

ghclass

an R package for managing classes with GitHub

UseR!2019 · Toulouse

bit.ly/User2019_ghclass

Colin Rundel

Univ of Edinburgh · Duke Univ

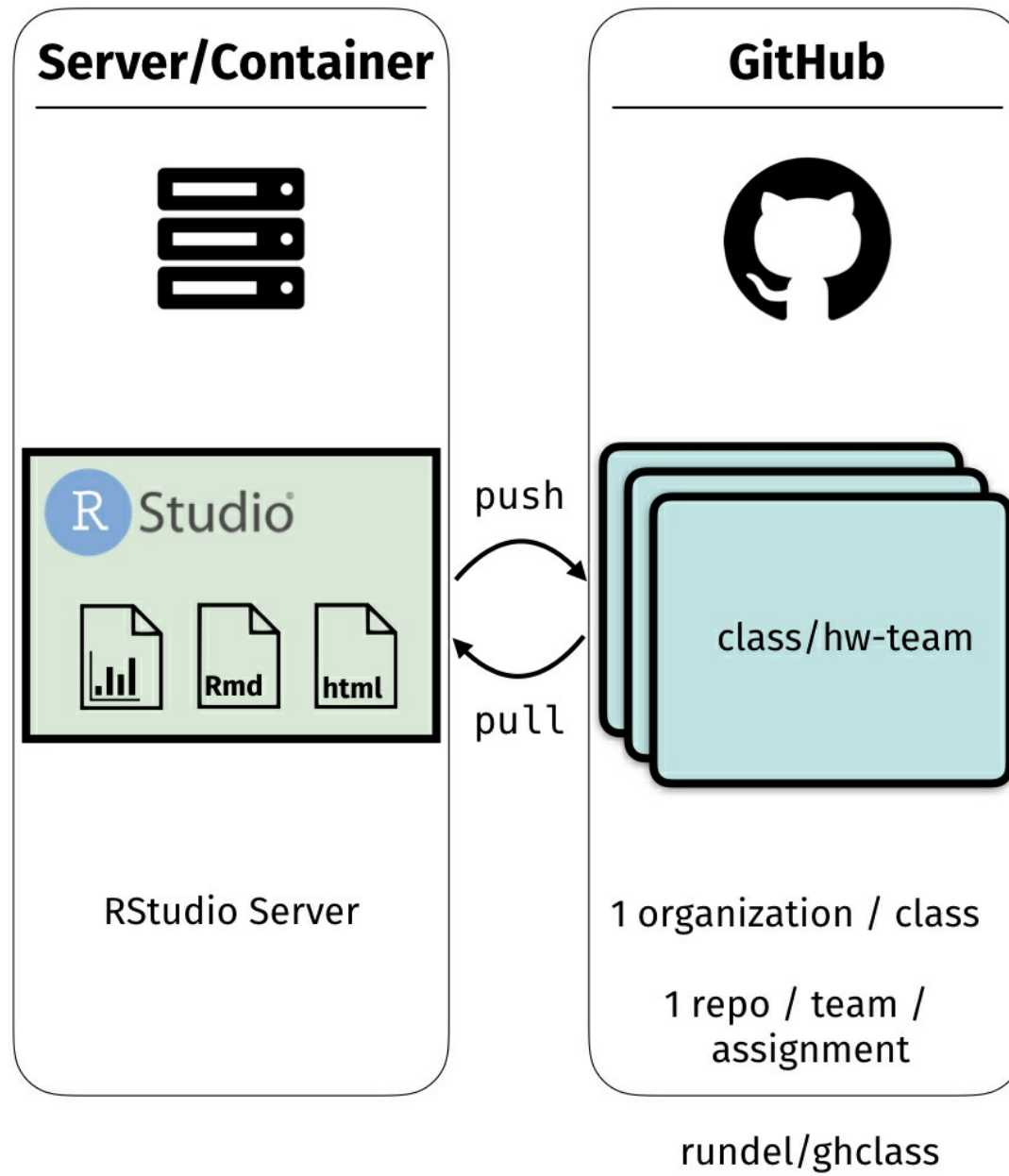
Server/Container

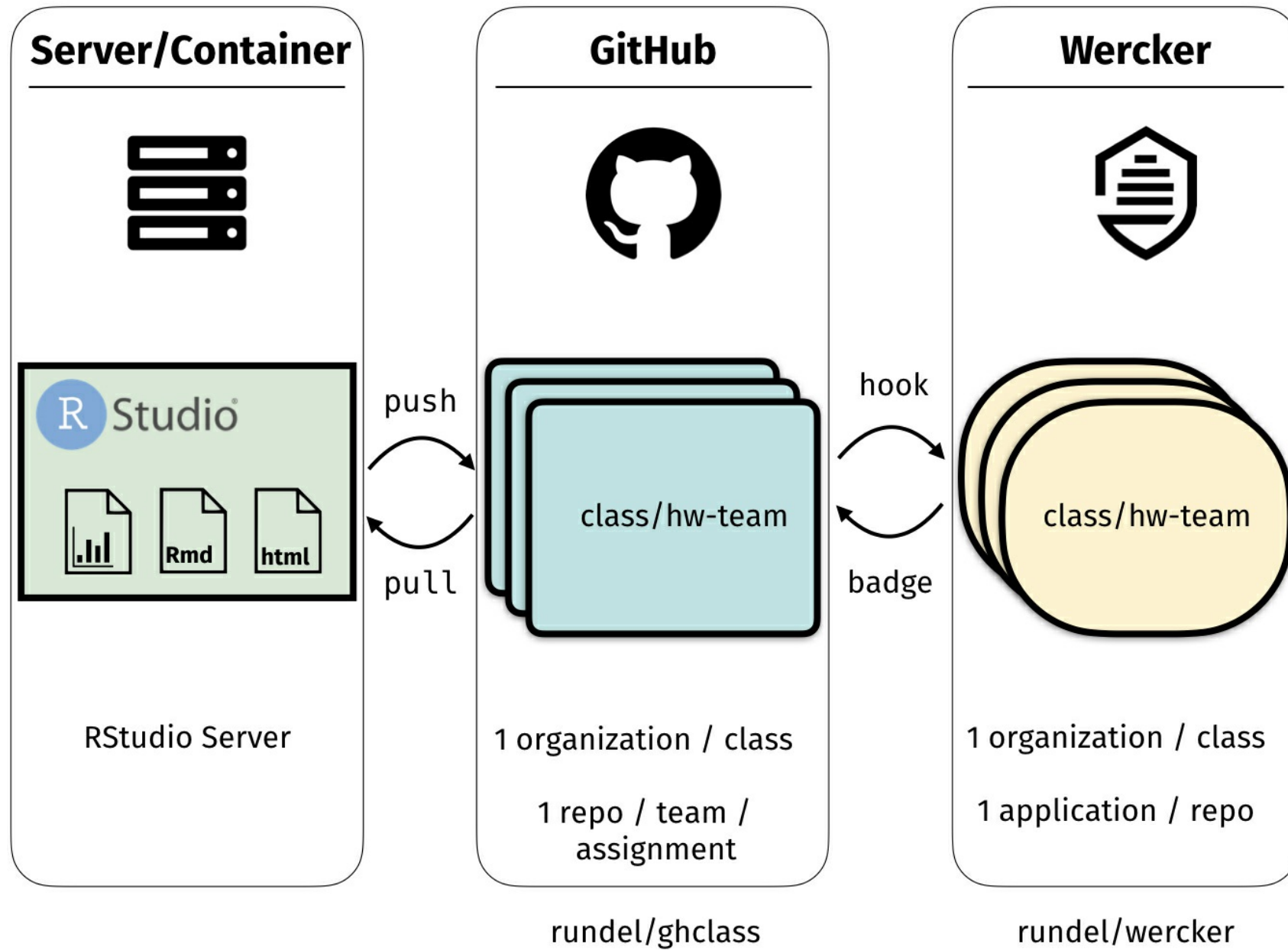


R Studio

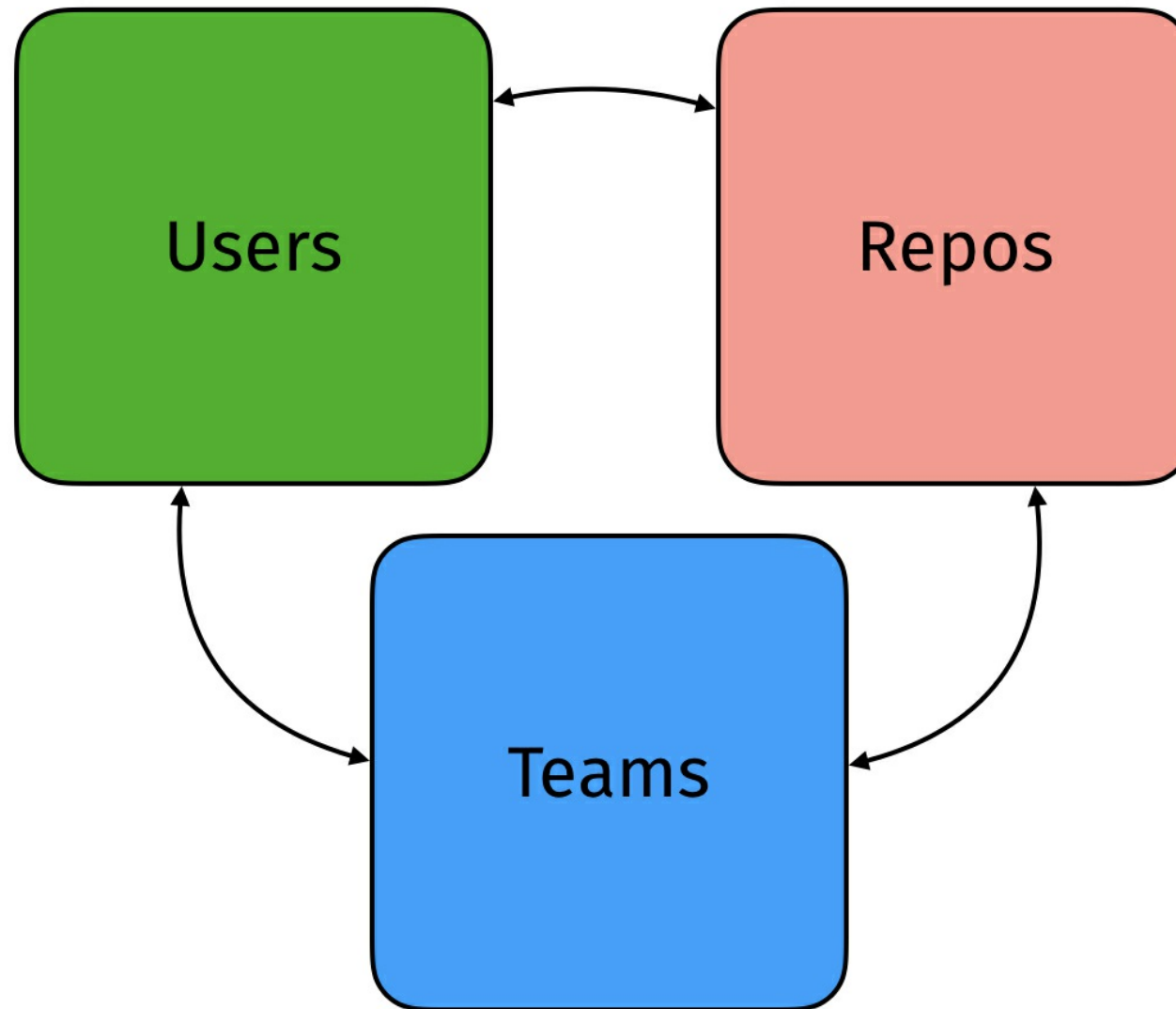


RStudio Server





GitHub Organization



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 [use this 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#-semester` 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



Find a member...

Members

Outside collaborators

Invite member



Select all

6 pending invitations

2FA ▾

Role ▾



Mine Cetinkaya-Rundel

mine-cetinkaya-rundel

2FA ✓



Private

Owner

0 teams



Colin Rundel

rundel

2FA ✗



Private ▾

Owner

0 teams



Therese Anders

thereseanders

2FA ✗



Private

Owner

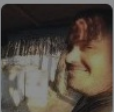
0 teams



Find a member...

☐ Select all

☐  **Mine Cetinkaya-Rundel**
mine-cetinkaya-rundel

☐  **Colin Rundel**
rundel

☐  **Therese Anders**
thereseanders

Pending invitations



ghclass-any
ghclass-any

Edit invitation



ghclass-bruno
ghclass-bruno

Edit invitation



ghclass-celine
ghclass-celine

Edit invitation



ghclass-diego
ghclass-diego

Edit invitation



ghclass-elijah
ghclass-elijah

Edit invitation



ghclass-francis
ghclass-francis

Edit invitation

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

Invite member

Pending invitations

2FA

Role

Owner

0 teams



Owner

0 teams



Owner

0 teams



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



Select all

2FA ▾

Role ▾



ghclass-any

2FA ✕



Private

Member

0 teams



ghclass-bruno

2FA ✕



Private

Member

0 teams



ghclass-celine

2FA ✕



Private

Member

0 teams



ghclass-diego

2FA ✕



Private

Member

0 teams



ghclass-elijah

2FA ✕



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.

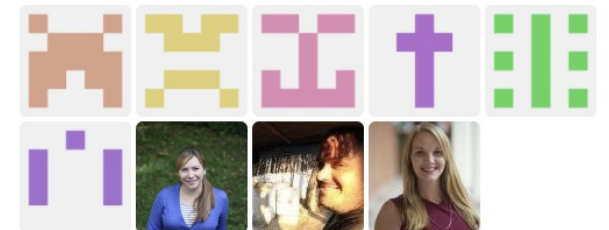
Create a new repository

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

☐ Select all

Visibility ▾

Members ▾

☐ hw01-team01 Secret



2 members

0 teams

☐ hw01-team02 Secret



2 members

0 teams

☐ 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

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

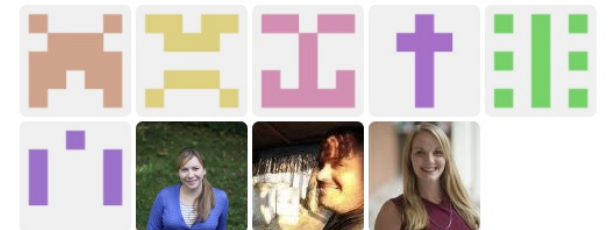
 0  0  0  0 Updated 37 seconds ago

Top languages

 R

People

9 >



0 seats left — [Buy more](#)

ghclass-demo / hw01-team01 Private

Watch 0

Star 0

Fork 0

Code

Issues 0

Pull requests 0

Projects 0

Wiki

Security

Insights

Settings

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 Fork 0

Code Issues 0 Pull requests 0 Projects 0 Wiki Security Insights Settings

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



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

DI77

Sta 323 - Homework 1

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

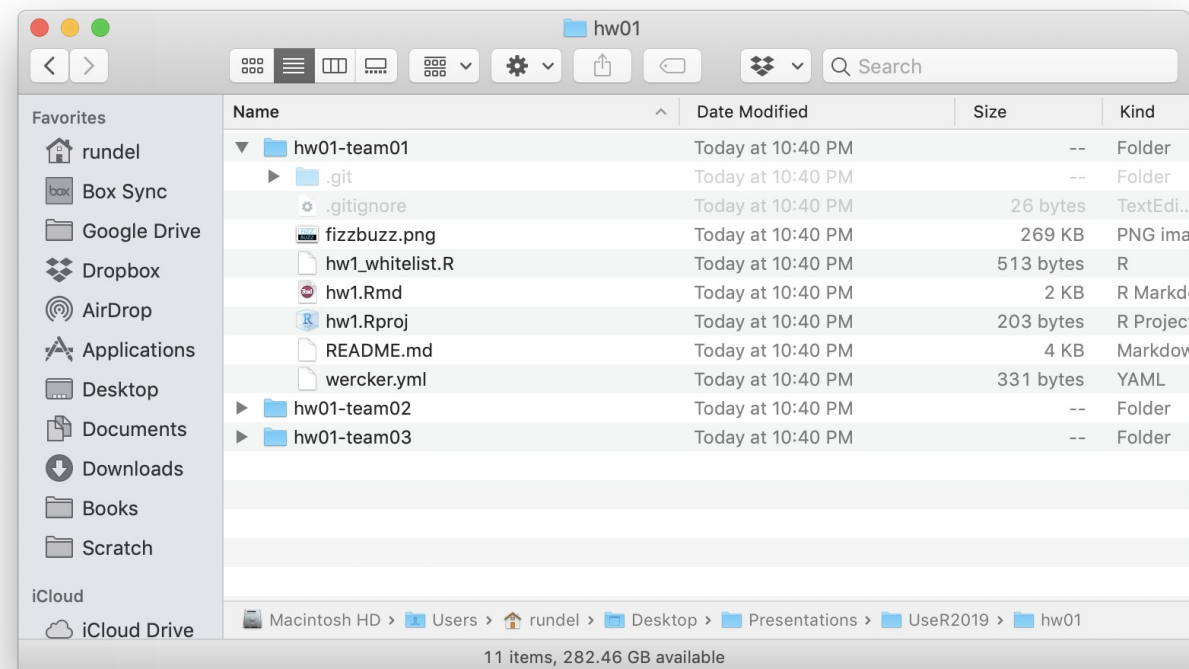
FIZZ

DI77

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 formatting 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-celine

  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.

@@ -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](#)



bit.ly/User2019_ghclass



github.com/rundel



rundel@gmail.com



[@rundel](#)