Introduction to GitHub

Image: https://github.com

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Davis, CA | August 28, 2019

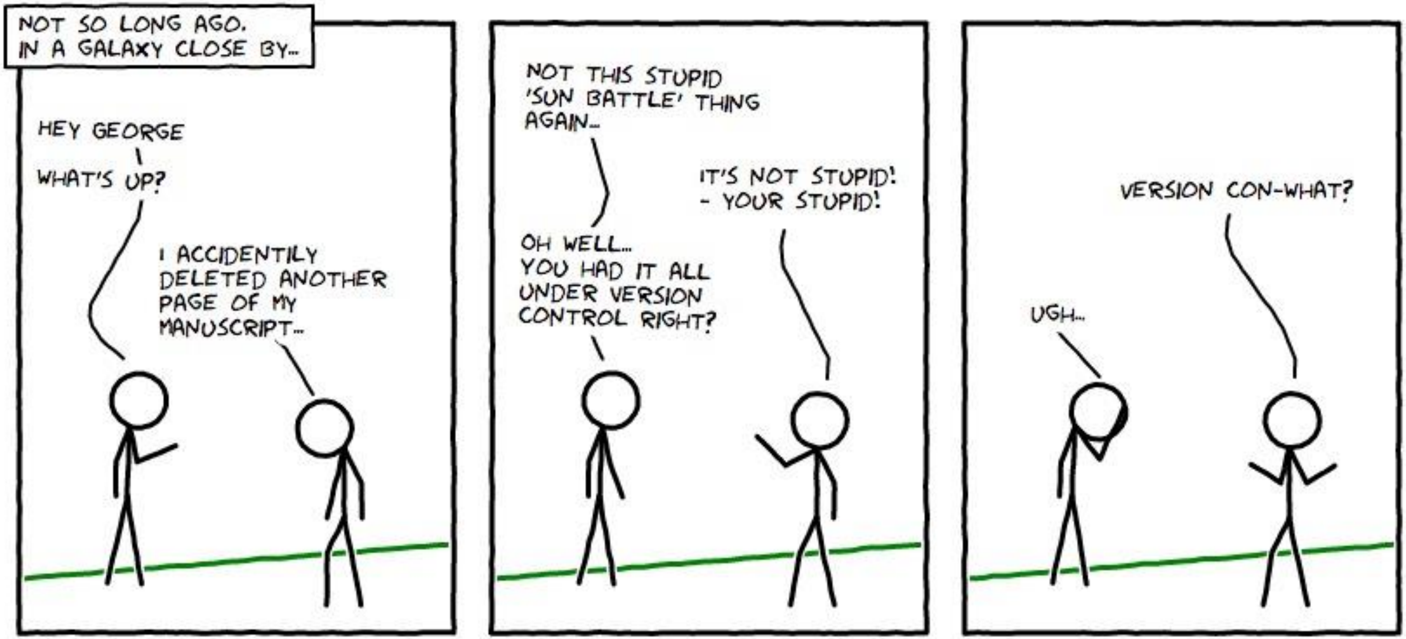
NOT SO LONG AGO.
IN A GALAXY CLOSE BY...
HEY GEORGE
WHAT'S UP?
I ACCIDENTILY DELETED ANOTHER PAGE OF MY MANUSCRIPT...
NOT THIS STUPID 'SUN BATTLE' THING AGAIN...
OH WELL... YOU HAD IT ALL UNDER VERSION CONTROL RIGHT?
IT'S NOT STUPID! - YOUR STUPID!
UGH...
VERSION CON-WHAT?

Image: xkcd CC BY-NC 2.5

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1. Creating, managing, and updating repositories

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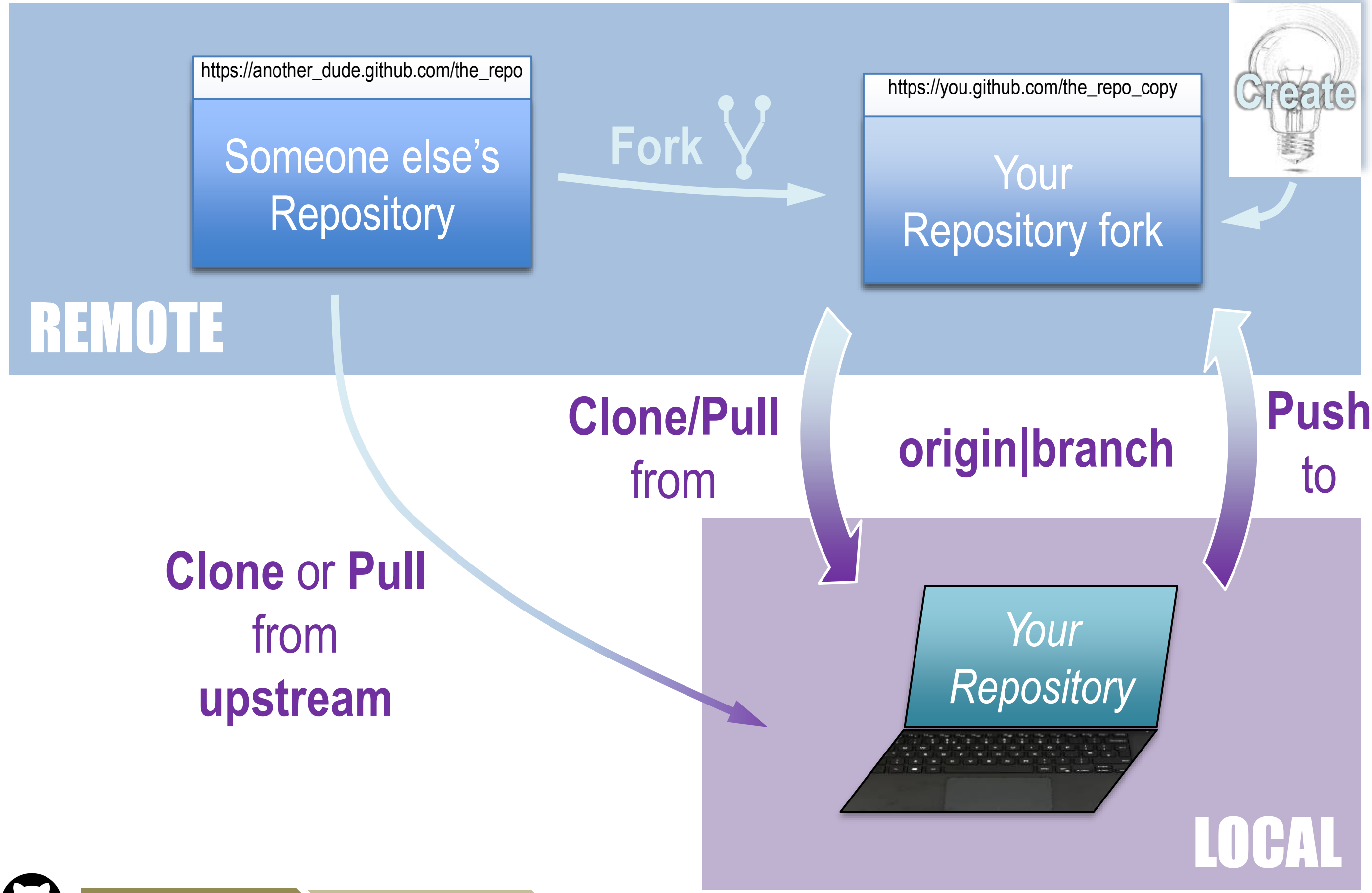
- Write a README.md
- Write Wikis

3. GitHub Pages

- Install and modify (basic) Themes
- Setup master (home) pages: https://my-master.github.io

Creating, managing, and updating repositories

How it works & git vocabulary

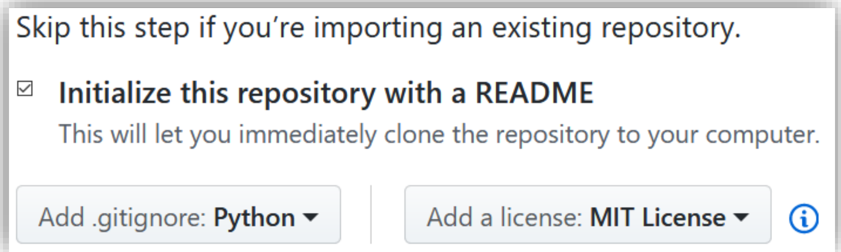

https://another_dude.github.com/the_repo
Someone else's Repository
Fork
https://you.github.com/the_repo_copy
Your Repository fork
Create
REMOTE
Clone/Pull from
origin|branch
Push to
Clone or Pull from upstream
Your Repository
LOCAL

Create a remote Repository

Option 1: Fork an existing repository.

Option 2: **Create a new repository**.

1. **Go to https://github.com and sign in.**
2. **In the upper left corner click on Repositories** New **.**
3. **Name your** *public* **repository (e.g.,** *juices***), add a description, check** *Initialize … with a README*, **select** *Add .gitignore: …*, **and** *Add a license: …*



Skip this step if you're importing an existing repository.

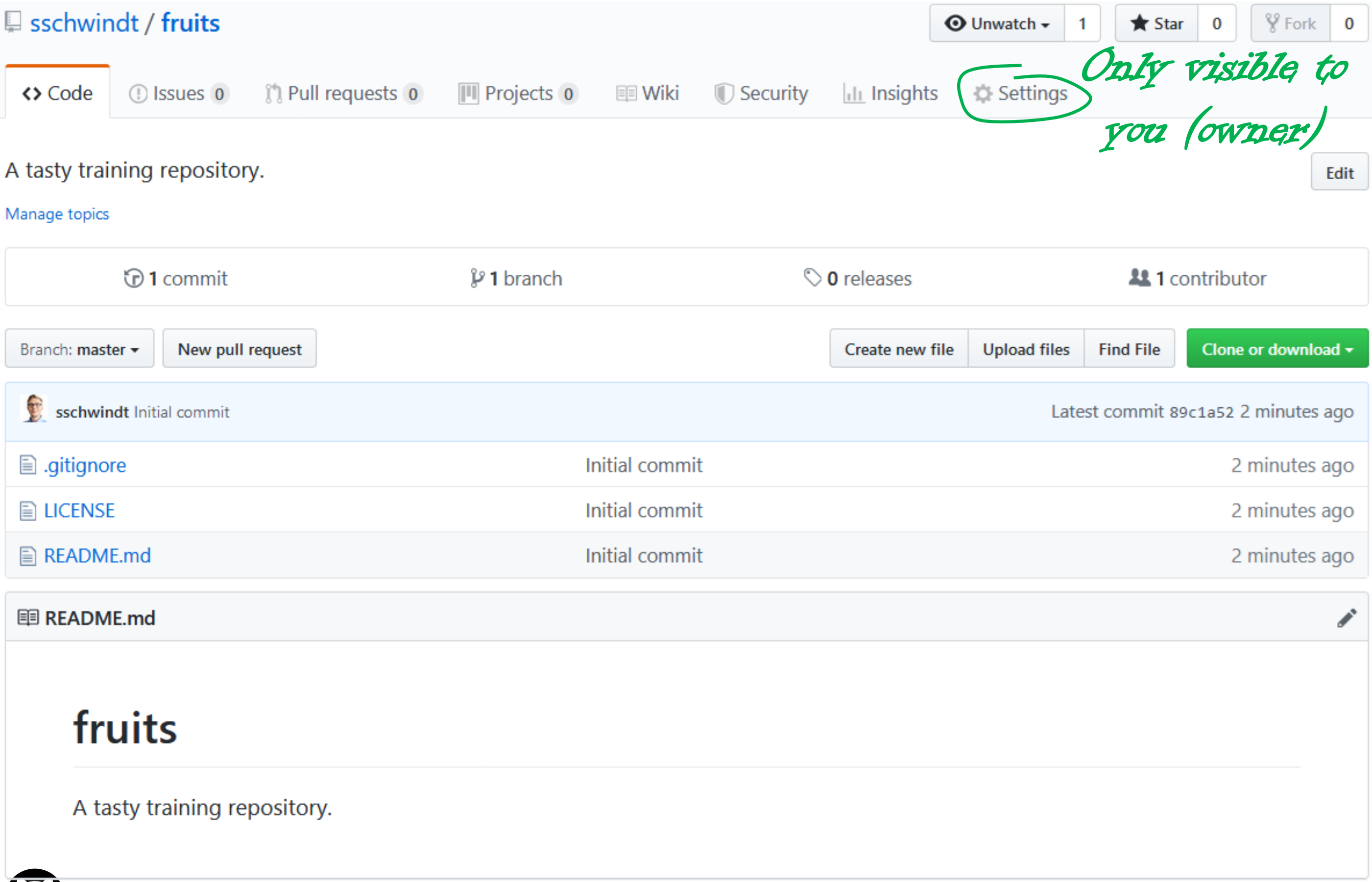
☑ Initialize this repository with a README

This will let you immediately clone the repository to your computer.

Add .gitignore: Python ▾ | Add a license: MIT License ▾ ⓘ

4. **Click on** Create repository **.**

Create a Repository



sschwindt / fruits

Only visible to you (owner)

A tasty training repository.

1 commit | 1 branch | 0 releases | 1 contributor

sschwindt Initial commit — Latest commit 89c1a52 2 minutes ago

.gitignore	Initial commit	2 minutes ago
LICENSE	Initial commit	2 minutes ago
README.md	Initial commit	2 minutes ago

README.md

fruits

A tasty training repository.

Clone a Repository (make local)

Option 1: Download as .zip file (quick-&-dirty).

Option 2: **Pull with git bash**.

1. **Create a new folder for GitHub repositories (e.g.,** *D:\GitHub\* **).**
2. **Open Git Bash (Windows) / command line (Linux).**
   → Requires that git is installed (https://git-scm.com/downloads)
3. **Navigate to the GitHub folder (git bash):** *cd "D:/GitHub/"*
4. **Clone the before created repository:**

   git clone https://github.com/sschwindt/fruits

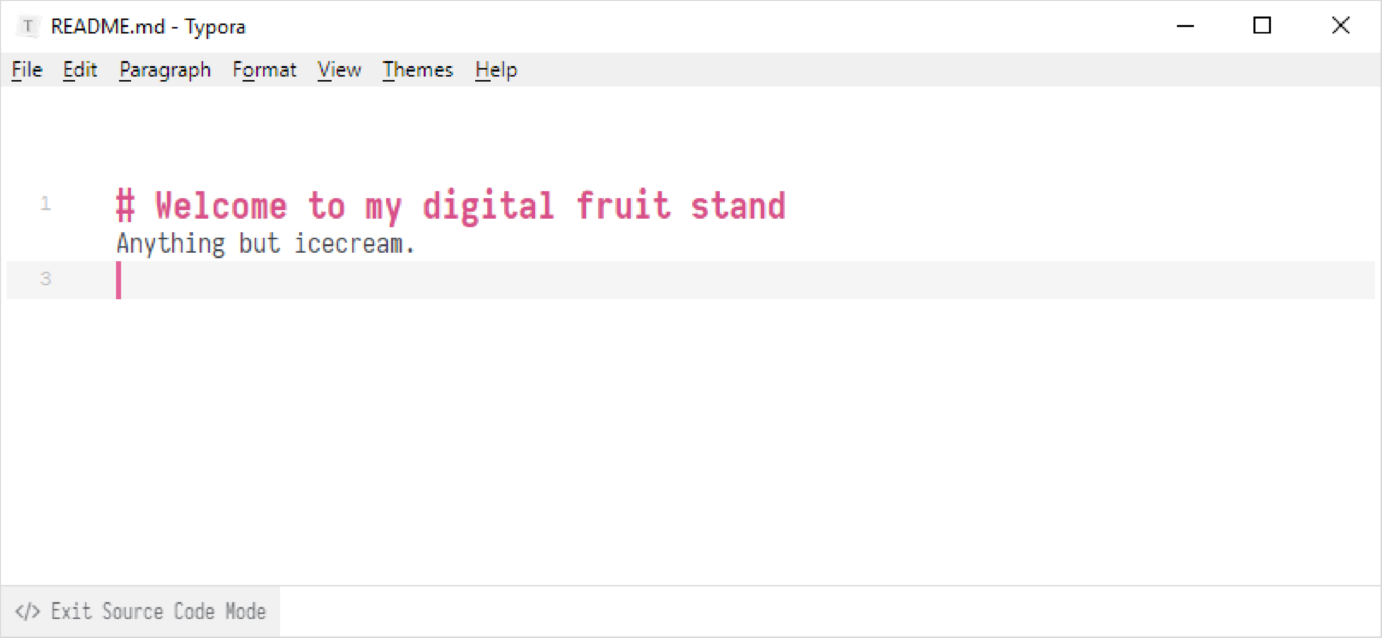
Keep Git Bash open – we'll need it!

Verify that the folder *D:\GitHub\fruits* **contains the repository (explorer).**

Repository → Clone

Modify a Repository (local)

Modify *D:\GitHub\fruits \README.md* **by using any text editor:**



README.md - Typora
File Edit Paragraph Format View Themes Help
</> Exit Source Code Mode

```
# Welcome to my digital fruit stand
Anything but icecream.

```

Push local changes to a remote Repository

Go back to Git Bash:

1. **Go to local copy:** *cd fruits*
2. **Verify status of local copy:** *git status*

   ⟶ Git Bash should prompt that README.md was modified (nothing else).
3. Optional: see what has been changed: *git diff*
4. **Add (stage) changes:** *git add .*

   Determines what is added.

   git add README.md would be sufficient here.

   .gitignore provides enhanced control
5. **Commit changes:**

   git commit –m "Modify Readme"

   Keep track of commits by adding a message (-m).

5. Optional: update local branch (more later on): *git pull --rebase*
6. **Push changes:** *git push* (user name and password will be queried)

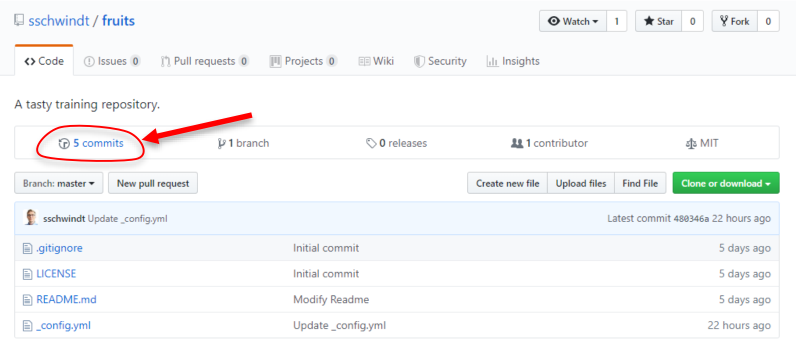
   It may be necessary to set the upstream origin : --set-upstream origin master

Push local changes to a remote Repository

7. Optional: View commit history: *git log*

OR

View detailed commit history on GitHub



sschwindt / **fruits**

Watch ▾ 1 | ★ Star 0 | Fork 0

<> Code | Issues 0 | Pull requests 0 | Projects 0 | Wiki | Security | Insights

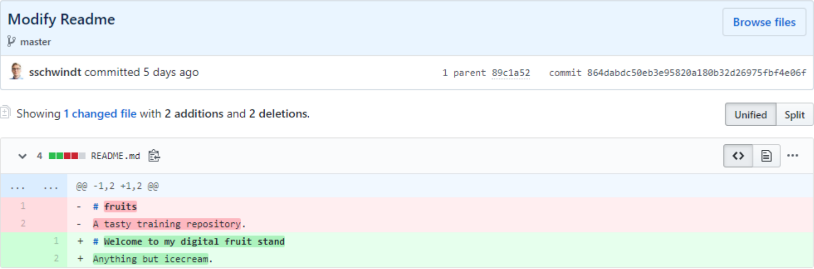
A tasty training repository.

5 commits | 1 branch | 0 releases | 1 contributor | MIT

Branch: master ▾ | New pull request | Create new file | Upload files | Find File | Clone or download ▾

sschwindt Update _config.yml — Latest commit 480346a 22 hours ago

.gitignore	Initial commit	5 days ago
LICENSE	Initial commit	5 days ago
README.md	Modify Readme	5 days ago
_config.yml	Update _config.yml	22 hours ago



Modify Readme

master

Browse files

sschwindt committed 5 days ago — 1 parent 89c1a52 — commit 864dabdc50eb3e95820a180b32d26975fbf4e06f

Showing **1 changed file** with **2 additions** and **2 deletions**.

Unified | Split

4 README.md

```
...   ...   @@ -1,2 +1,2 @@
1           - # fruits
2           - A tasty training repository.
      1     + # Welcome to my digital fruit stand
      2     + Anything but icecream.
```

Updating & merging local repositories

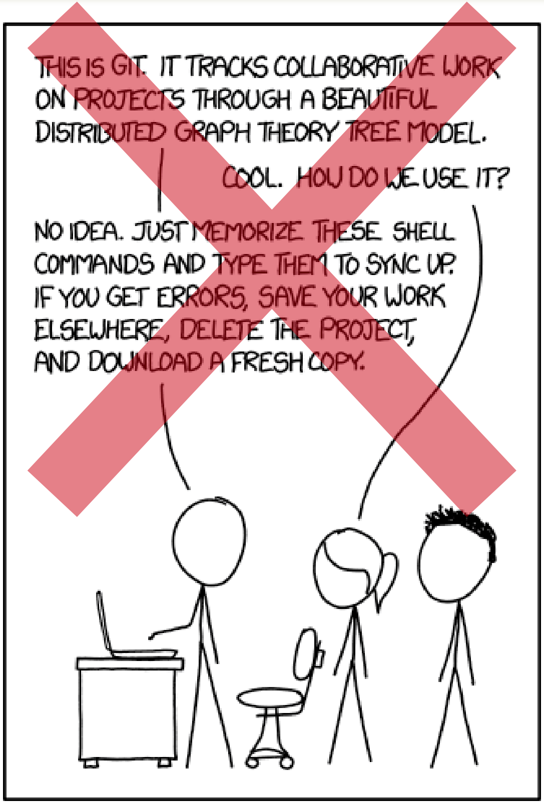

THIS IS GIT. IT TRACKS COLLABORATIVE WORK ON PROJECTS THROUGH A BEAUTIFUL DISTRIBUTED GRAPH THEORY TREE MODEL.
COOL. HOW DO WE USE IT?
NO IDEA. JUST MEMORIZE THESE SHELL COMMANDS AND TYPE THEM TO SYNC UP. IF YOU GET ERRORS, SAVE YOUR WORK ELSEWHERE, DELETE THE PROJECT, AND DOWNLOAD A FRESH COPY.

Image: xkcd 1579 CC BY-NC 2.5

No! ☹

Let's do an exercise …

Repository › Update

Pull/merge changes from a remote Repository

Partner exercise

Partner A

Invite a partner to your repository

1. **Go to your repo on GitHub:** e.g., *https://github.com/klarrieu/veggies*
2. **Select** *Settings → Collaborators* **and add partner B.**

Partner B

Accept the invitation to collaborate & clone the repository

1. **Go to local folder:** *cd "D:/GitHub"*
2. **Clone the repository:** *git clone https://github.com/klarrieu/veggies*
3. **Go to local copy:** *cd veggies*

Now both partners should have a local copy of A's repository.

Pull/merge changes from a remote Repository

Both partner A and B

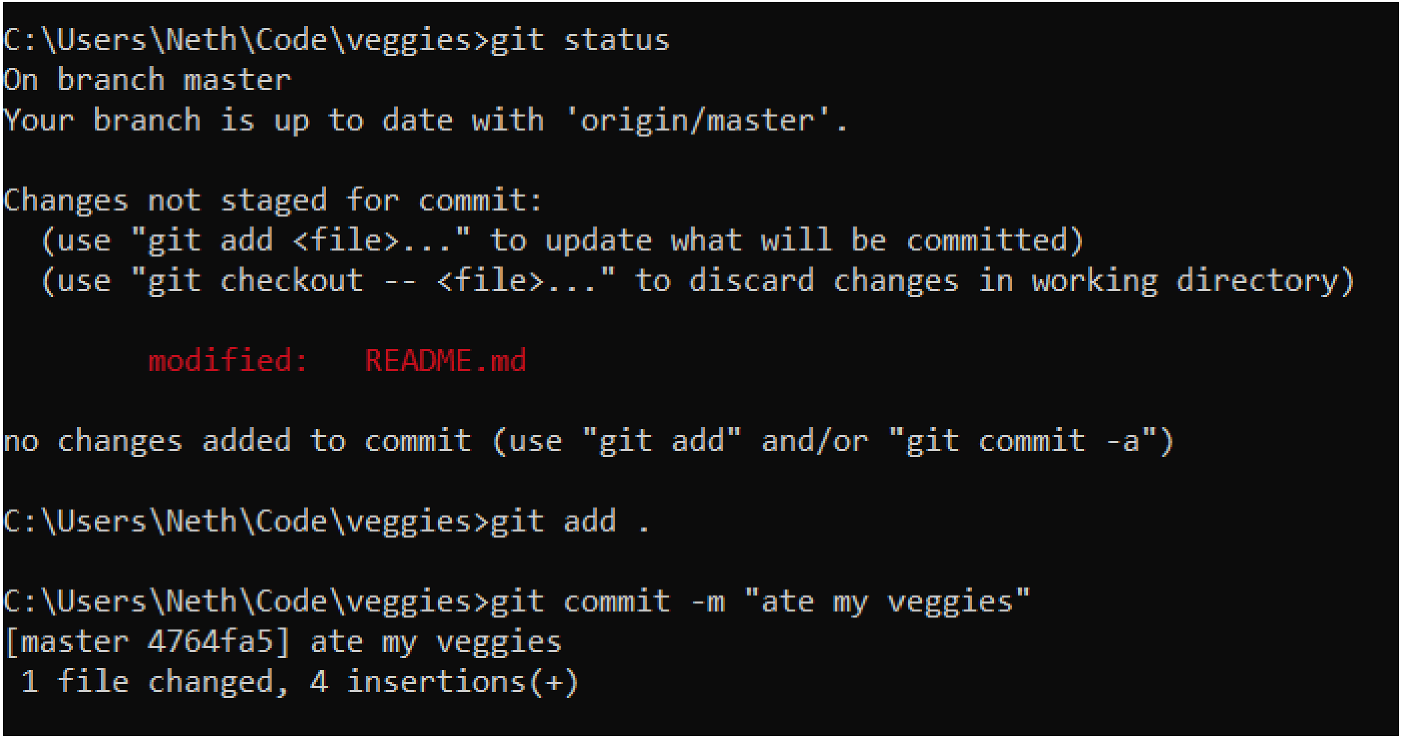
→ **Modify** *README.md* **in your local repository**

→ **Add (***git add .* **), commit (***git commit –m "I did…omg"***), and push (***git push***) your changes**

… and see what happens.

Pull/merge changes from a remote Repository

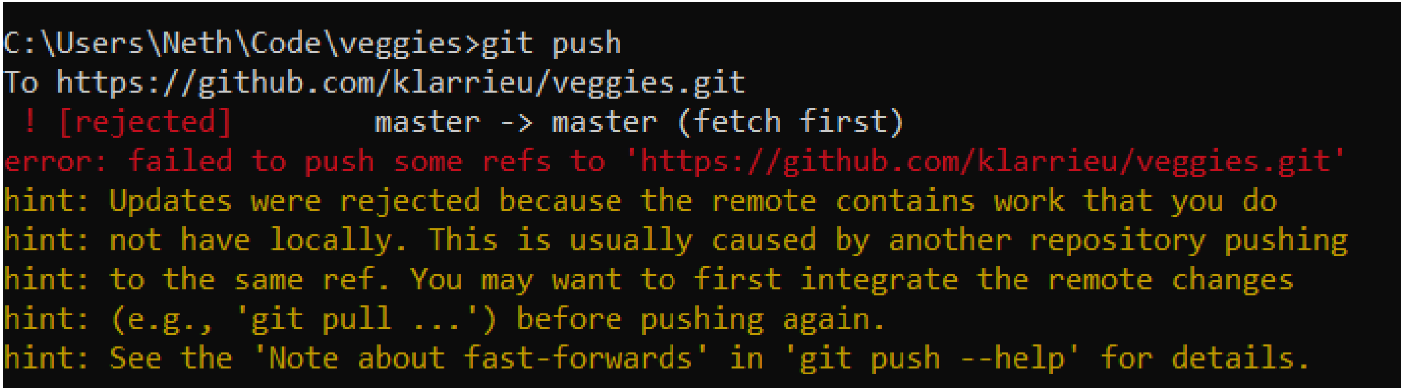
Modifying your local copy, it appears nothing is wrong…



```
C:\Users\Neth\Code\veggies>git status
On branch master
Your branch is up to date with 'origin/master'.

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   README.md

no changes added to commit (use "git add" and/or "git commit -a")

C:\Users\Neth\Code\veggies>git add .

C:\Users\Neth\Code\veggies>git commit -m "ate my veggies"
[master 4764fa5] ate my veggies
 1 file changed, 4 insertions(+)
```

Pull/merge changes from a remote Repository

…but when you try to push your changes to remote, you see this!



```
C:\Users\Neth\Code\veggies>git push
To https://github.com/klarrieu/veggies.git
 ! [rejected]        master -> master (fetch first)
error: failed to push some refs to 'https://github.com/klarrieu/veggies.git'
hint: Updates were rejected because the remote contains work that you do
hint: not have locally. This is usually caused by another repository pushing
hint: to the same ref. You may want to first integrate the remote changes
hint: (e.g., 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
```

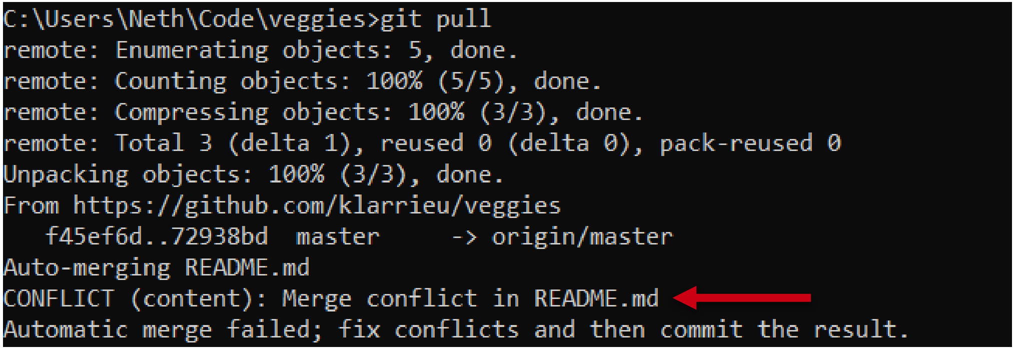
While we were modifying the local repo, changes were made to remote.

We need to pull the remote changes before we can integrate our local changes (*git pull --rebase*).

Pull/merge changes from a remote Repository

Merge conflict: Multiple contributors pushed changes to the same lines in the same file.

→ Git does not know which changes should be kept.

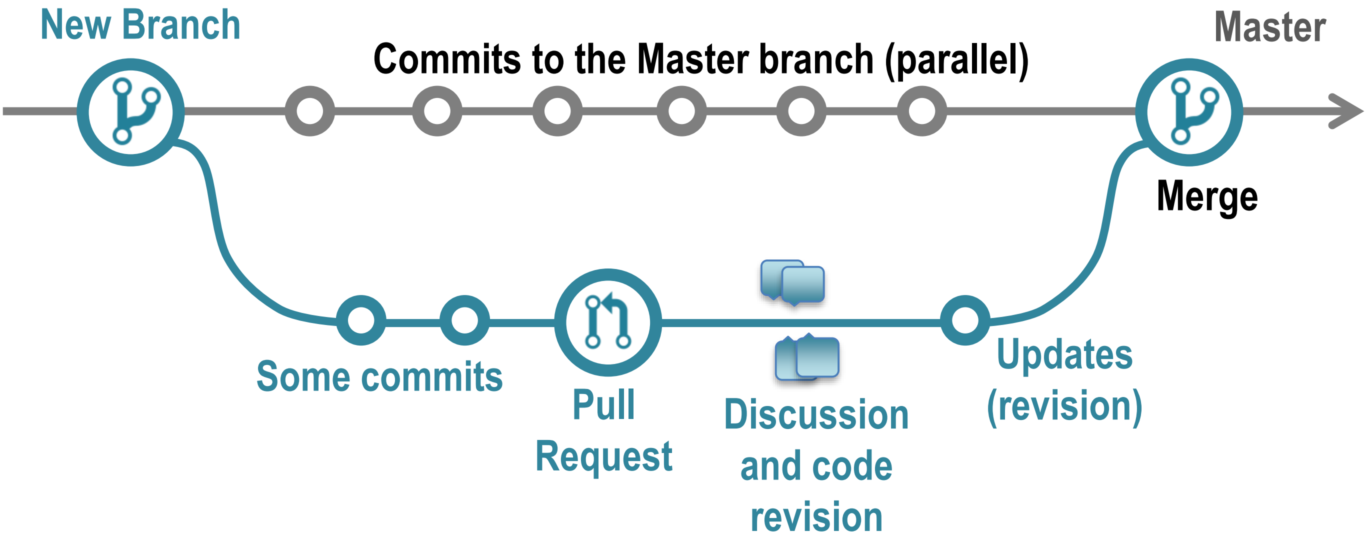


```
C:\Users\Neth\Code\veggies>git pull
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
From https://github.com/klarrieu/veggies
   f45ef6d..72938bd  master     -> origin/master
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
Automatic merge failed; fix conflicts and then commit the result.
```

Remedy:

1. **Open the file where the merge conflict occurred** (README.md)
2. **Edit the file, deciding which lines of code to keep in the process.**
3. **Add [***git add .* **], commit [***git commit –m “Fixed merge conflict”***], and push [***git push***] your changes.**

Working with branches


New Branch
Commits to the Master branch (parallel)
Master
Merge
Some commits
Pull Request
Discussion and code revision
Updates (revision)

Further reading: https://help.github.com/en/articles/about-branches

Images: slidesharecdn.com, octicons.github.com

Markdown & Documentation

What is Markdown

Created in 2004, Markdown became a popular **markup** language.

Syntactically distinguishable computer text

Syntactic text

```
# Better than Word/Richtext
*OS*-independent functionality:
- Avoid formatting of the same kind of thing redundantly (and inconsistently)
- Backwards compatibility
- Formulae handling … etc.
```

Marked up

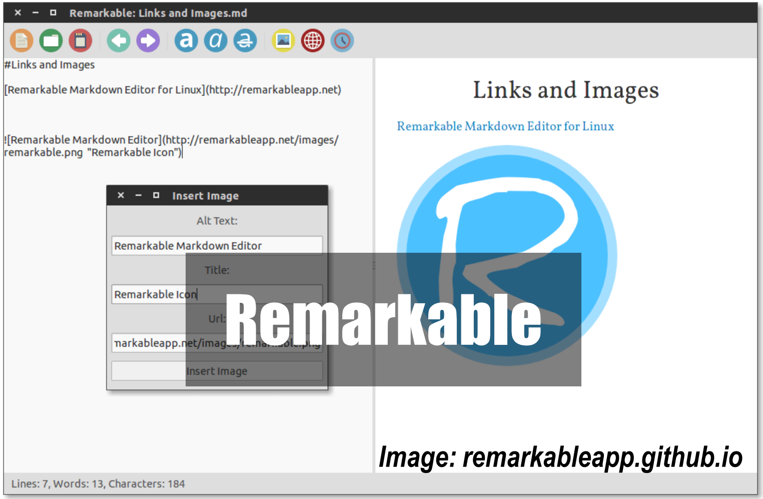
Better than Word/Richtext

OS-independent functionality:

- *Avoid formatting of the same kind of thing redundantly (and inconsistently)*
- *Backwards compatibility*
- *Formulae handling … etc.*

- ▶ Popular markup languages: LaTeX, XML, HTML, **Markdown** (simplified HTML)
- ▶ Popular editors: Remarkable, Abricotine, Mark Text, Typora

Get your favorite …



```
#Links and Images

[Remarkable Markdown Editor for Linux](http://remarkableapp.net)


![Remarkable Markdown Editor](http://remarkableapp.net/images/
remarkable.png "Remarkable Icon")
```

Alt Text: Remarkable Markdown Editor

Title: Remarkable Icon

Url: narkableapp.net/images/remarkable.png

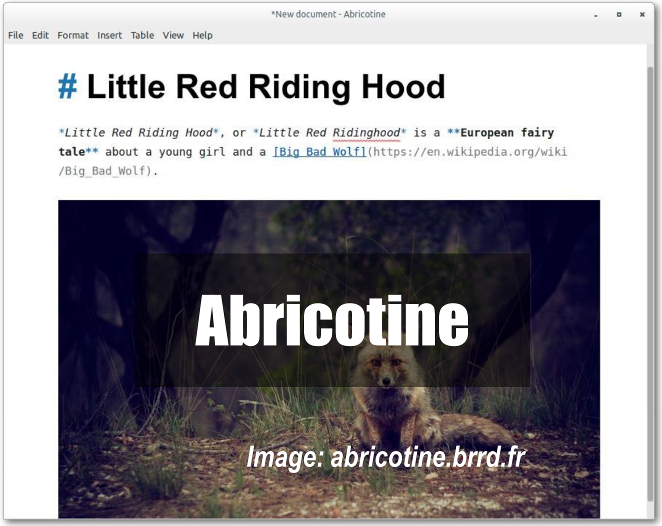
Links and Images

Remarkable Markdown Editor for Linux

Lines: 7, Words: 13, Characters: 184

Remarkable

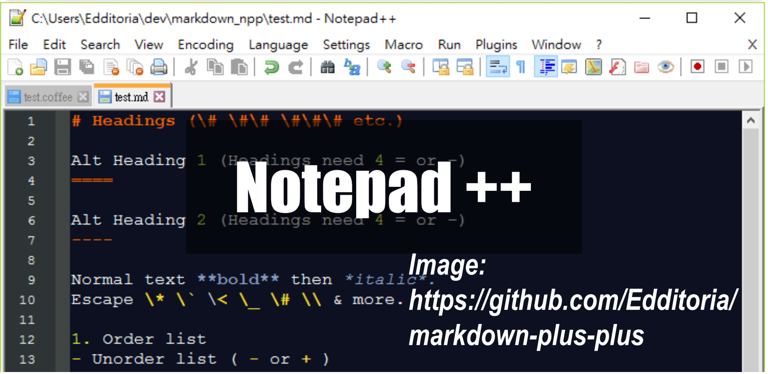
Image: remarkableapp.github.io



```
# Little Red Riding Hood

*Little Red Riding Hood*, or *Little Red Ridinghood* is a **European fairy
tale** about a young girl and a [Big Bad Wolf](https://en.wikipedia.org/wiki
/Big_Bad_Wolf).
```

Abricotine

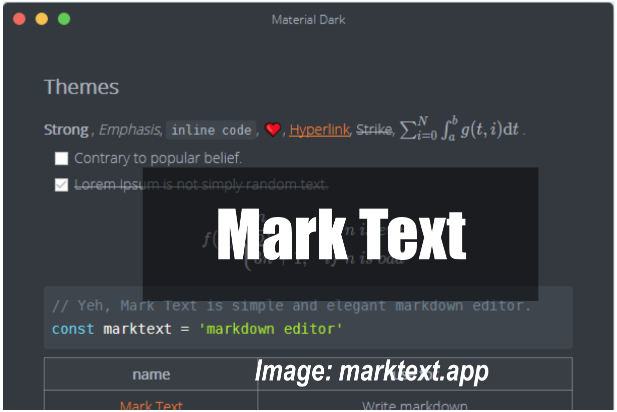
Image: abricotine.brrd.fr



```
# Headings (\# \#\# \#\#\# etc.)

Alt Heading 1 (Headings need 4 = or -)
====

Alt Heading 2 (Headings need 4 = or -)
----

Normal text **bold** then *italic*.
Escape \* \` \< \_ \# \\ & more.

1. Order list
- Unorder list ( - or + )
```

Notepad ++

Image: https://github.com/Edditoria/markdown-plus-plus



Themes

Strong, *Emphasis*, `inline code`, ❤, Hyperlink, ~~Strike~~, $\sum_{i=0}^{N} \int_a^b g(t,i)dt$.

□ Contrary to popular belief.

☑ ~~Lorem Ipsum is not simply random text.~~

```
// Yeh, Mark Text is simple and elegant markdown editor.
const marktext = 'markdown editor'
```

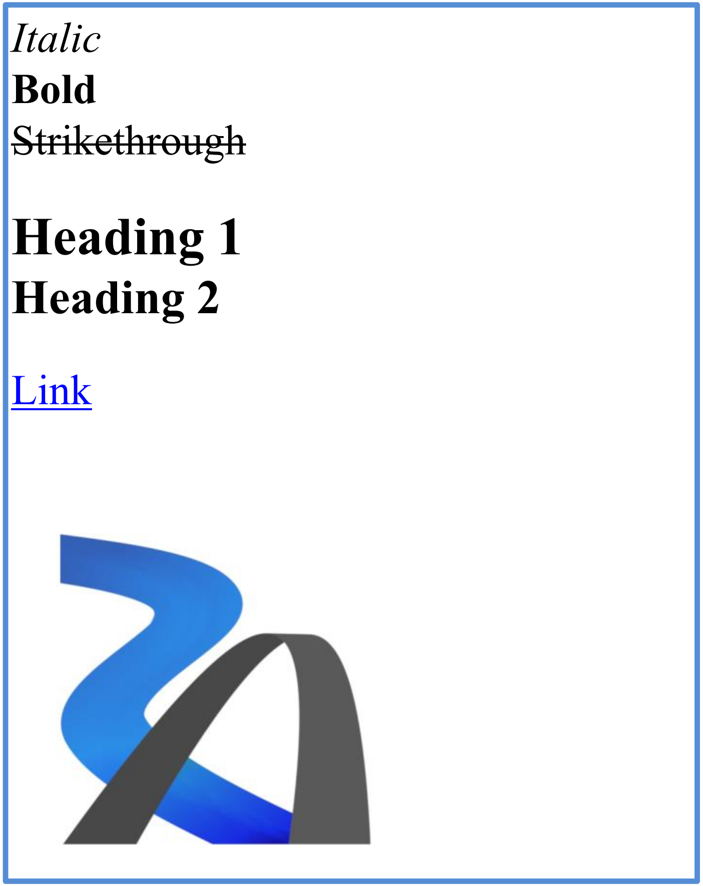
name	[illegible]
Mark Text	Write markdown

Mark Text

Image: marktext.app

How to use Markdown (.md) (1)

```
*Italic*
**Bold**
~~Strikethrough~~

# Heading 1
## Heading 2

[Link](https://fruitsinfo.com)


![ImgName](https://raw.githubusercontent.com/RiverArchitect/Media/master/images/RA_icon.png)
```



Italic

Bold

~~Strikethrough~~

Heading 1

Heading 2

Link

How to use Markdown (.md) (2)

~~~
> Blockquote

* List item 1
* List item 2

1. Numbered list item 1
2. Numbered list item 2

*** (Horizontal Rule)


Embedded `inline code`

```
# code block
print (‘To be or not to be’)
```
~~~

> *Blockquote*

- *List item 1*
- *List item 2*

1. *Numbered list item 1*
2. *Numbered list item 2*

(Horizontal Rule)

Embedded `inline code`

```
# code block
print (‘To be or not to be’)
```

How to use Markdown (.md) (3)

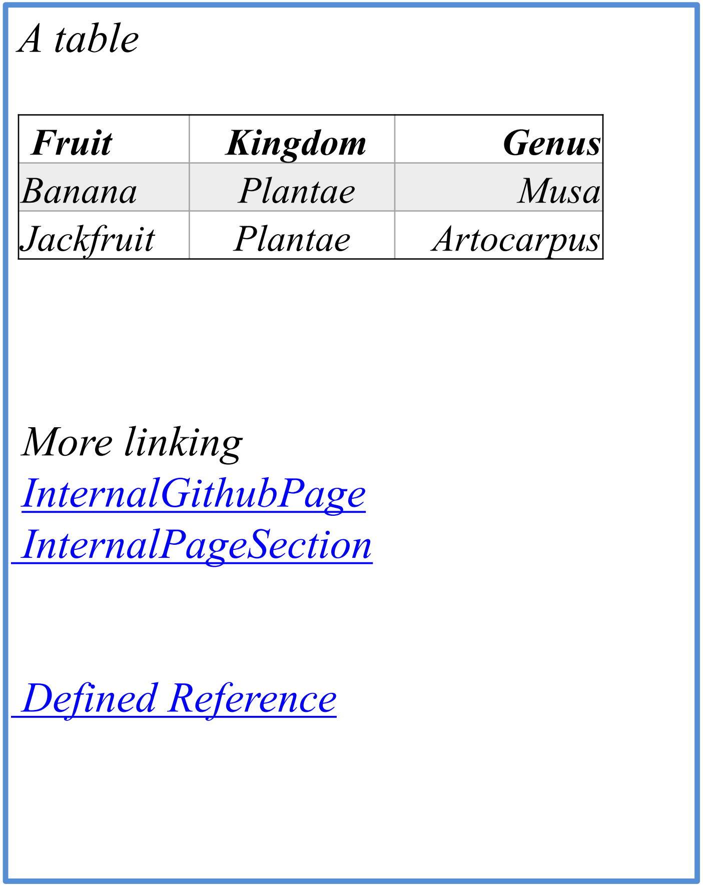
```
A table

| Fruit | Kingdom | Genus |
|-------|:-------:|------:|
|Banana | Plantae | Musa |
|Jackfruit|Plantae|Artocarpus|



More linking
[[InternalGithubPage]]
[InternalPageSection](Internal
PageSection#Header-name)
```

Go to section   Space = "-"

```
[Defined Reference][1]
```

Define it!

```
[1]: https://wikipedia.org
```



A table

Fruit	Kingdom	Genus
Banana	Plantae	Musa
Jackfruit	Plantae	Artocarpus

More linking

InternalGithubPage

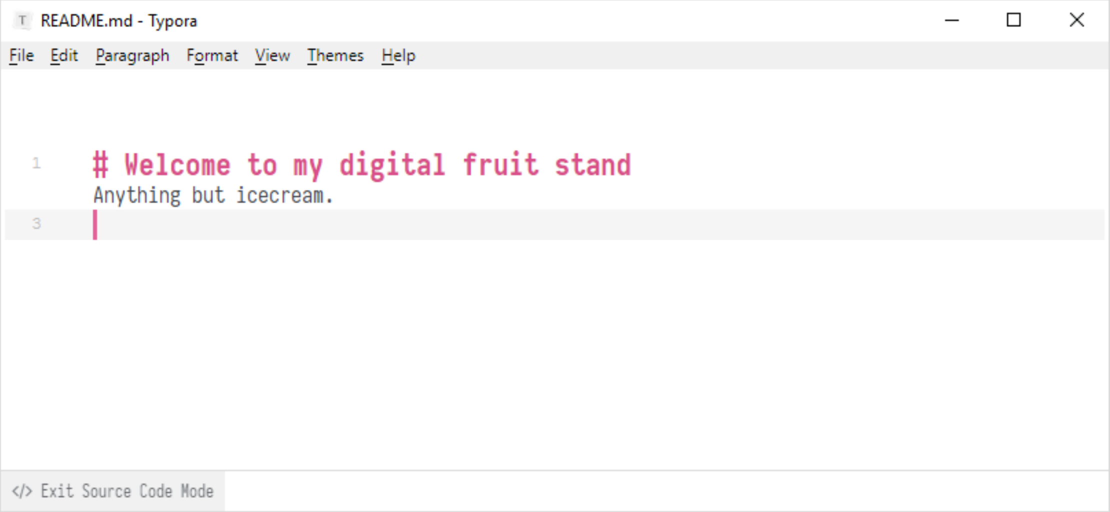
InternalPageSection

Defined Reference

Edit README.md

Go back to Git Bash:

1. **Go to local copy of Repository:** *cd fruits*
2. **Verify status of local copy:** *git status*
3. **In the explorer: Open README.md with Markdwon Editor and rewrite it**: README.md = your automated welcome page



README.md - Typora
File Edit Paragraph Format View Themes Help
</> Exit Source Code Mode

```
# Welcome to my digital fruit stand
Anything but icecream.
```

Push local changes to remote

Go back to Git Bash:

1. **Verify status of local copy:** *git status*

   ⟶ Git Bash should prompt that README.md was modified (nothing else).

2. **Add (stage) changes:** *git add .*

3. **Commit changes:**

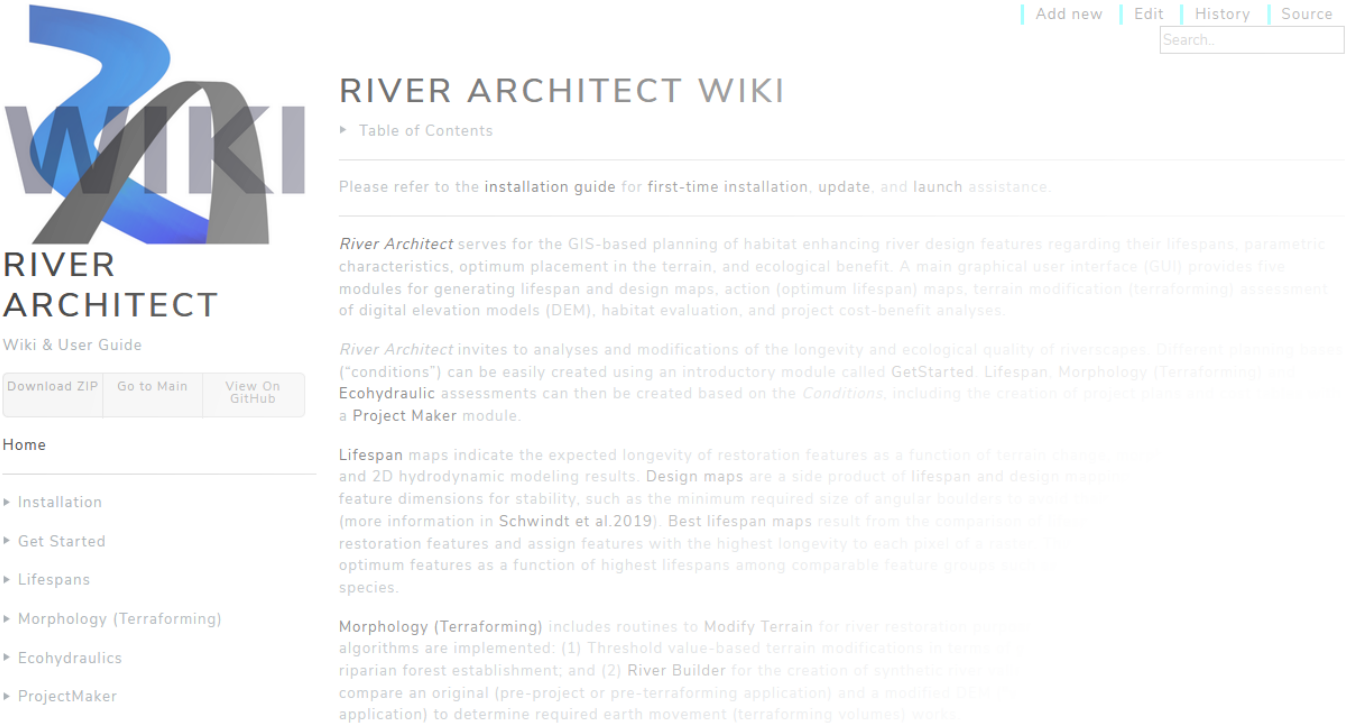
   git commit –m "Make Readme Great Again"

5. **Update local branch** (just good practice…): *git pull --rebase*

6. **Push changes:** *git push*

Wikis

Working collaboratively is more than sharing codes …



Home

- Installation
- Get Started
- Lifespans
- Morphology (Terraforming)
- Ecohydraulics
- ProjectMaker

RIVER ARCHITECT WIKI

- Table of Contents

Please refer to the installation guide for first-time installation, update, and launch assistance.

River Architect serves for the GIS-based planning of habitat enhancing river design features regarding their lifespans, parametric characteristics, optimum placement in the terrain, and ecological benefit. A main graphical user interface (GUI) provides five modules for generating lifespan and design maps, action (optimum lifespan) maps, terrain modification (terraforming) assessment of digital elevation models (DEM), habitat evaluation, and project cost-benefit analyses.

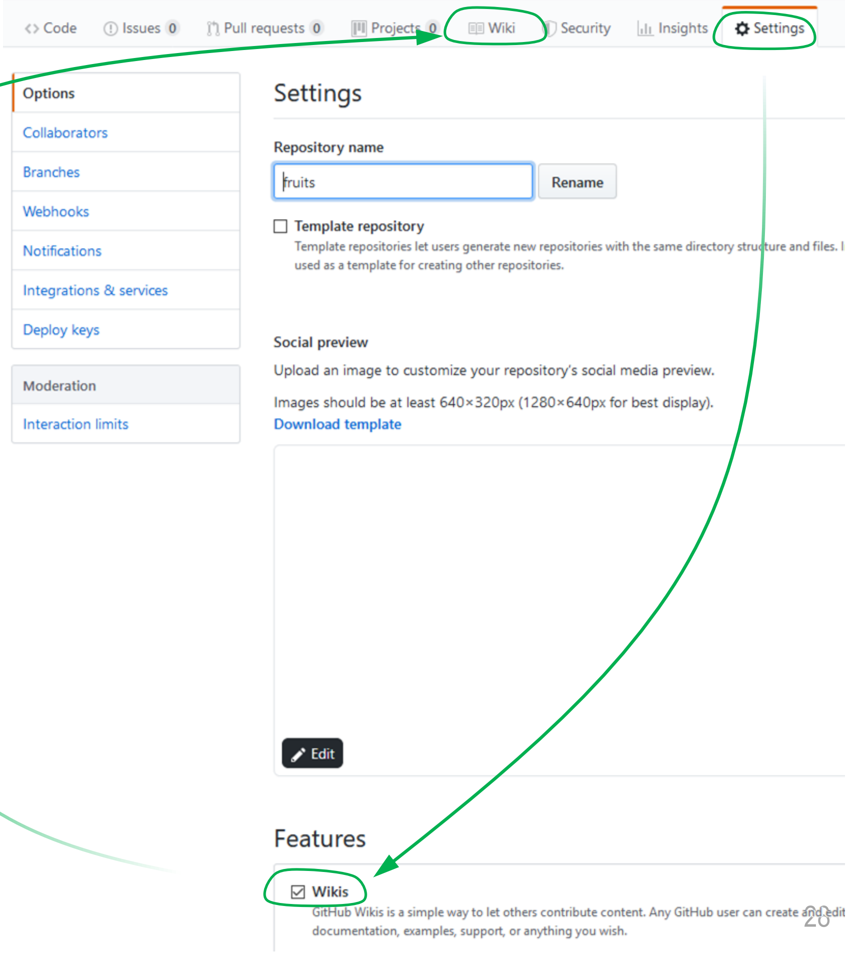
River Architect invites to analyses and modifications of the longevity and ecological quality of riverscapes. Different planning bases ("conditions") can be easily created using an introductory module called GetStarted. Lifespan, Morphology (Terraforming) and Ecohydraulic assessments can then be created based on the *Conditions*, including the creation of project plans and cost tables with a Project Maker module.

Lifespan maps indicate the expected longevity of restoration features as a function of terrain change, morph
and 2D hydrodynamic modeling results. Design maps are a side product of lifespan and design mapping
feature dimensions for stability, such as the minimum required size of angular boulders to avoid their
(more information in Schwindt et al.2019). Best lifespan maps result from the comparison of lifesp
restoration features and assign features with the highest longevity to each pixel of a raster. The
optimum features as a function of highest lifespans among comparable feature groups such as
species.

Morphology (Terraforming) includes routines to Modify Terrain for river restoration purpo
algorithms are implemented: (1) Threshold value-based terrain modifications in terms of g
riparian forest establishment; and (2) River Builder for the creation of synthetic river valle
compare an original (pre-project or pre-terraforming application) and a modified DEM (p
application) to determine required earth movement (terraforming volumes) works.

Wikis

Enable Wiki for a repository



<> Code | Issues 0 | Pull requests 0 | Projects 0 | Wiki | Security | Insights | Settings

- Options
- Collaborators
- Branches
- Webhooks
- Notifications
- Integrations & services
- Deploy keys

- Moderation
- Interaction limits

Settings

Repository name

fruits | **Rename**

□ **Template repository**

Template repositories let users generate new repositories with the same directory structure and files. I
used as a template for creating other repositories.

Social preview

Upload an image to customize your repository's social media preview.

Images should be at least 640×320px (1280×640px for best display).
Download template

Edit

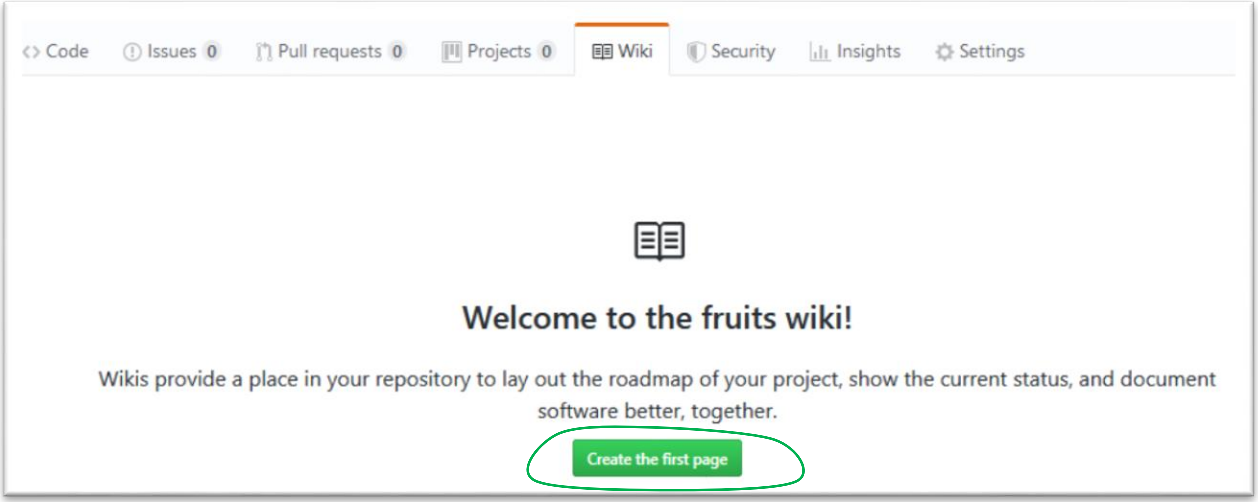
Features

☑ **Wikis**

GitHub Wikis is a simple way to let others contribute content. Any GitHub user can create and edit
documentation, examples, support, or anything you wish.

Wikis

Get started



Welcome to the fruits wiki!

Wikis provide a place in your repository to lay out the roadmap of your project, show the current status, and document software better, together.

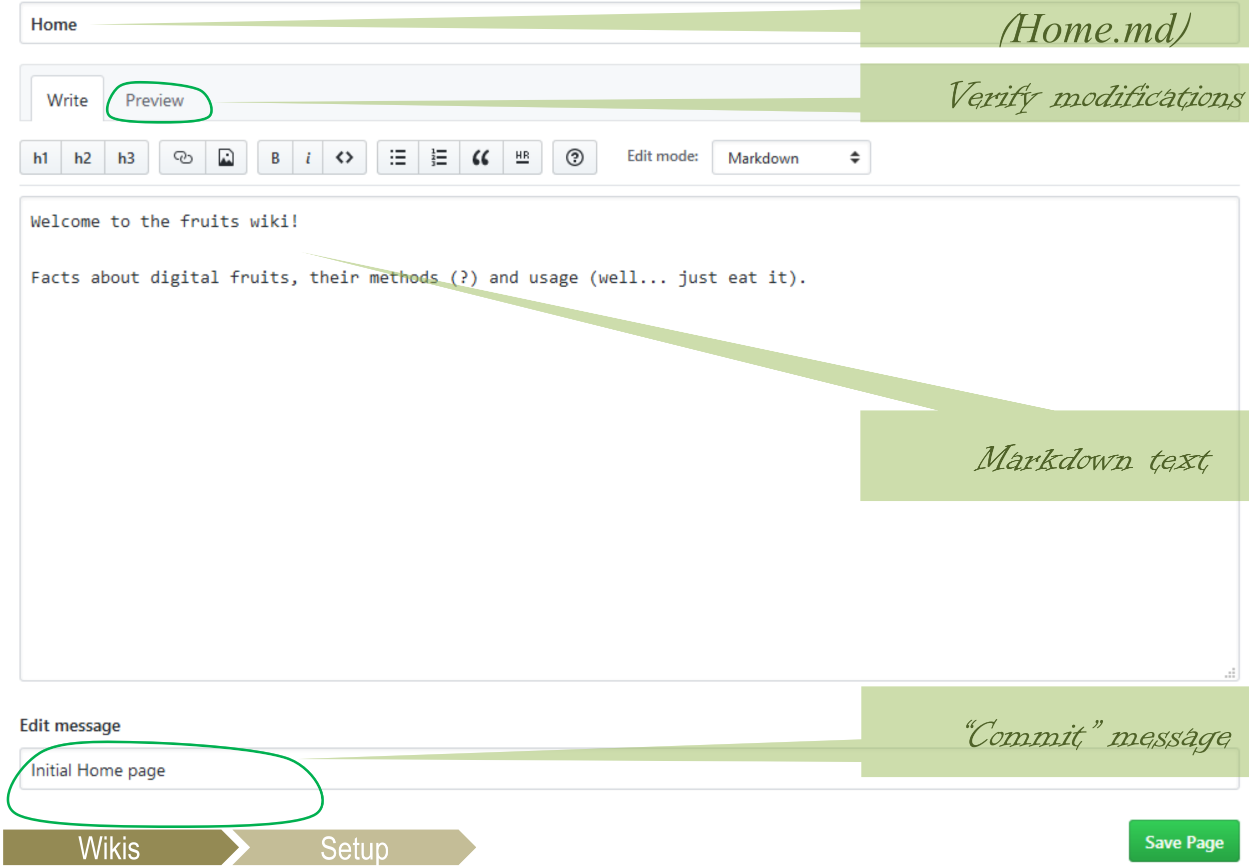
Note: The Wiki is a repository within the repository

→ It can be cloned like any other repository:

`https://github.com/`*`YOUR_ID`*`/`*`REPO`*`.wiki.git`

Wikis

Get started: Create “Home”.md



Home

Edit mode: Markdown

```
Welcome to the fruits wiki!

Facts about digital fruits, their methods (?) and usage (well... just eat it).
```

Edit message

Initial Home page

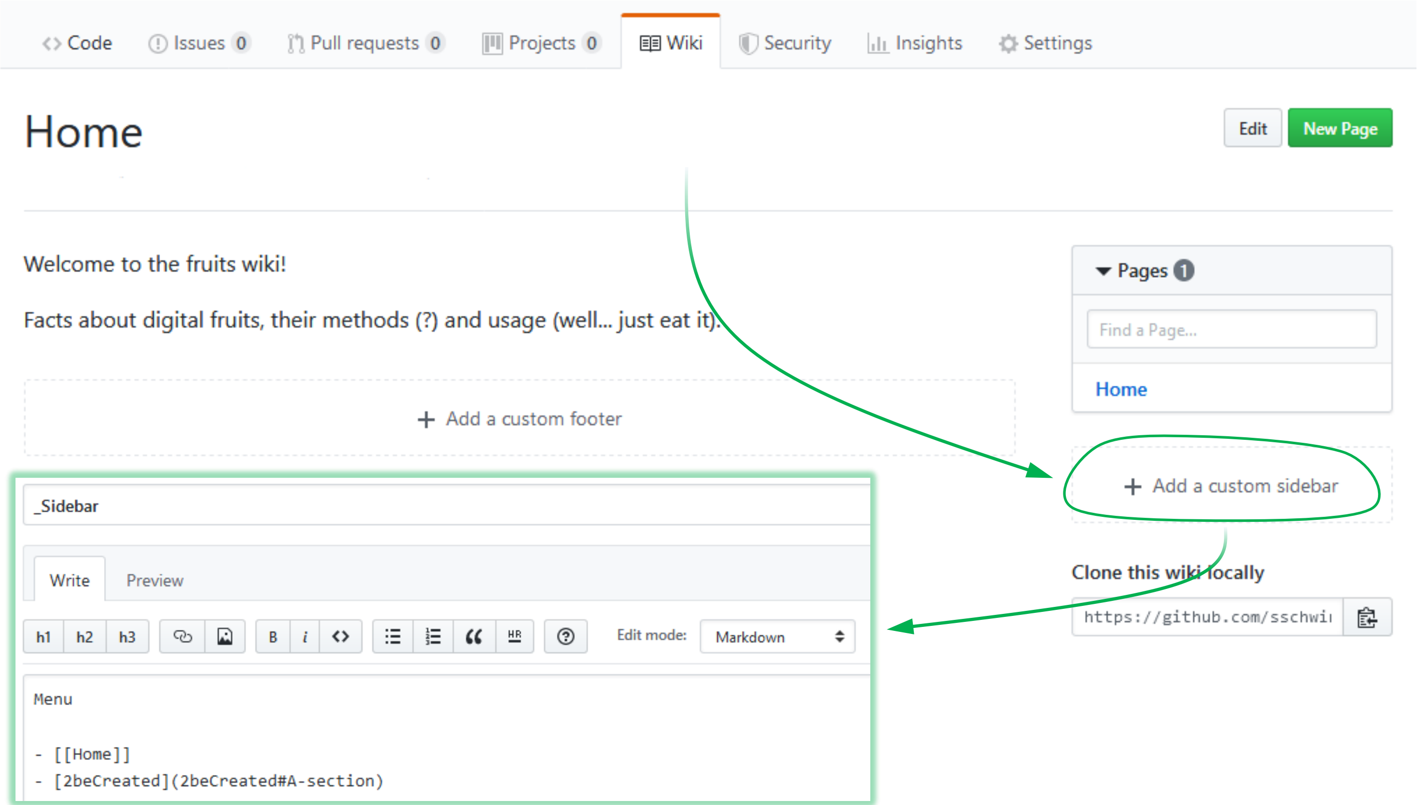
Define page name (Home.md)

Verify modifications

Markdown text

“Commit” message

Get started: Add a sidebar



Home

Welcome to the fruits wiki!

Facts about digital fruits, their methods (?) and usage (well... just eat it).

https://github.com/sschwi

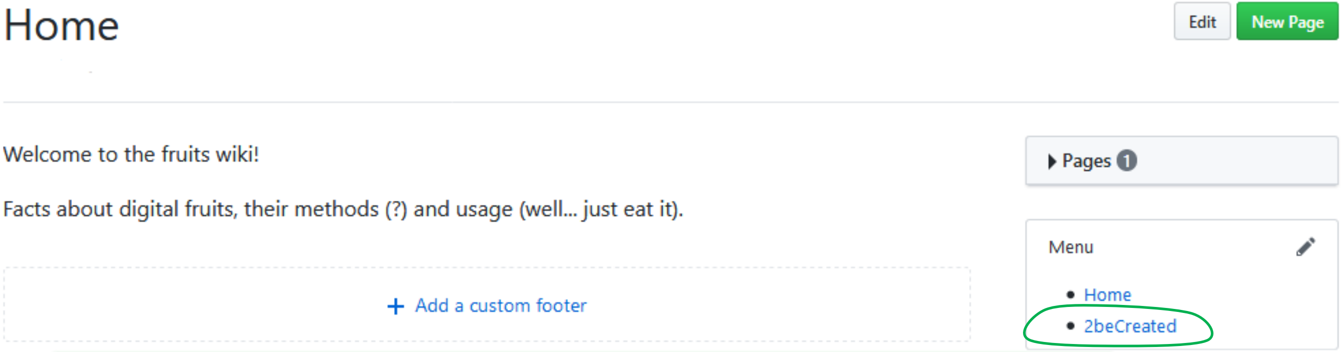
_Sidebar

Edit mode: Markdown

```
Menu

- [[Home]]
- [2beCreated](2beCreated#A-section)
```

Wikis

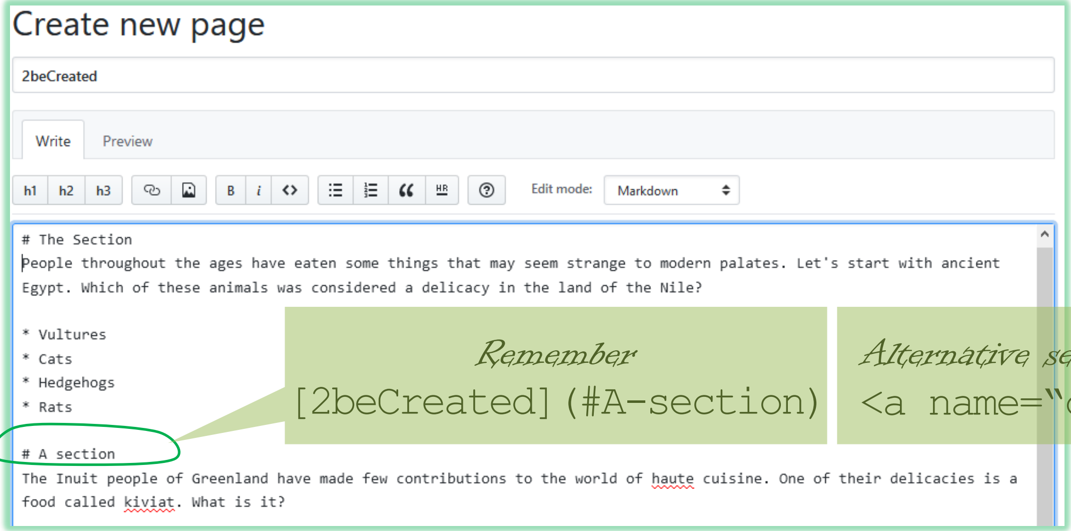
Get started: Add another page



Home

Welcome to the fruits wiki!

Facts about digital fruits, their methods (?) and usage (well... just eat it).



Create new page

2beCreated

```
# The Section
People throughout the ages have eaten some things that may seem strange to modern palates. Let's start with ancient
Egypt. Which of these animals was considered a delicacy in the land of the Nile?

* Vultures
* Cats
* Hedgehogs
* Rats

# A section
The Inuit people of Greenland have made few contributions to the world of haute cuisine. One of their delicacies is a
food called kiviat. What is it?
```

Remember

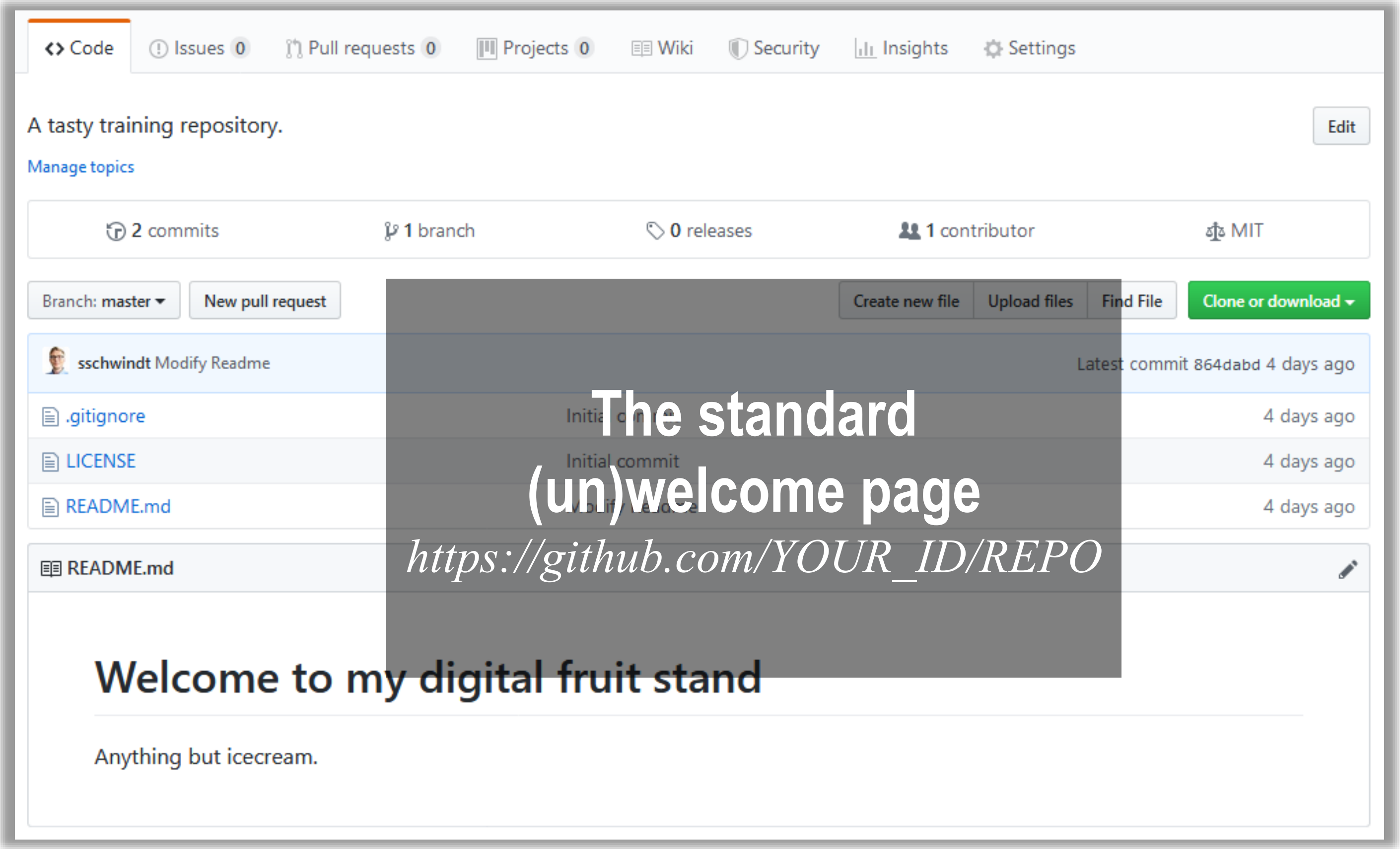
[2beCreated](#A-section)

Alternative section link name

<a name="other"></a>

GitHub pages

GitHub Pages



A tasty training repository.

2 commits | 1 branch | 0 releases | 1 contributor | MIT

sschwindt Modify Readme — Latest commit 864dabd 4 days ago

.gitignore	Initial commit	4 days ago
LICENSE	Initial commit	4 days ago
README.md	Modify Readme	4 days ago

README.md

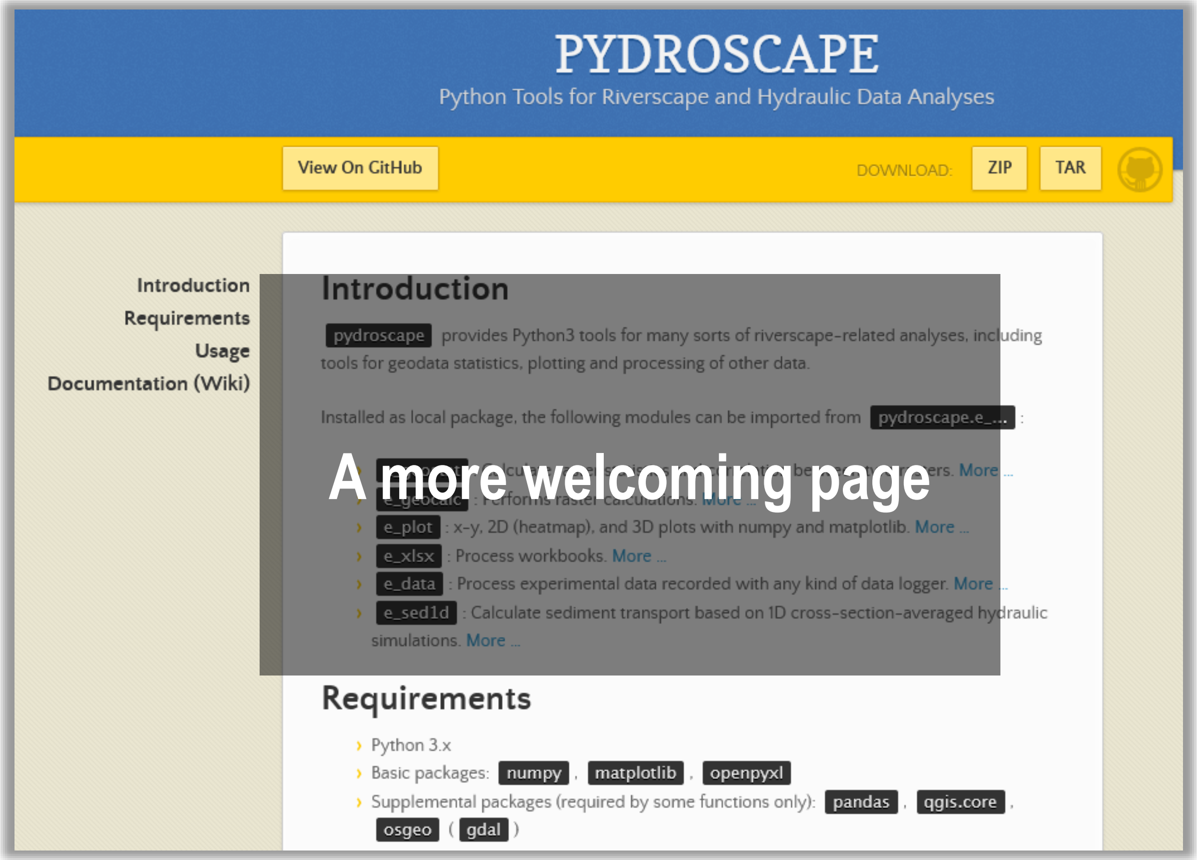
Welcome to my digital fruit stand

Anything but icecream.

The standard (un)welcome page

https://github.com/YOUR_ID/REPO

GitHub Pages



Introduction

`pydroscape` provides Python3 tools for many sorts of riverscape-related analyses, including tools for geodata statistics, plotting and processing of other data.

Installed as local package, the following modules can be imported from `pydroscape.e_...` :

- [illegible] : Calculate [illegible] between [illegible]ers. More ...
- `e_geocalc` : Performs raster calculations. More ...
- `e_plot` : x-y, 2D (heatmap), and 3D plots with numpy and matplotlib. More ...
- `e_xlsx` : Process workbooks. More ...
- `e_data` : Process experimental data recorded with any kind of data logger. More ...
- `e_sed1d` : Calculate sediment transport based on 1D cross-section-averaged hydraulic simulations. More ...

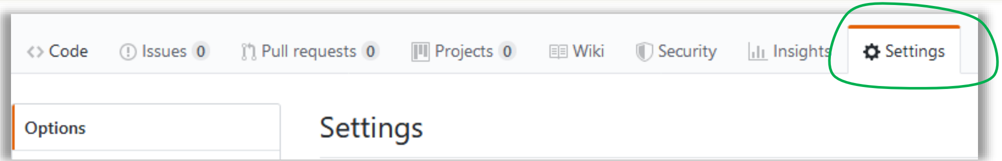
Requirements

- Python 3.x
- Basic packages: `numpy` , `matplotlib` , `openpyxl`
- Supplemental packages (required by some functions only): `pandas` , `qgis.core` , `osgeo` (`gdal`)

A more welcoming page

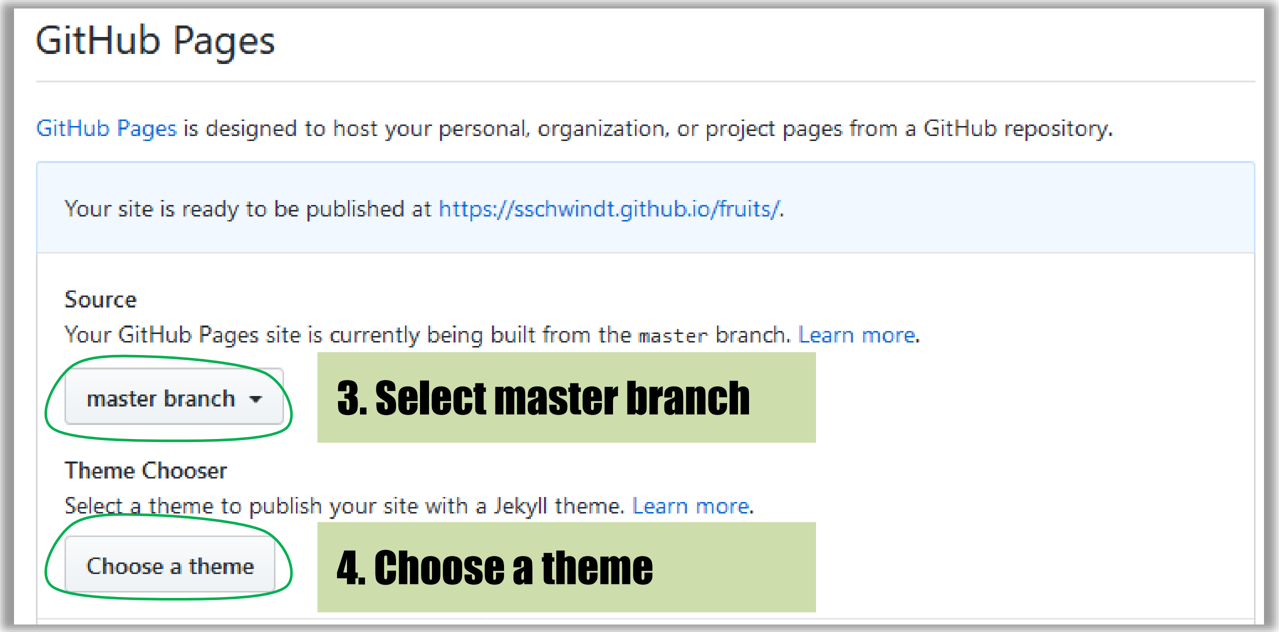
GitHub Pages

1. Go to Settings



Settings

2. Scroll to GitHub Pages



GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

Your site is ready to be published at https://sschwindt.github.io/fruits/.

Source

Your GitHub Pages site is currently being built from the `master` branch. Learn more.

master branch ▾

3. Select master branch

Theme Chooser

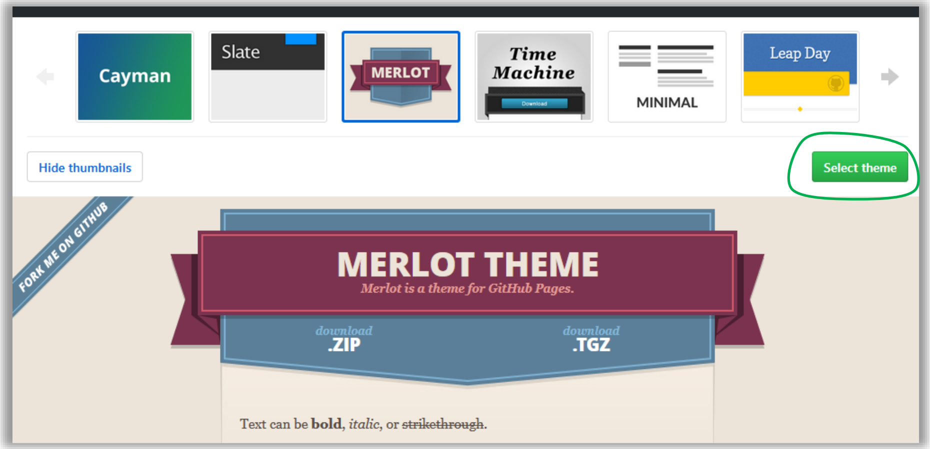
Select a theme to publish your site with a Jekyll theme. Learn more.

Choose a theme

4. Choose a theme

GitHub Pages

1. Select a Theme



MERLOT THEME

Merlot is a theme for GitHub Pages.

download .ZIP

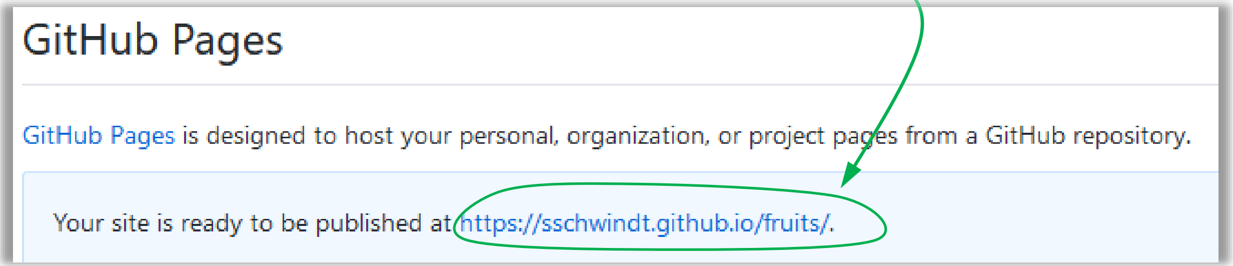
download .TGZ

Text can be **bold**, *italic*, or ~~strikethrough~~.

More Themes are available (maybe tricky to install…)

https://jekyllthemes.io/github-pages-templates

2. Wait 2-3 Minutes, then check out GitHub page



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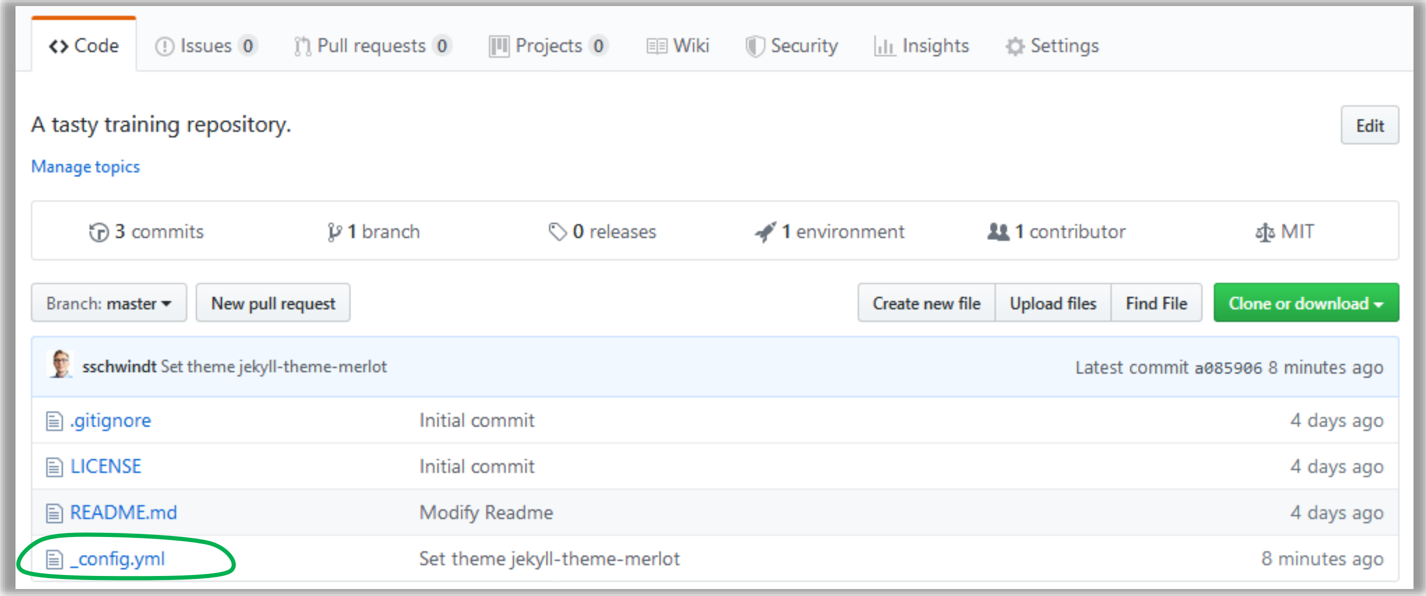
Your site is ready to be published at https://sschwindt.github.io/fruits/.

GitHub Pages

Looks nice, but there's room for optimization. The *_config.yml* file provides some options:



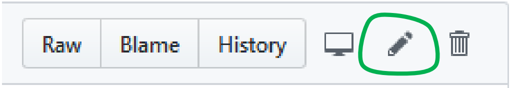
A tasty training repository.

3 commits · 1 branch · 0 releases · 1 environment · 1 contributor · MIT

sschwindt Set theme jekyll-theme-merlot — Latest commit a085906 8 minutes ago

.gitignore	Initial commit	4 days ago
LICENSE	Initial commit	4 days ago
README.md	Modify Readme	4 days ago
_config.yml	Set theme jekyll-theme-merlot	8 minutes ago

Open (click on) *_config.yml* & Start editing



GitHub Pages

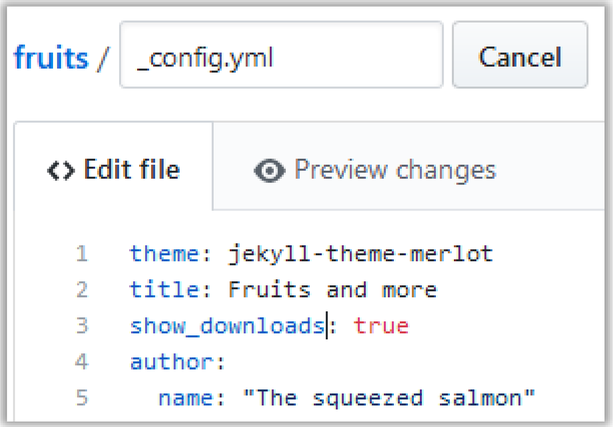
Modify _*config.yml* & adapt it to your needs. Some options:

Keyword:	Possible Values	Description
theme:	*"jekyll-theme-NAME"*	*Define / modify the installed theme.*
title:	*"Another title name"*	*Modify the title shown on github pages.*
description:	*"Text"*	*Modify the repository descriptions*
show_downloads:	*BOOL (true or false)*	*Enable download buttons.*
analystics: *google:*	*Google Analytics ID*	*Use SEO / webmaster tools (also available for bing)*
author: *name:*	*"Text"*	*E.g., "Ms. X"*
timezone:	*America/Los_Angeles*	*Uses* http://en.wikipedia.org/wiki/List_of_tz_database_time_zones

More: https://jekyllrb.com/docs/variables/

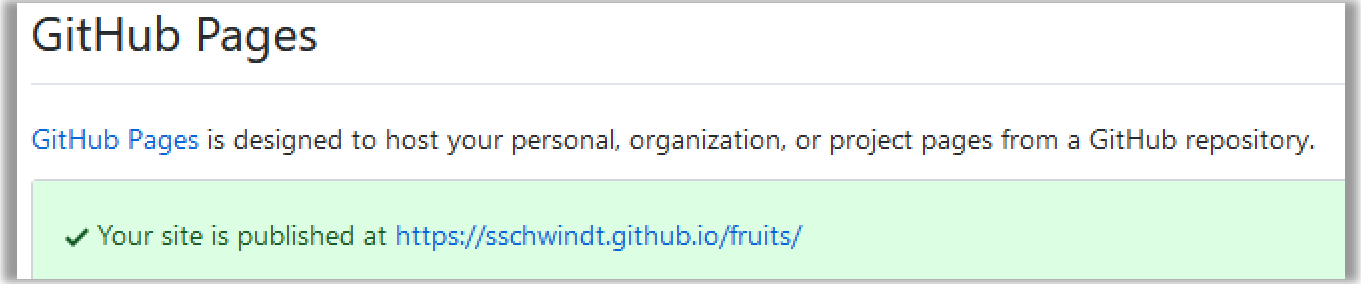
GitHub Pages

After editing, save and wait for 2-3 minutes.



```
theme: jekyll-theme-merlot
title: Fruits and more
show_downloads: true
author:
  name: "The squeezed salmon"
```

Then refresh :



GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

✓ Your site is published at https://sschwindt.github.io/fruits/

If variables were badly defined, you'll receive an email with a site generation error notice.

GitHub Pages

- There are more options to adapt templates

  Find the default.html of the selected Jekyll-theme and copy it into your repository :

  1. Create *_layouts/default.html*
  2. Edit *_layouts/default.html*

  Note: HTML skill are required.

- Creating a "home" repository: *https://YOUR_ID.github.io*

  This is how GitHub Pages can constitute you homepage, cheap and well referenced in google (SEO is another topic though).

  1. Create a new repository called *YOUR_ID.github.io*
  2. Install a GitHub pages theme
  3. Modify & adapt it to your needs.

Thank you for listening.

Get inspired by the River Architect Repository:
https://riverarchitect.github.io

More information and contact:
https://sschwindt.github.io
https://github.com/klarrieu