

NCATS

COLLABORATE. INNOVATE. ACCELERATE.

2021 NCATS Coding Camp

Nathan Hotalling, Shawn Li, Ewy Mathé, Jorge Neyra, Trung Nguyen, Kyle Spencer, Tongan Zhao, Mark Williams



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Overview of 2021 NCATS Coding Camp

<https://github.com/ncats/2021CodingCamp>

Goal: To provide assisted learning in coding concepts. The camp tailors to beginner or seasoned computational experts and no previous experience is required.

Outcomes:

- Introduction to GitHub and team coding best practices
- Advance knowledge and skills in a particular language or application of software/methods of participant's choice.
- Code that you could reuse in the future
- Community building

The more effort you put in, the more you'll get out of it!



Course Organization

- There are 22 'campers' and 8 TAs. Ideally, we'll have 8 groups of 2-3
- All code, course descriptions, useful links, etc. will be organized in our GitHub site
- Each group will have its own folder in GitHub, and each camper will create a subfolder for their project
- Communication will largely happen via our Slack channel (2021_summercodingcamp)
- Each camper will briefly present on their project at the end of the camp.



Meet your TAs



Nathan Hotaling, Madhuri Vihani
Python/VSCode



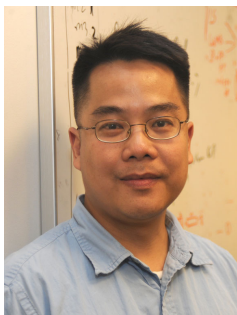
Shawn Li
Python



Ewy Mathé
R/RStudio



Jorge Neyra
Python, JavaScript/HTML



Đắc-Trung Nguyễn
R, Python, or other



Kyle Spencer
R/Rstudio, RShiny



Tongan Zhao
Python, Java



Mark Williams
Python/Java/Perl



Meet your campers

William Kariampuzha
Maria Antony
Deborah Rodriguez
Tracey Oellerich
Jordan Daitch
Hope Shapiro
Wenyu Zeng
David Madoo
Ivan Pavlinov
Pei-Hsuan Chu
Parker Brewster

Abir Malik
Lo (Lucy) Lai
MarySheyla (Shey) Alvarez
Josh Abbott
Katlin Recabo
Oscar Cheng
Ainslie Tisdale
Surendra Karavadhí
Jessica Faupel-Badger
Edward Chiang
Cole Tindall

[Mural Link](#)



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Expectations

TAs

- ~3 hours available per week (1 hour as a group)
- Help break up project into steps
- Provide technical guidance/feedback on coding issues, revising timeline, etc.
- Provide links to useful resources and share amongst the wider group
- Help administer the GitHub Site

Campers

- ~ 8 hours per week on project
- Come up with a project
- Communicate effectively with TA and larger group to get feedback
- Ask questions, don't stay blocked
- Creating a presentation at the end of camp
- Document your progress: take snapshots, include versions of software you're using, explain input



Homework For Thursday

1. Get a Slack account and send Ewy your Slack ID to be added to the class Slack channel
 - Go to nihncats.slack.com and sign in with NIH credentials
 - If you want Slack installed on your desktop, you'll need to submit an IT ticket (<https://myitsm.nih.gov/sp>)
2. Get a GitHub account
 - Get an account (can use personal or NIH email)
 - Send ID to your TA or Ewy so they can add you to the repo with "write" access
3. Select a TA and a project. Here are some points to consider when selecting a project:
 - You only have 8 weeks, and it'll fly by!
 - Be realistic in what you can achieve and start small (it's easy enough to scale up)
 - Reach out to TAs individually to help with your selection
 - This is a great opportunity to work on something you've always wanted to but never took the time to do
 - If you can line it up with your current work, great!
4. Create a subfolder under your TA's folder with a short description of your project and a draft timeline of the weeks to come
5. Be ready to talk about your project on Thursday in 2-3 min (one powerpoint slide)



Looking ahead

Week1 (Monday): Introduction

Week 2: Select project, get set up on GitHub/Slack, start a timeline for your project

Week 3: Set up your environment to complete project, finalize timeline, work on your first task

Weeks 4-6: Keep working on tasks, revise timeline as appropriate

Week 7: Prep your final presentation for last week, maybe start presentations that week

Week 8: Final project presentation



Weekly Meetings

Formal time, set aside, to meet as a larger group.

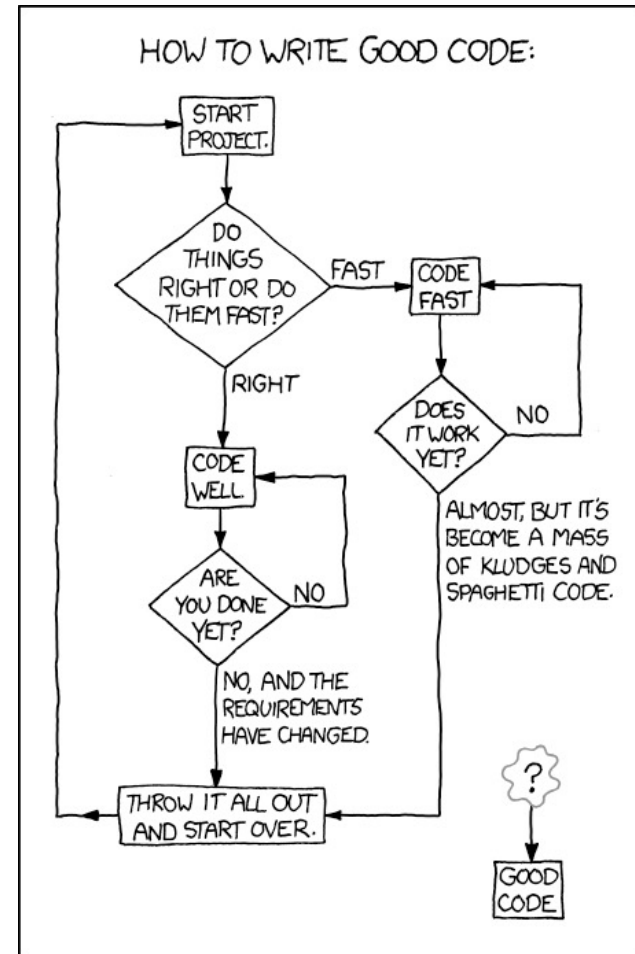
- Each group will have 5-6 min to share on their progress, thoughts, blockers, whatever they will like.
- This is a chance to share progress, and get feedback from the wider group.
- If there is a particular skill that multiple campers are looking to expand upon, we can use this time to also lecture on that skill (TAs needs at least 2 days heads up and this will depend on ask)

Remember to ask questions and share what you're doing! Chances are, someone is asking themselves the same thing so we can all learn from each other!



Final Thoughts

- Work with your TA to set weekly goals and deadlines so that you can progress throughout the camp
- Setting up your coding environment and getting code to work takes time, be patient
- Dedicate appropriate time to this camp, this camp is largely self-driven
- Questions? There's always Slack, your TAs, or contact Ewy directly



XKCD



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What is Git

- Free, open-source version control system (like CVS, Subversion, etc.)
- Automatically tracks changes between versions
→ No need for different names (e.g. File_v1, File_v2, ..., File_Final, File_FinalFinal)
- Very useful for team coding (if you're ambitious, you can also use this to write papers)
- Requires you to give a brief description of what changes you made
- **Bonus 1**: you can readily go back to previous versions if you don't like the changes made
- **Bonus 2**: a good way to create a community!



Software Based on Git

Numerous software rely on Git: GitHub, GitLab, Bitbucket, etc.

NCATS has 398 GitHub repositories

- 84 are public (anyone can access)

- 266 are private (designated members only can access)

- 48 are internal (anyone within NCATS can access)

Quick Tutorial Overview

<https://www.youtube.com/watch?v=iv8rSLsi1xo>

Let's take a look at our GitHub repository for the camp:

<https://github.com/ncats/2021CodingCamp>

- * The repo is public

- * All the class code will be uploaded in this repository



Our camp GitHub repo

<https://github.com/ncats/2021CodingCamp>

The screenshot shows the GitHub repository page for `ncats / 2021CodingCamp`. The repository is public. The main branch is `main` with 1 branch and 0 tags. The repository has 5 commits. The README file is highlighted, showing the title **2021 NCATS Summer Coding Camp** and the section **Course Goals**. The course goals text states: "The goal of the camp is to provide assisted learning in coding concepts. The camp tailors to beginner or seasoned computational experts and no previous experience is required. At the end of this course, participants will have been introduced to GitHub and team coding best practices. Depending on their level of proficiency in programming prior to starting the camp, the expectation is for participants to have advanced their knowledge and skills in a particular language or application of software/code of their choice." The right sidebar shows the repository is public, has no description, website, or topics provided, and lists contributors Mathelab Ewy and MarkDWilliams.

- * The repo is public
- * All the class code will be uploaded in this repository



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Languages, their uses, and resources

Languages

- R/Rstudio/Rshiny (scripting language): commonly used in Biostatistics/Bioinformatics, powerful statistics and visualizations
 - Python (scripting language): commonly used in machine learning and data science
 - Java (compiled language): commonly used to develop applications (e.g. workflows, software that can run on multiple platforms)
 - JavaScript (scripting language): used to develop web applications (advanced functions for drop-down menus, contact forms, etc.)
 - Perl (scripting language): powerful parsing language with advanced regular expression capabilities
- * All have a strong community where you can find snippets of code, get your questions answered, etc.

Resources?

Biostars, StackOverflow, YouTube, and Google

