SI 506: Programming I
Winter 2022

Prologue

Anthony Whyte <arwhyte@umich.edu>
Lecturer III, School of Information
715 N. University Ave, Ann Arbor, MI 48109
Roumanis Square, 2nd floor ("the loft")

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Welcome

go blue

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Prerequisites

none 😉

no prior programming

experience is required

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Questionnaire

No wrong answers

SI 506 questionnaire

This anonymous questionnaire is designed to provide the SI 506 teaching team with basic student information in order to better adapt this course to meet your needs and interests. We will ask you to 1) identify your program of study, 2) provide us with a bit of info regarding your laptop, 3) describe your prior programming experience--if any, 5) familiarity with certain file types, 6) indicate prior use of various cloud services, 7) rate your level of enthusiasm for learning to program, and surface any meta-worries or anxieties that you might have about the course. There are no wrong answers; only useful information to be shared.

NEXT

Page 1 of 11

Never submit passwords through Google Forms.

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Teaching Team

https://www.si506.org/team/

Anthony Whyte

Yaoqi Liao

GSI

Yash Kamat

GSI

Tasha Torchon

GSI

Joshua Horowitz

IA

Swathi Komarivelli

IA

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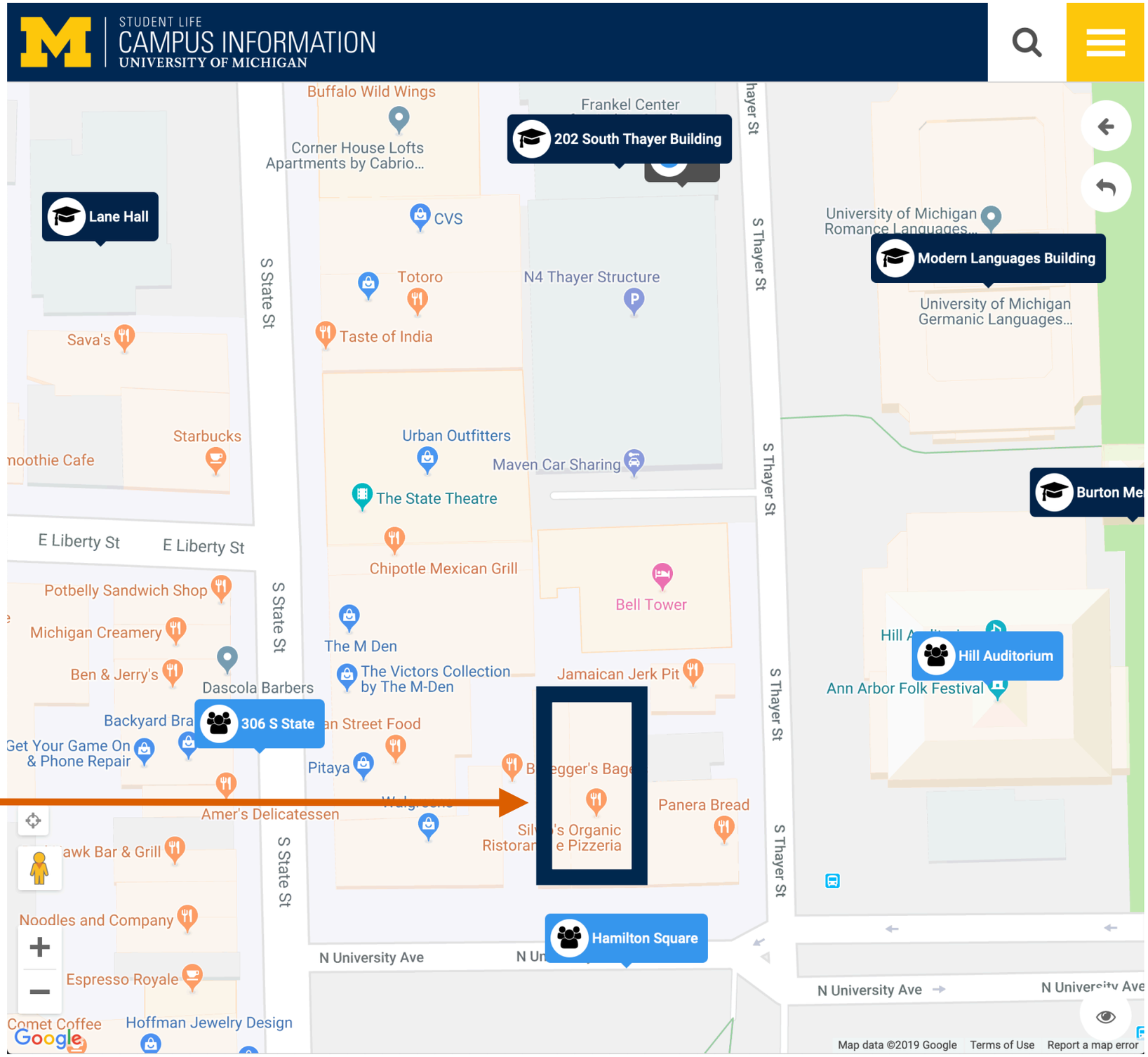
arwhyte: office

office: Roumanis Square, 2nd floor, UMSI Loft, Rm 201H



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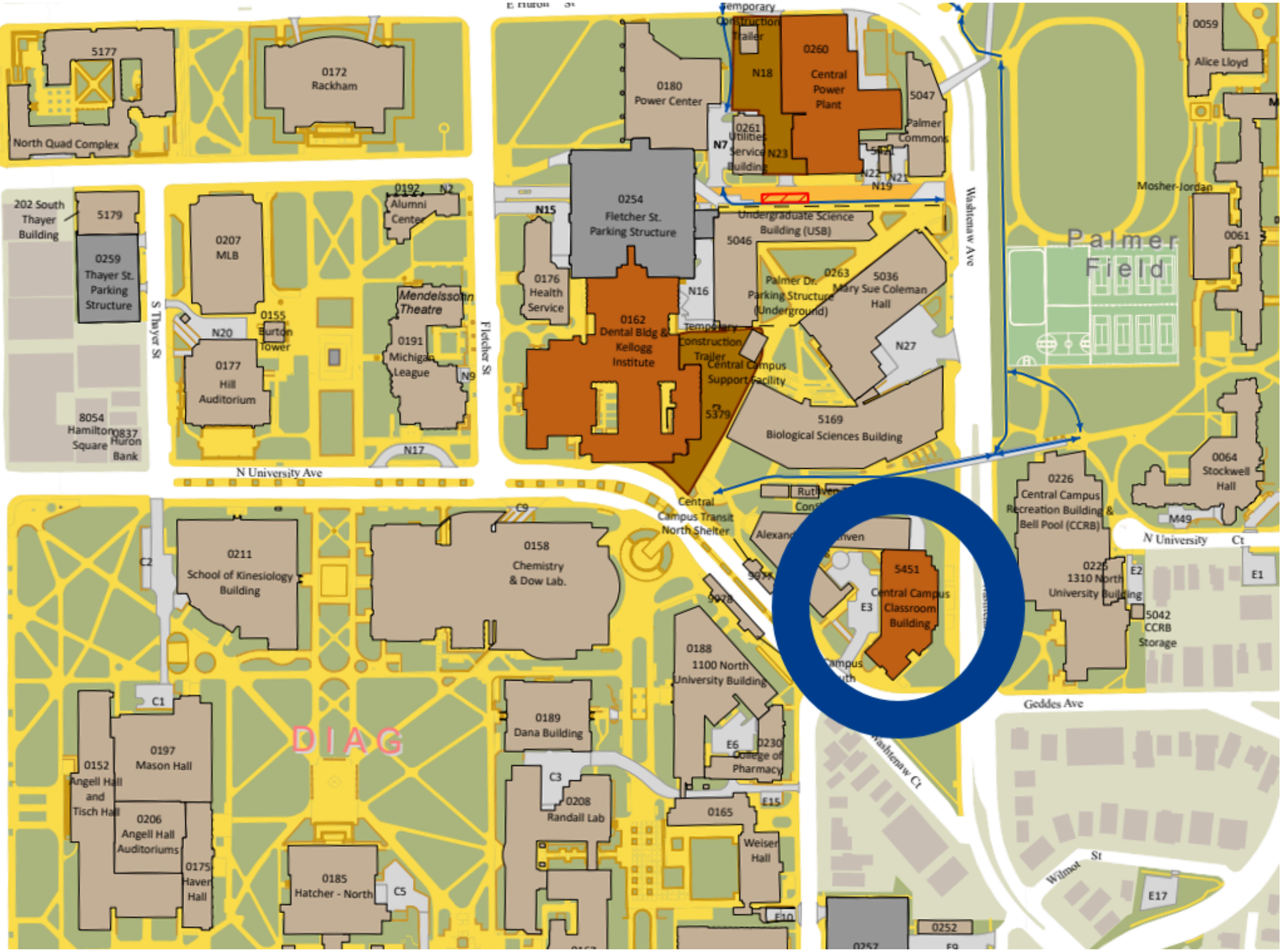
Central Campus Classroom Building

CCCB location (open Winter 2022)



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Central Campus Classroom Building

CCCB exterior

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2460 CCCB

our classroom

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teaching & learning

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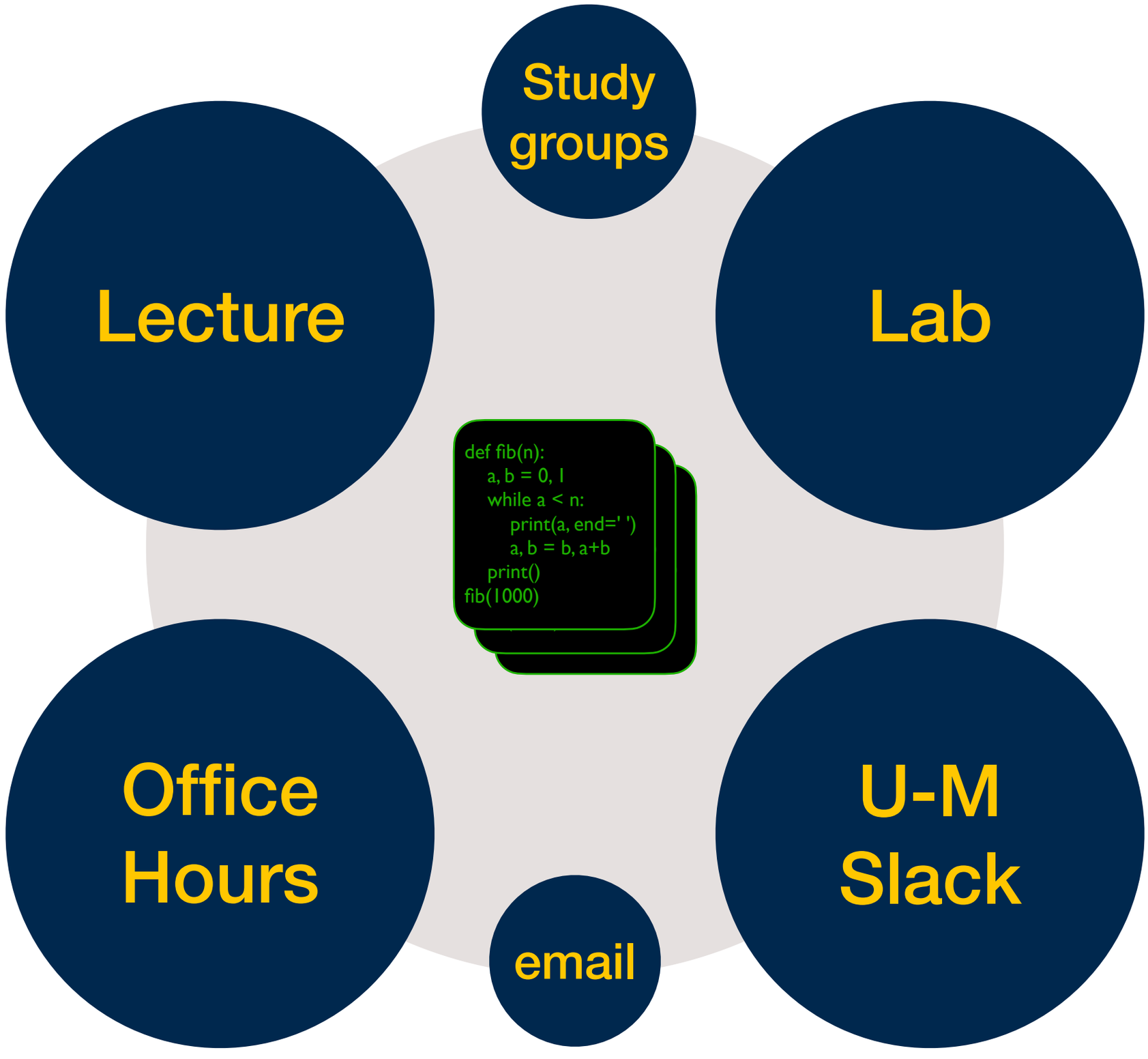
Communication channels



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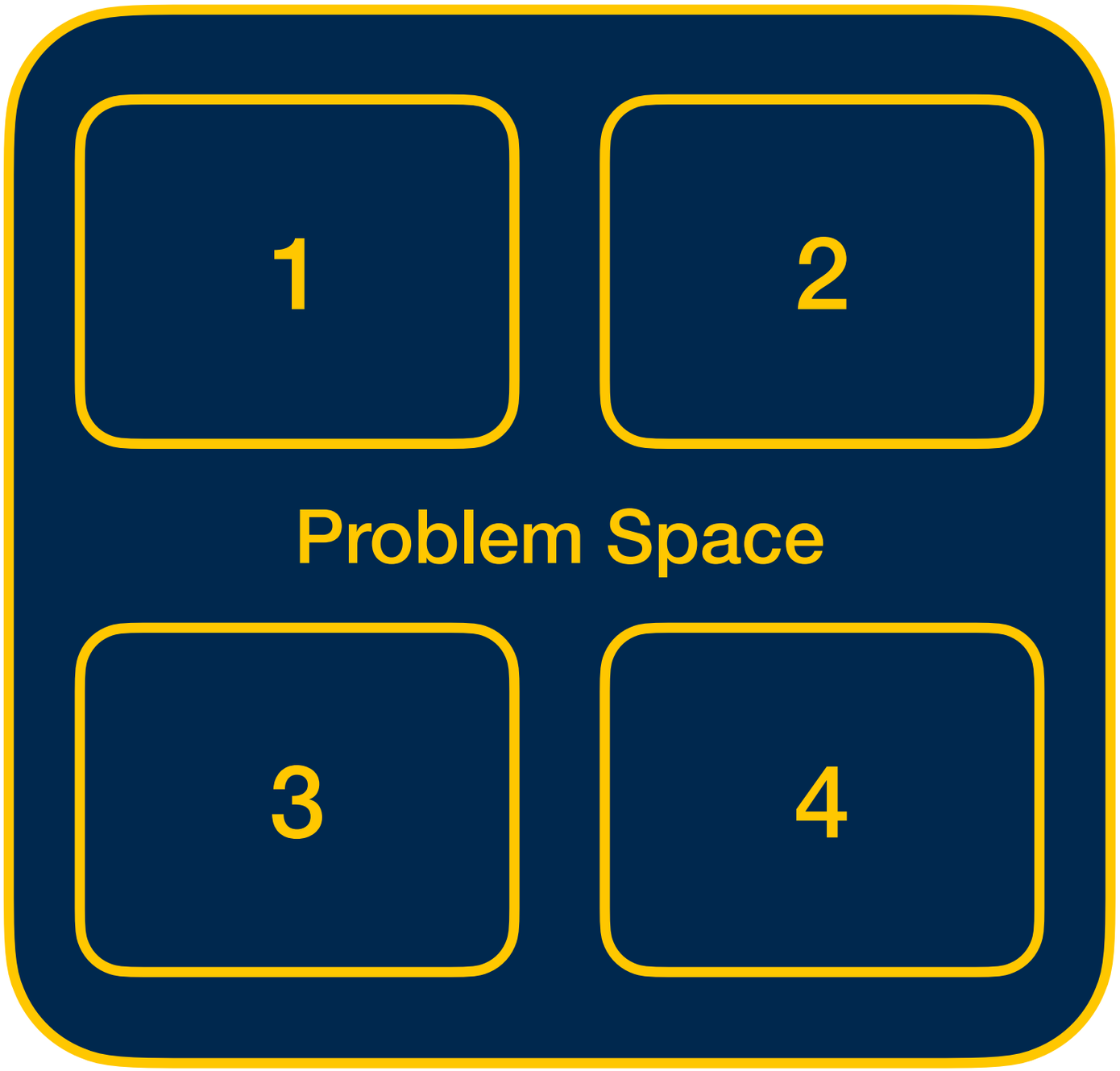
Problem-solving (programmatic)

decompose a problem into subproblems



- Divide problems into sub-problems.
- Work iteratively, moving from general solutions to specific solutions.
- For each sub-problem write working code.
- Solve each sub-problem before proceeding to next problem.

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Language of instruction

expressive, flexible, general purpose, beginner-friendly

python™

scripting,
data analysis,
artificial intelligence,
scientific computing,
web development

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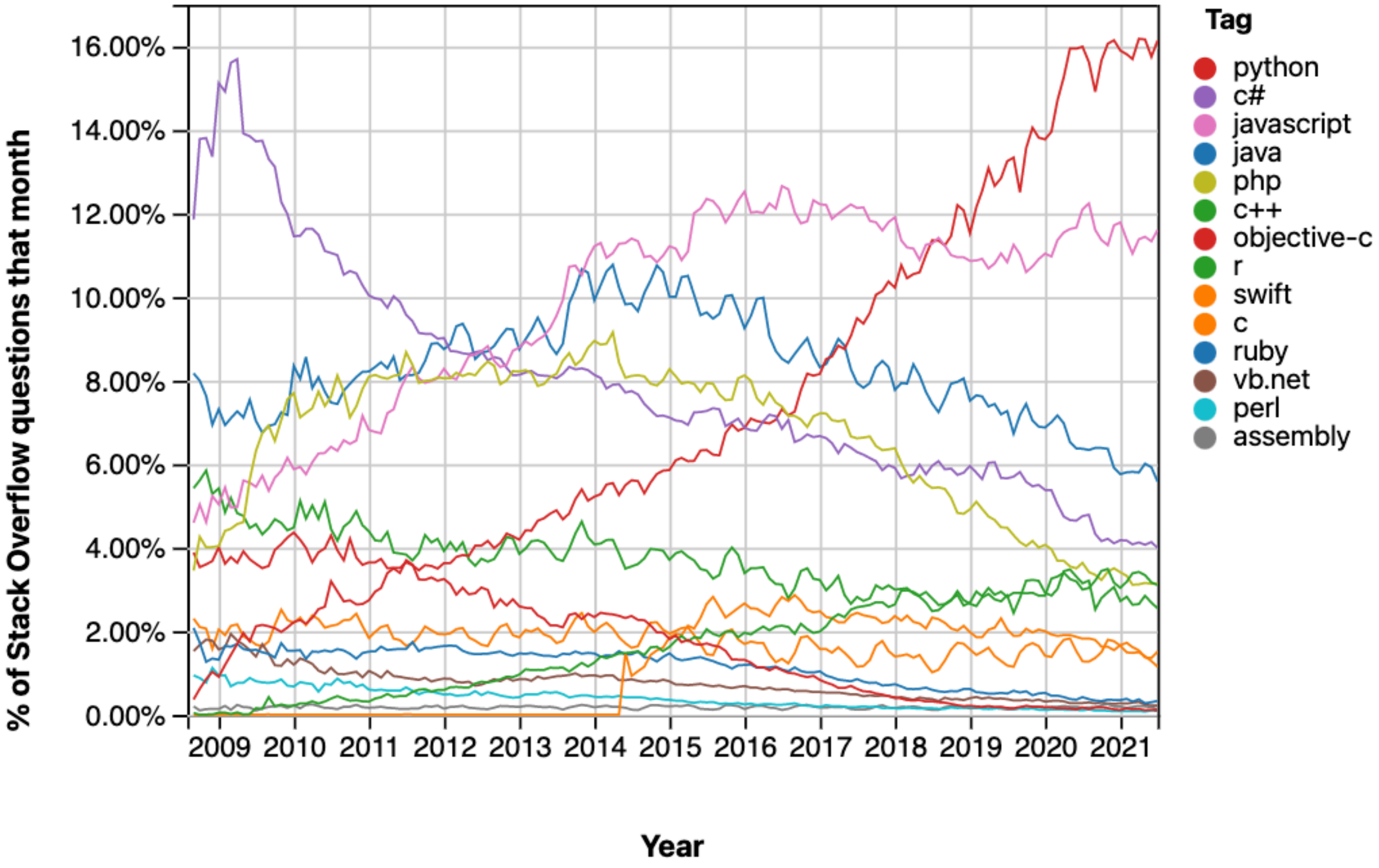
Gauging interest in Python

stackoverflow trends (Q&A):



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Topics
programming fundamentals

Syntax / Semantics

variables
objects
operators
expressions
statements

Data Structures

strings
lists
tuples
dictionaries
nested structures

Iteration

Definite iteration
Indefinite iteration
Accumulation
Comprehensions

Control Flow

conditional execution
(if-elif-else)
truth value

Functions

built-in
user-defined
main()
parameters
return value

Files

read / write
file objects
.txt, .csv, .json

Web API

package install (pip)
HTTP GET requests

Modules

import
modular design

Documentation

comments
Docstrings
README

Errors

tracebacks
debugging

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Write programs
modular, reusable code

```
import json
import requests
```

```
ENDPOINT = 'https://swapi.py4e.com/api'
```

```
def create_person(response):
```

```
def get_resource(url, params=None)
```

```
def write_json(filepath, data):
```

```
def main()
    response = get_resource(f"{ENDPOINT}/people/", {'search': 'rey'})
    rey = create_person(response)
    print(f'Rey = {rey}')
    write_json('rey.json', rey)
```

```
if __name__ == '__main__':
    main()
```


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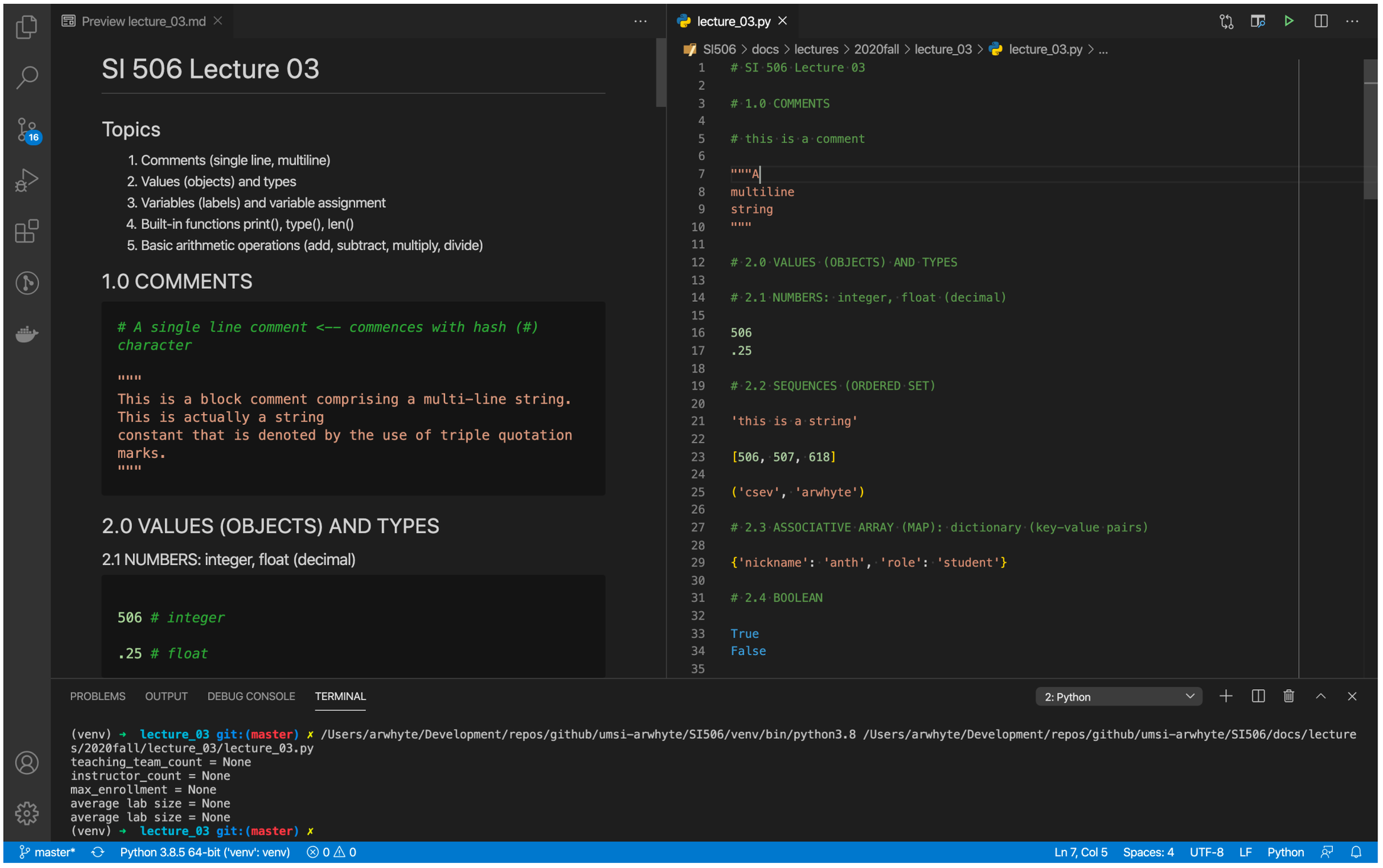
The terminal

interact with your operating system / file system

```
arwhyte@0587377524:~/Documents/umich/courses/SI506                    ⌥⌘1
→  Documents cd ..
→  ~ clear
→  ~ mkdir Documents/umich/courses/SI506
→  ~ cd Documents/umich/courses/SI506
→  SI506 pwd
/Users/arwhyte/Documents/umich/courses/SI506
→  SI506 mkdir assignments
→  SI506 mkdir lectures
→  SI506 cd lectures
→  lectures mkdir lectures_01
→  lectures cd ../../
→  courses cd SI506
→  SI506 python3
Python 3.10.1 (main, Dec  6 2021, 22:25:40) [Clang 13.0.0 (clang-1300.0.29.3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> teaching_team = ['Anthony', 'Tasha', 'Yash', 'Yaoqi', 'Joshua', 'Swathi']
>>> gsi_members = teaching_team[1:4]
>>> ia_members = teaching_team[-2:]
>>> print(gsi_members)
['Tasha', 'Yash', 'Yaoqi']
>>> print(ia_members)
['Joshua', 'Swathi']
>>> instructor = None
>>> for member in teaching_team:
...     if member not in gsi_members and member not in ia_members:
...         instructor = member
...
>>> print(instructor)
Anthony
>>> exit()
→  SI506
```

Visual Studio Code

https://code.visualstudio.com/



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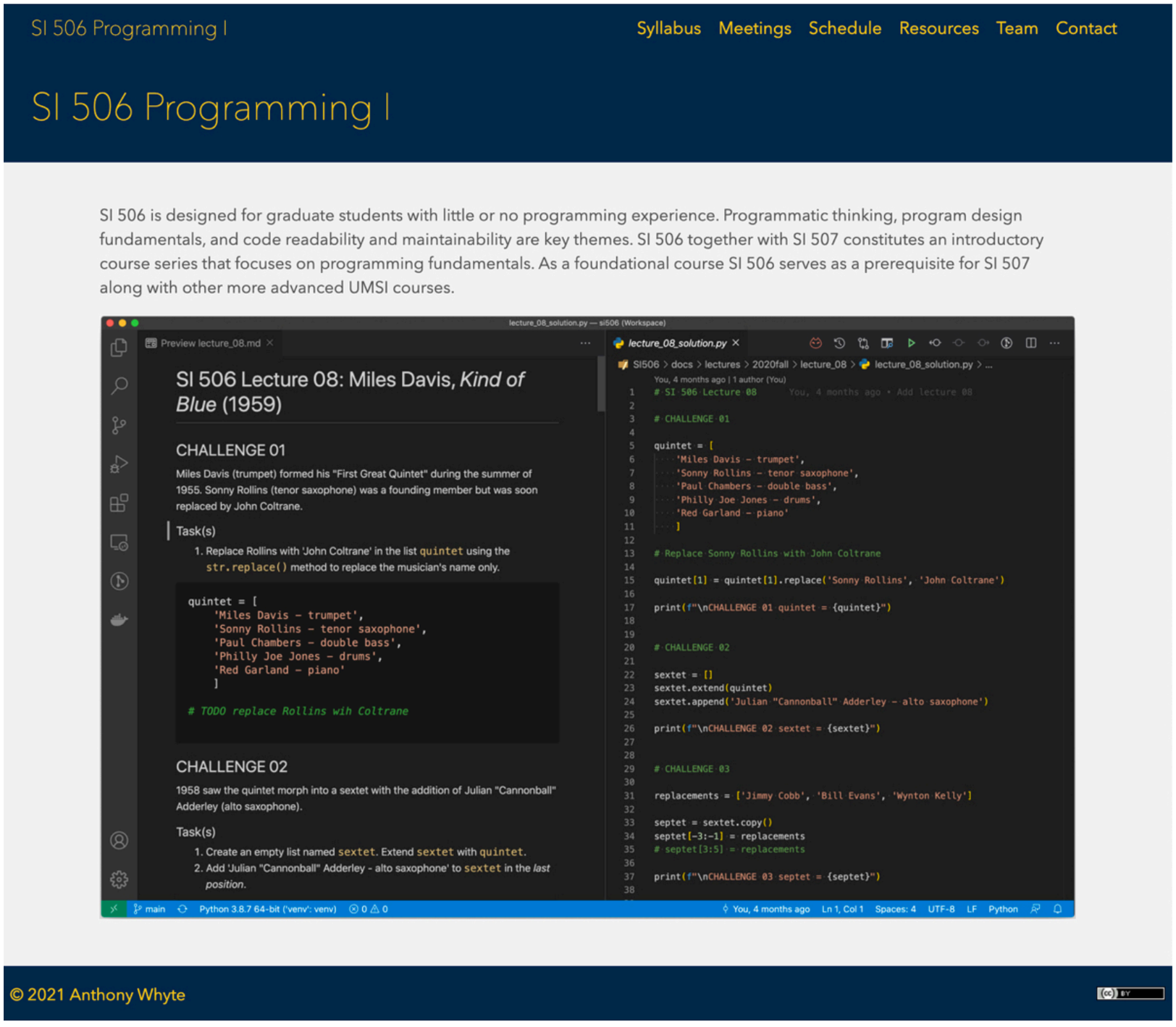
infrastructure

si506.org

syllabus, meetings, schedule, resources, team



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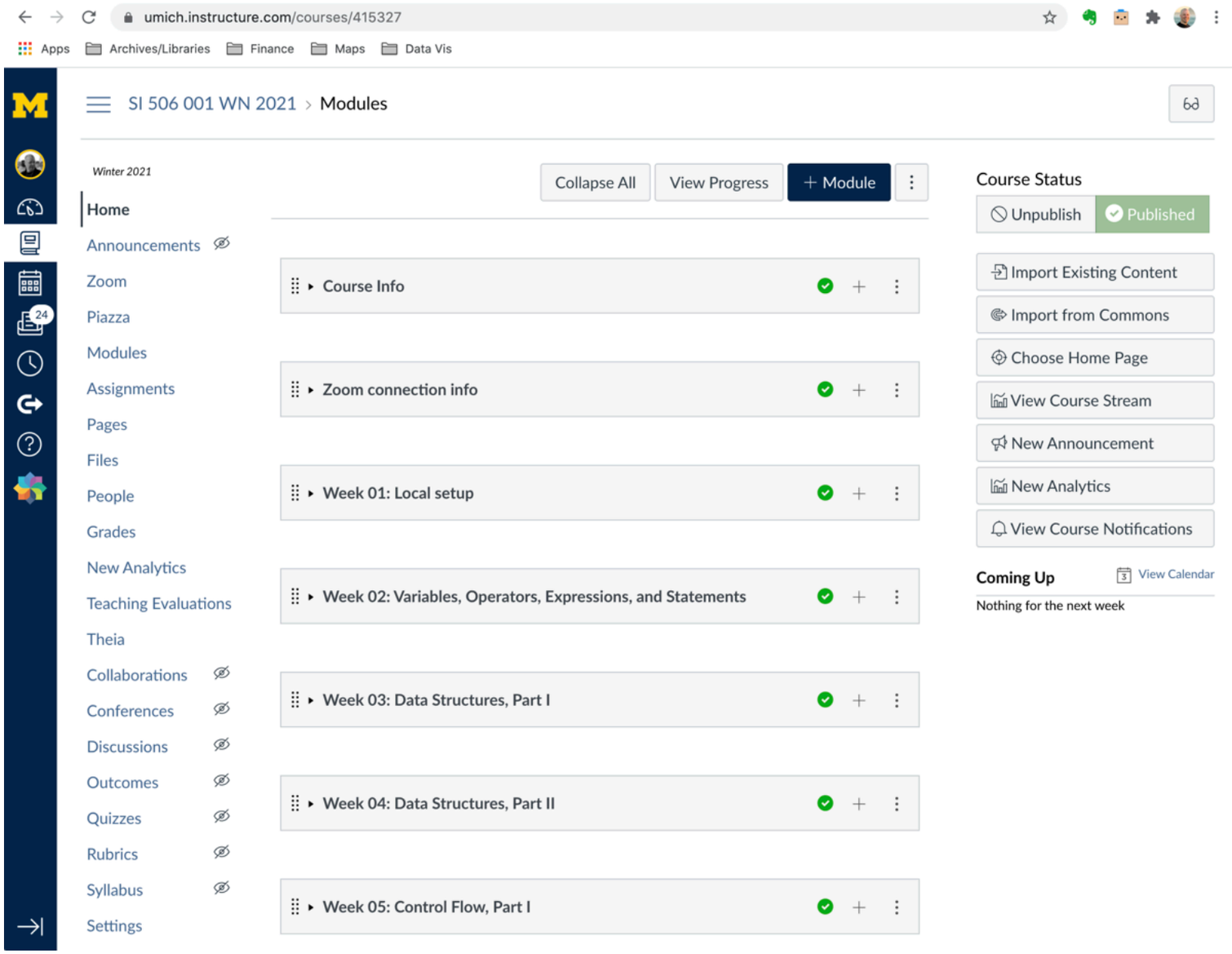
Canvas LMS

Modules: Zoom info, weekly readings, assignments



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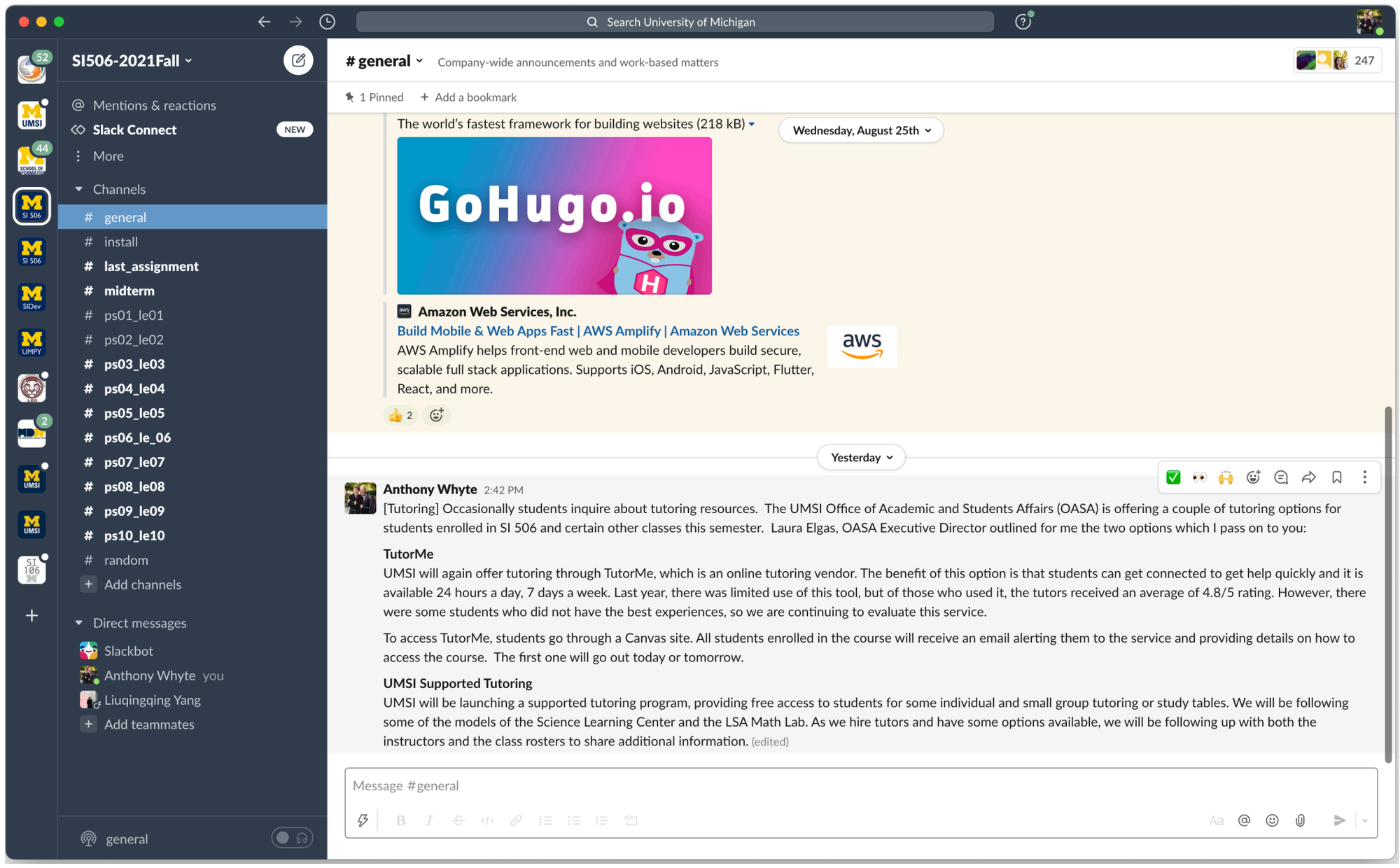
Slack

SI506-2021Fall workspace



signup instructions: https://si506.org/resources

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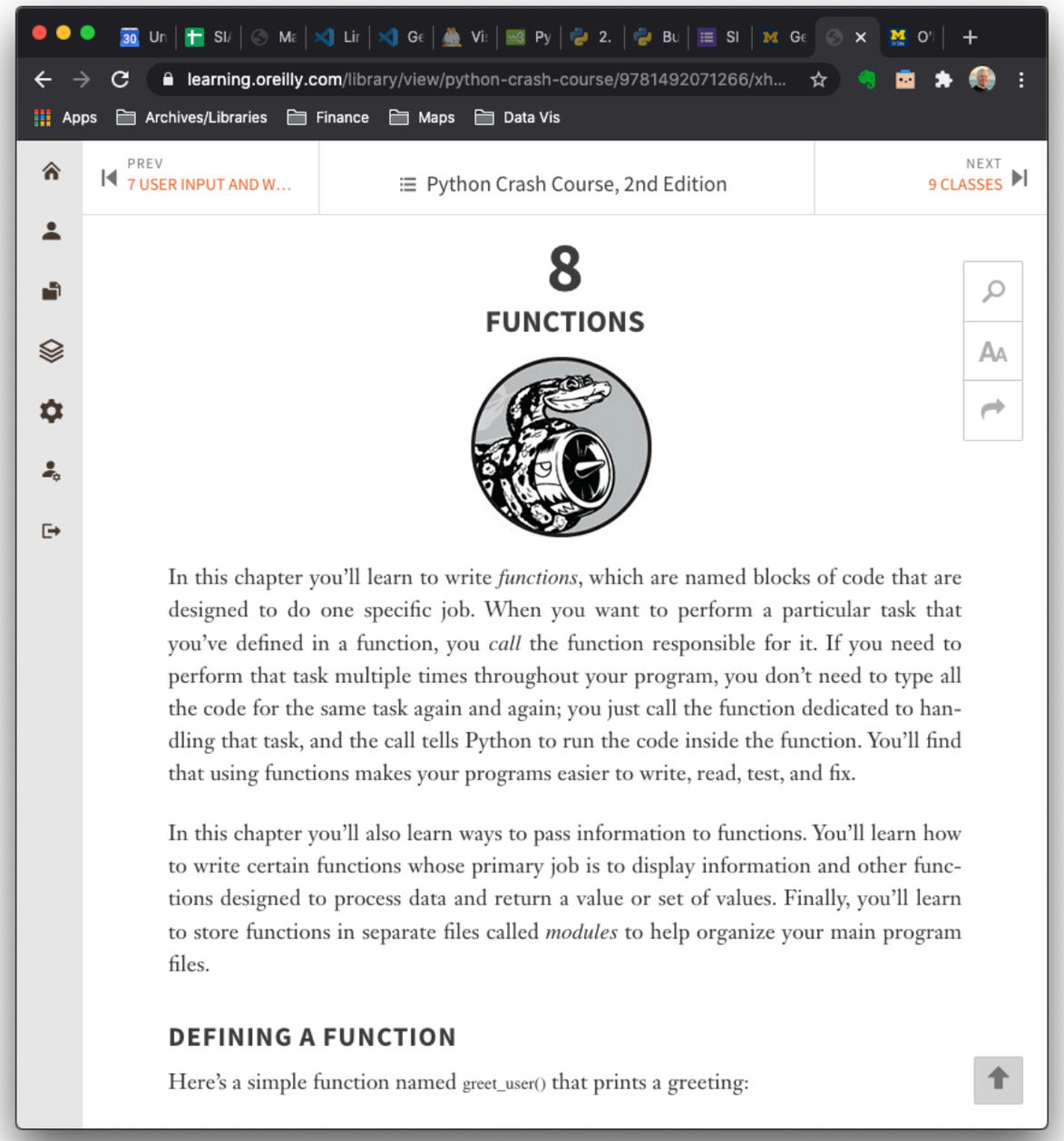
O'Reilly Learning Platform

Free school account



signup instructions: https://si506.org/resources

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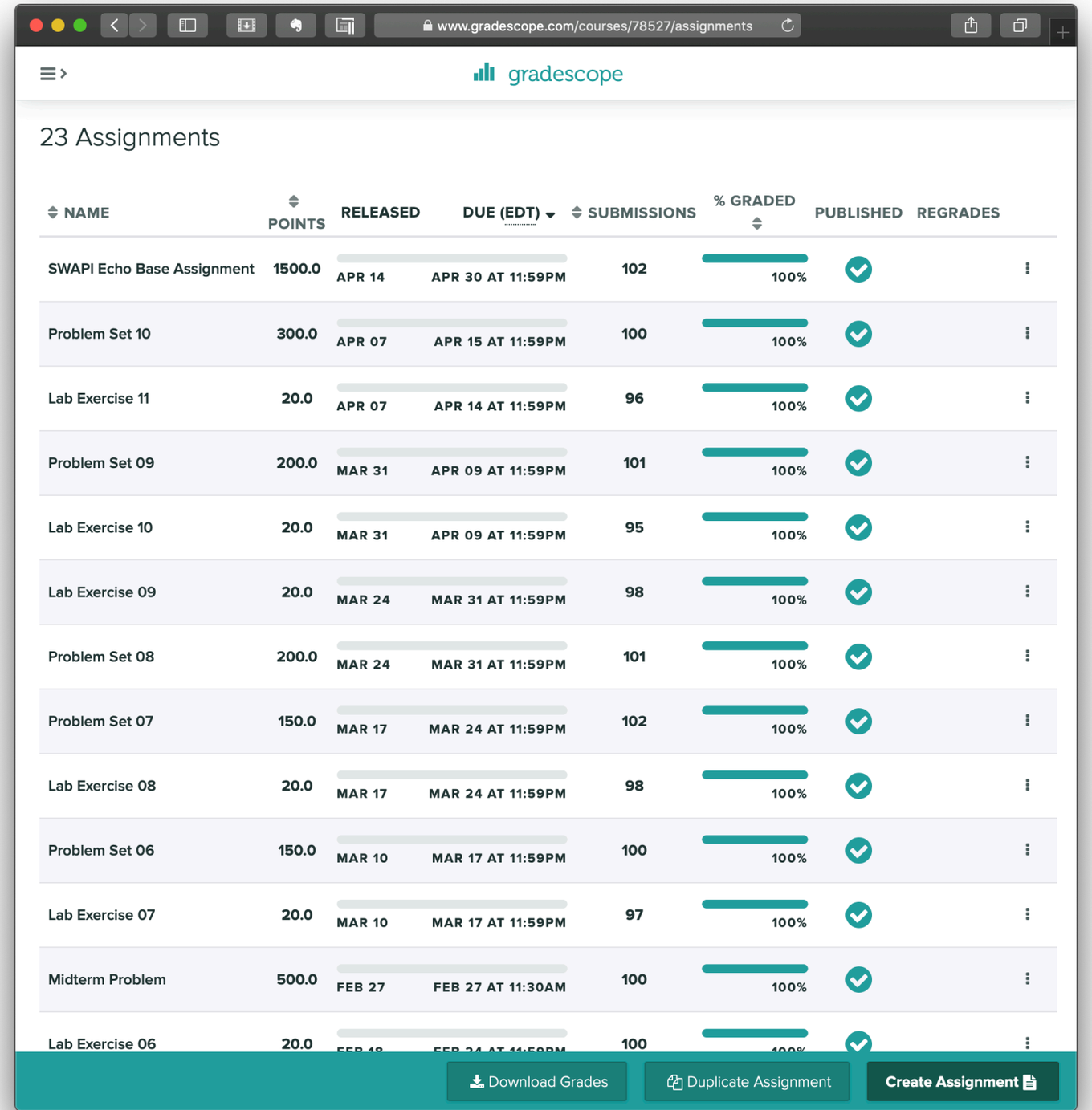
Gradescope

auto graded programming assignments



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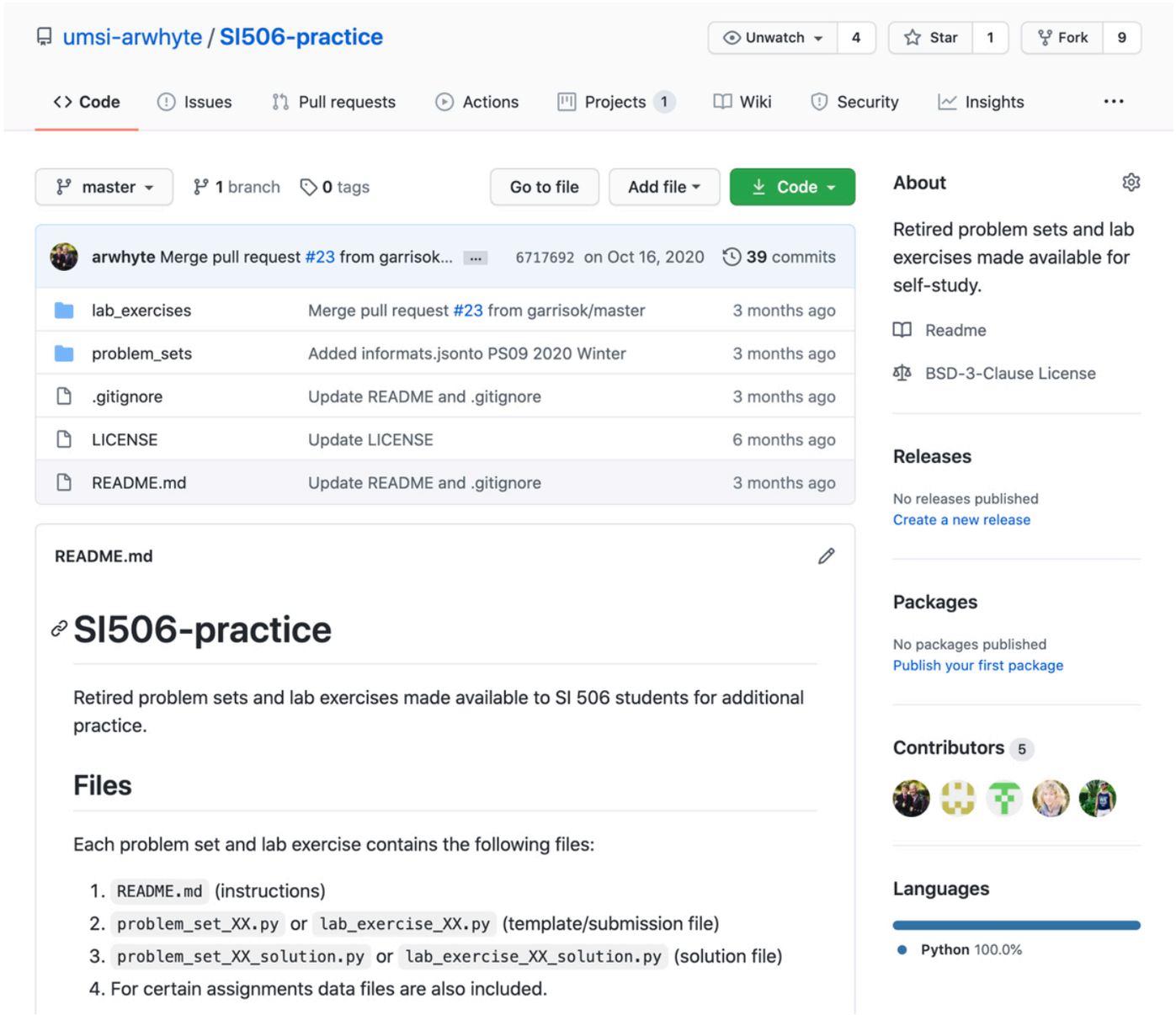
Github repo: SI506-practice

https://github.com/umsi-arwhyte/SI506-practice



practice problems

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This week
deliverables

Activate
U-M Slack Account
U-M Zoom Account
O'Reilly School Account

Review
(si506.org)
syllabus
meetings
schedule
resources

Take
Questionnaire

Install
Python 3.10.1
VS Code + extensions

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Suggested best practices

we recommend, you decide

Attend
lectures
labs
office hours

Watch
recordings

Post
Slack

Read
weekly readings

Practice
write code

Submit
assignments
(on time)

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finis

Slide deck revisions

errata: corrections and other changes

Slide no(s).	Fix ver.	Description
	v1p1	