



CSE 163

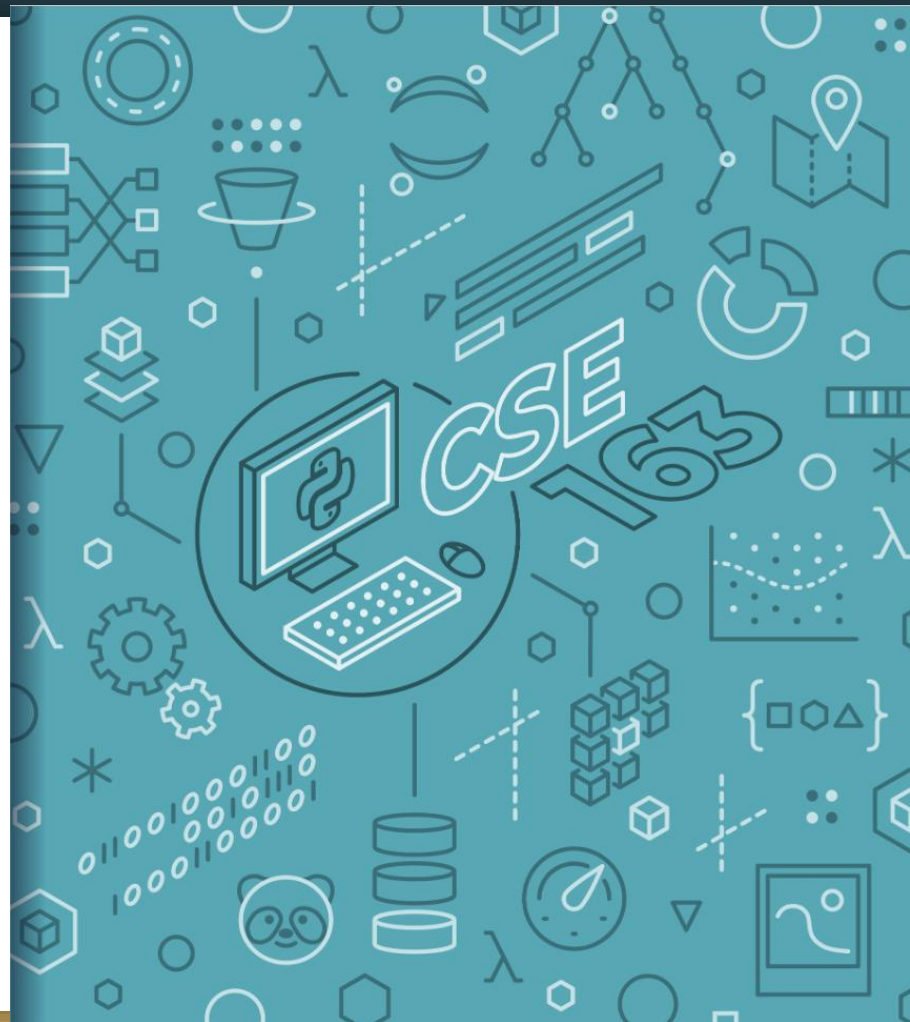
Tuples, Sets, and Dictionaries

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Spring 2026

🌟 **Icebreaker (discuss with neighbors):** ‘
What is your favorite activity to do to relax?
Add to our Slido!



[slido.com](#)
#cse163



Announcements

- **Take Home Assessment 1: Processing** due on Gradescope tomorrow at 11:59pm!
- **Lesson 4 Canvas Quiz** due tonight at 11:59pm!
- **Reading Assignment 2** will be released tomorrow, it is due Monday April 13th at 11:59pm
- **Section tomorrow!**

Grading FAQ

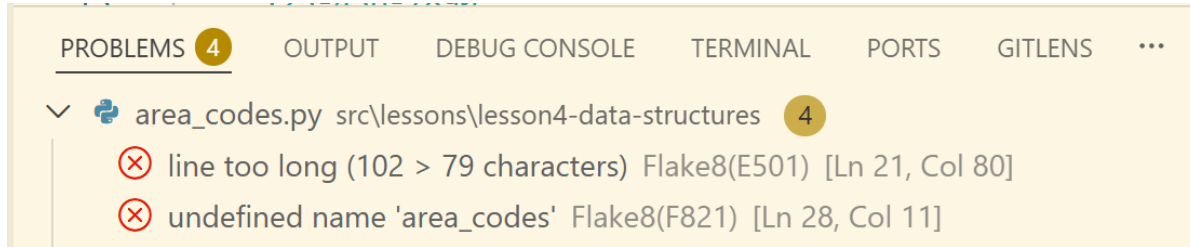
- THA 1 Grading
 - Technical Component is staff-graded on correctness
 - Creative Component is staff-graded on completeness
 - Peer review assignments will go out on Friday (April 10th) and be due on Wednesday (April 15)
 - “I Like, I Wish, What If”
 - Initial grades expected by next Thursday (April 16)
- Resubmissions
 - “Late THA 1 period” opens on Friday (April 10th) and closes on Tuesday (April 14th)
 - The later you make an initial submission, the later you will get initial feedback
 - Submissions made during this time will receive feedback by the following Thursday (April 23)
 - **ONLY TECHNICAL COMPONENT** will be assessed in resubmissions

Final Project/Portfolio

- Choose which option you want by **Thursday, April 30th (Project Part 1 deadline)**
- Projects can be done with up to 2 partners; portfolios are solo
 - **Partners need not be in your section**
- Cannot switch once you've chosen your option!
- Projects are new analyses using existing datasets
- Portfolios are “resubmissions” and polishing of quarter-long creative work.

Flake8

- Flake8 is the linter we use for this course. You can find flake8 errors in the Problems tab of VS Code:



- We will spend some time in class showing how to use flake8 on VS Code and JupyterHub

Lesson Recap

- **List**
 - Has indices, this can be added/removed at any place
- **Set**
 - No duplicates, fast membership queries, no order
- **Dictionary**
 - Key-value pairs. Keys are unique, values are not.
- **Tuple**
 - “Immutable list”, used for multiple returns, can “unpack”

List Comprehensions

```
squares = [  
    for i in range(1, 11)  
        if i % 2 == 0  
            squares.append(i ** 2)
```

List Comprehensions

```
squares = [i ** 2 for i in range(1, 11) if i % 2 == 0]
```

List Comprehensions

```
squares = [  
    i ** 2  
    for i in range(1, 11)  
    if i % 2 == 0  
]
```

4) Put it all in a list

3) Expression with loop variable

1) What are you looping over?

2) [Optional] Skip if this is false

List Comprehensions

expression | iteration | condition

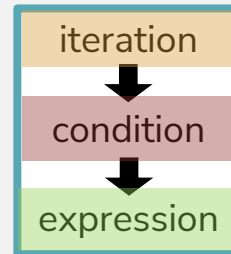
```
squares = [i ** 2 for i in range(1, 11) if i % 2 == 0]
```

```
squares = []
```

```
for i in range(1, 11):
```

```
    if i % 2 == 0:
```

```
        squares.append(i ** 2)
```



Tuples

- A tuple is a lot like a list, but it is *immutable!*

```
t = (1, "hello", 3.4)
print(t)           # (1, 'hello', 3.4)
print(t[0])       # 1
t[1] = 'goodbye'  # Error!
```

Unpacking Tuples

- We can “unpack” tuples to get their contents
- The number of variables MUST match the number of tuple elements!

```
t = (1, "hello", 3.4)
```

```
# Good!
```

```
a, b, c = t
```

```
# Not good!
```

```
a, b = t
```

```
a, b, c, d = t
```

Set

- Data structure highly optimized for membership queries
 - “if x in set” is very **fast!**
- Acts a lot like a list, BUT
 - Does not allow **indexing** operations
 - Does not allow **duplicates**

<code>set()</code>	Makes an empty set
<code>s.add(x)</code>	Adds x to s
<code>s.remove(x)</code>	Removes x from s
<code>s.clear()</code>	Removes all values from s

Dictionary

- Python has a data structure called a dictionary that allows us to use arbitrary data as keys
 - Keys are unique, but values need not be!
 - We will see some more advanced uses of dictionaries later in the course!

```
d = {}  
d['a'] = 1  
d['b'] = 2  
print(d) # {'a': 1, 'b': 2}
```

Type Annotations

- Sometimes our data structures will have many different data types in it!

```
strings: list[str] = ['by', 'any', 'other', 'name']  
numbers: dict[str, float] = {"Act 2": 2.24}
```

- Careful about how you use pipes (|) and commas (,)
 - list[str | int] means a list of strings, ints, or both
 - list[str, int] means a list of strings AND ints
 - ***This also applies to parameters and returns!***

```
def mystery(a: bool | int, b: int) -> set[str, float]:
```

Group Work: Best Practices

- When working with a new group for the first time:
 - Introduce yourself!
 - If possible, angle one of your screens so that everyone can see and discuss together
 - Be respectful of each other and allow everyone to speak
- Tips:
 - Start with making sure that everyone agrees to work on the same problem
 - Allow everyone to contribute or a chance to ask questions.
 - Ask if everyone agrees and periodically ask each other questions.
 - Call TAs or Adrian over if you need any help.
 - Don't sit in silence.