Using GitHub for scientific research

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Three good reasons to use GitHub

Version control

Share and collaborate

Publish your work

github pages

fork

master

repository

atom

.gitignore

markdown

collaborator

public

sync

command line tools

SHA hash

commit

blame

merge

branch

pull request

issues

history

wiki

clone

gist

git

private

release

Today’s workshop

Background

Specifics

Demonstration

Collaborative project

Quiz

GitHub

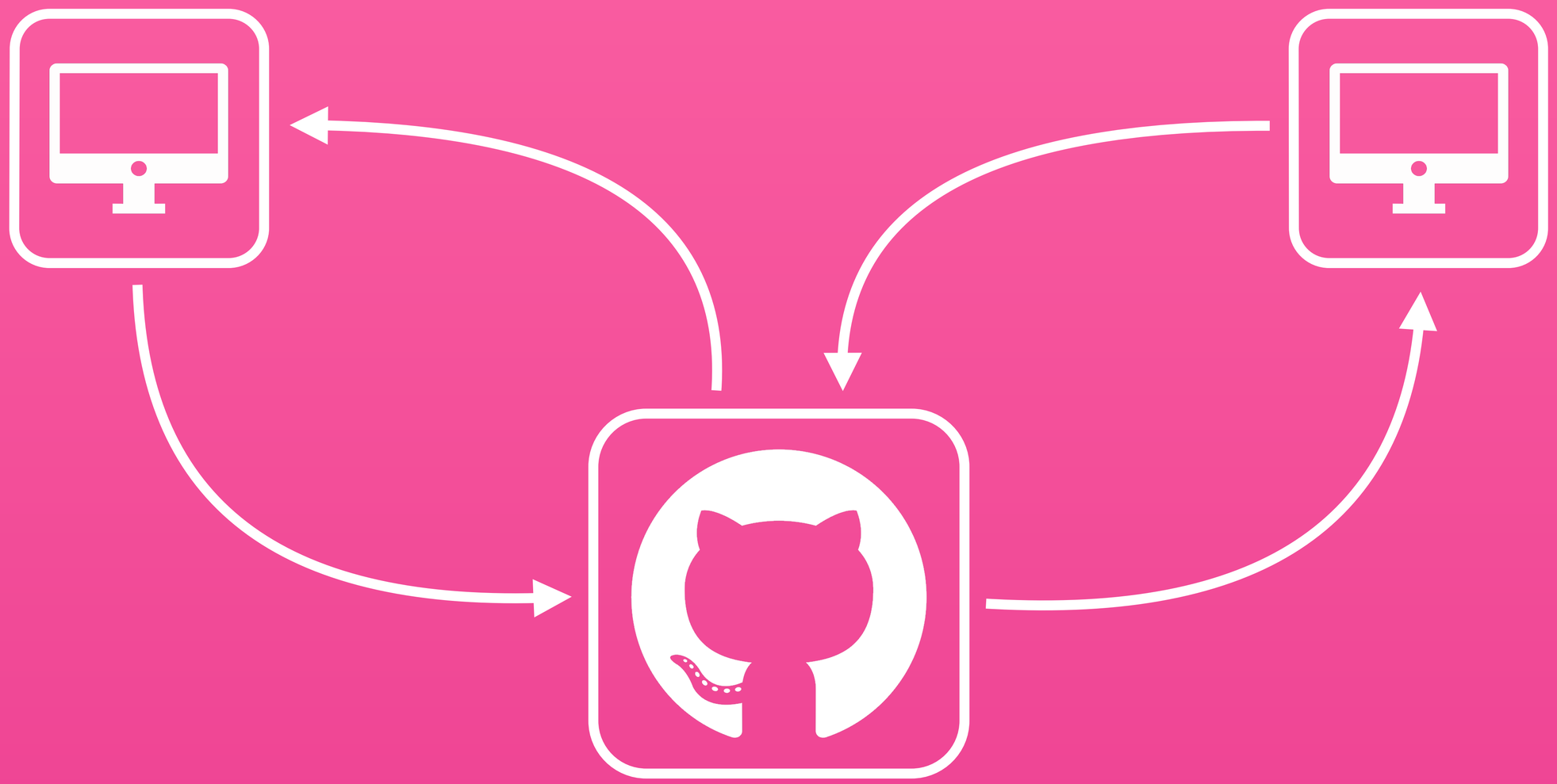
GitHub Education

Free micro account for students

Host 5 private repositories

Usually $7 per month

Big picture



Key terms

Repository

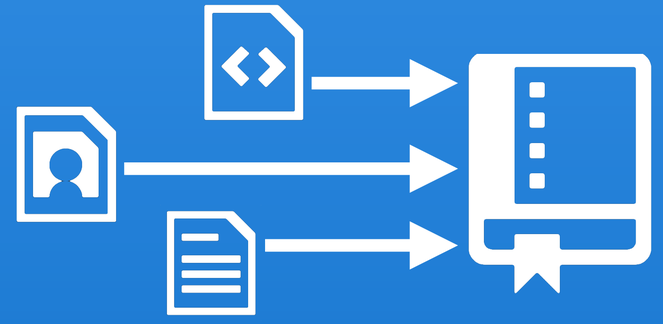
Commit

Branch

Fork

Pull request

Repository



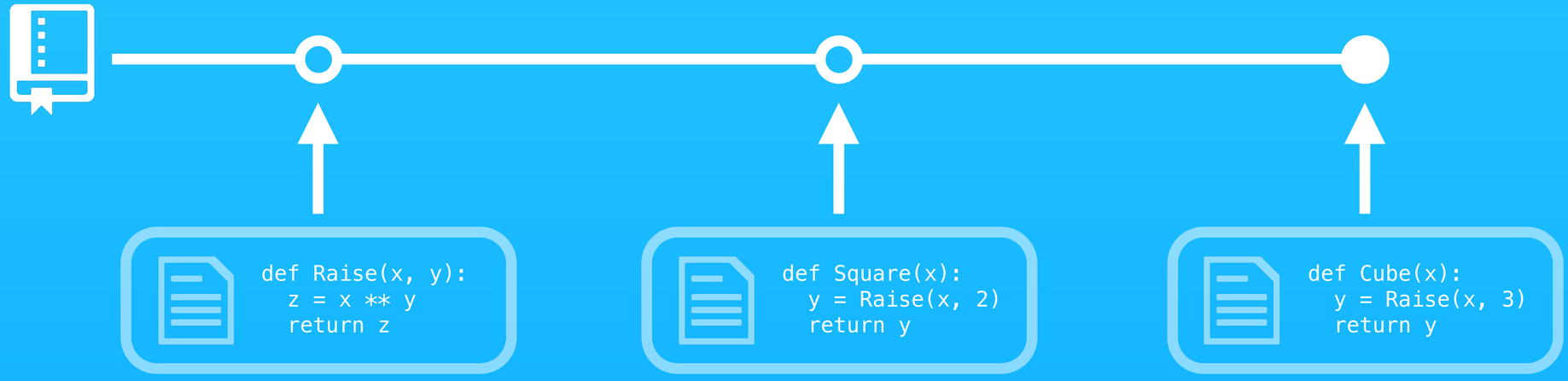
+ Commit

```
1  def Hello(name):
2    greeting = "Hello " + name
3    print greeting
```

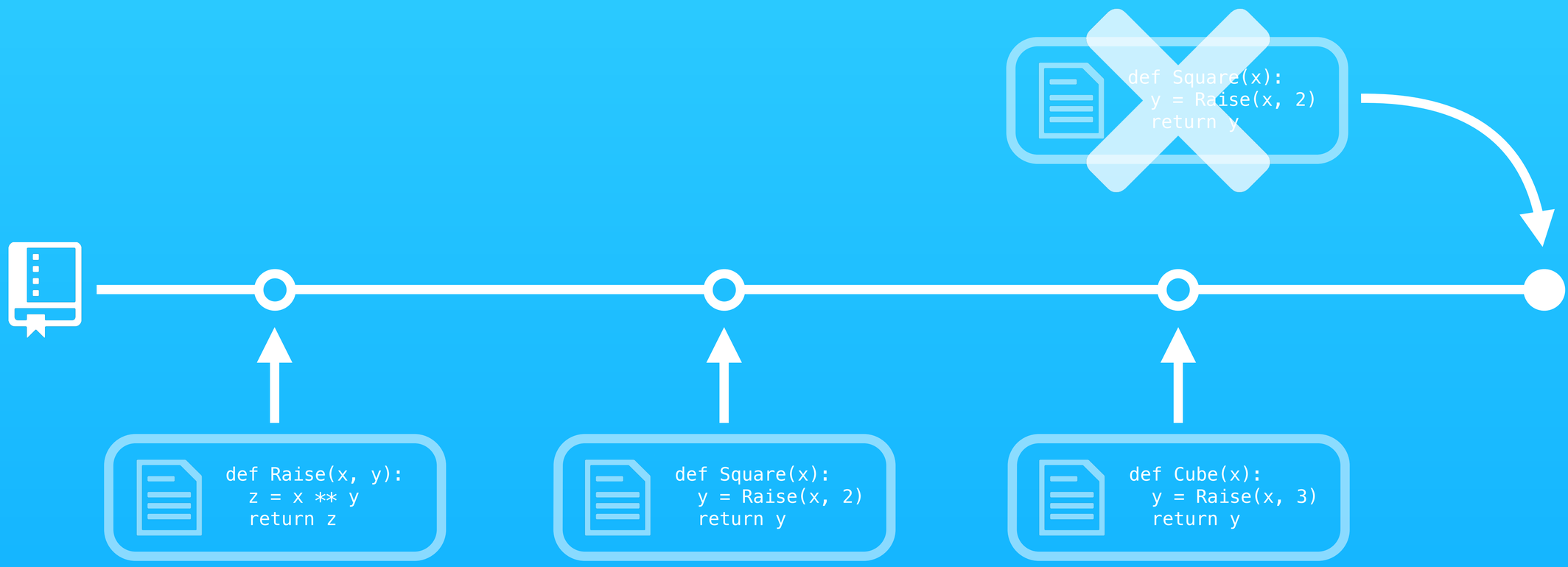
+ Commit

```
1  def Hello(name):
2    greeting = "Hello " + name
3    print greeting
4
5  def Bye(name):
6    valediction = "Bye bye " + name
7    print valediction
```

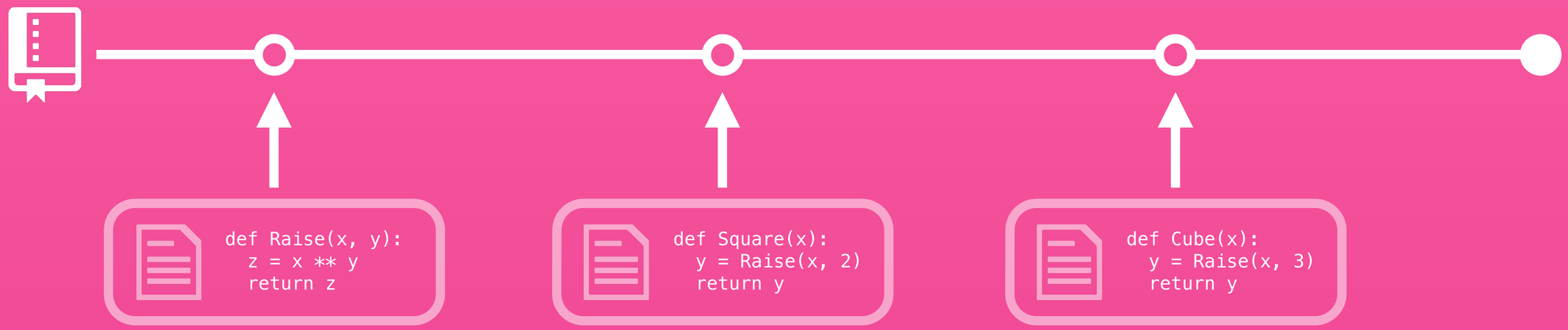
Revert a commit



Revert a commit

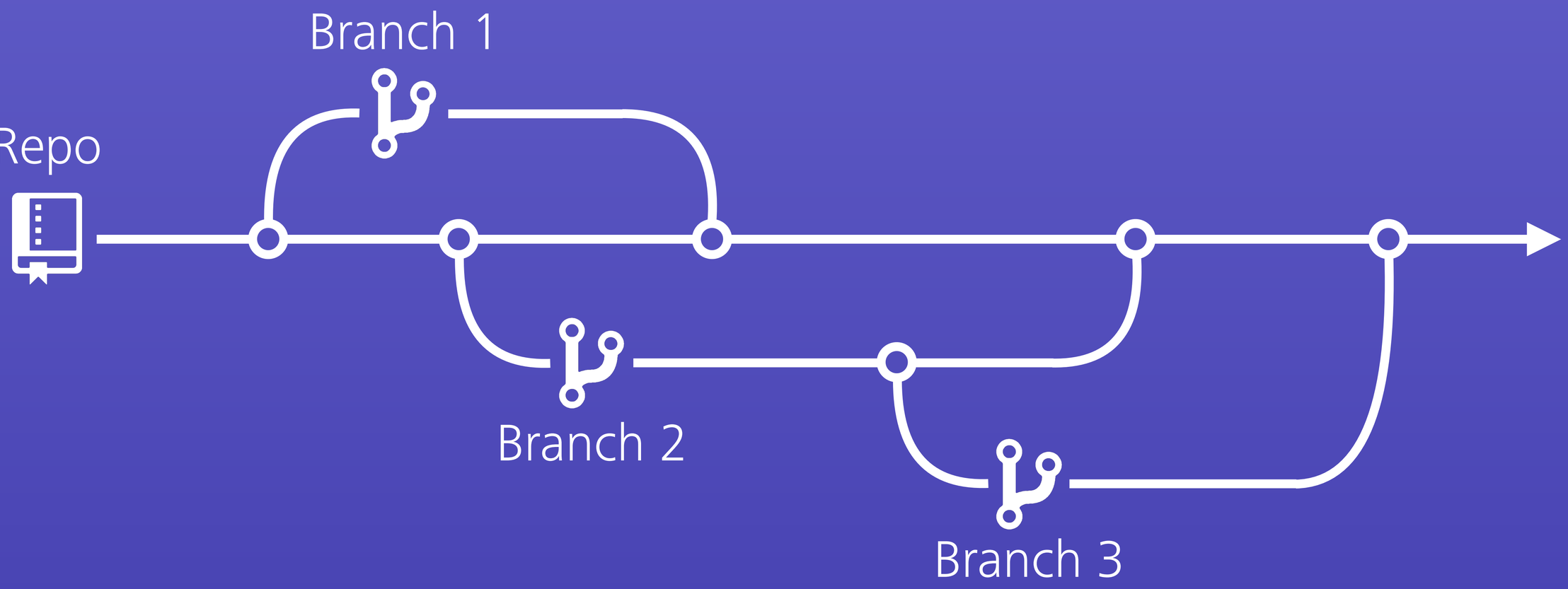


Roll back to a previous commit

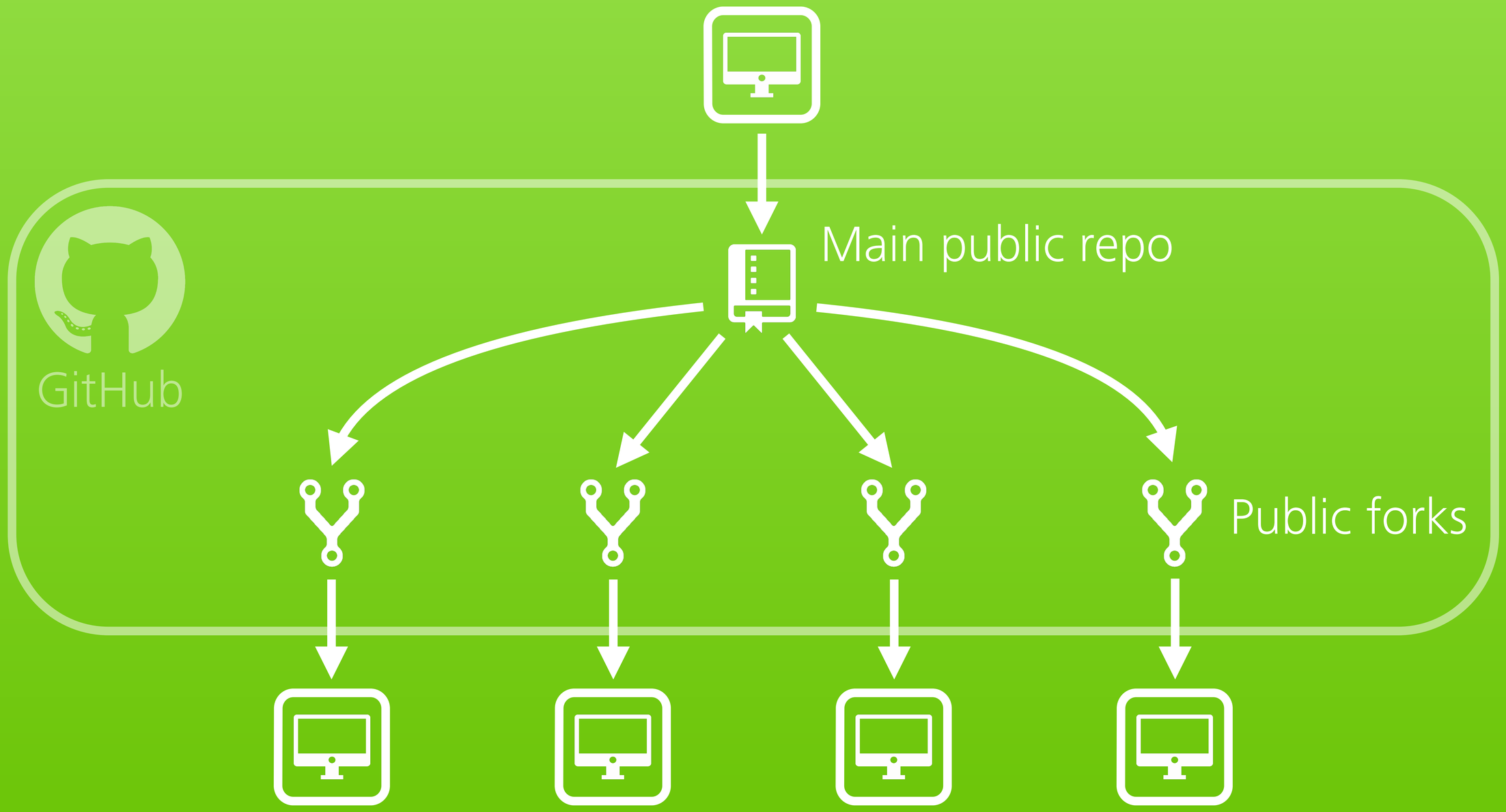


Roll back to a previous commit

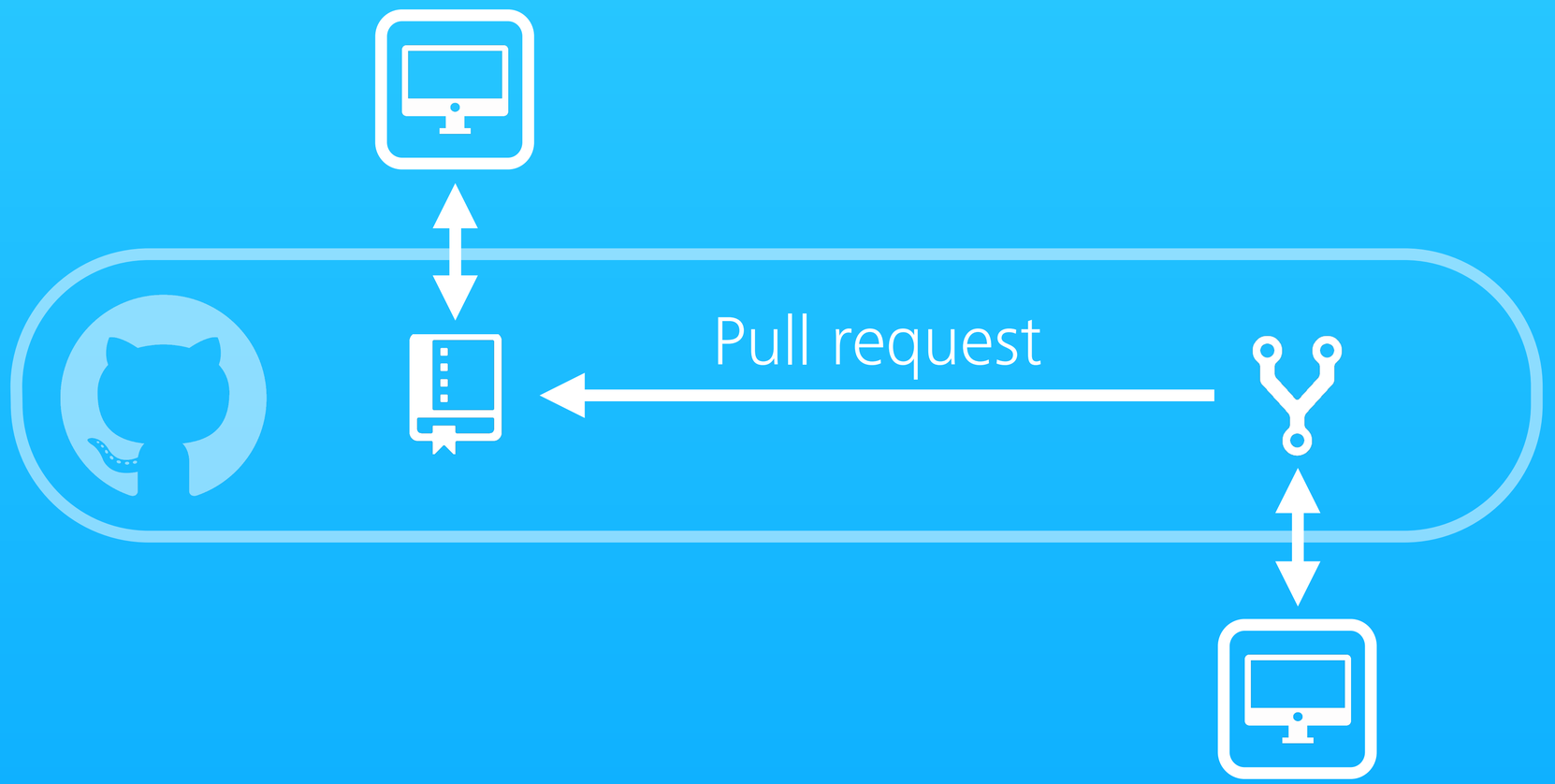
Branch



Fork



Pull request

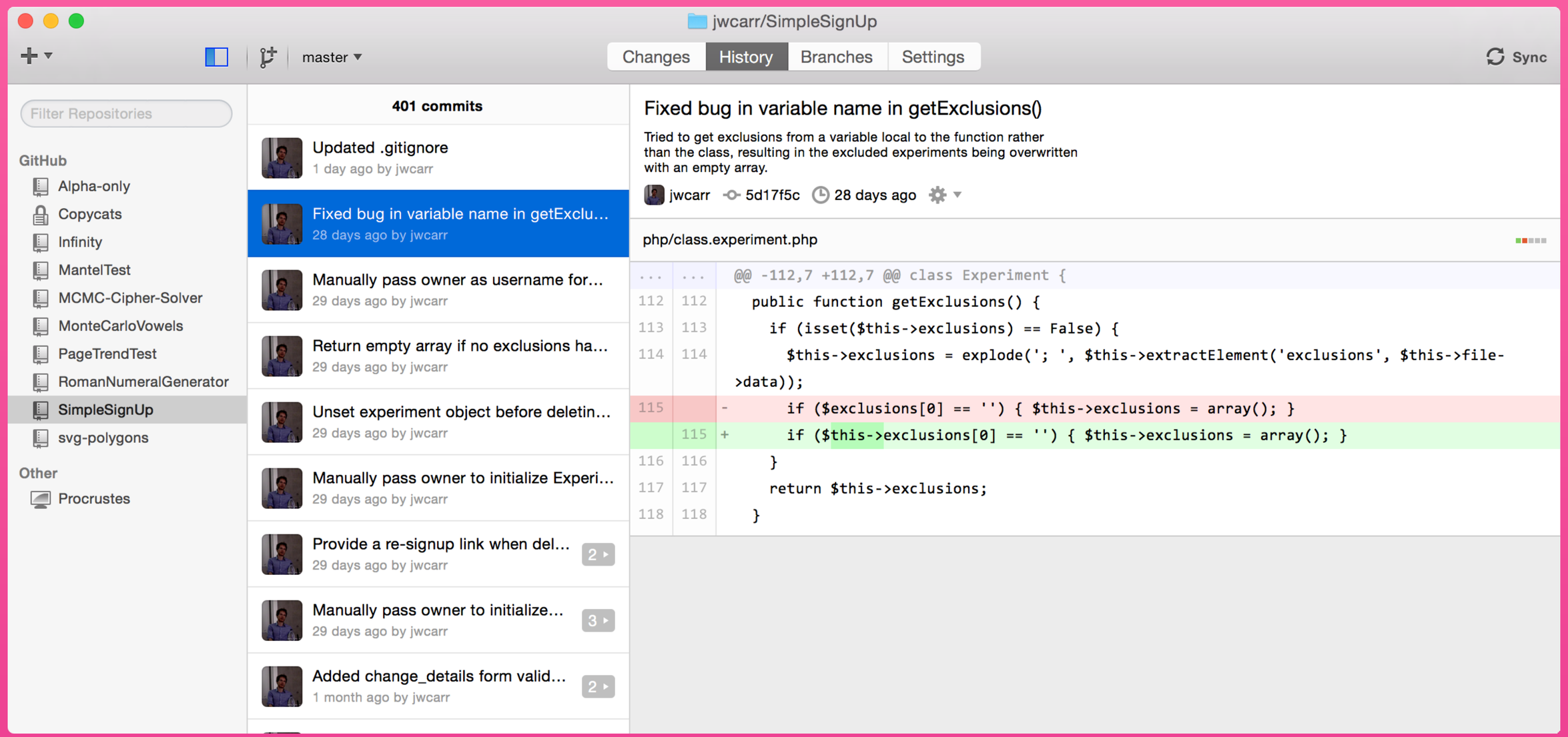


Two handy apps

GitHub

Atom

GitHub


jwcarr/SimpleSignUp
master
Changes
History
Branches
Settings
Sync
Filter Repositories
GitHub
Alpha-only
Copycats
Infinity
MantelTest
MCMC-Cipher-Solver
MonteCarloVowels
PageTrendTest
RomanNumeralGenerator
SimpleSignUp
svg-polygons
Other
Procrustes
401 commits
Updated .gitignore
1 day ago by jwcarr
Fixed bug in variable name in getExclu...
28 days ago by jwcarr
Manually pass owner as username for...
29 days ago by jwcarr
Return empty array if no exclusions ha...
29 days ago by jwcarr
Unset experiment object before deletin...
29 days ago by jwcarr
Manually pass owner to initialize Experi...
29 days ago by jwcarr
Provide a re-signup link when del...
29 days ago by jwcarr
2
Manually pass owner to initialize...
29 days ago by jwcarr
3
Added change_details form valid...
1 month ago by jwcarr
2
Fixed bug in variable name in getExclusions()
Tried to get exclusions from a variable local to the function rather than the class, resulting in the excluded experiments being overwritten with an empty array.
jwcarr
5d17f5c
28 days ago
php/class.experiment.php
@@ -112,7 +112,7 @@ class Experiment {
112 112 public function getExclusions() {
113 113 if (isset($this->exclusions) == False) {
114 114 $this->exclusions = explode('; ', $this->extractElement('exclusions', $this->file->data));
115 - if ($exclusions[0] == '') { $this->exclusions = array(); }
115 + if ($this->exclusions[0] == '') { $this->exclusions = array(); }
116 116 }
117 117 return $this->exclusions;
118 118 }

Atom

svg_polygons.py - /Users/jon/Sites/Infinity - Atom

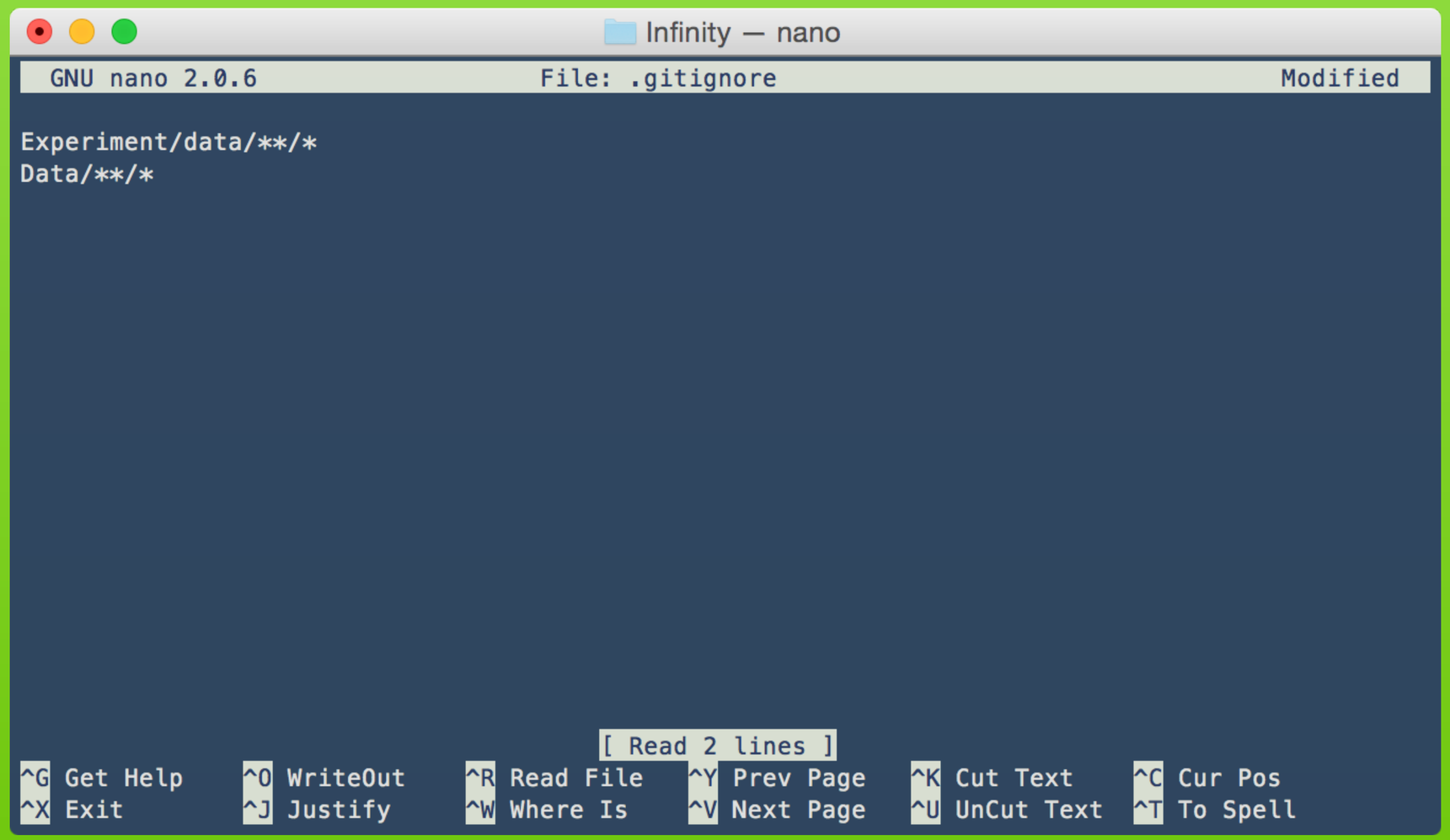
Infinity
- Data
- Experiment
- images
- Visualizer
- .gitignore
- analysis.py
- geometry.py
- initial_set_generator.py
- language_generator.py
- MantelTest.py
- page.py
- pointedness.py
- random_assign_to_chain.p
- README.md
- svg_polygons.py
- vocalize.py

analysis.py | MantelTest.py | svg_polygons.py

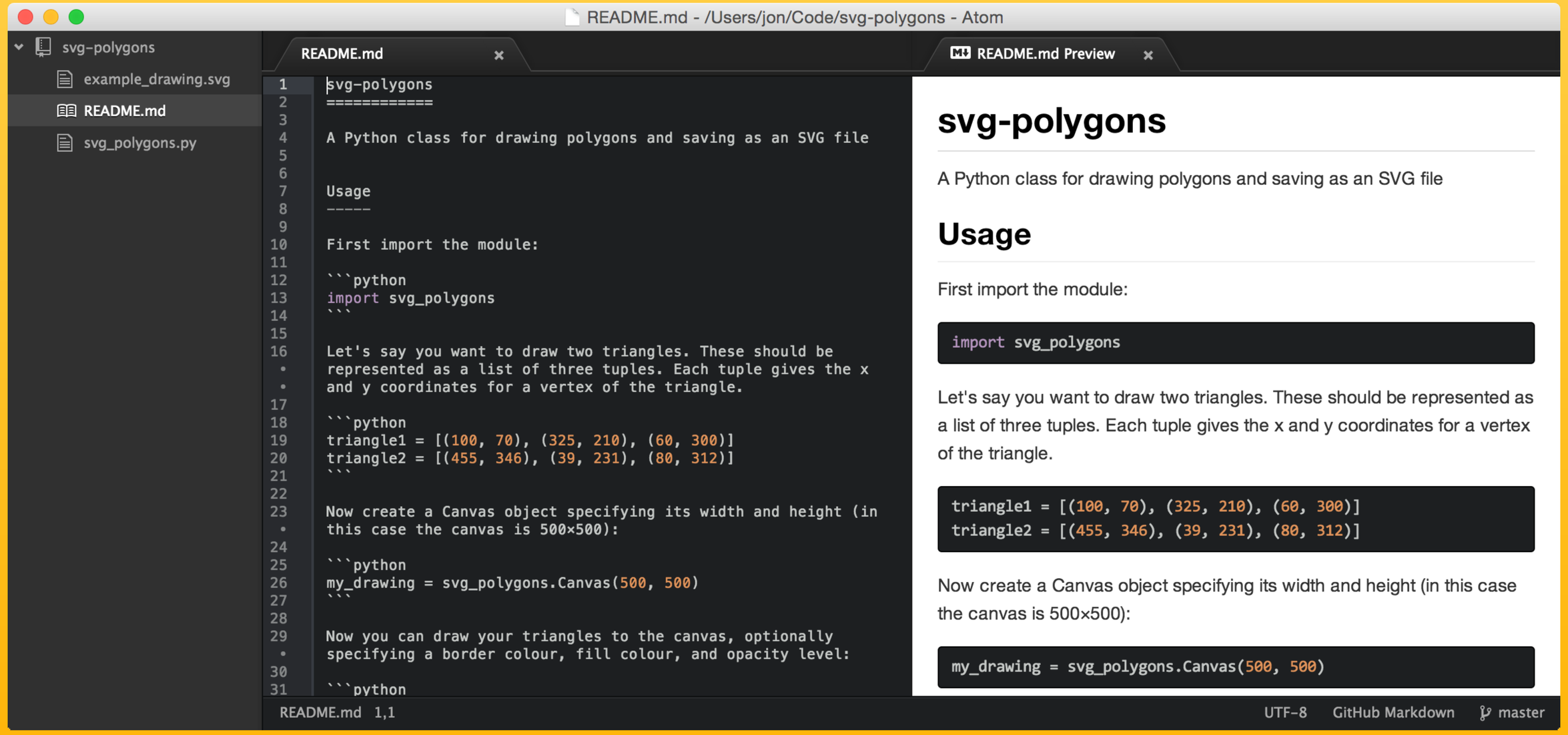
```
#! /usr/bin/env python

class Canvas:

  width = 0
  height = 0
  canvas = ''
  shape_count = 0

  def __init__(self, width=500, height=500):
    self.width = width
    self.height = height

  def polygon(self, shape, border_colour='black', fill_colour=None, opacity=1.0):
    canvas = "\n  <g id='shape%s'>" % self.shape_count
    points = [(str(vertex[0]) + "," + str(vertex[1])) for vertex in shape]
    canvas += "\n    <polygon points='" + (" ".join(points)) + "' style='fill:%s; stroke:%s; fill-opacity:%s; stroke-opacity:%s; stroke-wid
    canvas += "\n  </g>\n"
    self.canvas += canvas
    self.shape_count += 1

  def circle(self, position, radius=1, border_colour='black', fill_colour=None, opacity=1.0):
    canvas = "\n  <g id='shape%s'>" % self.shape_count
    canvas += "\n    <circle cx='%s' cy='%s' r='%s' style='stroke:%s; fill:%s; fill-opacity:%s; stroke-opacity:%s;' />" % (position[0], pos
    canvas += "\n  </g>\n"
    self.canvas += canvas
    self.shape_count += 1

  def save(self, filename='drawing'):
    canvas = self.addHeader()
    canvas += self.addCanvas()
    canvas += self.addFooter()
    f = open(filename + '.svg', 'w')
    f.write(canvas)
    f.close()
```

svg_polygons.py 1,1 | UTF-8 | Python | master | +50

.gitignore


Infinity — nano
GNU nano 2.0.6 File: .gitignore Modified
Experiment/data/**/*
Data/**/*
[Read 2 lines]
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell

(GitHub Flavored) Markdown



Other GitHub features

Issues: Bug reporting and feature requests

Wiki: Document the project

Pages: Free webpage for your project

Gist: A mini repo for snippets of text

Demo…

Collaborative project

Aim: Build a simple Mantel Test module in Python

Three teams will each implement part of the code

Then we'll test our code at the end

Team 1	Team 2	Team 3
`ReadFile()`	`PairwiseDistances()`	`MonteCarlo()`

Quiz

1. What's the name of the GitHub mascot?
2. What's the difference between a fork and a branch?
3. What's a pull request?
4. Can you delete a previous commit?
5. What would you use a .gitignore file for?
6. What could you use GitHub Issues for?

Homework

(if you're keen)

Merge the functions created by the other two teams

into your fork of the repository

Test out the final code for yourself!