

USING GITHUB

sub-group meeting
Tues. Sep 8, 2015

Why use git and github?

- Allows us to keep track of our changes in the finest-grained, easiest to maintain way
- Provides redundancy/backups if a machine (e.g. centurion) crashes
- Allows us to collaborate on code development (can easily work on the same code or see each others' code)
- Can ensure our code is running correctly with periodic checks from others (or ourselves)
- Better way to view and update documentation
- Increases productivity by emphasizing important tasks
- Keeps track of sub-tasks to ensure certain things don't get left behind

git features

- **clone** — import a git repository
- **pull** — download all recent changes
- **add** — Add files that have been modified to be staged for next commit
- **commit** — a record of the state of your code at a particular point in time. usually occurs when a particular feature has been added (only commit when code is running properly on your machine)
- **push** — move your local commits to the repository (for others to see) after a series of commits
- **branch** — list and create new branches
- **checkout** — way to change to a different branch
- **pull-request** — a way to ask others to review your code before merging your changes to another branch

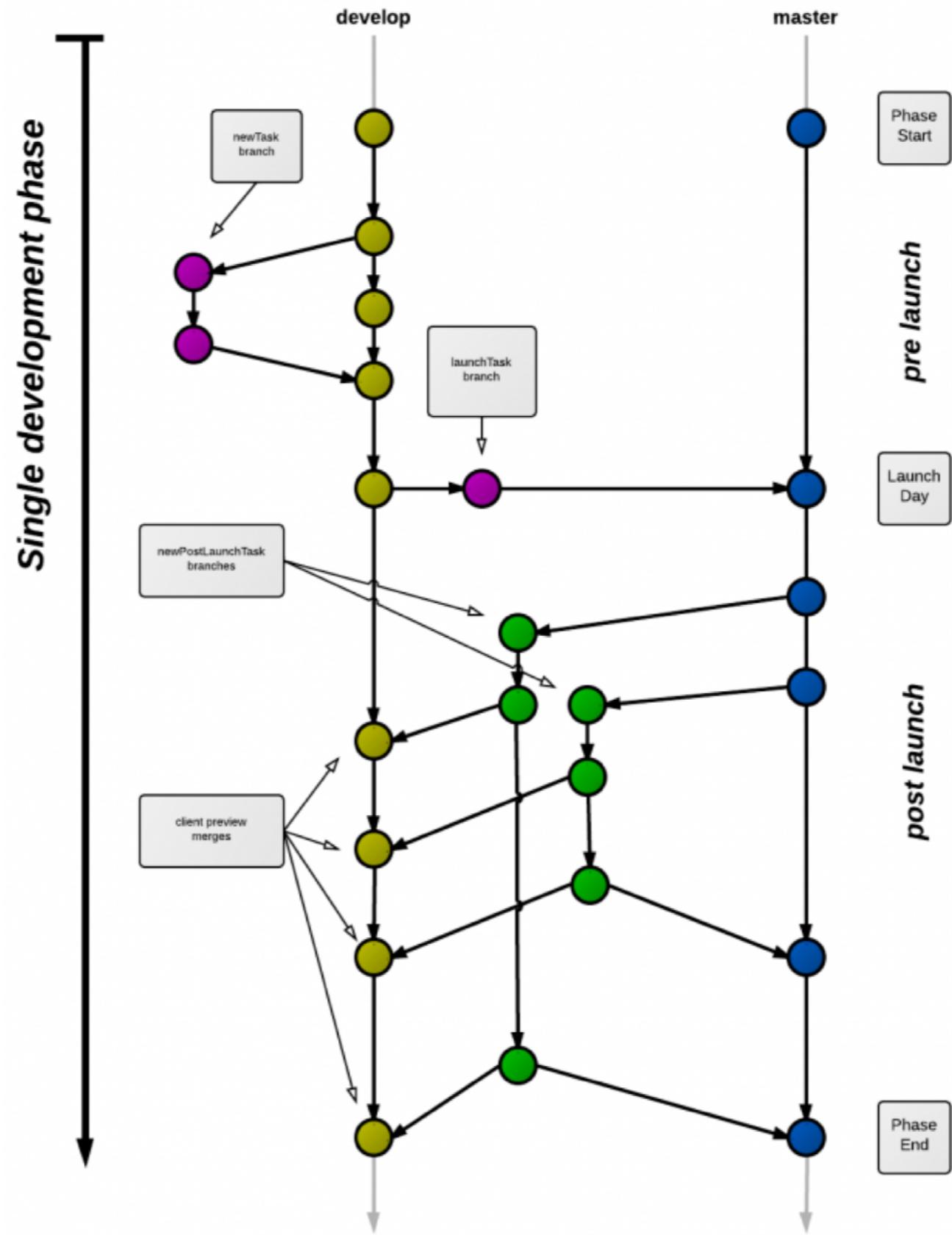
Example use case

```
[rehnd@heron ~] $ git clone https://github.com/rehnd/test.git
Cloning into 'test'...
remote: Counting objects: 22, done.
remote: Compressing objects: 100% (21/21), done.
remote: Total 22 (delta 9), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (22/22), done.
Checking connectivity... done.
[rehnd@heron ~] $ cd test/
[rehnd@heron test] $ ls
LICENSE README.md test.cpp
[rehnd@heron test] $ emacs README.md
[rehnd@heron test] $ git status
On branch development
Your branch is up-to-date with 'origin/development'.
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")
[rehnd@heron test] $ git add README.md
[rehnd@heron test] $ git commit -m "Added a line to README.md"
[development af73c59] Added a line to README.md
 1 file changed, 2 insertions(+)
[rehnd@heron test] $ git push
Counting objects: 3, done.
Delta compression using up to 8 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 373 bytes | 0 bytes/s, done.
Total 3 (delta 1), reused 0 (delta 0)
To https://github.com/rehnd/test.git
  f6adaa3..af73c59  development -> development
[rehnd@heron test] $
[rehnd@heron test] $ git branch -a
* development
  remotes/origin/HEAD -> origin/development
  remotes/origin/development
  remotes/origin/master
[rehnd@heron test] $ git pull
Already up-to-date.
```

good workflow with branches



github features

- **Release** — a way to mark a significant stage in the code development process, ready for others to use
- **Milestone** — a general goal or addition of a major feature during development that can be made up of several smaller sub-tasks
- **Issue** — a smaller sub-task of a Milestone. one or several of these can form a Milestone
- **Labels** — can be added to Milestones and Issues to mark bug fixes, features, etc.
- **wiki** — a wiki present on github for writing documentation/metadata about the project/repo

These features are really helpful for adding metadata to the development cycle/workflow

my opinion on best use of github+git

- 1) create Milestone (off of **development**)
 - a. create **branch** with **Milestone** name (or similar)
 - b. create **Issue**
 1. create **branch** with **Issue** name
 - i. make commits, pushes to **Issue** branch
 - ii. merge **Issue** branch to **Milestone** branch
 - iii. close **Issue** on github
 - c. Repeat 1)a.1. as needed
 - d. merge **Milestone** branch to **development** branch
 - 2) close **Milestone** on github
 - 3) repeat 1)-2) until a **Release**

How to use github

Now look at step-by-step procedure on github

1) create Milestone (off of development)

rehnd / test

A test directory for messing around with github — Edit

10 commits 2 branches 1 release 1 contributor

Branch: **development** / **test** / +

Added a line to README development
rehnd authored 38 minutes ago

LICENSE Initial commit 2 hours ago

README.md Added a line to README.md 38 minutes ago

test.cpp Adding jjjj an hour ago

README.md

test

Just added a development branch and now putting a README file in the development branch.

Adding a line for fun

Adding another line for fun

Unwatch 1 Star 0 Fork 0

Code

- Issues 0
- Pull requests 0
- Wiki

Pulse

Graphs

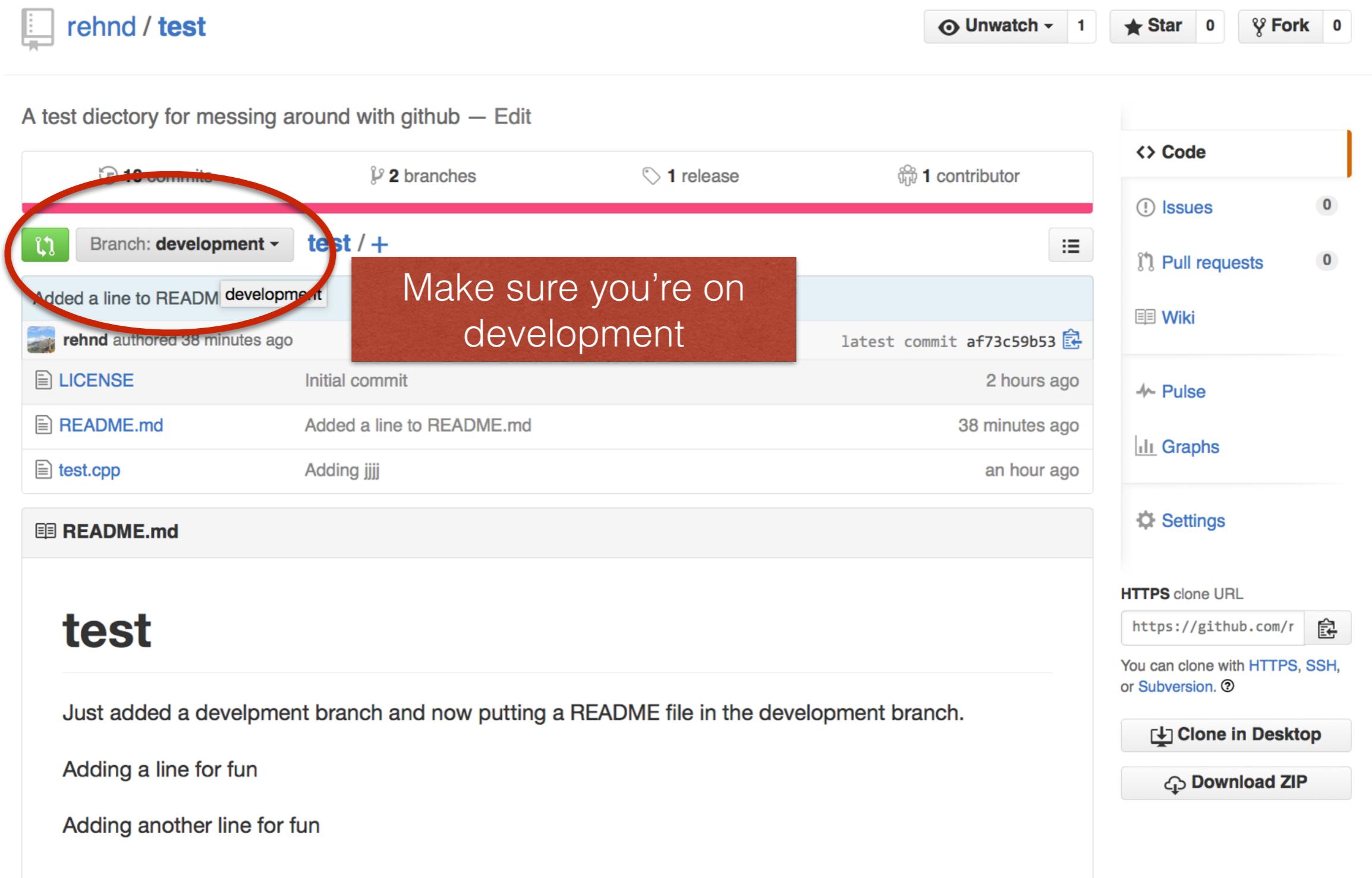
Settings

HTTPS clone URL
<https://github.com/r>

You can clone with **HTTPS**, **SSH**, or **Subversion**. ?

Clone in Desktop

Download ZIP



1) create Milestone (off of development)

rehnd / test

A test directory for messing around with github — Edit

10 commits 2 branches 1 release 1 contributor

Branch: development / test / + Click on Issues

Added a line to README development
rehnd authored 38 minutes ago latest commit af73c59b53

LICENSE Initial commit 2 hours ago

README.md Added a line to README.md 38 minutes ago

test.cpp Adding jjjj an hour ago

README.md

test

Just added a development branch and now putting a README file in the development branch.

Adding a line for fun

Adding another line for fun

Code Issues Pull requests Wiki Pulse Graphs Settings

HTTPS clone URL <https://github.com/r>

You can clone with [HTTPS](#), [SSH](#), or [Subversion](#).

Clone in Desktop Download ZIP

The screenshot shows a GitHub repository page for 'rehnd / test'. At the top, there are statistics: 10 commits, 2 branches, 1 release, and 1 contributor. Below this, a navigation bar shows 'Branch: development' with options for 'test / +' and a 'Click on Issues' button. The main content area displays a list of files and their recent activity. On the right side, there's a sidebar with links for 'Code', 'Issues' (which is circled in red), 'Pull requests', 'Wiki', 'Pulse', 'Graphs', and 'Settings'. Below the sidebar, there's a section for cloning the repository via HTTPS, SSH, or Subversion, along with 'Clone in Desktop' and 'Download ZIP' buttons. A large red box covers the top half of the page, containing the text 'Click on Issues'.

1) create Milestone (off of development)

The screenshot shows a GitHub repository page for 'rehnd / test'. At the top, there are navigation links: Issues, Pull requests, Labels, and Milestones. The 'Milestones' link is highlighted with a red oval. In the top right corner, there are buttons for Unwatch (with 1), Star (with 0), and Fork (with 0). Below the navigation, there are status indicators: 0 Open issues and 1 Closed issue. A large red box labeled '1. Select Milestones' covers the main content area. Inside this box, there is a search bar with a magnifying glass icon, followed by the text 'We couldn't find anything!' and the message 'There aren't any milestones that match. Give it another shot above.' To the right of the main content, a sidebar contains icons for Issues, Pull requests, Labels, Milestones, and other repository details. A green button labeled 'New milestone' is highlighted with a red oval.

rehnd / test

Unwatch 1 | Star 0 | Fork 0

Issues | Pull requests | Labels | **Milestones**

0 Open | 1 Closed

1. Select Milestones

New milestone

We couldn't find anything!

There aren't any milestones that match. Give it another shot above.

2. Select New milestone

1) create Milestone (off of development)

Create a title and create
Milestone

New milestone

Create a new milestone to help organize your issues and pull requests. Learn more about [milestones and issues](#).

Title

Description

Due Date (optional) clear

◀ September ▶ ◀ 2015 ▶

Mon Tue Wed Thu Fri Sat Sun

31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4

Create milestone

1)a. create branch with Milestone name

A test directory for messing around with github — Edit

10 commits 2 branches

Branch: development

Switch branches/tags

milestone-branch

Branches Tags

Create branch: milestone-branch from 'development'

README.md

test

Just added a development branch and now putting a README file in the development branch.

Adding a line for fun

Adding another line for fun

Go to the main page and select Branch:...

Make sure to be branching from development

Code Issues Pull requests Wiki Pulse Graphs Settings

HTTPS clone URL <https://github.com/r>

You can clone with [HTTPS](#), [SSH](#), or [Subversion](#).

Clone in Desktop Download ZIP

Contributor

latest commit af73c59b53

3 hours ago

an hour ago

2 hours ago

1)b. create Issue

The screenshot shows a GitHub Issues page with the following elements:

- Header:** A navigation bar with tabs for "Issues" (selected), "Pull requests", "Labels", and "Milestones".
- Search Bar:** A search bar with the query "is:issue is:open".
- Buttons:** A "New issue" button highlighted with a red oval.
- Statistics:** A summary showing "0 Open" and "2 Closed".
- Filter Options:** "Author", "Labels", "Milestones", "Assignee", and "Sort" dropdowns.
- Message Area:** A large area containing an exclamation mark icon and the text "There aren't any open issues." followed by a descriptive message.
- Right Sidebar:** A vertical sidebar with icons for "Issues", "Pull requests", "Labels", "Milestones", "Assignee", "Sort", "Help", "Graphs", and "Settings".

New issue

Issues Pull requests Labels Milestones

Filters is:issue is:open

0 Open 2 Closed Author Labels Milestones Assignee Sort

! There aren't any open issues.

Use the links above to find what you're looking for, or try [a new search query](#). The Filters menu is also super helpful for quickly finding issues most relevant to you.

Issues Pull requests Labels Milestones Assignee Sort Help Graphs Settings

1)b. create Issue

The screenshot shows the GitHub issue creation interface. At the top, there are tabs for Issues (selected), Pull requests, Labels, and Milestones. Below the tabs, there's a form to enter an issue title ('issue-title') and a file attachment area ('Leave a comment'). A red arrow points to the 'issue-title' input field. To the right, there's a 'Labels' section showing 'None yet' and a 'Milestone' section. A red box highlights the 'Milestone' section with the text: 'Name the Issue and click on Milestone. Select the Milestone just created'. A red arrow points to the 'Milestone' button, which is circled in red. A modal window titled 'Set milestone' is open, showing a 'Filter milestones' input field and two tabs: 'Open' (selected) and 'Closed'. It displays a single milestone entry: 'milestone-title' and 'No due date'. At the bottom right of the main form is a green 'Submit new issue' button.

Name the Issue and click on Milestone. Select the Milestone just created

Labels

None yet

Milestone

Set milestone

Filter milestones

Open Closed

milestone-title

No due date

Submit new issue

1)b.1. create branch with Issue name

A test directory for messing around with github — Edit

10 commits 3 branches

Branch: milestone-bran... ← **test** / +

Switch branches/tags

issue-branch ←

Add a new branch

Create branch: issue-branch from 'milestone-branch'

README.md

test.cpp Adding jjjj

2 hours ago

test

Just added a development branch and now putting a README file in the development branch.

Adding a line for fun

Adding another line for fun

Go to the home page
(select Code on the right)

or

Code

Issues 1

Pull requests 0

Wiki

Pulse

Graphs

Settings

HTTPS clone URL

<https://github.com/r>

You can clone with **HTTPS**, **SSH**, or **Subversion**. ?

Clone in Desktop

Download ZIP

Change to Milestone branch

Enter title of new Issue branch (similar name to Issue title)

1)b.1.i. make commits/pushes to Issue branch

```
[rehnd@heron test] $ git pull
From https://github.com/rehnd/test
 * [new branch]      issue-branch -> origin/issue-branch
Already up-to-date.
[rehnd@heron test] $ git branch -a
* development
  remotes/origin/HEAD -> origin/development
  remotes/origin/development
  remotes/origin/issue-branch
  remotes/origin/master
  remotes/origin/milestone-branch
[rehnd@heron test] $ git checkout issue-branch
Branch issue-branch set up to track remote branch issue-branch from origin.
Switched to a new branch 'issue-branch'
[rehnd@heron test] $ git status
On branch issue-branch
Your branch is up-to-date with 'origin/issue-branch'.
nothing to commit, working directory clean
[rehnd@heron test] $ emacs README.md
[rehnd@heron test] $ git status
On branch issue-branch
Your branch is up-to-date with 'origin/issue-branch'.
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")
[rehnd@heron test] $ git add README.md
[rehnd@heron test] $ git status
On branch issue-branch
Your branch is up-to-date with 'origin/issue-branch'.
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

    modified:   README.md

[rehnd@heron test] $ git commit -m "Added line to README"
[issue-branch c5fa7a9] Added line to README
 1 file changed, 3 insertions(+), 1 deletion(-)
[rehnd@heron test] $ git push
Counting objects: 3, done.
Delta compression using up to 8 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 370 bytes | 0 bytes/s, done.
Total 3 (delta 1), reused 0 (delta 0)
To https://github.com/rehnd/test.git
  af73c59..c5fa7a9  issue-branch -> issue-branch
```

1)b.1.ii merge Issue branch to Milestone branch

A test directory for messing around w...

11 commits

Your recently pushed branches:

- issue-branch (2 minutes ago)

Branch: issue-branch ▾

This branch is 1 commit ahead of development

Added line to README

rehnd authored 2 minutes ago

LICENSE Initial commit

README.md Added line to README

test.cpp Adding jjjj

README.md

test

Just added a development branch and now putting a README file in the development branch.

Adding a line for fun

Adding another line for fun

Adding yet another line

Go to the home page
(select Code on the right)

Change to Issue branch

Select Compare & pull request

1 contributor

Compare & pull request

Pulse

Graphs

Settings

HTTPS clone URL

https://github.com/r

You can clone with HTTPS, SSH, or Subversion. ?

Clone in Desktop

Download ZIP

The screenshot shows a GitHub repository interface. A large red box highlights the main content area. Inside the red box, three steps are outlined: 'Go to the home page (select Code on the right)', 'Change to Issue branch', and 'Select Compare & pull request'. Red arrows point from these steps to their respective locations on the screen. The 'Code' button on the top right is circled in red. The 'Compare & pull request' button is also circled in red. The 'Branch: issue-branch ▾' dropdown is also circled in red. The rest of the interface is visible outside the red box, including the sidebar with 'Issues' (1), 'Pull requests' (0), 'Wiki', 'Pulse', 'Graphs', and 'Settings'.

1)b.1.ii merge Issue branch to Milestone branch

Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also [compare across forks](#).

base: development ▾ ... compare: issue-branch ▾ ✓ Able to merge. These branches can be automatically merged.

Added line to README

Write Preview

Leave a comment

MUST change this to milestone-branch!!!!

Markdown supported

Labels

None yet

Milestone

milestone-title

Assignee

No one—assign yourself

Add comments and select Create pull request

Attach images by dragging & dropping or [selecting them](#).

Create pull request

1)b.1.ii merge Issue branch to Milestone branch

Added line to README #8

Open rehnd wants to merge 1 commit into **development** from **issue-branch**

Conversation 0 Commits 1 Files changed 1

rehnd commented 11 seconds ago
No description provided.

Added line to README

rehnd added this to the **milestone-title** milestone 11 seconds ago

Add more commits by pushing to the **issue-branch** branch on **rehnd/test**.

This branch is up-to-date with the base branch
Merging can be performed automatically.

Merge pull request You can also open this in GitHub Desktop or view

Write Preview

Leave a comment

Attach images by dragging & dropping or selecting them.

Close pull request Comment

Note: should say "milestone-branch".

This is VERY bad

This now allows others to decide whether to merge the pull request.

Usually the minimum amount of work necessary to merge is to make sure someone else's code compiles and runs. Should also look at the diff shown to see the user's changes

1)b.1.iii close Issue on github

Added line to README #8

Merged

rehnd merged 1 commit into development from issue-branch

Note: should say
“milestone-branch”.

This is VERY bad

Conversation 0

Commits 1

Files changed 1

+3 -1



rehnd commented 5 minutes ago

No description provided.

Owner



Added line to README

c5fa7a9



rehnd added



rehnd merged



Pull request su

You're all set—the

Revert

Delete branch

After the changes are
merged, the branch
Issue branch should be
deleted

(it can always be brought
back later if needed)



Write Preview

Leave a comment

Markdown supported

Attach images by dragging & dropping or selecting them.

Comment

Labels

None yet

Milestone

milestone-title

Assignee

No one—assign yourself

Notifications

Unsubscribe

You're receiving notifications
because you modified the
open/close state.

1 participant



Lock conversation

1)d., 2) merging and closing the Milestone

Merging and closing the Milestone works just like merging and closing an Issue

General comments

Github takes a bit of getting used to

- good to spend 30 min or so on a test directory to make sure you know how to maneuver

Usually best to ask questions if doing something non-standard

- some changes to github can be very hard/impossible to change after the fact