SM-2302 Software for Mathematicians

Git & GitHub: Version control

Dr. Haziq Jamil

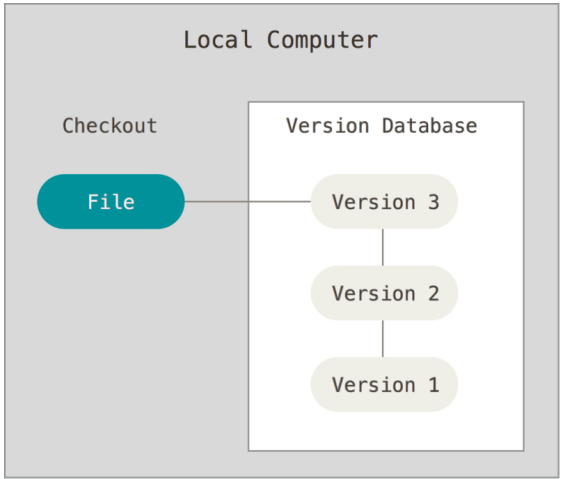
Mathematical Sciences, Faculty of Science, UBD
https://github.com/sm2302-aug24

Semester I 2024/25

last modified: 2024-07-06

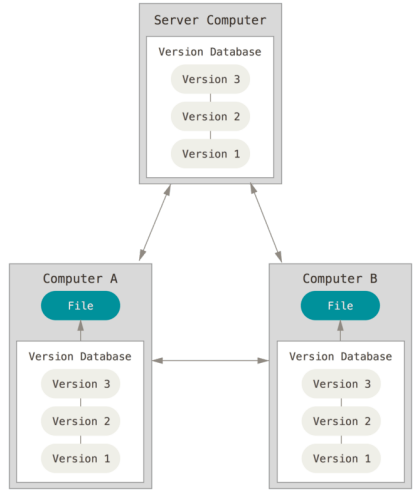
Why version control?

- Simple formal system for tracking changes to a project over time
- Time machine for your projects
  - Track blame and/or praise
  - Remove the fear of breaking things
- Learning curve can be a bit steep, but when you need it you *REALLY* need it



Why Git?

- Distributed
  - Work online or offline
  - Collaborate with large groups
- Popular and Successful
  - Active development
  - Shiny new tools and ecosystems
  - Fast
- Tracks any type of file
- Branching
  - Smarter merges



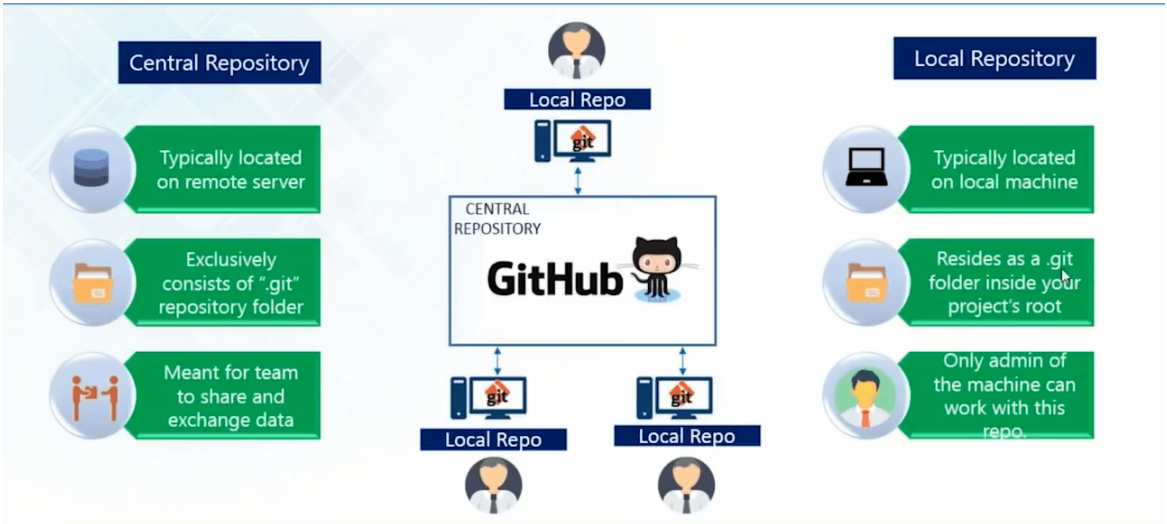
Veryifying git installation

Git should already be installed in the lab PCs. Verify by launching the terminal and typing

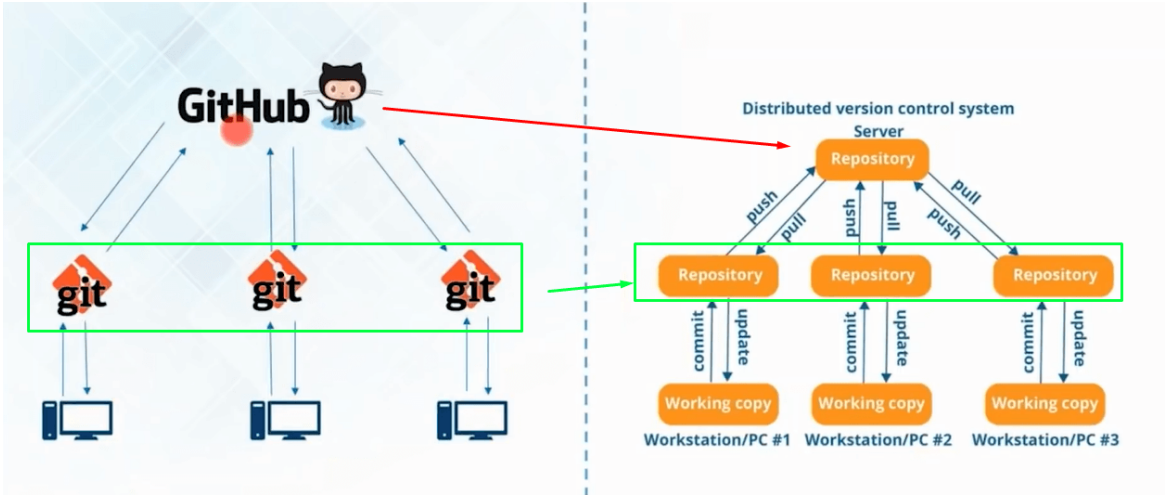
```
haziqj@Haziqs-MacBook-Air ~ % git --version
git version 2.39.3 (Apple Git-146)
```

On your own PCs, you can install git by following the directions in Happy Git and GitHub for the useR.

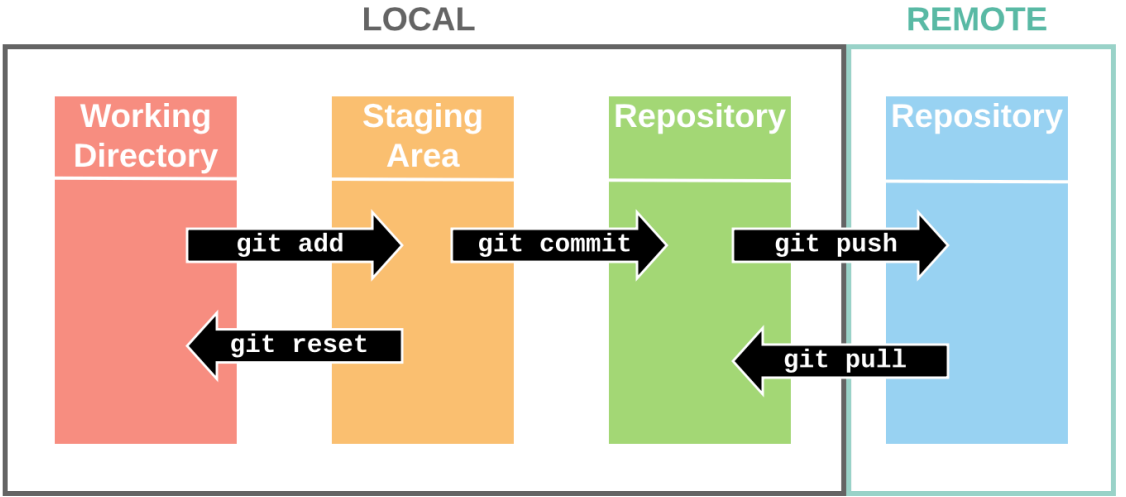
Git vs GitHub



Git vs GitHub (cont.)



Git in a nutshell



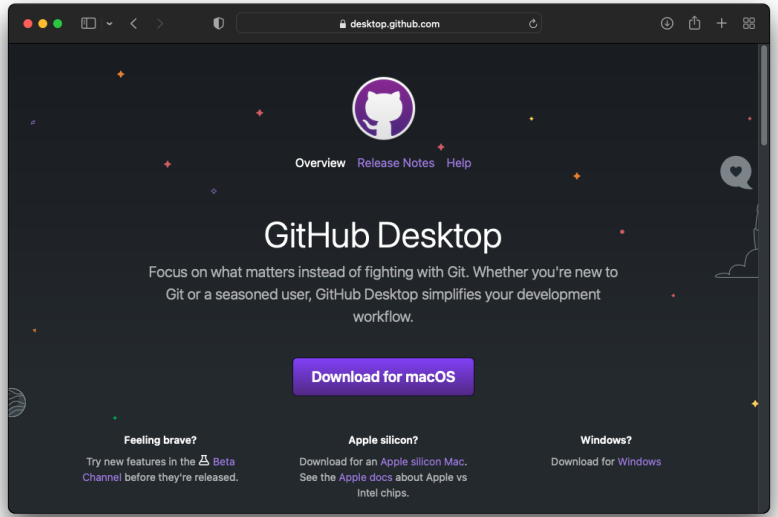
https://support.nesi.org.nz/hc/en-gb/articles/360001508515-Git-Reference-Sheet

Quick tutorial

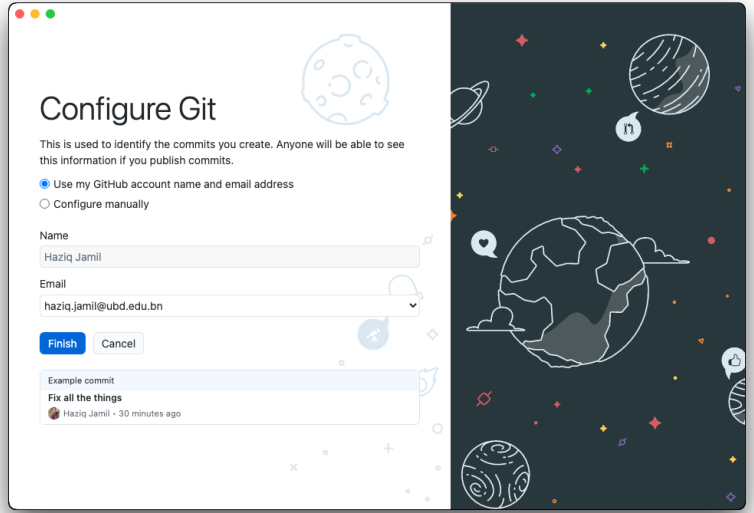
Follow along

`https://docs.github.com/en/get-started/quickstart/hello-world`

Install GitHub Desktop



Configure Git



Git sitrep

```
usethis::git_sitrep()
## Git config (global)
## • Name: <unset>
## • Email: <unset>
## • Global (user-level) gitignore file: <unset>
## • Vaccinated: FALSE
##   See `?git_vaccinate` to learn more
##   Defaulting to 'https' Git protocol
## • Default Git protocol: 'https'
## • Default initial branch name: <unset>
## GitHub
## • Default GitHub host: 'https://github.com'
## • Personal access token for 'https://github.com': <unset>
## • To create a personal access token, call `create_github_token()`
## • To store a token for current and future use, call `gitcreds::gitcreds_set()`
##   Read more in the 'Managing Git(Hub) Credentials' article:
##    https://usethis.r-lib.org/articles/articles/git-credentials.html
## Git repo for current project
##   No active usethis project
```

Configure Git (cont.)

Remark

Do this only if sitrep still shows wrong info.

The following will tell Git who you are, and other common configuration tasks.

```
usethis::use_git_config(
  user.name = "Haziq Jamil",
  user.email = "haziq.jamil@ubd.edu.bn"
  # push.default = "simple",
  # pull.rebase = FALSE
)
```

This can also be done via the terminal with,

```
$ git config --global user.name "Haziq Jamil"
$ git config --global user.email "haziq.jamil@ubd.edu.bn"
$ git config --global push.default simple
```

Typical GitHub workflow

I want to start a project that involves some code.

1. Go to GitHub.com and create a new repo.
   - Can initialise accordingly (.gitignore and/or README)
2. Clone to local repo
3. Add code inside
4. Commit and push

   Not really going to spend much time branching and creating pull requests

Version control best practices

- Commit early, often, and with complete code.
- Write clear and concise commit summary messages.
- Test code before you commit.
- Use branches.
- Communicate with your team.

Git and GitHub resources

- Git's Pro Git book, Chapters Getting Started and Git Basics will be most useful if you are new to Git and GitHub
- Git cheatsheet by Atlassian
- GitHub's interactive tutorial
- Free online course from Udacity
- Happy Git with R by Jenny Bryan