title: Git FUN!damentals
subtitle: Github-based workflow
minutes:

Enter the OctoCat

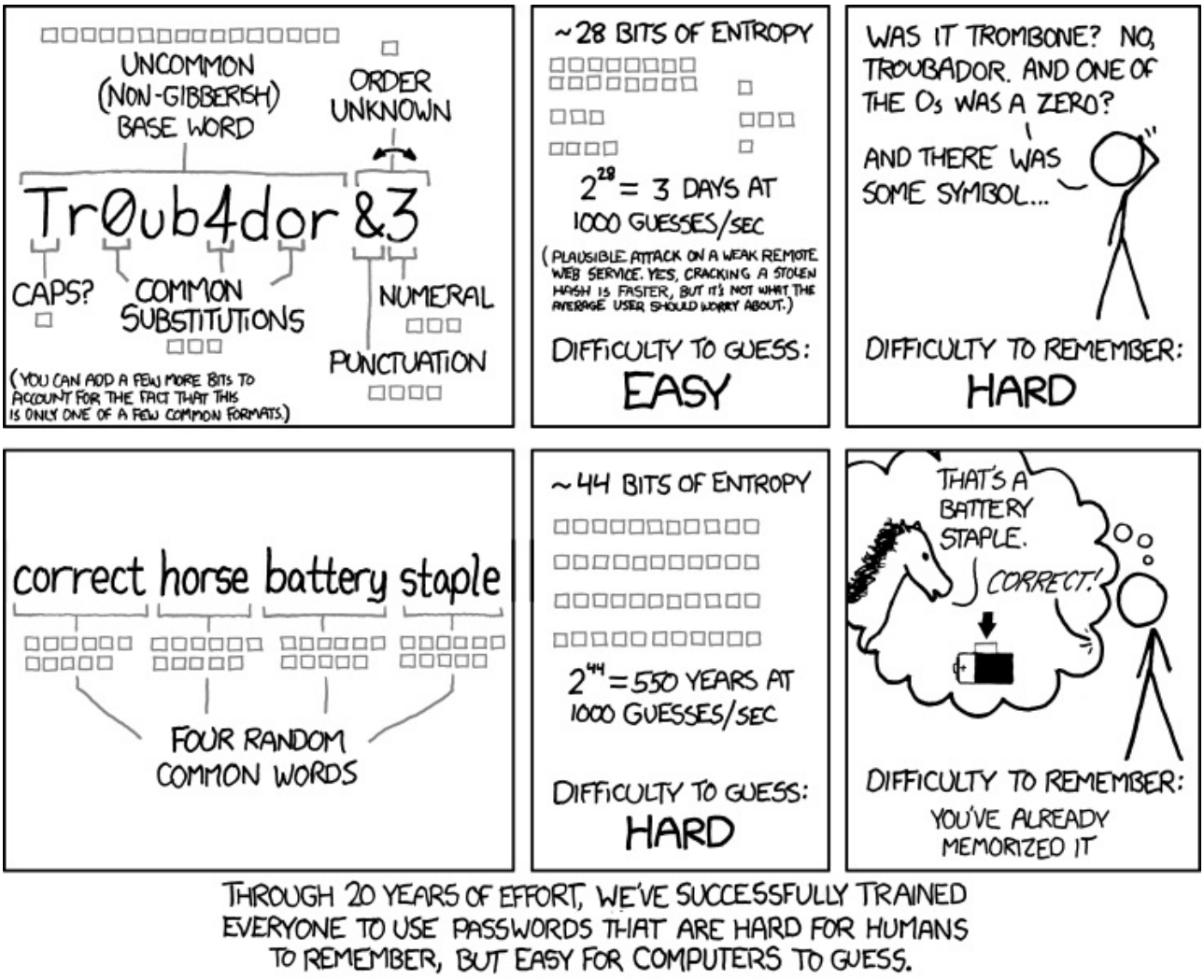
While git is useful to use locally, it is invaluable when there are lots of people contributing to the same project. Github works by being a remote server that stands outside of your local file directory. The basic GitHub workflow looks like:

1. Pull
2. Branch
3. Modify
4. Commit

5. Push

Your first GitHub account

- Go to https://github.com/join (https://github.com/join)
- Follow instructions!
- A free/student account is fine, and you'll get free private repos as a student
- You'll want to use the same email address that you used for git locally
- Choose a strong password!



Enhancing your GitHub account

GitHub offers account upgrades for current students, that you can apply for at https://education.github.com/ (https://education.github.com/)

The education upgrade comes with:

- Free private repositories
- Free upgrade to a Micro account on GitHub (for writing code)
- Free Travis CI account (for testing code)
- Free SendGrid account (automated email API)
- 15USD in Amazon Web Services credits (for deploying code)

- 50USD in Digital Ocean credits (for deploying code)
- No transaction fees for your first 1000USD in sales via Stripe

Creating repos on GitHub

- Go to your homepage
- Press the + in the upper righthand corner
- Select repository

GitHub initializes your repo for you, and can also create a LICENSE, README, and .gitignore with common non-comitted files

Cloning a repo from GitHub

- Many workshops at the D-Lab develop and distribute materials via GitHub
- The process of copying one of these repositories to your local directory is called `cloning`

On the righthand side of the page, you'll see a `clone URL`.

Branching

We've mentioned branching a few times now as the proper workflow. While you may think making changes on your local repository and tracking the changes is sufficient, many workflows will necissitate branching. Branching allows for multiple versions of a repository to exist together in your local files. If you are working on a new feature, you should first create a new branch and then work on the feature in that branch. This allows the master branch to continue serving as the working program, and additionally allows for other intermediate fixes to made to the master branch, all while you're working on your own new feature.

Let's make a new branch in our fruits repository:

```
$ git branch new_fruits
$ git checkout new_fruits
```

We're going to use this branch to add new fruits, while someone else will take care of the fruits already there. If we type `git branch` now we can see the newly created branch. The `checkout` command changes the branch you are currently working on. We can switch between branches by typing:

```
$ git checkout master
$ git checkout new_fruits
```

Each checkout will change the files your working on to the state of that branch.
Let's add a couple fruits to fruit_list.txt:

```
$ nano fruit_list.txt
```

Adding:

```
banana
kiwi
peach
orange
grape
```

Then we add and commit the changes *to that branch* (it will automatically add and commit to the branch you are checked out on):

```
$ git add fruit_list.txt
$ git commit -m "added some new fruits"
```

If the feature works, and we decide we like it, we can merge it into the master branch, after first checking out to `master`:

```
$ git checkout master
```

If we `cat fruit_list.txt`, we see that it does not include our new feature. To merge:

```
$ git merge new_fruits
```

Now the master branch has our new feature. We can delete the branch when work on the feature is over:

```
$ git branch -d new_fruits
```

When we type `git branch` we no longer see our branch.

Vegetables

Everyone will now be working with the person next to them as if you were collaborating on a project together. As we've been working with fruits today, let's finish with vegetables. Partner 1 should create a new repository in GitHub - "vegetables", `clone` the repository to their computer, create a new `branch`, add a file titled `vegetables_list.txt`, which contains a list of vegetables, `add` the file, `commit` the file, `merge` it to the master branch, and `push` it to the remote repository. After this, you should see the file inside the repository on GitHub.

Partner 1 should then give access to the repository to Partner 2 by clicking on the repository, clicking the "Settings" tab, then "Collaborators", and adding Partner 2.

Partner 2 should then `clone` Partner 1's repository, create a new `branch`, modify `vegetables_.txt`, `add` the file, `commit` the file, `merge` to master, and `push` to the remote repository. The changes should now appear on the GitHub page.

To complete the process, Partner 1 should `pull` the changes from the remote to update their local repository.