ghclass

an R package for managing classes with GitHub

EdinbR 2019

bit.ly/EdinbR2019_ghclass

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Background

- I am a Lecturer at University of Edinburgh, School of Mathematics

    - Statistics and Data Science
    - Technology Enhanced Mathematics Education

- Teaching Statistical Computing since 2014

    - Reproducible computing / research skills
    - R w/ RStudio (server) + RMarkdown
    - git w/ GitHub

Context

- This semester I am the course organizer for Math 11176 - Statistical Programming

    - MSc course w/ ~200 students enrolled

- Multiple marked assignments (both individual and team based)

- For each assignment we distribute:

    - Instruction document
    - Template `Rmd` for solutions
    - Data and other support files

- Need to collect:

    - Completed template `Rmd`
    - Knit output (`pdf`, `html`, `md`, etc.)

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**
   - Check config with `usethis :: git_sitrep()` and
     `ghclass :: github_test_token()`

3. Signup for the GitHub Education Discount - **education.github.com/benefits**

4. Create a GitHub Organization for your class - **github.com/organizations/new**

5. Invite students to join the Organization

Only step 4 & 5 must 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, allows related operations to be grouped.

3. Most actions are non-destructive and/or backed by git, the handful of dangerous operations will warn you.

4. 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 Organization has a slightly more informative name .

(I find `course-when` works well, e.g. `statprog-s1-2019`).

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

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

ghclass-demo

This organization has no repositories.

Create a new repository

Top languages

🔵 R

People   3 ›

Invite someone

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'.
## ✔ Invited user 'ghclass-elijah' to org 'ghclass-demo'.
## ✔ Invited user 'ghclass-francis' to org 'ghclass-demo'.
```

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

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

```
org_pending(org = "ghclass-demo")
```

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

ghclass-demo

🔍 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	⚙ ⌄

ghclass-demo

Repositories   Packages

Find a member...   Invite member

☐ Select all   ending invitations   2FA ▾   Role ▾

☐ Mine Cetinkaya-Run   Owner   0 teams   ⚙▾
   mine-cetinkaya-rundel

☐ Colin Rundel   Owner   0 teams   ⚙▾
   rundel

☐ Therese Anders   Owner   0 teams   ⚙▾
   thereseanders

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Pending invitations   ✕

ghclass-anya   Edit invitation
ghclass-anya

ghclass-bruno   Edit invitation
ghclass-bruno

ghclass-celine   Edit invitation
ghclass-celine

ghclass-diego   Edit invitation
ghclass-diego

ghclass-elijah   Edit invitation
ghclass-elijah

ghclass-francis   Edit invitation
ghclass-francis

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("ghclass-demo")
```

```
## [1] "ghclass-elijah"  "ghclass-francis"
```

several emails and a week later ...

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

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

```
org_pending("ghclass-demo")
```

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

Lets create an team assignment

```r
org_create_assignment(
  org = "ghclass-demo",
  repo = roster$hw01,
  user = roster$github,
  team = roster$hw01,
  source_repo = "statprog-s1-2019/hw1"
)
```

```
## ✔ Mirrored 'statprog-s1-2019/hw1' to 'ghclass-demo/hw01-team01'.
## ✔ Mirrored 'statprog-s1-2019/hw1' to 'ghclass-demo/hw01-team02'.
## ✔ Mirrored 'statprog-s1-2019/hw1' to 'ghclass-demo/hw01-team03'.
## ✔ Created team 'hw01-team01' in org 'ghclass-demo'.
## ✔ Created team 'hw01-team02' in org 'ghclass-demo'.
## ✔ Created team 'hw01-team03' in org 'ghclass-demo'.
## ✔ 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'.
## ✔ Added 'ghclass-francis' to team 'hw01-team03'.
## ✔ 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'.
```

Now an individual assignments

```r
org_create_assignment(
  org = "ghclass-demo",
  repo = paste0("proj1-", roster$github),
  user = roster$github,
  source_repo = "statprog-s1-2019/proj1"
)
```

```
## ✔ Mirrored 'statprog-s1-2019/proj1' to 'ghclass-demo/proj1-ghclass-anya'.
## ✔ Mirrored 'statprog-s1-2019/proj1' to 'ghclass-demo/proj1-ghclass-bruno'.
## ✔ Mirrored 'statprog-s1-2019/proj1' to 'ghclass-demo/proj1-ghclass-celine'.
## ✔ Mirrored 'statprog-s1-2019/proj1' to 'ghclass-demo/proj1-ghclass-diego'.
## ✔ Mirrored 'statprog-s1-2019/proj1' to 'ghclass-demo/proj1-ghclass-elijah'.
## ✔ Mirrored 'statprog-s1-2019/proj1' to 'ghclass-demo/proj1-ghclass-francis'.
## ✔ Added user 'ghclass-anya' to repo 'ghclass-demo/proj1-ghclass-anya'.
## ✔ Added user 'ghclass-bruno' to repo 'ghclass-demo/proj1-ghclass-bruno'.
## ✔ Added user 'ghclass-celine' to repo 'ghclass-demo/proj1-ghclass-celine'.
## ✔ Added user 'ghclass-diego' to repo 'ghclass-demo/proj1-ghclass-diego'.
## ✔ Added user 'ghclass-elijah' to repo 'ghclass-demo/proj1-ghclass-elijah'.
## ✔ Added user 'ghclass-francis' to repo 'ghclass-demo/proj1-ghclass-francis'.
```

Fixing a file

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

```
## ✖ Failed to add file 'fizzbuzz.png' to repo 'ghclass-demo/hw01-team01', this file a
##   If you want to force add this file, re-run the command with `overwrite = TRUE`.
## ✖ Failed to add file 'fizzbuzz.png' to repo 'ghclass-demo/hw01-team02', this file a
##   If you want to force add this file, re-run the command with `overwrite = TRUE`.
## ✖ Failed to add file 'fizzbuzz.png' to repo 'ghclass-demo/hw01-team03', this file a
##   If you want to force add this file, re-run the command with `overwrite = TRUE`.
```

```r
repo_add_file(repo = org_repos(org = "ghclass-demo", filter = "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

```
(contact = roster %>%
  transmute(
    repo = paste0("ghclass-demo/", hw01),
    email = glue::glue("* {name} - [{email}](mailto:{email})")
  ) %>%
  group_by(repo) %>%
  summarize(emails = paste(email, collapse = "\n") %>% paste0("\n\n\n", .)))
```

```
## # A tibble: 3 x 2
##   repo                emails
##   <chr>               <chr>
## 1 ghclass-demo/hw01-… "\n\n\n* Anya - [anya@school.edu](mailto:anya@school…
## 2 ghclass-demo/hw01-… "\n\n\n* Bruno - [bruno@school.edu](mailto:bruno@sch…
## 3 ghclass-demo/hw01-… "\n\n\n* Celine - [celine@school.edu](mailto:celine@…
```

```
repo_modify_file(
  repo = contact$repo,
  path = "README.md",
  pattern = "Friday, October 4th",
  content = contact$emails,
  method = "after"
)
```

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

README.md

Statistical Programming - Homework 1

Due by 11:59 pm on Friday, October 4th.

README.md

Statistical Programming - Homework 1

Due by 11:59 pm on Friday, October 4th.

README.md

Statistical Programming - Homework 1

Due by 11:59 pm on Friday, October 4th

- Anya - anya@school.edu
- Diego - diego@school.edu.

Collect student work

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

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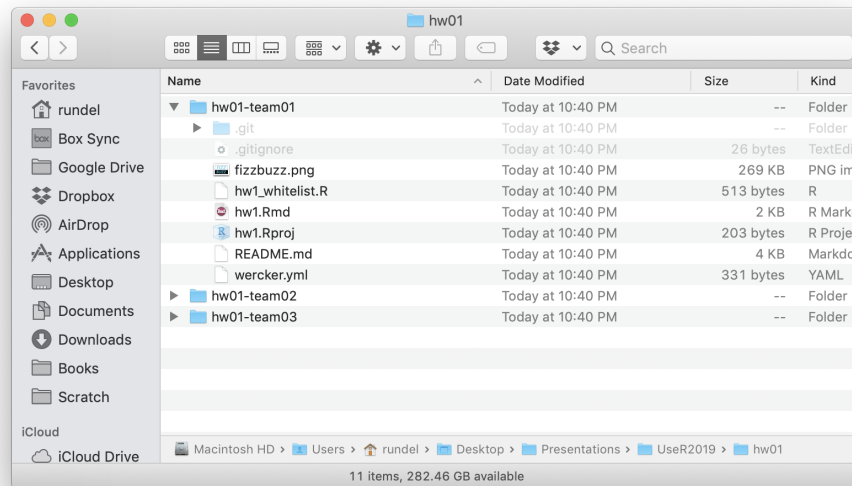
Feedback?

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

```
## ✔ Cloned 'ghclass-demo/hw01-team01'.
## ✔ Added branch 'styler' to 'hw01-team01'.
## ✔ Added files 'hw1.Rmd' to 'hw01-team01'.
## ✔ Committed changes to 'hw01-team01'.
## ✔ Pushed from 'hw01-team01' to 'origin/styler'.
## ✔ Created pull request for 'ghclass-demo/hw01-team01 (master ← styler)'.
```

styler revisions #4

🔀 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-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**   **Ready for review**
Draft pull requests cannot be merged.

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:

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

GitHub Actions

```
repo_add_badge(org_repos(org = "ghclass-demo", filter = "hw01-"), workflow =
```

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

👁 Watch ▾   0   ★ Star   0   ⑂ Fork   0

<> Code   ⓘ Issues 0   ⑂ Pull requests 1   ▶ Actions   ▥ Projects 0   ▤ Wiki   🛡 Security   ▥ Insights   ⚙ Settings

No description, website, or topics provided.

Edit

Manage topics

⊕ **7 commits**   ⑂ **2 branches**   ◌ **0 releases**   👥 **1 contributor**

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

👤 **rundel** Update hw1.Rmd   ● Latest commit 9de4f18 10 seconds ago

📁 .github/workflows	Initial commit	3 minutes ago
📄 .gitignore	Initial commit	3 minutes ago
📄 README.md	Update README.md	31 seconds ago
📄 fizzbuzz.png	Adding file: fizzbuzz.png	2 minutes ago
📄 hw1.Rmd	Update hw1.Rmd	now
📄 hw1.Rproj	Initial commit	3 minutes ago
📄 hw1_whitelist.R	Initial commit	3 minutes ago

📖 **README.md**   ✏

🐙 Check Repo no status

Statistical Programming - Homework 1

Due by 11:59 pm on Monday, October 7th.

Update hw1.Rmd

master acea870

Check Repo ⌃

on: push

✓ knit

✓ allowed-files

Check Repo / **knit**

successful 1 minute ago in 56s

Search logs   ‹ › ⋯

▶ ✓ Set up job   0s

▶ ✓ Initialize containers   52s

▶ ✓ Checkout   1s

▼ ✓ Check   2s

```
  4
  5
  6   processing file: hw1.Rmd
  7
  8     |
  9     |                                                    |   0%
 10     |
 11     |.........                                           |  14%
 12     ordinary text without R code
 13
 14
 15     |
 16     |..................                                  |  29%
 17   label: unnamed-chunk-1
 18
 19     |
 20     |...........................                         |  43%
 21     ordinary text without R code
 22
 23
```

29 lines (26 sloc) | 623 Bytes   Raw   Blame   History

```yaml
 1  on:
 2    push:
 3      branches:
 4      - master
 5      paths:
 6      - 'hw1.Rmd'
 7  name: Check Repo
 8  jobs:
 9    allowed-files:
10      runs-on: ubuntu-latest
11      container:
12        image: rocker/tidyverse:latest
13      steps:
14      - name: Checkout
15        uses: actions/checkout@master
16      - name: Check
17        run:  Rscript -e "rmarkdown::render('hw1.Rmd')"
18    knit:
19      runs-on: ubuntu-latest
20      container:
21        image: rocker/r-ver:latest
22      steps:
23      - name: Checkout
24        uses: actions/checkout@master
25      - name: Check
26        run: Rscript -e "source('https://raw.githubusercontent.com/statprog-s1-2019/hw1/master/hw1_whitelist.R')"
27
28
```

Repo statistics

```
org_repo_stats(org = "tidyverse", filter = "tidy", inc_prs = FALSE)
```

```
## # A tibble: 5 x 6
##    repo         private commits last_update         open_issues closed_issues
##    <chr>        <lgl>     <int> <dttm>                     <int>         <int>
## 1 tidyverse/…  FALSE       910 2019-10-16 00:47:22           36           540
## 2 tidyverse/…  FALSE       235 2019-10-13 22:13:17            5           143
## 3 tidyverse/…  FALSE       523 2019-10-13 02:29:59           41            50
## 4 tidyverse/…  FALSE        63 2019-09-30 05:56:42           17             1
## 5 tidyverse/…  FALSE        97 2019-09-17 05:46:32            4            21
```

Currently only in the `repo_stats` branch

Contributor statistics

```
repo_contributors(repo = "tidyverse/dplyr") %>% arrange(desc(commits))
```

```
## # A tibble: 100 x 3
##    repo            username          commits
##    <chr>           <chr>               <int>
##  1 tidyverse/dplyr romainfrancois      2264
##  2 tidyverse/dplyr hadley              1670
##  3 tidyverse/dplyr krlmlr               701
##  4 tidyverse/dplyr lionel-              424
##  5 tidyverse/dplyr batpigandme           34
##  6 tidyverse/dplyr lindbrook             27
##  7 tidyverse/dplyr jimhester             25
##  8 tidyverse/dplyr yutannihilation       19
##  9 tidyverse/dplyr hannesmuehleisen      16
## 10 tidyverse/dplyr jennybc               14
## # … with 90 more rows
```

Currently only in the `repo_stats` branch

Future Work

- We will be submitting to CRAN ~~in the next month~~ soon

- More support for GitHub actions for automated feedback

- Migrate more internals to use the V4 GraphQL API

- 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/EdinbR2019_ghclass

github.com/rundel

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@rundel