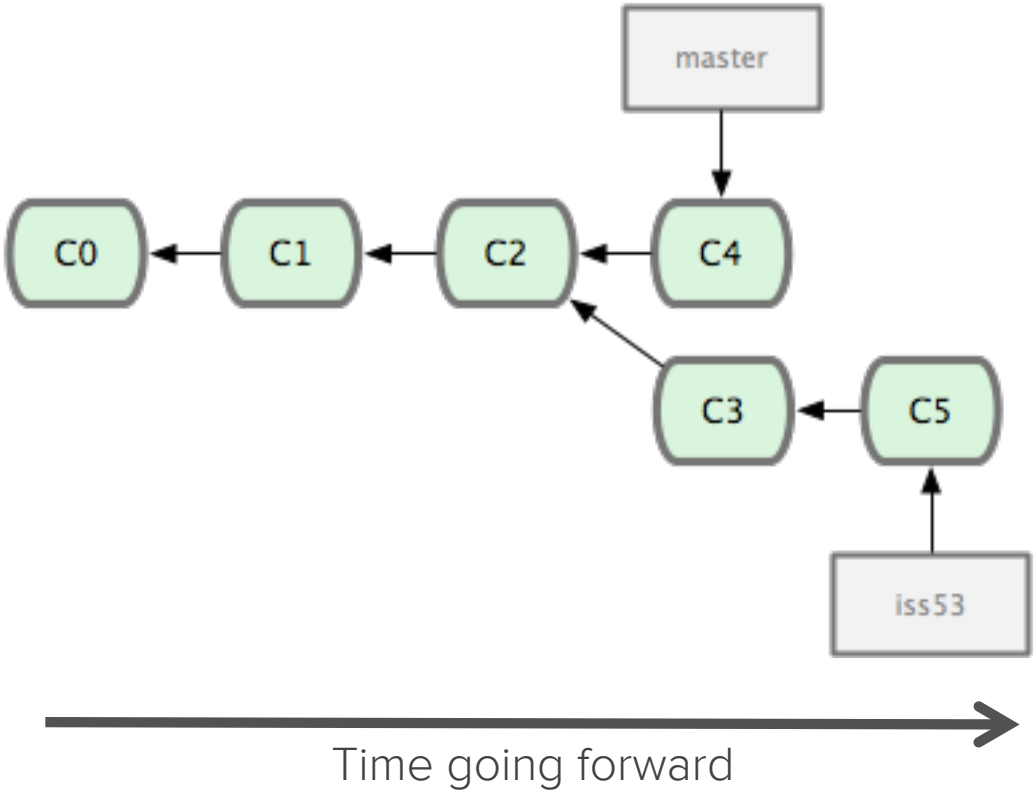
- The main branch in your project
- Doesn't *have* to be called master, but almost always is!



## 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

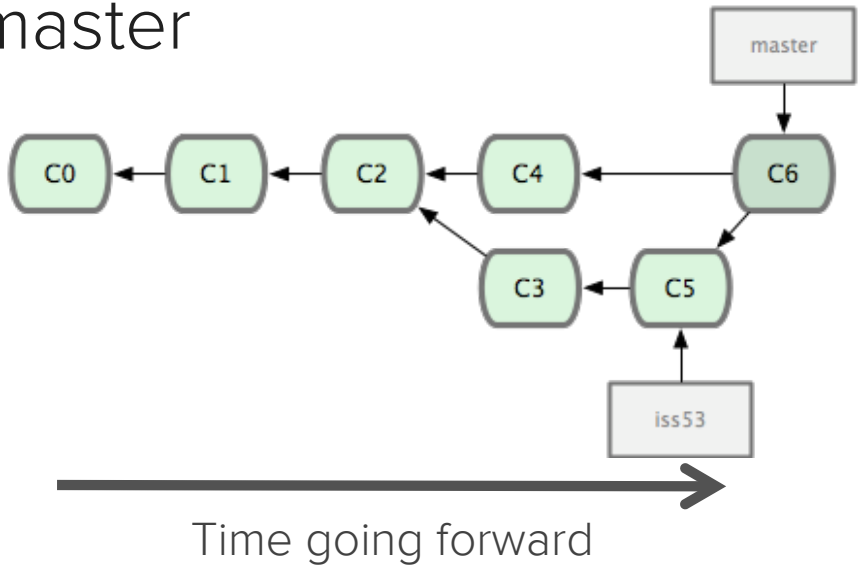
# Key Concepts: Branching off of the master branch




Images from:
http://codingdomain.com/git/merging/

# Key Concepts: Merging

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



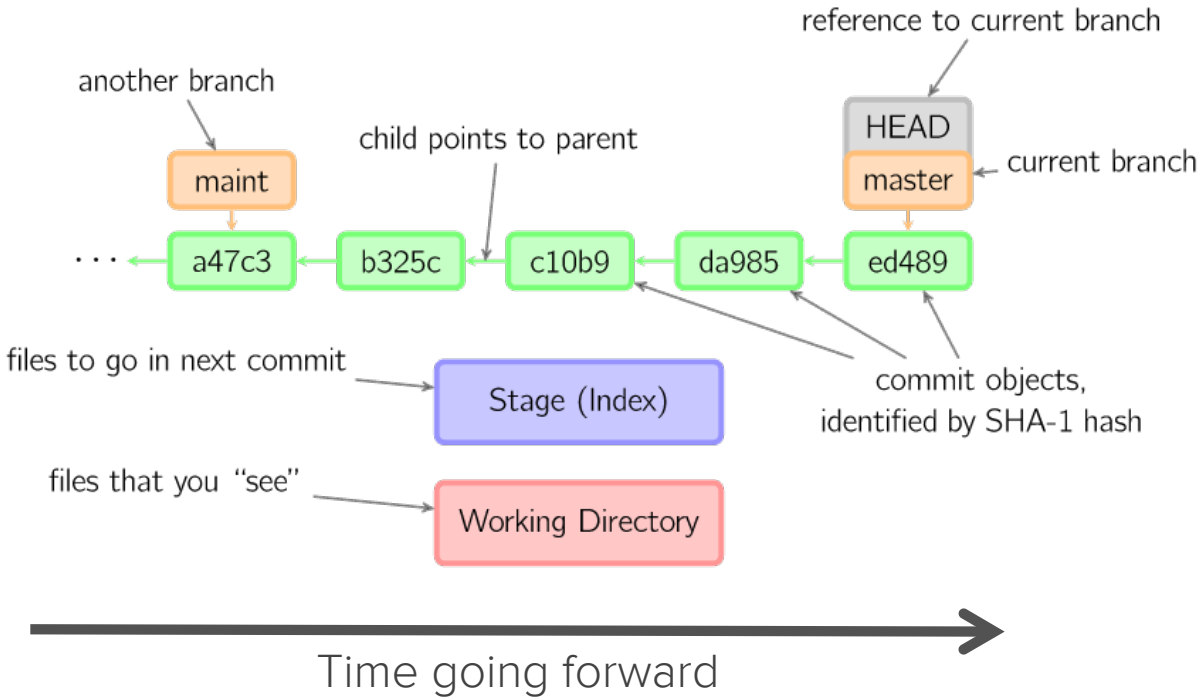
# Key Concepts: How do you make a commit anyway?

- 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’
  - Staging is the new preferred term – but you can see both ‘index’ and ‘staging’ being used

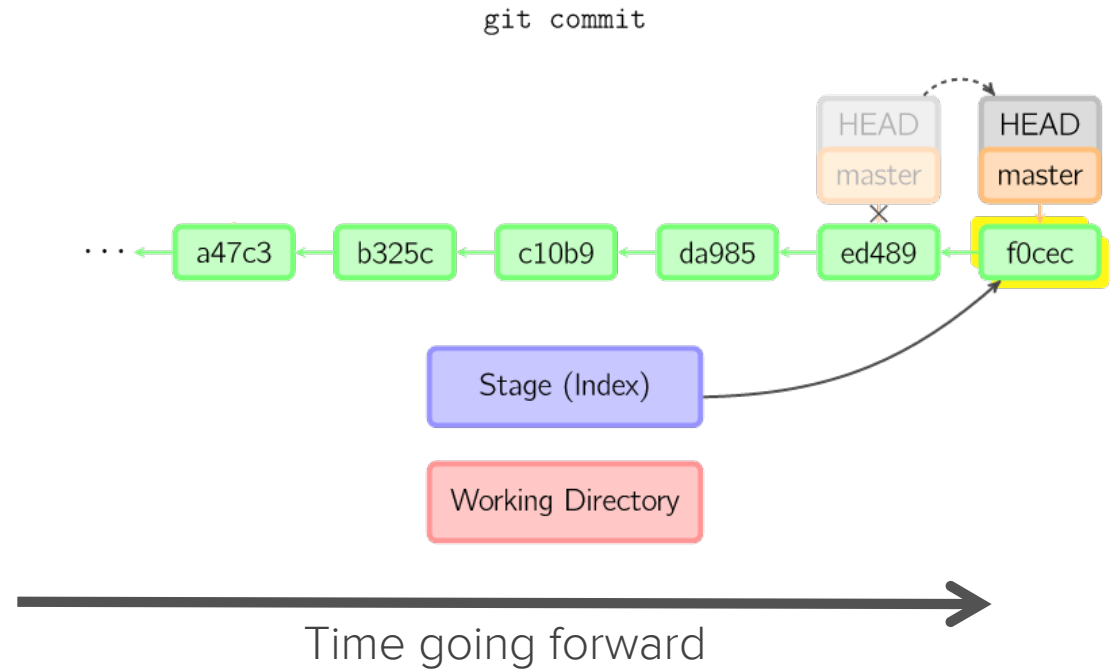
## Key Concepts: How do you make a commit anyway?

- 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?



# 4 What is GitHub?

# What is GitHub?

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

Octocat!