

ghclass

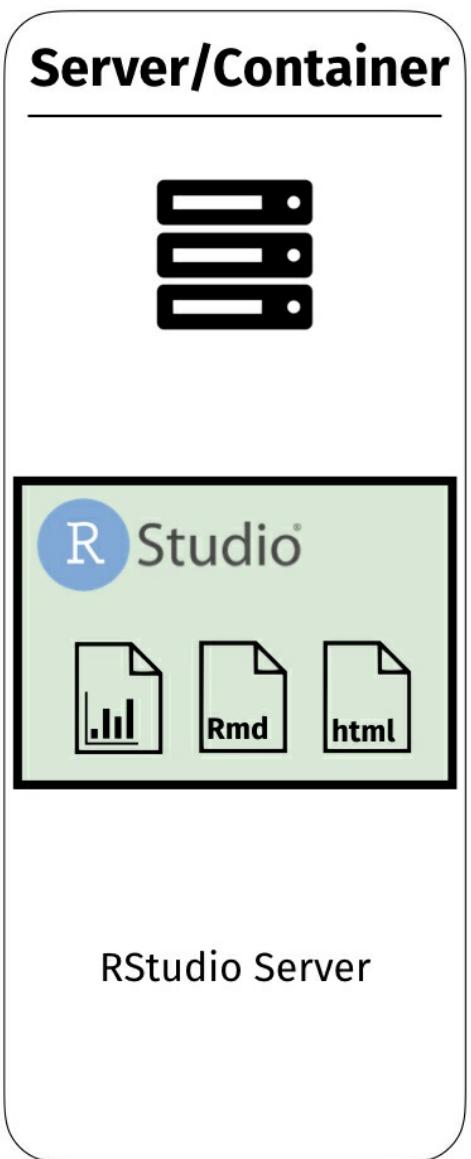
an R package for managing classes with GitHub

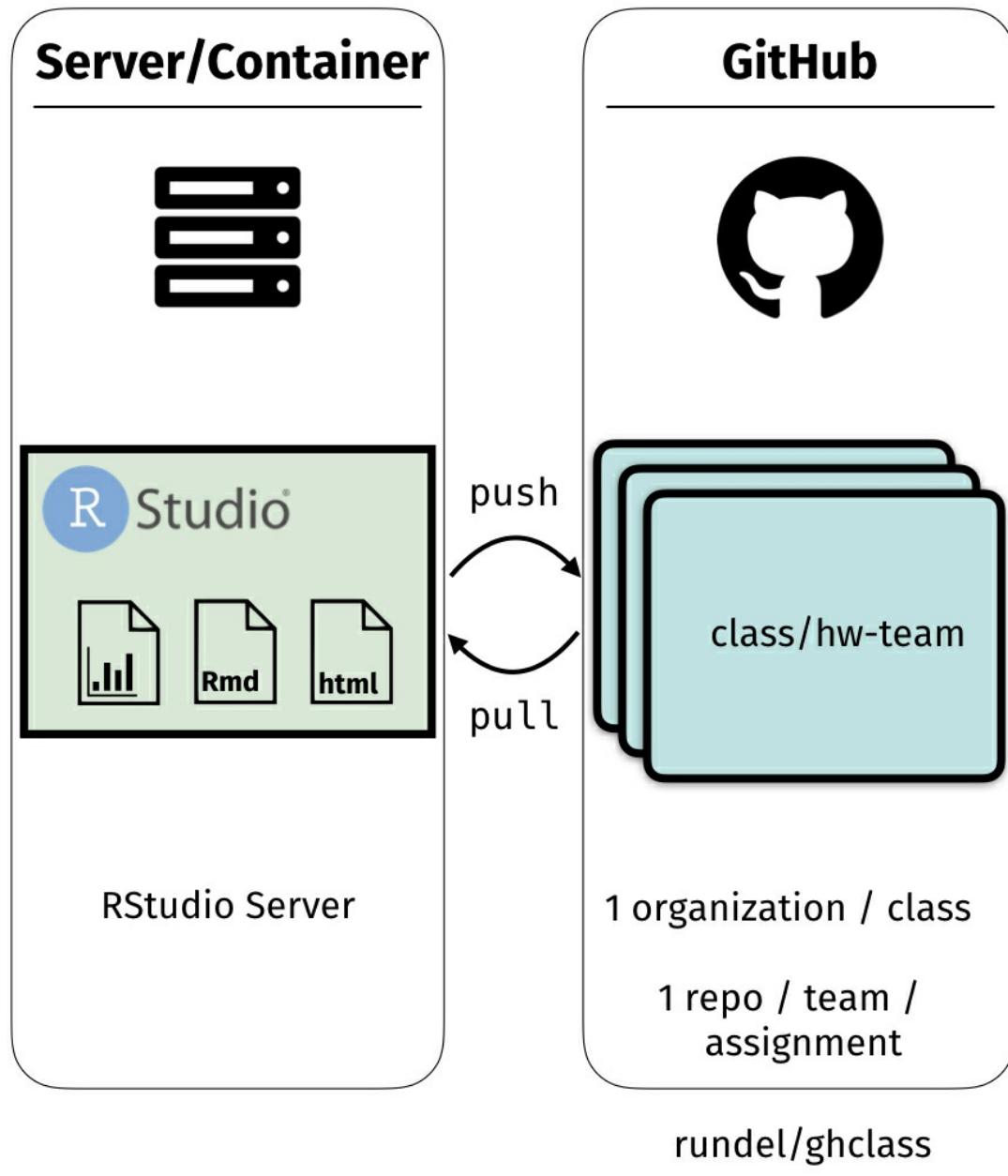
UseR!2019 · Toulouse

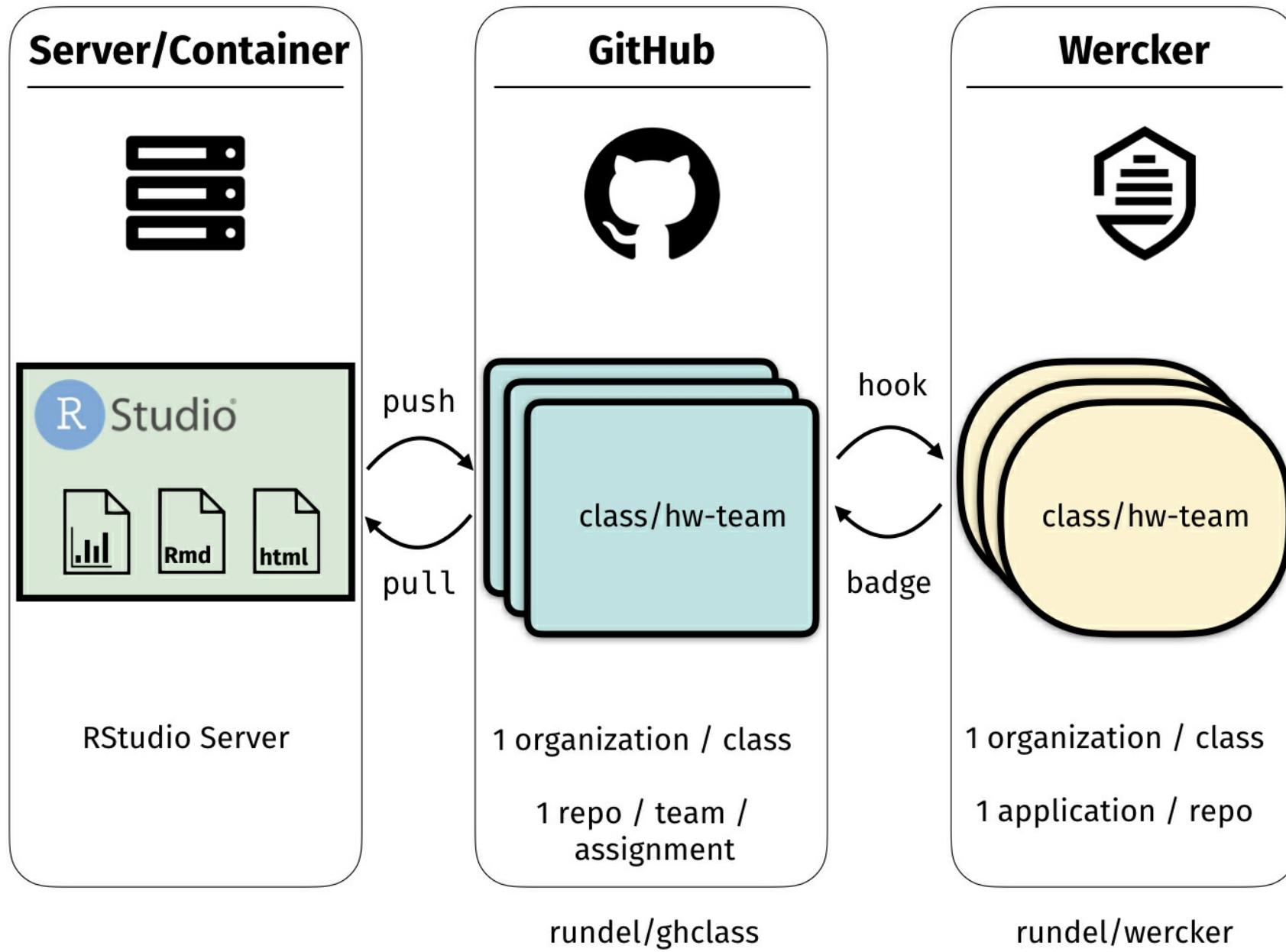
bit.ly/User2019_ghclass

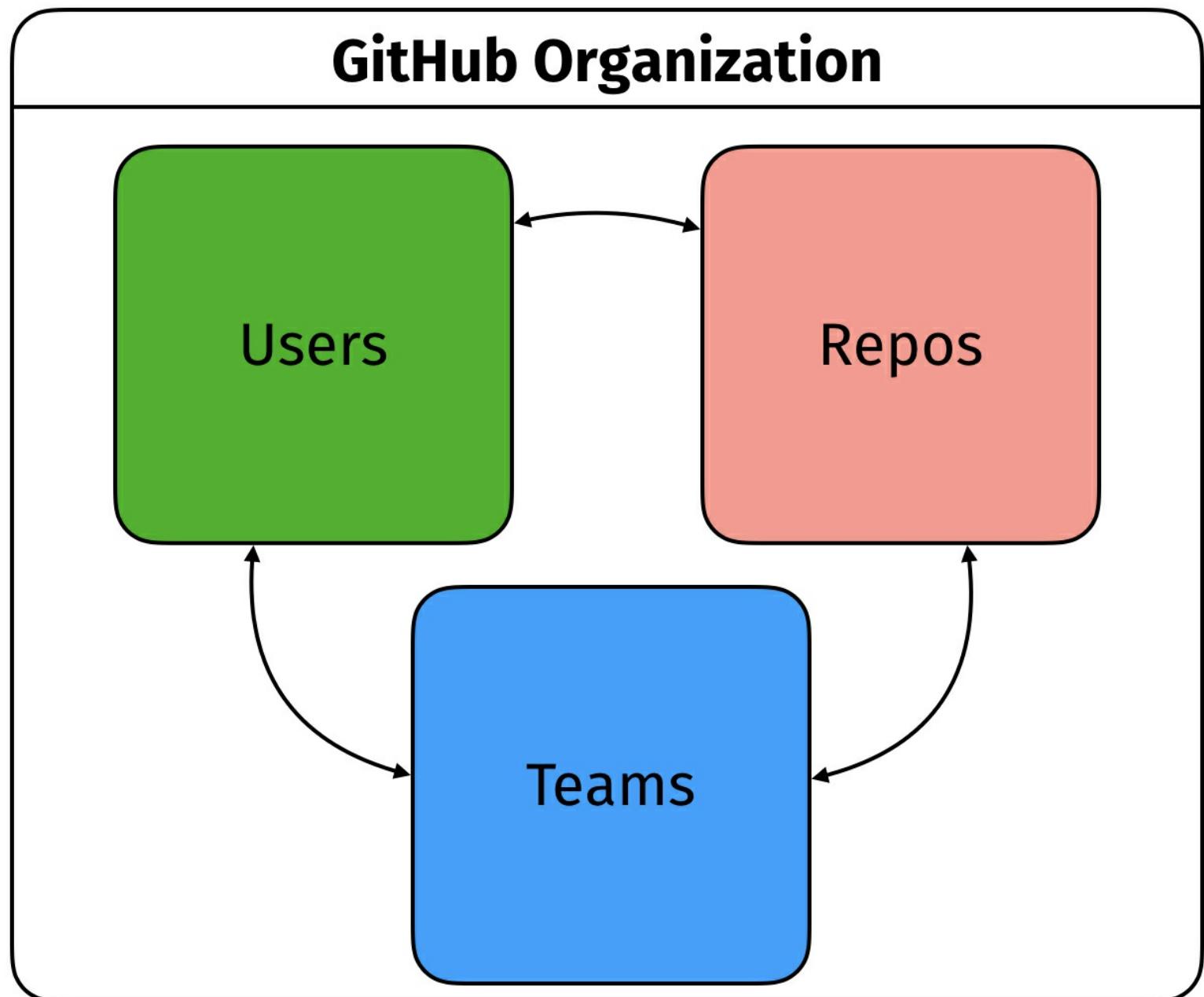
Colin Rundel

Univ of Edinburgh · Duke Univ









Setup

1. Signup for a GitHub Account - github.com
2. Setup git and get a GitHub personal access token (PAT) - github.com/settings/tokens
 - Need help? Read [usethis setup vignette](#) or [happy git with R](#)
3. Signup for the GitHub Education Discount - education.github.com/benefits
4. Create a GitHub Organization for your class - github.com/organizations/new

Only step 4 needs to be repeated for a new class!

Introduction to ghclass

```
remotes::install_github("rundel/ghclass")
library(ghclass)
```

Some design principals behind this package:

1. All of the package's functions are prefixed with either `org`, `repo`, `team`, `github` or `local_repo` to indicate what they operate on.
2. Most functions are vectorized over their parameters, to allow related operations to be grouped.
3. All messaging is built on `usethis::ui_*` functions, as such you can make it shutup with `options(usethis.quiet = TRUE)`.
4. Most actions are non-destructive and/or backed by git, the handful of dangerous operations will warn you.
5. Follow the unix design philosophy when possible, work towards simple & composable functions

Org & Roster

Today we will be using **ghclass-demo** as our example, hopefully your Org has a slightly more informative name .

(I find course#-semster works well, e.g. Sta323-Sp19).

```
(roster = readr::read_csv("files/roster.csv"))

## # A tibble: 6 x 5
##   uid    email          github      hw01      hw02
##   <chr> <chr>          <chr>       <chr>     <chr>
## 1 za17  anya@school.edu ghclass-anya hw01-team01 hw02-team01
## 2 kb34  bruno@school.edu ghclass-bruno hw01-team02 hw02-team02
## 3 ac13  celine@school.edu ghclass-celine hw01-team03 hw02-team03
## 4 bd88  diego@school.edu ghclass-diego hw01-team01 hw02-team03
## 5 se01  elijah@school.edu ghclass-elijah hw01-team02 hw02-team01
## 6 df00  francis@school.edu ghclass-francis hw01-team03 hw02-team02
```



ghclass-demo

Repositories Packages People 3 Teams Projects Settings

This organization has no repositories.

Create a new repository

Top languages R

People 3 >

Invite someone

Checking your git config

```
usethis::git_sitrep()

## Git user
## * Name: 'Colin Rundel'
## * Email: 'rundel@gmail.com'
## * Vaccinated: TRUE
## usethis + git2r
## * Default usethis protocol: <unset>
## * git2r supports SSH: TRUE
## * Credentials: '<usethis + git2r default behaviour>'

## GitHub
## * Personal access token: '<found in env var>'
## * User: 'rundel'
## * Name: 'Colin Rundel'

## Repo
## * Path: '/Users/rundel/Desktop/Presentations/.git'
## * Local branch -> remote tracking branch: 'master' -> 'origin/master'
## GitHub pull request readiness
## * origin: rundel/Presentations, can push
## * upstream: '<no such remote>'
```

Checking your git config - ghclass

```
github_test_token()  
  
## Your github token is functioning correctly.  
  
github_test_token("bad token")  
  
## ✖ Your github token failed to authenticate.  
## [Error: GitHub API error (401): 401 Unauthorized]
```

Inviting Students

```
org_invite(org = "ghclass-demo", user = roster$github)
```

```
##     Invited user 'ghclass-anya' to org 'ghclass-demo'.
##     Invited user 'ghclass-bruno' to org 'ghclass-demo'.
##     Invited user 'ghclass-ceLINE' to org 'ghclass-demo'.
##     Invited user 'ghclass-diego' to org 'ghclass-demo'.
##     User 'ghclass-elijah' is already a pending member of org 'ghclass-demo'.
##     User 'ghclass-francis' is already a pending member of org 'ghclass-demo'.
```

```
org_members("ghclass-demo", include_admins = FALSE)
```

```
## character(0)
```

```
org_pending_members("ghclass-demo")
```

```
## [1] "ghclass-anya"    "ghclass-bruno"   "ghclass-elijah"  "ghclass-francis"
## [5] "ghclass-ceLINE"
```

 ghclass-demo

[Repositories](#) [Packages](#) [People 3](#) [Teams](#) [Projects](#) [Settings](#)

[Members](#) [Outside collaborators](#) [Invite member](#)

Select all 6 pending invitations 2FA ▾ Role ▾

<input type="checkbox"/>		Mine Cetinkaya-Rundel mine-cetinkaya-rundel	2FA ✓	 Private	Owner	0 teams	
<input type="checkbox"/>		Colin Rundel rundel	2FA ✗	 Private ▾	Owner	0 teams	
<input type="checkbox"/>		Therese Anders thereseanders	2FA ✗	 Private	Owner	0 teams	

ghclass-demo

Repositories Packages

Find a member...

Select all

Mine Cetinkaya-Rundel
mine-cetinkaya-rundel

Colin Rundel
rundel

Therese Anders
thereseanders

Pending invitations

ghclass-anya
ghclass-anya

ghclass-bruno
ghclass-bruno

ghclass-ceLINE
ghclass-ceLINE

ghclass-diego
ghclass-diego

ghclass-elijah
ghclass-elijah

ghclass-francis
ghclass-francis

Edit invitation

Edit invitation

Edit invitation

Edit invitation

Edit invitation

Invite member

Pending invitations 2FA ▾ Role ▾

Owner 0 teams

Owner 0 teams

Owner 0 teams

Pending invitations

×

ghclass-anya
ghclass-anya

ghclass-bruno
ghclass-bruno

ghclass-ceLINE
ghclass-ceLINE

ghclass-diego
ghclass-diego

ghclass-elijah
ghclass-elijah

ghclass-francis
ghclass-francis

Edit invitation

Edit invitation

Edit invitation

Edit invitation

Edit invitation

Invitations are sent via email and can be accepted at
<https://github.com/ghclass-demo>

A few days later ...

```
org_members("ghclass-demo", include_admins = FALSE)  
## [1] "ghclass-anya"    "ghclass-bruno"   "ghclass-ceLINE" "ghclass-diego"  
  
org_pending_members("ghclass-demo")  
## [1] "ghclass-elijah"  "ghclass-francis"
```

several emails and a week later ...

```
org_members("ghclass-demo", include_admins = FALSE)  
## [1] "ghclass-anya"    "ghclass-bruno"   "ghclass-ceLINE" "ghclass-diego"  
## [5] "ghclass-elijah"  "ghclass-francis"  
  
org_pending_members("ghclass-demo")  
## character(0)
```

 ghclass-demo

[Repositories](#) [Packages](#) [People 9](#) [Teams](#) [Projects](#) [Settings](#)

Find a member... [Members](#) [Outside collaborators](#) [Invite member](#)

<input type="checkbox"/> Select all		2FA	Role
<input type="checkbox"/>	 ghclass-anya	2FA X	🔒 Private Member 0 teams ⚙️
<input type="checkbox"/>	 ghclass-bruno	2FA X	🔒 Private Member 0 teams ⚙️
<input type="checkbox"/>	 ghclass-celine	2FA X	🔒 Private Member 0 teams ⚙️
<input type="checkbox"/>	 ghclass-diego	2FA X	🔒 Private Member 0 teams ⚙️
<input type="checkbox"/>	 ghclass-elijah	2FA X	🔒 Private Member 0 teams ⚙️

Setup Teams

```
roster
```

```
## # A tibble: 6 x 5
##   uid   email           github      hw01      hw02
##   <chr> <chr>          <chr>      <chr>      <chr>
## 1 za17  anya@school.edu ghclass-anya  hw01-team01 hw02-team01
## 2 kb34  bruno@school.edu ghclass-bruno  hw01-team02 hw02-team02
## 3 ac13  celine@school.edu ghclass-ceLINE  hw01-team03 hw02-team03
## 4 bd88  diego@school.edu ghclass-diego  hw01-team01 hw02-team03
## 5 se01  elijah@school.edu ghclass-elijah  hw01-team02 hw02-team01
## 6 df00  francis@school.edu ghclass-francis hw01-team03 hw02-team02
```

```
team_create("ghclass-demo", team = roster$hw01)
```

```
##     Created team 'hw01-team01' in org 'ghclass-demo'.
##     Created team 'hw01-team02' in org 'ghclass-demo'.
##     Created team 'hw01-team03' in org 'ghclass-demo'.
```

```
team_invite("ghclass-demo", user = roster$github, team = roster$hw01)
```

```
##     Added 'ghclass-anya' to team 'hw01-team01'.
##     Added 'ghclass-diego' to team 'hw01-team01'.
##     Added 'ghclass-bruno' to team 'hw01-team02'.
##     Added 'ghclass-elijah' to team 'hw01-team02'.
##     Added 'ghclass-ceLINE' to team 'hw01-team03'.
```



ghclass-demo

Repositories Packages People 9 Teams 3 Projects Settings

This organization has no repositories.

Create a new repository

Top languages

R

People 9 >



0 seats left — [Buy more](#)

 ghclass-demo

Repositories Packages People 9 Teams 3 Projects Settings

Find a team... New team

<input type="checkbox"/> Select all	Visibility ▾	Members ▾
<input type="checkbox"/> hw01-team01 Secret		2 members 0 teams
<input type="checkbox"/> hw01-team02 Secret		2 members 0 teams
<input type="checkbox"/> hw01-team03 Secret		2 members 0 teams

Previous Next

Setup Repos

```
roster$hw01
```

```
## [1] "hw01-team01" "hw01-team02" "hw01-team03" "hw01-team01" "hw01-team02"  
## [6] "hw01-team03"
```

```
repo_create("ghclass-demo", name = roster$hw01)
```

```
##     Created repo 'ghclass-demo/hw01-team01'.  
##     Created repo 'ghclass-demo/hw01-team02'.  
##     Created repo 'ghclass-demo/hw01-team03'.
```

```
repo_add_team(repo = org_repos("ghclass-demo", filter = "hw01-"),  
              team = org_teams("ghclass-demo", filter = "hw01-"))
```

```
##     Added team 'hw01-team01' to repo 'ghclass-demo/hw01-team01'.  
##     Added team 'hw01-team02' to repo 'ghclass-demo/hw01-team02'.  
##     Added team 'hw01-team03' to repo 'ghclass-demo/hw01-team03'.
```



ghclass-demo

[Repositories 3](#) [Packages](#) [People 9](#) [Teams 3](#) [Projects](#) [Settings](#)

Find a repository... Type: All ▾ Customize pins [New](#)

hw01-team03 Private

0 0 0 0 Updated 33 seconds ago

hw01-team02 Private

0 0 0 0 Updated 35 seconds ago

hw01-team01 Private

0 0 0 0 Updated 37 seconds ago

Top languages

R

People 9 >

0 seats left — [Buy more](#)

[ghclass-demo / hw01-team01](#) Private

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No description, website, or topics provided. [Edit](#)

[Manage topics](#)

1 commit 1 branch 0 releases 1 contributor

Branch: master ▾ [New pull request](#) [Create new file](#) [Upload files](#) [Find File](#) [Clone or download ▾](#)

[rundel](#) Initial commit Latest commit 3009227 10 seconds ago

[.gitignore](#) Initial commit 10 seconds ago

Help people interested in this repository understand your project by adding a README. [Add a README](#)



Provide Template Code

```
(repos = org_repos("ghclass-demo", filter = "hw01-"))

## [1] "ghclass-demo/hw01-team01" "ghclass-demo/hw01-team02"
## [3] "ghclass-demo/hw01-team03"

repo_mirror(source_repo = "Sta323-Sp19/hw1",
            target_repo = repos)

##     Cloned 'Sta323-Sp19/hw1'.
##     Pushed (mirror) 'hw1' to repo 'ghclass-demo/hw01-team01'.
##     Pushed (mirror) 'hw1' to repo 'ghclass-demo/hw01-team02'.
##     Pushed (mirror) 'hw1' to repo 'ghclass-demo/hw01-team03'.
##     Removed local copy of 'Sta323-Sp19/hw1'
```

 ghclass-demo / hw01-team01 Private

 Watch 0

 Star 0

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 Code

 Issues 0

 Pull requests 0

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 Wiki

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No description, website, or topics provided.

 Edit

[Manage topics](#)

 2 commits

 1 branch

 0 releases

 1 contributor

Branch: master 

[New pull request](#)

[Create new file](#)

[Upload files](#)

[Find File](#)

[Clone or download !\[\]\(9499c41b255835fea752941a20ea888b_img.jpg\)](#)

 rundel Fix due date

Latest commit f2ea9e1 on Jan 18

 .gitignore

Initial

6 months ago

 README.md

Fix due date

6 months ago

 fizzbuzz.png

Initial

6 months ago

 hw1.Rmd

Initial

6 months ago

 hw1.Rproj

Initial

6 months ago

 hw1_whitelist.R

Initial

6 months ago

 wercker.yml

Initial

6 months ago

 README.md



Sta 323 - Homework 1

Due by 11:59 pm on Thursday 1/24/2019.

FIZZ
BUZZ
FIZZBUZZ

Background

The FizzBuzz test is a common programming interview question used to establish if a candidate can actually program in a language that they claim experience in.

The problem statement is as follows:

Save some steps

```
org_create_assignment(org = "ghclass-demo", repo = roster$hw02, user = roster$github,
                      team = roster$hw02, source_repo = "Sta323-Sp19/hw2")
```

```
##      Created repo 'ghclass-demo/hw02-team01'.
##      Created repo 'ghclass-demo/hw02-team02'.
##      Created repo 'ghclass-demo/hw02-team03'.
##      Created team 'hw02-team01' in org 'ghclass-demo'.
##      Created team 'hw02-team02' in org 'ghclass-demo'.
##      Created team 'hw02-team03' in org 'ghclass-demo'.
##      Added 'ghclass-anya' to team 'hw02-team01'.
##      Added 'ghclass-elijah' to team 'hw02-team01'.
##      Added 'ghclass-bruno' to team 'hw02-team02'.
##      Added 'ghclass-francis' to team 'hw02-team02'.
##      Added 'ghclass-ceLINE' to team 'hw02-team03'.
##      Added 'ghclass-diego' to team 'hw02-team03'.
##      Added team 'hw02-team01' to repo 'ghclass-demo/hw02-team01'.
##      Added team 'hw02-team02' to repo 'ghclass-demo/hw02-team02'.
##      Added team 'hw02-team03' to repo 'ghclass-demo/hw02-team03'.
##      Cloned 'Sta323-Sp19/hw2'.
##      Pushed (mirror) 'hw2' to repo 'ghclass-demo/hw02-team01'.
##      Pushed (mirror) 'hw2' to repo 'ghclass-demo/hw02-team02'.
##      Pushed (mirror) 'hw2' to repo 'ghclass-demo/hw02-team03'.
##      Pushed (mirror) 'hw2' to repo 'ghclass-demo/hw02-team03'.
##      Pushed (mirror) 'hw2' to repo 'ghclass-demo/hw02-team01'.
##      Pushed (mirror) 'hw2' to repo 'ghclass-demo/hw02-team02'.
##      Removed local copy of 'Sta323-Sp19/hw2'
```

Individual assignments (e.g. exams)

```
org_create_assignment(org = "ghclass-demo", repo = paste0("exam1-", roster$github),
                      user = roster$github, source_repo = "Sta323-Sp19/midterm1")

##      Created repo 'ghclass-demo/exam1-ghclass-anya'.
##      Created repo 'ghclass-demo/exam1-ghclass-bruno'.
##      Created repo 'ghclass-demo/exam1-ghclass-ceLINE'.
##      Created repo 'ghclass-demo/exam1-ghclass-diego'.
##      Created repo 'ghclass-demo/exam1-ghclass-elijah'.
##      Created repo 'ghclass-demo/exam1-ghclass-francis'.
##      Added user 'ghclass-anya' to repo 'ghclass-demo/exam1-ghclass-anya'.
##      Added user 'ghclass-bruno' to repo 'ghclass-demo/exam1-ghclass-bruno'.
##      Added user 'ghclass-ceLINE' to repo 'ghclass-demo/exam1-ghclass-ceLINE'.
##      Added user 'ghclass-diego' to repo 'ghclass-demo/exam1-ghclass-diego'.
##      Added user 'ghclass-elijah' to repo 'ghclass-demo/exam1-ghclass-elijah'.
##      Added user 'ghclass-francis' to repo 'ghclass-demo/exam1-ghclass-francis'.
##      Cloned 'Sta323-Sp19/midterm1'.
##      Pushed (mirror) 'midterm1' to repo 'ghclass-demo/exam1-ghclass-anya'.
##      Pushed (mirror) 'midterm1' to repo 'ghclass-demo/exam1-ghclass-bruno'.
##      Pushed (mirror) 'midterm1' to repo 'ghclass-demo/exam1-ghclass-ceLINE'.
##      Pushed (mirror) 'midterm1' to repo 'ghclass-demo/exam1-ghclass-diego'.
##      Pushed (mirror) 'midterm1' to repo 'ghclass-demo/exam1-ghclass-elijah'.
##      Pushed (mirror) 'midterm1' to repo 'ghclass-demo/exam1-ghclass-francis'.
##      Removed local copy of 'Sta323-Sp19/midterm1'
```

Making Changes

```
repo_add_file(repo = org_repos("ghclass-demo", "hw01-"),
              file = "files/fizzbuzz.png")
```

```
##     Added file 'fizzbuzz.png' to repo 'ghclass-demo/hw01-team01'.
##     Added file 'fizzbuzz.png' to repo 'ghclass-demo/hw01-team02'.
##     Added file 'fizzbuzz.png' to repo 'ghclass-demo/hw01-team03'.
```

```
repo_add_file(repo = org_repos("ghclass-demo", "hw01-"),
              file = "files/fizzbuzz.png", overwrite = TRUE)
```

```
##     Added file 'fizzbuzz.png' to repo 'ghclass-demo/hw01-team01'.
##     Added file 'fizzbuzz.png' to repo 'ghclass-demo/hw01-team02'.
##     Added file 'fizzbuzz.png' to repo 'ghclass-demo/hw01-team03'.
```

Modify a file

```
repo_modify_file(repo = org_repos("ghclass-demo", "hw01-"), file = "README.md",
                  pattern = "on Thursday 1/24/2019.", content = "on Wednesday 10/07/2019.")
```

```
##     Modified file 'ghclass-demo/hw01-team01/README.md'.
##     Modified file 'ghclass-demo/hw01-team02/README.md'.
##     Modified file 'ghclass-demo/hw01-team03/README.md'.
```

Sta 323 - Homework 1

Due by 11:59 pm on Thursday 1/24/2019.

FIZZ
BUZZ
FIZZBUZZ

Background

The FizzBuzz test is a common programming interview question used to establish if a candidate can actually program in a language that they claim experience in.

The problem statement is as follows:

Sta 323 - Homework 1

Due by 11:59 pm on Thursday 1/24/2019.

FIZZ

DIZZ

⌚ Sta 323 - Homework 1

Due by 11:59 pm on Wednesday 10/07/2019.

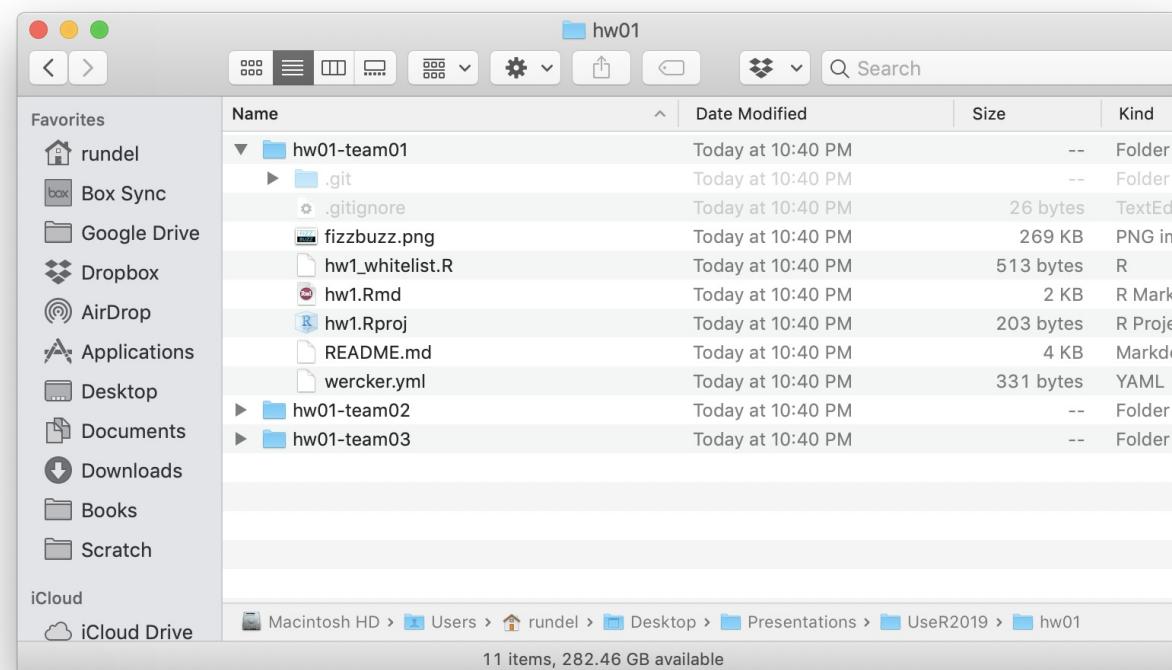
FIZZ

DIZZ

Collect student work

```
local_repo_clone(repo = org_repos("ghclass-demo", "hw01-"), local_path = "hw01")
```

```
## Cloned 'ghclass-demo/hw01-team01'.
## Cloned 'ghclass-demo/hw01-team02'.
## Cloned 'ghclass-demo/hw01-team03'.
```



Feedback?

```
repo_style("ghclass-demo/hw01-team01", files = "*.Rmd", draft = TRUE)

##     Created branch 'styler' from 'ghclass-demo/hw01-team01'.
##     Cloned 'ghclass-demo/hw01-team01@styler'.
##     Created pull request for 'ghclass-demo/hw01-team01 (master <= styler)'.
```

styler revisions #4

Edit

 Draft rundel wants to merge 1 commit into `master` from `styler` 

 Conversation 0

 Commits 1

 Checks 0

 Files changed 1

+14 -14 



rundel commented 15 seconds ago

+ ...

This pull request contains the results of running the automated R code formating tool styler on your repo. Styling is based on the [tidyverse R style guide](#).

Click on the commit below to see details of recommended changes. It is not necessary that your code cleanly pass these checks, but if there is a large number of significant changes suggested you should review the style guide with an eye towards potentially improving your code formatting.

@ghclass-anya, @ghclass-bruno, @ghclass-diego, @ghclass-elijah, @ghclass-francis, @ghclass-celeine

 Results of running styler: 

2f8eadd

Add more commits by pushing to the `styler` branch on [ghclass-demo/hw01-team01](#).



This pull request is still a work in progress

Draft pull requests cannot be merged.

Ready for review

Merge pull request 

You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

Reviewers



No reviews

Assignees



No one—assign yourself

Labels



None yet

Projects



None yet

Milestone



No milestone

Notifications

Customize

 Unsubscribe

You're receiving notifications because you authored the thread.

28 hw1.Rmd

```
@@ -16,32 +16,32 @@ seek help from StackOverflow in finding a way to test for integers, linked here:  
16  
17  
18  ``{r}  
19 -fizzbuzz # function(v) {  
20 -  for (i in v){ #iterates through the values defined in v  
21 -  
22 -  #Error cases  
23 -  if ((is.integer(i) == FALSE) & (is.double(i) == FALSE)){  
24 -    stop("Value is non-numeric")  
25 -  }  
26 -  else if ((i <= 0) || (i == Inf)){  
27 -    stop("Value is not in the acceptable range")  
28 -  }  
29 -  else if (i%%1 != 0){  
30 -    stop("Value is not an integer")  
31 -  }  
32 -  
33 -  
34 -  #Constructing working cases options  
35 -  else if ((i%%3 == 0) & (i%%5 == 0)){  
36 -    print("FizzBuzz")  
37 -  }  
38 -  else if (i%%3 == 0){  
39 -    print("Fizz")  
40 -  }  
41 -  else if (i%%5 == 0){  
42 -    print("Buzz")  
43 -  }  
16  
17  
18  ``{r}  
19 +fizzbuzz <- function(v) {  
20 +  for (i in v){ #iterates through the values defined in v  
21 +  
22 +  # Error cases  
23 +  if ((is.integer(i) == FALSE) & (is.double(i) == FALSE)){  
24 +    stop("Value is non-numeric")  
25 +  }  
26 +  else if ((i <= 0) || (i == Inf)){  
27 +    stop("Value is not in the acceptable range")  
28 +  }  
29 +  else if (i %% 1 != 0){  
30 +    stop("Value is not an integer")  
31 +  }  
32 +  
33 +  
34 +  #Constructing working cases options  
35 +  else if ((i %% 3 == 0) & (i %% 5 == 0)){  
36 +    print("FizzBuzz")  
37 +  }  
38 +  else if (i %% 3 == 0){  
39 +    print("Fizz")  
40 +  }  
41 +  else if (i %% 5 == 0){  
42 +    print("Buzz")  
43 +  }
```

Putting it all together

This is an example from my Organization folder for my Statistical Computing course last Spring:

```
library(ghclass)
library(dplyr)

df = readr::read_csv("hw2_teams.csv")

team_create("Sta323-Sp19", team = df$team)
team_invite("Sta323-Sp19", df$github, df$team)

repo_create("Sta323-Sp19", df$team)
repo_add_team(org_repos("Sta323-Sp19", "hw2-"), org_teams("Sta323-Sp19", "hw2-"))

mirror_repo("Sta323-Sp19/hw2", org_repos("Sta323-Sp19", "hw2-"))

wercker_add(repo = org_repos("Sta323-Sp19", "hw2-"), wercker_org = "Sta323-Sp19")

branch_create(
  repo = paste0("Sta323-Sp19/", df$team),
  cur_branch = "master",
  new_branch = df$github
)
```

Future Work

- We will be submitting to CRAN in the next month
- Active summer project adding functionality for peer review by Mine Cetinkaya-Rundel and Therese Anders
- Support for GitHub actions for automated feedback (**rundel/wercker** replacement)
- Support more workflows, if you GitHub based workflow for teaching that was not reflected here please get in touch.

Thank you!



[rundel/ghclass](https://github.com/rundel/ghclass)



bit.ly/User2019_ghclass



github.com/rundel



rundel@gmail.com



[@rundel](https://twitter.com/rundel)