

# Welcome to COGS 18:

# Introduction to Python

COGS 18

Reminder: This (and all lectures) in COGS 18 are being **recorded**.

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TAs

Aiden

IAs

Beibei

Jaime

Scott

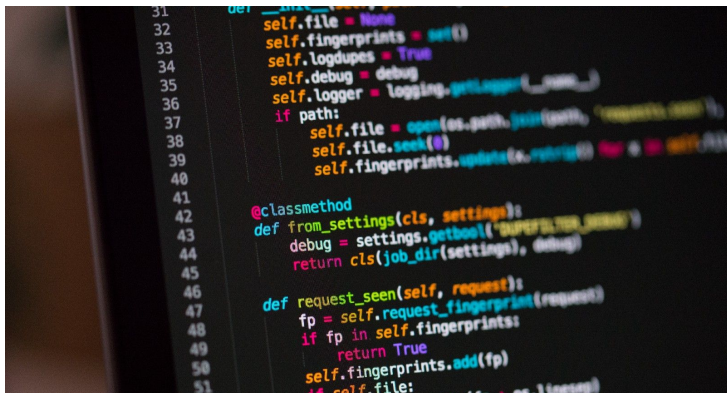
Andrew

Note: CodingLabs & Prof Ellis OH begin **Week 1**; all other OH begin Week 2

Zoom links/passwords are on Canvas homepage.

Let's chat: Teaching &  
Learning Programming

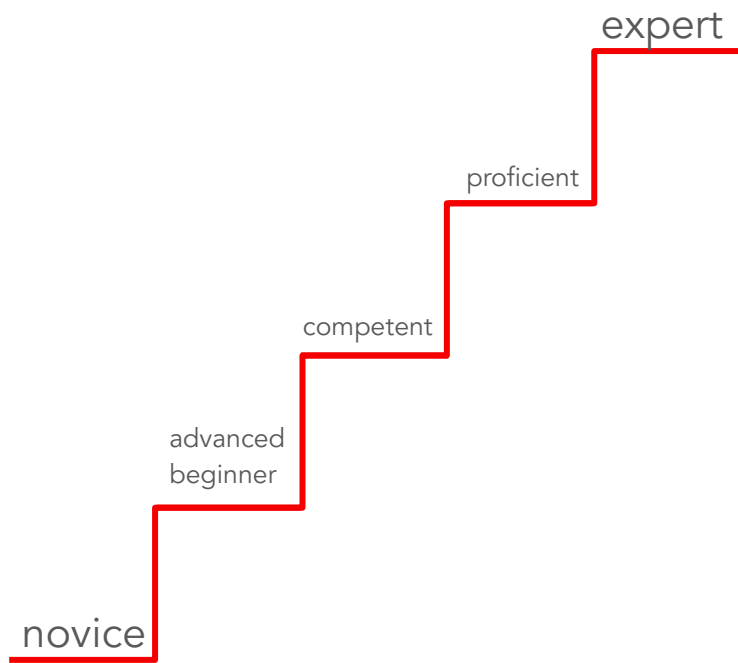
Intro Programming courses  
are often **thought of as**  
**difficult** and are courses with  
the **highest dropout rates**



....yet, the only thing that is slightly  
predictive of success in an intro  
programming course is...*how successful*  
*the student thinks they will be*

Things that do NOT predict success:

- gender
- age
- personality
- math ability



My goal is to have you  
all be able to **program**  
**at an introductory level**

It's generally accepted that it takes  
people **10 years to move from novice**  
**to expert programmer**. But, there are  
lots of steps in between! We're  
working to move you further away  
from novice (& in the direction of  
expert) than you are right now.

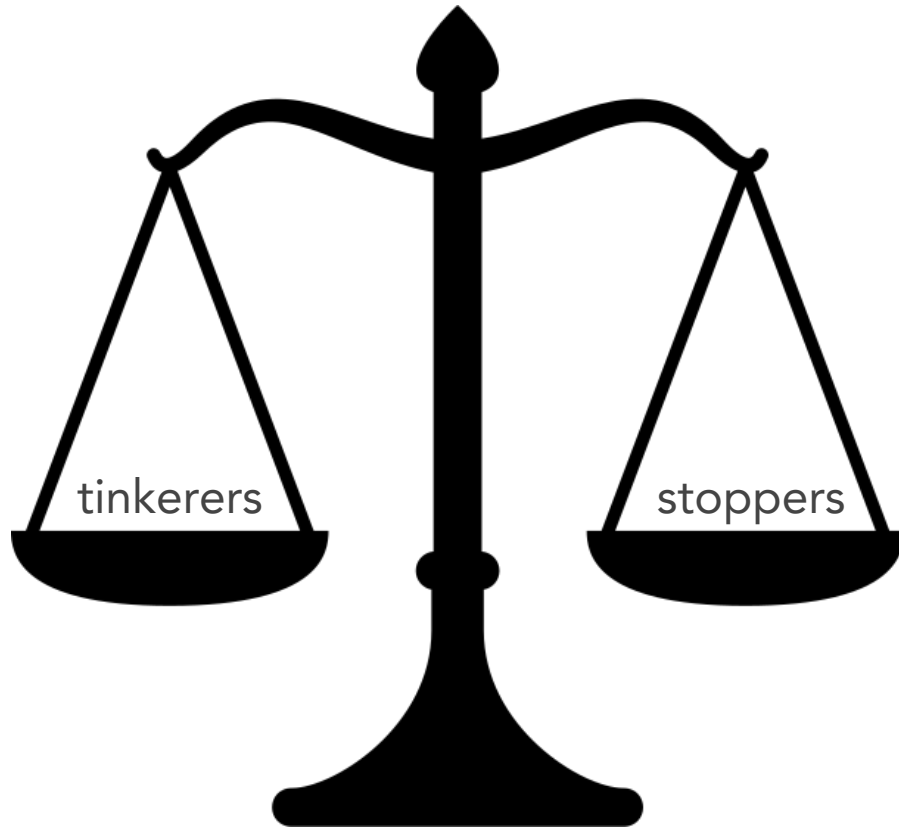


Mixed Messages: We tell people learning to program will be tough and frustrating but that if you're not having fun, you're doing it wrong.



Building Blocks: Too often, we also tell people to “just try things out” without explaining basic concepts. Other courses aren’t taught this way...





**Be a mover:** Make forward progress. Strike a balance between just stopping and tinkering forever.

If you're not moving forward, consider the **2-hour rule**.

If you're trying to figure something out and struggling to move forward at all, consider the 2-hour rule. If you're stuck, **work on the problem for an hour**. If you're still stuck, walk away & **take a 30 min break**. Then, **try again for another 30 minutes** or so. If you're **still completely stuck, stop and contact us** (come to office hours, post on Piazza). If you're not even sure what your question is, include what information that you do have - what you're stuck on, what you've tried, error messages you've received, etc.

# Why Python?

simple(r) syntax


widely-used

Jupyter Notebooks

*"It's not the best language for anything, but  
it's the second best for everything"*

-Brad Voytek





# COGS 18: How this course is going to work

To avoid the common pitfalls of intro programming courses, we're going to take the following approach:

1. First half of course: basic concepts
2. In-class practice (no stakes)
  - a. Zoom polls for comprehension
  - b. time to apply what was just explained
3. Coding Labs (low stakes)
  - a. Notebooks provided
  - b. Staff/classmates there to help
  - c. Checked for effort, not correctness
4. Assignments (mid stakes)
  - a. Completed individually (*can* work together)
  - b. Programmatically graded
5. Midterms (high stakes)
  - a. Completed totally individually

## COGS 18: How You'll Be Evaluated

	% of Grade	Requirement
Coding Labs	16%	Participate In 8 Coding Labs
Assignments	40%	Complete 5 assignments
Midterms	25%	2 midterms (1-2 h)
Final	19%	Complete final project or final exam

CodingLabs:  
apply concepts  
discussed in  
lecture using  
coding labs  
(18%). Practice  
makes progress.

Attempt for full credit (2% each)

- Have to make a concerted effort to complete labs
- Coding Labs will be submitted on datahub
- Answers will be sent out the following week
- Can work with others

You should attend the section to which you're assigned. You can attend a different section. However, if one section becomes too crowded each week, we'll revisit this policy.

There will be a single zoom link for all coding labs, regardless of day of week or time.  
Coding Labs start Wednesday.

(5) Assignments  
(40%) : Jupyter  
notebooks that are  
completed  
individually &  
graded  
programmatically.

Assignments always be due Fri @ 11:59 PM.

Assignment	Week	Median Time Spent (hours
A1	wk3	2
A2	wk4	4
A3	wk6	4
A4	wk7	5
A5	wk9	5



Assignment Submission @ Datahub: <https://datahub.ucsd.edu>

DATA SCIENCE / MACHINE LEARNING PLATFORM

UC San Diego

Information Technology Services - Educational Technology Services

Help Options ▾



Log In

Registered Users  
"username@ucsd.edu"

UC San Diego Jupyterhub (Data Science) Platform

Please don't send me a Canvas message. The UI is the worst and I miss messages and then feel bad.

Order I reply:

1. Campuswire
2. Email
- ~~3. Canvas~~

In technical  
classes,  
**Campuswire** is a  
particularly  
helpful resource

There are rules:

1. No duplicates.
2. Include Assignment & Question in Summary line.
3. Posts must include your question, what you've tried so far, and resources used.
4. Public posts are best.
5. Helping one another is encouraged.
6. No assignment code in public posts.
7. We're not robots.

Sign up: UPDATE

(2) Midterms (25%):  
will be open-book  
but completed  
individually.

Exams are open-book/open Google but **completed on your own**. These will be taken on datahub. Each will include a **combination of types of questions**. There will be a **flexible time window** when these exams can be taken/submitted. You can expect this exam to take you **1-2 hours to complete**.

(1) Final Project or  
Exam (19%): will be  
completed  
individually and  
submitted  
electronically on the  
day of the final.

It will be up to you which you do. The **project** will help you learn more and has the opportunity for EC and an A+ in the course, but takes longer. The **exam** takes less time, but the highest grade you can earn in the course is an A. You do not have to show up anywhere on the day of the actual final.

All exam  
and due  
dates are  
all listed  
on the  
course  
syllabus  
and are in  
Canvas

## COURSE SCHEDULE

Date	Week	Lecture	Day	Topic	Assignment (due 11:59 PM)	CodingLab (due 11:59 PM)
1/4	1	1	M	Introduction		
1/6	1	2	W	Tooling & Help		CL1: Tooling
1/8	1	3	F	Variables		
1/11	2	4	M	Operators		
1/13	2	5	W	Conditionals		CL2: Programming I
1/15	2	6	F	Debugging		
1/18	3	-	M	No Class		
1/20	3	7	W	Collections		CL3: Programming II
1/22	3	8	F	Loops	A1: Getting-Started	
1/25	4	9	M	Dictionaries [*]		
1/27	4	10	W	Review		CL4: Loops & Debugging
1/29	4	-	F	Midterm I	A2: Ciphers	
2/1	5	-	M	Functions I		
2/3	5	11	W	Algorithms		CL5: Functions
2/5	5	12	F	Functions II		
2/8	6	13	M	Classes I		
2/10	6	-	W	Classes II [**]		CL6: Classes



Your point of contact for COGS 18  
will be the course website:

<https://cogs18.github.io>

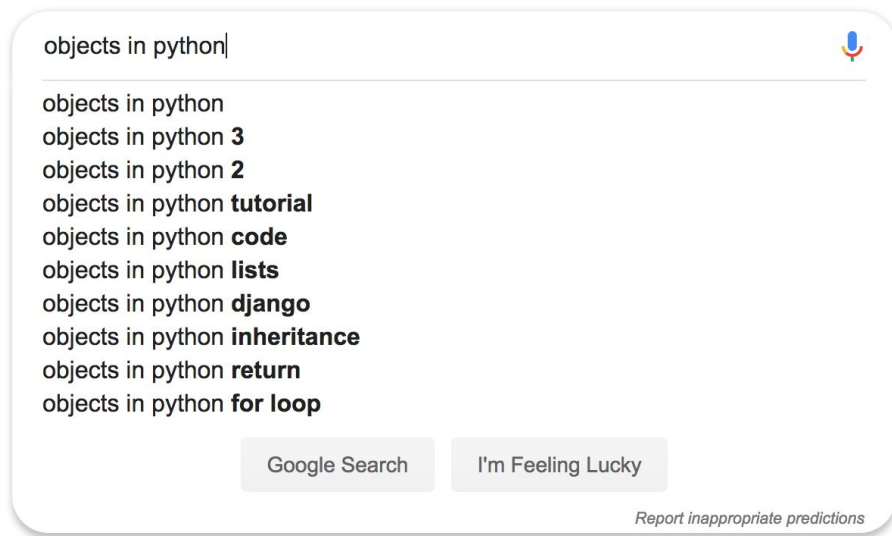
Course Website	<a href="https://cogs18.github.io">https://cogs18.github.io</a>	syllabus, Coding Lab Answers (& lecture notes)
Campuswire	<a href="https://campuswire.com/p/G5A5B51F9">https://campuswire.com/p/G5A5B51F9</a> (course code on canvas)	questions, discussion, regrades
Canvas	<a href="https://canvas.ucsd.edu/courses/21696">https://canvas.ucsd.edu/courses/21696</a>	grades, lecture videos, zoom links
Datahub	<a href="https://datahub.ucsd.edu/">https://datahub.ucsd.edu/</a>	coding labs, assignments, exams, (& lecture notes)
Lecture Slides	<a href="https://datahub.ucsd.edu/hub/user-redirect/git-sync?repo=https://github.com/COGS18/LectureNotes-Wi21">https://datahub.ucsd.edu/hub/user-redirect/git-sync?repo=https://github.com/COGS18/LectureNotes-Wi21</a>	Syncing to get most recent lecture slides
Anonymous Feedback	<a href="#">Submit via Google Form</a>	if I ever offend you, use an example you hate, or to provide general feedback

Any questions about  
course logistics?



Where to turn for **help**  
**and practice** when  
learning to program?

Including “in python” in your  
Google search can be magic

A mockup of a Google search interface. At the top, a search bar contains the text "objects in python|". To the right of the search bar is a microphone icon. Below the search bar, a list of search suggestions is displayed: "objects in python", "objects in python 3", "objects in python 2", "objects in python **tutorial**", "objects in python **code**", "objects in python **lists**", "objects in python **django**", "objects in python **inheritance**", "objects in python **return**", and "objects in python **for loop**". At the bottom of the suggestions list are two buttons: "Google Search" and "I'm Feeling Lucky". Below these buttons is a link that says "Report inappropriate predictions".

objects in python|

objects in python  
objects in python 3  
objects in python 2  
objects in python **tutorial**  
objects in python **code**  
objects in python **lists**  
objects in python **django**  
objects in python **inheritance**  
objects in python **return**  
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Google Search I'm Feeling Lucky

[Report inappropriate predictions](#)

# StackOverflow probably has the answer to your question



21 ● 3



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## Tags

A tag is a keyword or label that categorizes your question with other, similar questions. Using the right tags makes it easier for others to find and answer your question.

Popular

Name

New

**python** × 1137913

a multi-paradigm, dynamically typed, multipurpose programming language, designed to be quick (to learn, to use, and to

1085 asked today, 6241 this week

**python-3.x** × 151128

For questions about Python programming that are specific to version 3+ of the language. Use the more generic [python] tag

273 asked today, 1641 this week

**python-2.7** × 89413

the last major version in the 2.x series. Do not use this tag simply to convey the version of Python you're using, unless the question

40 asked today, 219 this week

**python-requests** × 9229

a full-featured Python HTTP library with an easy-to-use, logical API.

8 asked today, 81 this week

**wxpython** × 6191

a Python wrapper for the cross-platform C++ GUI API wxWidgets.

20 asked this week, 52 this month

**ipython** × 6036

a feature-rich interactive shell for Python, and provides a kernel for frontends such as IPython Notebook and Jupyter Notebook.

15 asked this week, 65 this month

**python-imaging-library** × 4495

The Python Imaging Library (PIL) provides the Python language with a de-facto standard foundation for image work. PIL's

23 asked this week, 113 this month

**python-3.6** × 3882

Version of the Python programming language released in December 2016. For issues specific to Python 3.6. Use more

10 asked today, 43 this week

**python-3.5** × 3260

The version of the Python programming language released on September 13, 2015. For issues that are specific to Python 3.5.

9 asked this week, 34 this month

**python-import** × 3150

For questions about importing modules in Python

18 asked this week, 58 this month

**python-3.4** × 2594

The version of the Python programming language released on March 16, 2014. For issues that are specific to Python 3.4. Use

6 asked this month, 126 this year

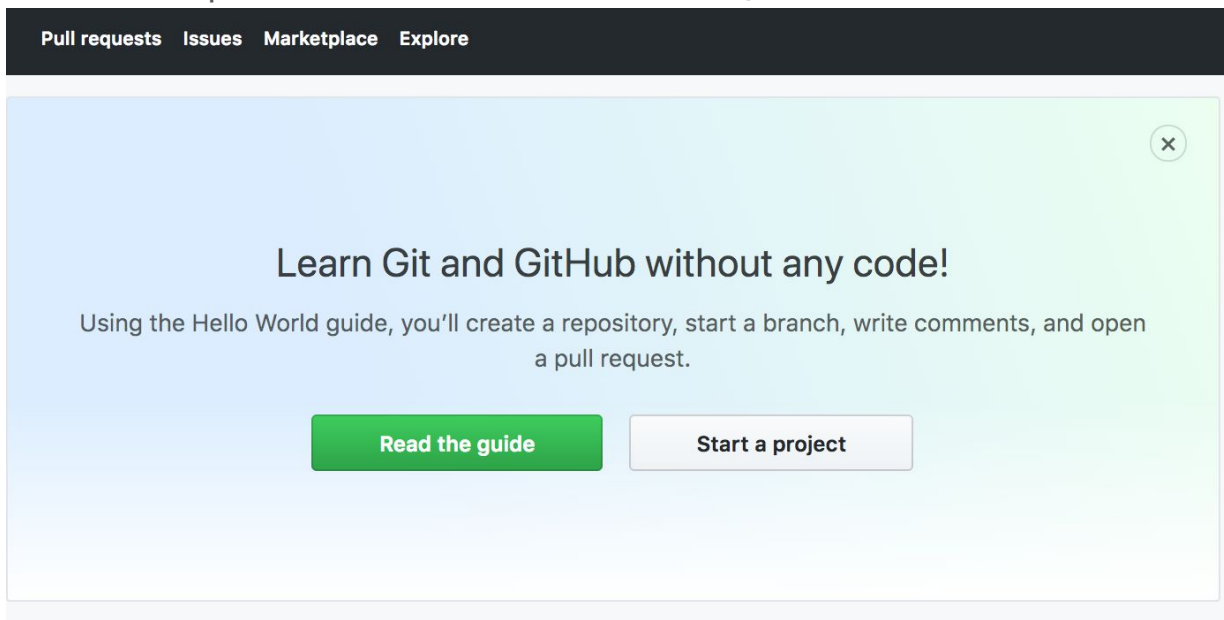
**python-sphinx** × 2365

a tool that makes it easy to create intelligent and beautiful documentation. Sphinx is especially suitable for Python

9 asked this week, 34 this month

# GitHub: programmers' social media platform

Code is shared on GitHub. In the beginning, it may be intimidating, but I encourage you to familiarize yourself with the platform and share code you write on GitHub.



There are also  
**COGS18-specific**  
**avenues** when  
looking for help

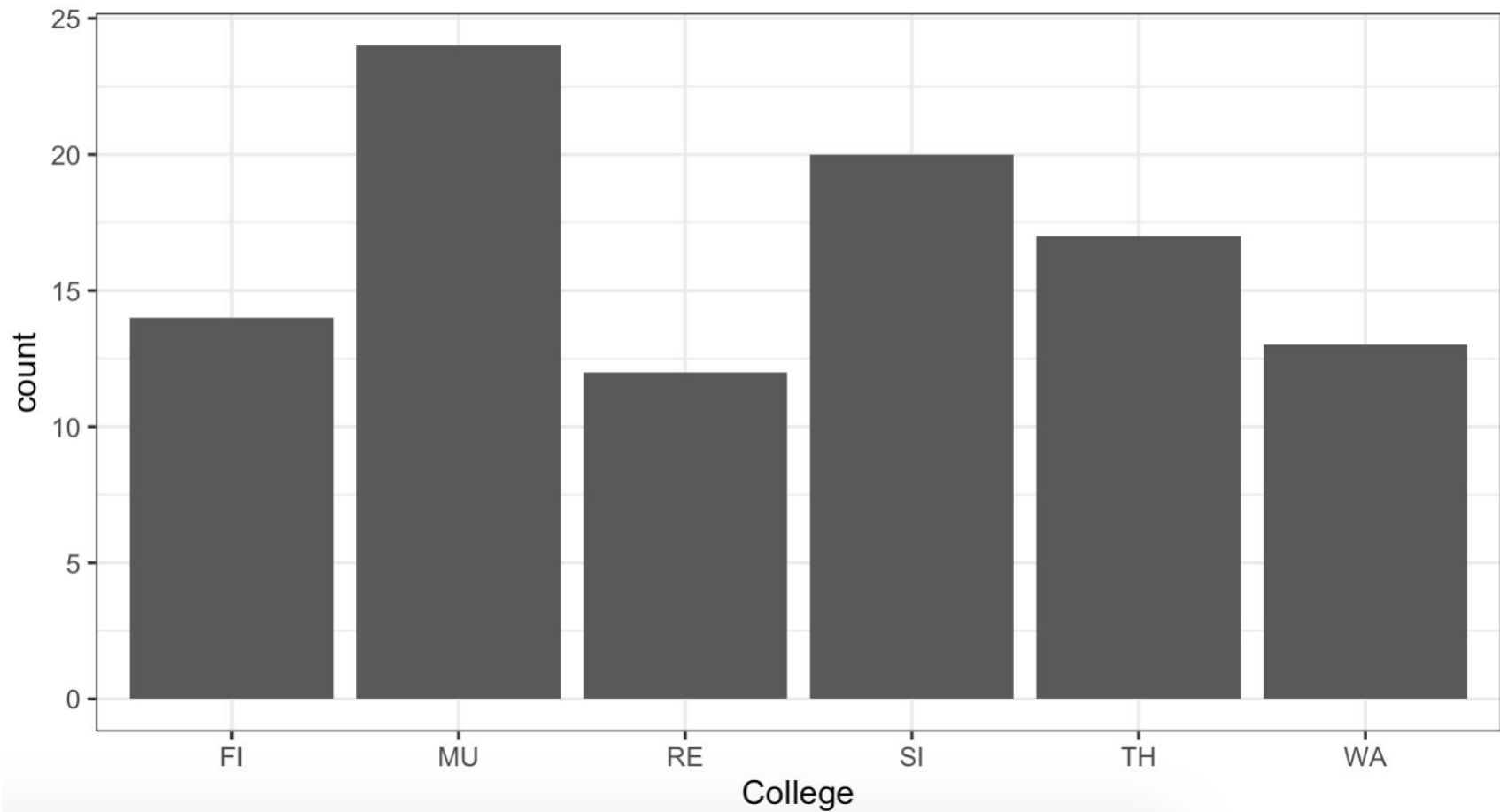
Questions in **CodingLabs**, coming to  
**office hours**, talking to your **classmates**,  
or reaching out for help on  
**Campuswire** are all options for you.  
You're encouraged to help one another  
on Campuswire!



Today I used a PDF slideshow,  
but every other day of class,  
**lecture notes** will be presented  
in a **Jupyter notebook**

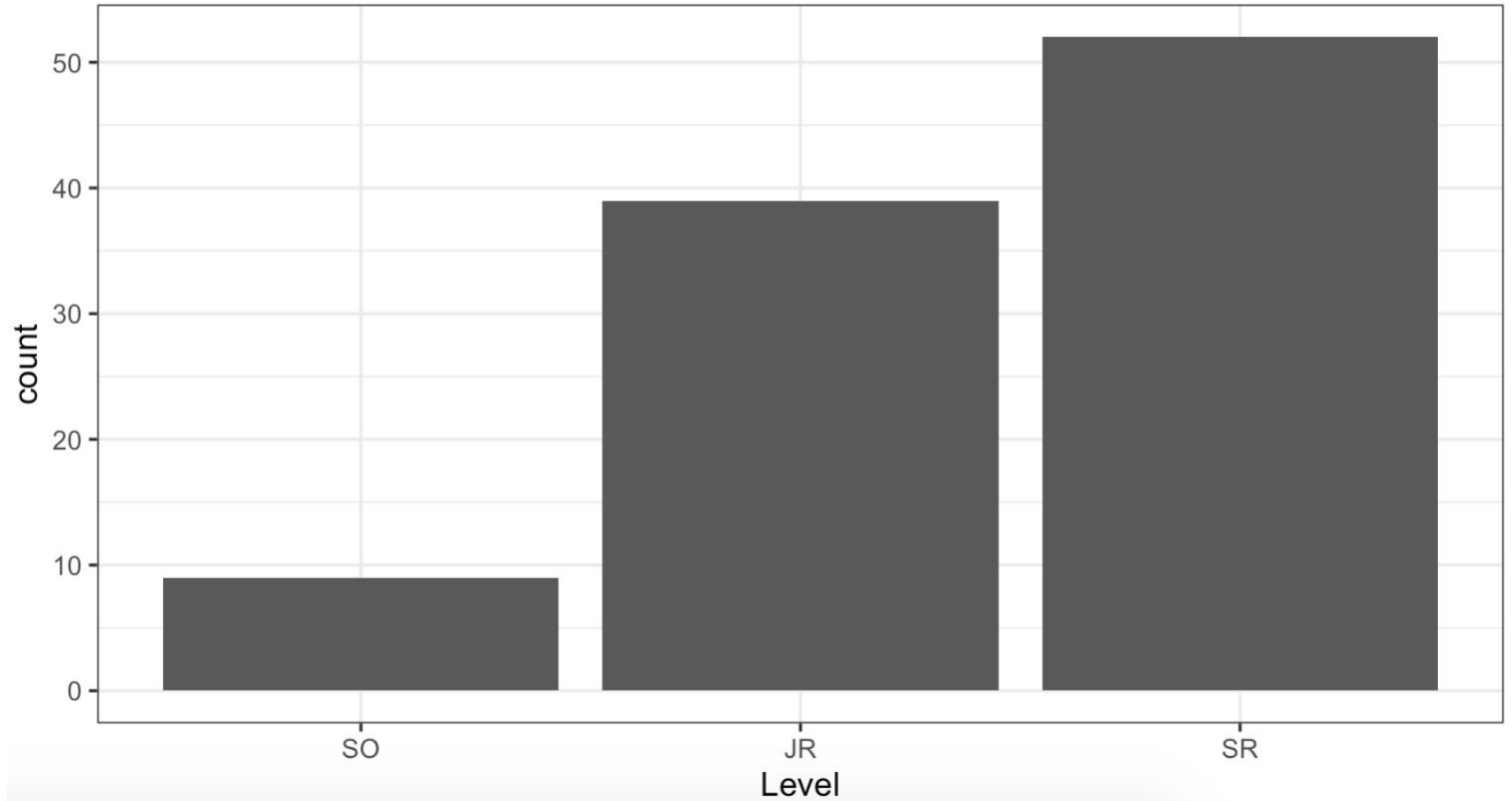


## COGS 18

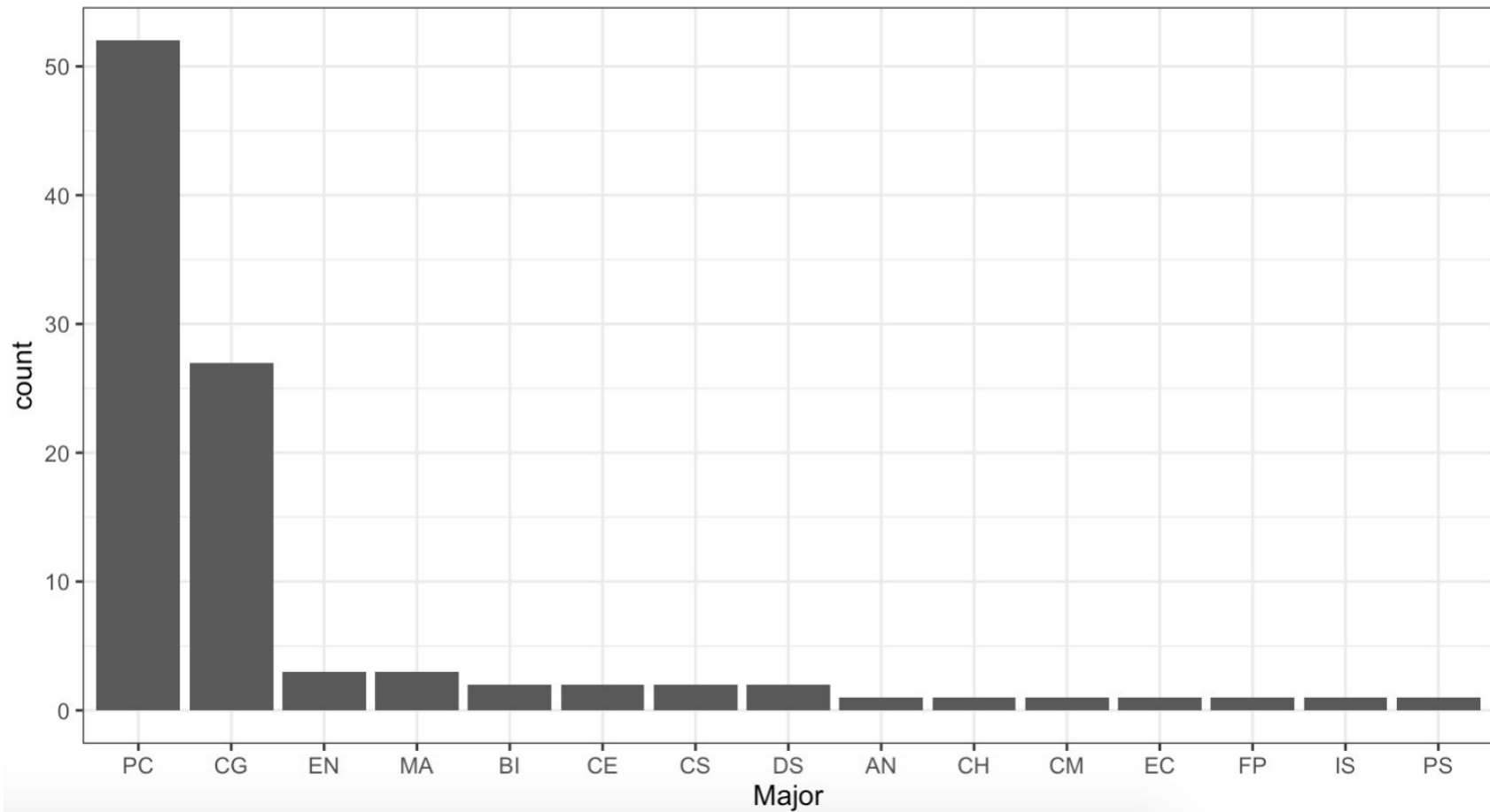




## COGS 18



## COGS 18





I'm excited to have you all in  
COGS 18 this quarter & I'd love  
to learn more about you:

[http://bit.ly/cogs18\\_survey\\_wi21](http://bit.ly/cogs18_survey_wi21)