CHALLENGE NUMBER

Get Git 1 / 11

The Challenge:

Install Git on your computer and configure your name and email.

Git

Git is **open source software** (free for anyone to use) written by Linus Torvalds who also wrote the Linux operating system.

It is a program for keeping track of changes over time, known in programming as **version control**.

Step: Install Git

- **Windows**: It's recommended to download GitHub for Windows, which includes Git and has an easier install: windows.github.com. Use the **Git Shell** for your terminal.
- **Mac**: You can also download GitHub for Mac, which includes Git, mac.github.com (from Preferences, select the command line tools install), or
  - download Git by itself at: git-scm.com/downloads and follow the installation instructions.

Git isn't like other programs on your computer. You'll likely not see an icon on your desktop, but it will always be available to you and you'll be able to access it at anytime from your terminal (which you're using in Git-it!) or Git desktop applications (like GitHub for Mac or Windows).

Step: Configure Git

Once it is installed, open **terminal** (aka Bash, aka Shell, aka Prompt). You can verify that it's really there by typing:

```
$ git --version
```

☜ **Git-it** ☞

```
git version 1.9.1
```

(Any version `1.7.10` or higher is fine.)

Next, configure Git so it knows who to associate your changes to:

Set your name:

```
$ git config --global user.name "<Your Name>"
```

Now set your email:

```
$ git config --global user.email <youremail@example.com>
```

Verify with `git-it verify`

Go to the next challenge `git-it`

Tips

Dollar signs `$` are often used in programming documentation to signify that the line is **command line** code (see the code snippets above). You don't actually type the `$` in though, only type what comes after. For instance, to run the verify command above, you're actually going to type `git-it verify` into terminal.

ALL CHALLENGES

Git-it

CHALLENGE NUMBER

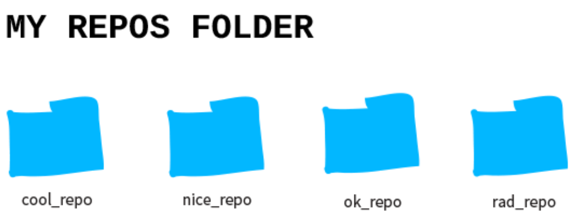
Repository 2 / 11

The Challenge:

Create a new repository on your computer.

Repositories

A **repository** is essentially a project. You can imagine it as a project's folder with all the related files inside of it. In fact, that's what it will look like on your computer anyways.



You tell Git what your project is and Git will start tracking all of the changes to that folder. Files added or subtracted or even a single letter in a single file changed -- all of it's tracked and time stamped by Git. That's **version control**.

Using Terminal

Terminal (or Bash) is a way of using your computer by just typing commands. You can rename files, open files, create new folders, and move between directories (folders) all by typing out commands. You can even run a text editor (such as Vim) in your terminal and never have to leave!

Besides navigating your computer, you can also use programs in Terminal that have a **command-line interface (CLI)**, meaning they can be run with commands in terminal. Git-it is one, you're using terminal to use it! Git is another. You can access and control Git through commands in terminal, as you'll be doing very soon!

In Git-it you'll learn a few basic command line actions which will be described within the steps.

Step: Create a Repository

You're going to create a new folder and initialize it as a Git repository.

To make things easier, name your folder what you'd name the project. How about 'hello-world'.

You can type these commands one at a time into your terminal window.

To make a new folder:

```
$ mkdir hello-world
```

To go into that folder:

```
$ cd hello-world
```

To create a new Git instance for a project:

```
$ git init
```

That's it! It will just return you to a new line. If you want to be double-sure that it's a Git repository, type `git status` and if it doesn't return 'fatal: Not a git repository...', you're golden!

Verify with `git-it verify`

Go to the next challenge `git-it`

Tips

Make a new folder (aka directory)

```
$ mkdir <FOLDERNAME>
```

Navigate into an existing folder (aka change directory)

```
$ cd <FOLDERNAME>
```

List the items in a folder

```
$ ls
```

Turn Git on for a folder

```
$ git init
```

GET GIT ↲

COMMIT TO IT ↳

GIT-IT CHALLENGES ABOUT DICTIONARY RESOURCES OPEN AN ISSUE

Commit To It

3 / 11

The Challenge:

Create a file in your new repository, add something to that file and commit those changes to Git.

Step: Create a New File

Now that you've got a repository started, add a file to it.

Open a text editor. Now write a couple of lines of text, perhaps say hello, and save the file as `readme.txt` in the 'hello-world' folder you created in the last challenge.

Step: Status, Add and Commit Changes

Next check the **status** of your repository to find out if there have been changes. Below in this terminal, you should still be within the 'hello-world' you created. See if there are changes listed:

```
$ git status
```

Then **add** the file you just created to the files you'd like to **commit** (aka save) to change.

```
$ git add readme.txt
```

Finally, **commit** those changes to the repository's history with a short description of the updates.

```
$ git commit -m "<your commit message>"
```

Step: Make More Changes

Now add another line to `readme.txt` and save.

In terminal, you can view the **diff**erence between the file now and how it was at your last commit.

```
$ git diff
```

Now with what you just learned above, commit this latest change.

Verify with `git-it verify`

Go to the next challenge `git-it`

Tips

Check status of changes to a repository

```
$ git status
```

View changes to files

```
$ git diff
```

Add a file's changes to be committed

```
$ git add <FILENAME>
```

To add all files changes

```
$ git add .
```

To commit (aka save) the changes you've added with a short message describing the changes

```
$ git commit -m "<your commit message>"
```

Git-it

CHALLENGE

NUMBER

GitHubbin

4 / 11

The Challenge:

Create a GitHub account, add username to your Git config.

Better, together

The repository you've created so far is just on your computer, which is handy, but makes it pretty hard to share and work with others on. No worries, that's what GitHub is for!

Step: Create a GitHub Account

GitHub is a website that allows people everywhere to upload what they're working on with Git and to easily work together.

Visit github.com and sign up for a free account. **High five, welcome!**

Step: Add username to Git

Add your GitHub username to your Git configuration, which will be needed in order to verify the upcoming challenges. Save it exactly as you created it on GitHub — **capitalize where capitalized**, and remember you don't need to enter the "<" and ">" .

Add your GitHub username to your configuration:

```
$ git config --global user.username <USerNamE>
```

Verify with `git-it verify`

Go to the next challenge `git-it`

Didn't Pass?

GitHub & Git config usernames do not match

A common error is not having your GitHub username match the case of the one you set with `git config`. For instance, 'JLord' isn't the same as 'jlord'

To change your username set with Git, just do the same command you did earlier, but with the correct capitalization:

```
$ git config --global user.username <USerNamE>
```

When you've made your updates, verify again!

COMMIT TO IT ↲ REMOTE CONTROL ↳

GIT-IT CHALLENGES ABOUT DICTIONARY RESOURCES OPEN AN ISSUE

CHALLENGE

NUMBER

Remote Control

5 / 11

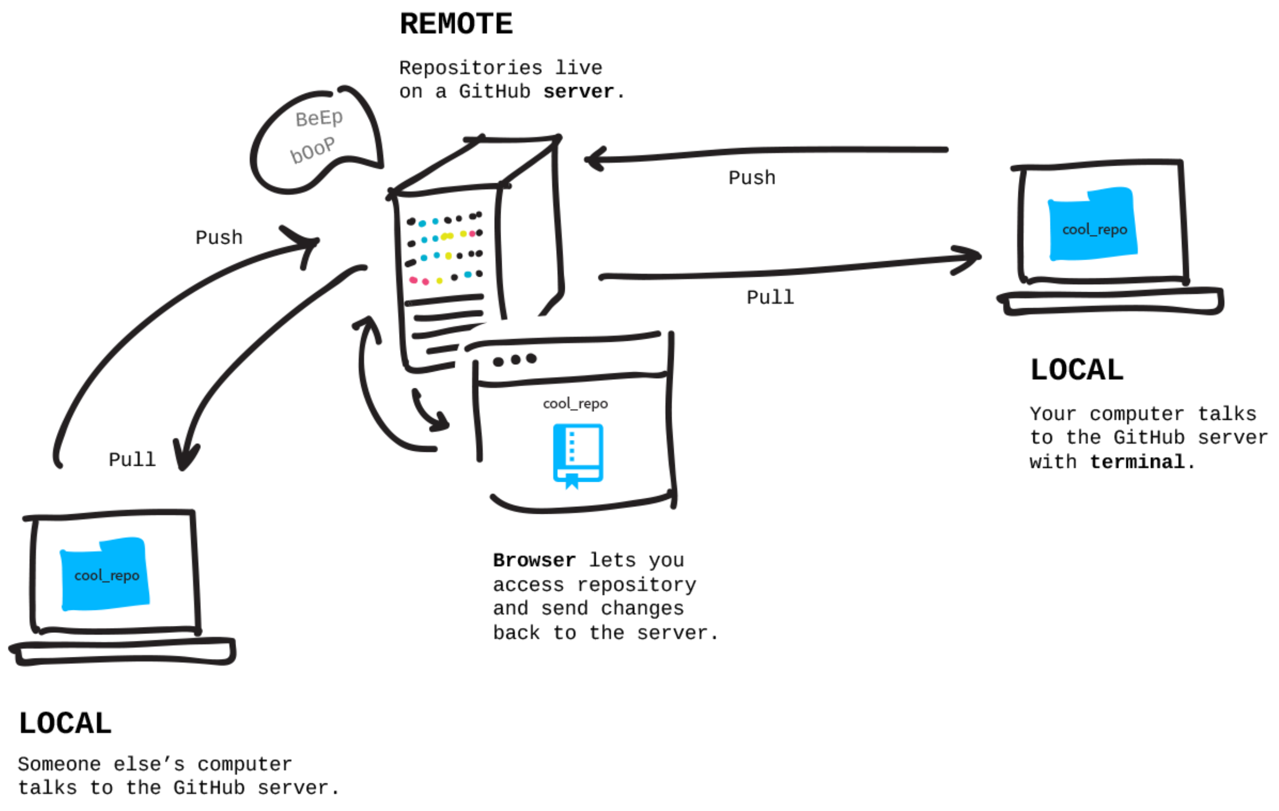
The Challenge:

Connect your local and remote repositories and push changes.

Remotes

When you put something on GitHub, that copy lives on one of GitHub's servers. This makes it a **remote** repository because it is not on your computer, but on a server, "remote" and somewhere else. By **pushing** your **local** (on your computer) changes to it, you keep it up to date.

Others can always get the latest from your project by **pulling** your changes down from the remote (and onto their computer). This is how everyone can work on a project together without needing access to your computer where your local copy is stored.


REMOTE
Repositories live on a GitHub **server**.
BeEp bOoP
Push
Pull
Push
Pull
cool_repo
cool_repo
cool_repo
LOCAL
Your computer talks to the GitHub server with **terminal**.
Browser lets you access repository and send changes back to the server.
LOCAL
Someone else's computer talks to the GitHub server.

Step: Create a Remote Repository

You want to sync your **local** version with one stored on GitHub.com called the **remote** version. So first create an empty remote repository on GitHub.com.

- Go to github.com, log in, and click the '+' in the top right to create a new repository.
- Give it a name that matches your local repository's name, 'hello-world', and a short description.
- Make it public.
- Don't initialize with a README because we already have a file, locally, named 'readme.txt'.
- Leave .gitignore and license on 'none'.
- Click create repository!

Readmes, .gitignores and Licenses

These are common files in open source projects.

A **readme** explains what the project is, how to use it, and often times, how to contribute (though sometimes there is an extra file, CONTRIBUTING.md, for those details).

A **.gitignore** is a list of files that Git should *not* track, for instance, files with passwords!

A **license** file is the type of license you put on your project, information on the types is here: choosealicense.com.

We don't need any of them, however, for this example.

Step: Connect your Local to your Remote

Now you've got an empty repository started on GitHub.com. At the top you'll see 'Quick Setup', make sure the 'HTTP' button is selected and copy the address — this is the location (address) of your repository on GitHub's servers.

Back in your terminal, and inside of the 'hello-world' folder that you initialized as a Git repository in the earlier challenge, you want to tell Git the location of the remote version on GitHub's servers. You can have multiple remotes so each requires a name. For your main one, this is commonly named `origin`.

```
$ git remote add origin <URLFROMGITHUB>
```

Your **local** repository now knows where your **remote** one named 'origin' lives on GitHub's servers. Think of it as adding a name and address on speed dial — now when you need to send something there, you can.

> **A note:**
>
> If you have **GitHub for Windows** on your computer, a remote named 'origin' is automatically created. In that case, you'll just need to tell it what URL to associate with origin. Use this command instead of the 'add' one above:

```
$ git remote set-url origin <URLFROMGITHUB>
```

Step: Push Work to your Remote

Next you want to **push** (send) everything you've done locally to GitHub. Ideally you want to stay in sync, meaning your local and remote versions match.

Git has a branching system so that you can work on different parts of a project at different times. We'll learn more about that later, but by default the first branch is named 'master'. When you push (and later pull) from a project, you tell Git the **branch name** you want and the name of the **remote** that it lives on.

In this case, we'll send our branch named 'master' to our remote on GitHub named 'origin'.

```
$ git push origin master
```

Now go to GitHub and refresh the page of your repository. WOAH! Everything is the same locally and remotely. Congrats on your first public repository!

Verify with `git-it verify`

Go to the next challenge `git-it`

Tips

Add remote connections

```
$ git remote add <REMOTENAME> <URL>
```

Set a URL to a remote

```
$ git remote set-url <REMOTENAME> <URL>
```

Pull in changes

```
$ git pull <REMOTENAME> <BRANCHNAME>
```

View remote connections

```
$ git remote -v
```

Push changes

```
$ git push <REMOTENAME> <BRANCH>
```

GITHUBBIN ↲

FORKS AND CLONES ↳

GIT-IT CHALLENGES ABOUT DICTIONARY RESOURCES OPEN AN ISSUE

Git-it

CHALLENGE

Forks And Clones

NUMBER

6 / 11

The Challenge:

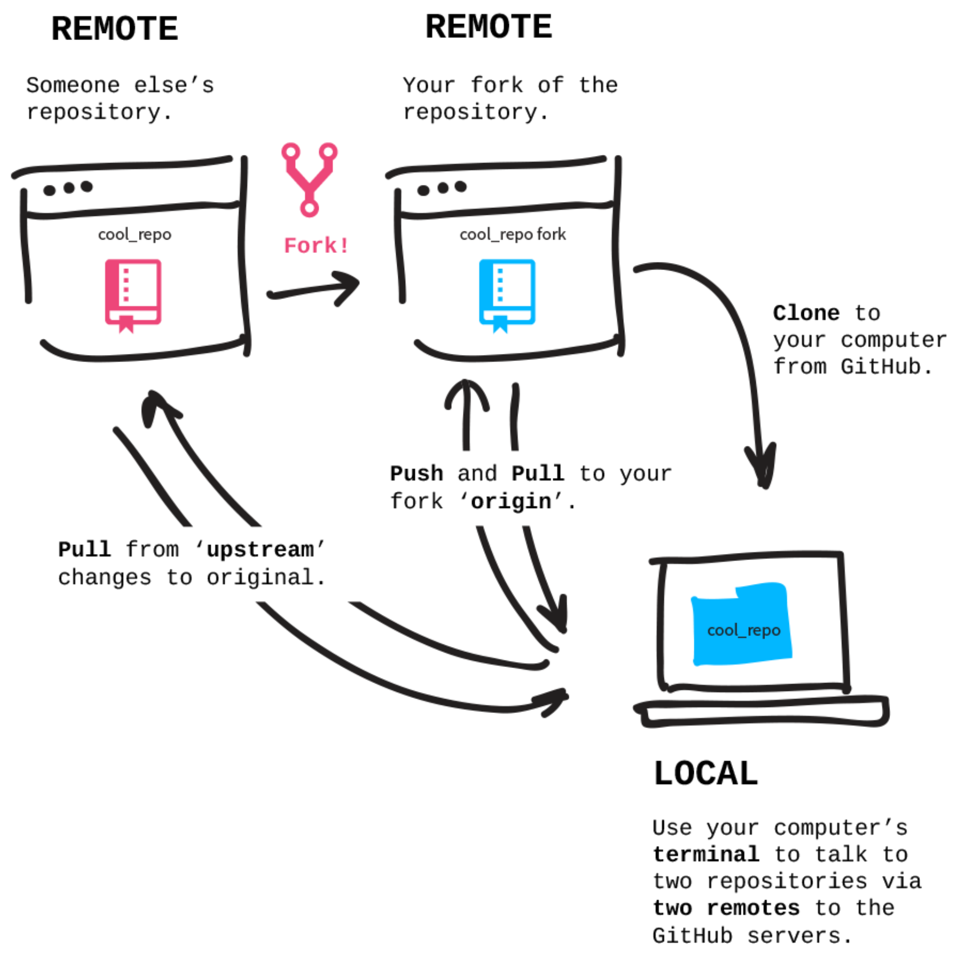
Fork a project from GitHub.com and clone it locally.

Forks

Now you've made a project locally and pushed it to GitHub, but that's only half the fun. The other half is working with other people and projects.

When you **fork** a repository, you're creating a copy of it on your GitHub account. Your fork begins its life as a **remote** repository. Forks are used for creating your own version of a project or contributing back fixes or features to the original project.

Once a project is forked, you then **clone** (aka copy) it from GitHub to your computer to work on locally.


REMOTE
Someone else's repository.
cool_repo
Fork!
REMOTE
Your fork of the repository.
cool_repo fork
Clone to your computer from GitHub.
Push and Pull to your fork 'origin'.
Pull from 'upstream' changes to original.
cool_repo
LOCAL
Use your computer's terminal to talk to two repositories via two remotes to the GitHub servers.

Step: Fork Patchwork Repository

The project we'll work with is github.com/jlord/patchwork. Go to that site and click the fork button at the top right. Once the fork animation is complete, you've got a copy on your account. Copy your fork's HTTP URL on the right sidebar.

Step: Clone Fork Locally

Now, in terminal, clone the repository onto your computer. It will create a new folder for the repository so no need to create one. But make sure you aren't cloning it inside of another Git repository folder! So, if you're still inside of the 'hello-world' repository you worked in on the earlier challenges, back out of that folder. You can leave the folder you're in (and be in the folder that it was inside of) by 'changing directory' with two dots:

```
$ cd ..
```

Now clone:

```
$ git clone <URLFROMGITHUB>
```

Go into the folder for the fork it created (in this case, named 'patchwork')

```
$ cd patchwork
```

Now you've got a copy of the repository on your computer and it is automatically connected to the remote repository (your forked copy) on your GitHub account.

Step: Connect to the Original Repository

But what if the original repository you forked from changes? You'll want to be able to **pull** in those changes too. So let's add another remote connection, this time to the original, github.com/jlord/patchwork, repository with its URL, found on the right hand side of the original on GitHub.

You can name this remote connection anything you want, but often people use 'upstream', let's use that for this.

```
$ git remote add upstream https://github.com/jlord/patchwork.git
```

Verify with `git-it verify`

Go to the next challenge `git-it`

Tips

Add remote connections

```
$ git remote add <REMOTENAME> <URL>
```

View remote connections

```
$ git remote -v
```

REMOTE CONTROL ↲

BRANCHES AREN'T JUST FOR BIRDS ↳

GIT-IT CHALLENGES ABOUT DICTIONARY RESOURCES OPEN AN ISSUE

Git-it

CHALLENGE

NUMBER

Branches Aren't Just For Birds

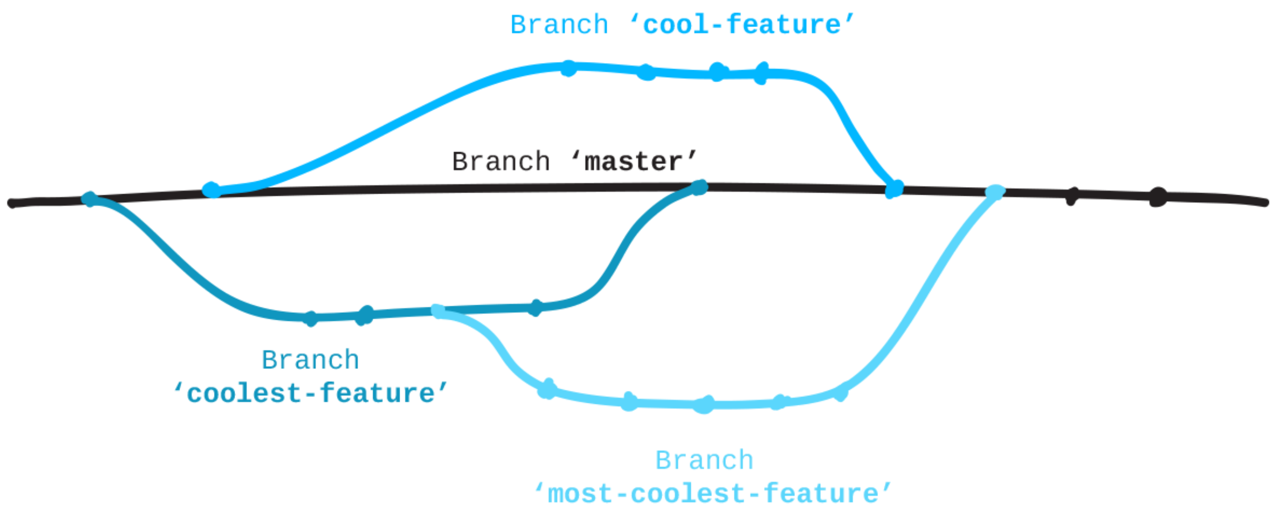
7 / 11

The Challenge:

Create a new branch on your fork for your contribution.

Branches

Git repositories use branches to isolate work when needed. It's common practice when working on a project or with others on a project to create a **branch** to keep your changes in until they are ready. This way you can do your work while the main, commonly named 'master', branch stays stable. When your branch is ready, you merge it back into 'master'.



For a great visualization on how branches work in a project, see this GitHub Guide: guides.github.com/overviews/flow

GitHub Pages

GitHub will automatically serve and host static website files in branches named 'gh-pages'. Since the project you forked creates a website, its main branch is 'gh-pages' instead of 'master'. All sites like this can be found using this pattern for the URL:

```
http://githubusername.github.io/repositoryname
```

Step: Create a branch

When you create a branch, Git copies everything from the current branch you're on and places it in the branch you've requested.

Type `git status` to see what branch you're currently on (it should be 'gh-pages').

Create a branch and name it "add-<username>", where 'username' is your username. For instance, "add-jlord". **Branches are case-sensitive so name your branch exactly the way your GitHub name appears**.

```
$ git branch <BRANCHNAME>
```

Now you have a branch with a new name identical to 'gh-pages'.

To go into that branch and work on it, similar to using `cd` to change directory in terminal, you **checkout** a branch. Go onto your new branch:

```
$ git checkout <BRANCHNAME>
```

Step: Create a new file

Back to the text editor:

- Create a new file named "add-<USERNAME>.txt", where 'username' is your username. For instance, "add-jlord.txt".
- Then, just write your GitHub username in it, that's it and that's all. For instance, I'd type 'jlord'.

- Save this file in the 'contributors' folder in Patchwork: **Patchwork/contributors/add-yourusername.txt**
- Next, check in your changes!

Step: Check-in

Go through the steps for checking in a project:

```
$ git status
```

```
$ git add <FILENAME>
```

```
$ git commit -m "<commit message>"
```

Now push your update to your fork on GitHub:

```
$ git push origin <BRANCHNAME>
```

Verify with `git-it verify`

Go to the next challenge `git-it`

Didn't Pass?

File NOT in contributors folder

The file you create should inside the existing 'contributors' folder in the Patchwork repository. If you put it somewhere else, simply use Finder or Windows Explorer to move your file into the folder. You can check `git status` again and you'll find it sees your changes. Stage and then commit "all" (-A) of these changes (additions and deletions) with the commands below.

```
$ git add -A
$ git commit -m "move file into contributors folder"
```

Branch name expected: _____

The branch name should match your user name exactly. To change your branch name:

```
$ git branch -M <NEWBRANCHNAME>
```

When you've made your updates, verify again!

Tips

You can create and switch to a branch in one line:

```
$ git checkout -b <BRANCHNAME>
```

Create a new branch:

```
$ git branch <BRANCHNAME>
```

Move onto a branch:

```
$ git checkout <BRANCHNAME>
```

List the branches:

```
$ git branch
```

Rename a branch you're currently on:

```
$ git branch -m <NEWBRANCHNAME>
```

Verify what branch you're working on

```
$ git status
```

FORKS AND CLONES ↲

IT'S A SMALL WORLD ↳

GIT-IT CHALLENGES ABOUT DICTIONARY RESOURCES OPEN AN ISSUE

Git-it

CHALLENGE NUMBER

It's A Small World 8 / 11

The Challenge:

Add a collaborator to your project.

Social Coding

Working with others is one of the best things about GitHub because it makes it easy to work from all over the world at any time.

Collaborators are other GitHub users who are given permission to make edits to a repository owned by someone else. To add collaborators to a project, visit the repository's GitHub page and click the 'Settings' icon on the right side menu. Then select the 'Collaborators' tab. Type in the username to add and click 'Add'.

Step: Hello, Repo Robot!

Go to the your forked Patchwork repository's page on GitHub and add 'reporobot' as a collaborator. The URL should look like this, but with your username.

```
github.com/YOURUSERNAME/patchwork/settings/collaboration
```

Verify with `git-it verify`

Go to the next challenge `git-it`

BRANCHES AREN'T JUST FOR BIRDS ↲

PULL NEVER OUT OF DATE ↳

GIT-IT CHALLENGES ABOUT DICTIONARY RESOURCES OPEN AN ISSUE

Git-it

CHALLENGE NUMBER

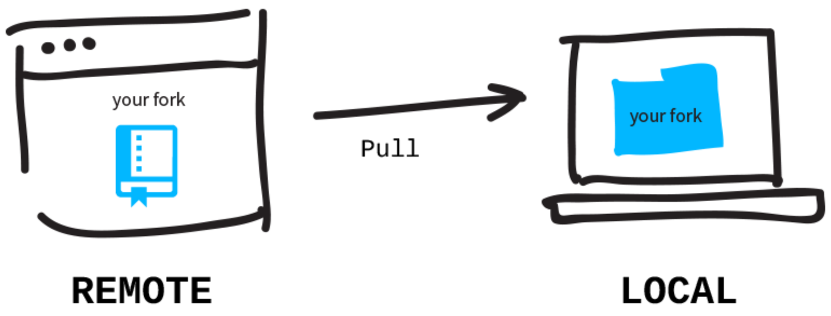
Pull Never Out Of Date 9 / 11

The Challenge:

Keep your file up to date by pulling in changes from collaborators.

Pulling from a Remote

If you're working on something with someone you need to stay up to date with the latest state. So you'll want to **pull** in any changes that may have been made.



Step: What has Reporobot been up to?

See if Reporobot has made any changes to your 'add-' branch by pulling in from the remote named 'origin' on GitHub:

```
$ git pull <REMOTENAME> <BRANCHNAME>
```

If nothing's changed, it will tell you 'Already up-to-date'. If there are changes, it will merge those changes into your local version.

Did Reporobot make changes? Git tells you where changes were made. You can open that file and see Reporobot's updates. Surprise, Reporobot is an artist!

Verify with `git-it verify`

Go to the next challenge `git-it`

TIPS

Check Git status

```
$ git status
```

Pull in changes from a remote branch

```
$ git pull <REMOTENAME> <REMOTEBRANCH>
```

See changes to the remote before you pull in

```
$ git fetch --dry-run
```

Requesting You Pull Please 10 / 11

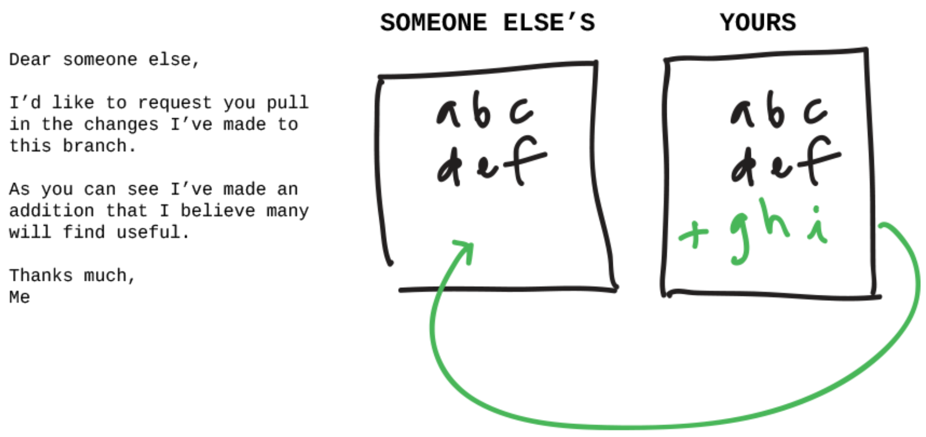
The Challenge:

Submit a Pull Request on the original Patchwork repository.

Pull Requests

When you make changes and improvements to a project you've forked, often you'll want to send those changes to the maintainer of the original and **request** that they **pull** the changes into the original so that everyone can benefit from the updates - that's a **pull request**.

We want to add you to the list of workshop finishers, so make a **pull request** to the original: github.com/jlord/patchwork.


Dear someone else,
I'd like to request you pull in the changes I've made to this branch.
As you can see I've made an addition that I believe many will find useful.
Thanks much,
Me
SOMEONE ELSE'S
YOURS
abc
def
abc
def
+ghi

Step: Create a pull request

Visit the original repository you forked on GitHub, in this case http://github.com/jlord/patchwork.

Often GitHub will detect if you've pushed a branch to a fork and display it at the top of the original's website. If you see that with your 'add-username' branch, you can click Create Pull Request from there. If not:

- Click 'Pull request' on the right-side menu, then 'New pull request'.
- Select the branch with the changes you want to submit. **It should be the one with 'add-yourusername'**.

You'll now see a page with the details of the pull request you're in the process of submitting. The page shows the commits and changes associated with your pull request as compared to the 'gh-pages' branch of the original.

If the original repository has a **contribution documentation**, GitHub will link to it. This is documentation from repository owners on how to best make contributions to that project.

If everything is good, and as you expect it:

- Click 'Create pull request'
- Add a title and description to the changes you're suggesting the original author pull in.
- Click 'Send pull request'!

High five! You've submitted your pull request, take a few seconds to bask in the moment.

If all is well with your pull request, it will be merged within moments. If it's not merged automatically within a few moments, you'll then likely have some comments from Reporobot on why it couldn't merge it. If so, close your pull request on GitHub, make the necessary changes to your branch, push those changes and resubmit your pull request.

Verify with `git-it verify`

Go to the next challenge `git-it`

PULL NEVER OUT OF DATE ↲

MERGE TADA ↳

GIT-IT CHALLENGES ABOUT DICTIONARY RESOURCES OPEN AN ISSUE

Git-it

CHALLENGE

NUMBER

Merge Tada

11 / 11

The Challenge:

Merge your branch locally, delete old branch and pull from upstream for much win!

Step: Merge Locally

Your pull request has been merged! Now, since you know that you definitely want those updates in your forked version, and your branch is in good working order, merge it into the main branch on your forked repository, in this case, 'gh-pages'.

First, move into the branch you want to merge *into* — in this case, branch 'gh-pages'.

```
$ git checkout gh-pages
```

Now tell Git what branch you want to merge *in* — in this case, your feature branch that begins with "add-".

```
$ git merge <BRANCHNAME>
```

Tidy up by deleting your feature branch now that it has been merged.

```
$ git branch -d <BRANCHNAME>
```

You can also delete the branch from your fork on GitHub:

```
$ git push <REMOTENAME> --delete <BRANCHNAME>
```

Step: Pull from Upstream

And last but not least, if you pull in updates from the original (since it now shows you on the home page) you'll be up to date and have a version too, live at: yourusername.github.io/patchwork.

To pull from the original upstream:

```
$ git pull upstream gh-pages
```

Congratulations!

You've created local repositories, remote repositories, worked with a collaborator, pushed, pulled and joined the millions of others developing and enriching open source!

Visit jlord.github.io/patchwork to see your name incorporated!

Verify with `git-it verify`

Go to the next challenge `git-it`

Tips

Merge a branch into current branch

```
$ git merge <BRANCHNAME>
```

Change the branch you're working on

```
$ git checkout <BRANCHNAME>
```

Delete a local branch

```
$ git branch -d <BRANCHNAME>
```

Delete a remote branch

```
$ git push <REMOTENAME> --delete <BRANCHNAME>
```

Pull from a remote branch

```
$ git pull <REMOTENAME> <BRANCHNAME>
```