# CSE 8A: Intro to Programming in Python
## Fall 2021

Lecture 15 - Debugging, Midterm QA

UC San Diego

# Stack frames key points

1. Python doesn't evaluate a function until it is called
2. First line to execute in a python code is the first statement that isn't part of any functions
3. Function returns when the last statement of the function is executed or when a return statement is executed
4. Function returns to its caller
5. A function stack frame is created when a function is called, and is destroyed when a function returns to its caller
6. A function can only access variables in its own frame or variables in the global frame
7. Local variables take precedence than the global variables

# Debugging

- Find the errors in your program
- Three kinds of errors
  - Syntax error

```
nums = [1, 2, 3]
for i in nums
    print(i)
```

SyntaxError ✕

❌ invalid syntax

OK
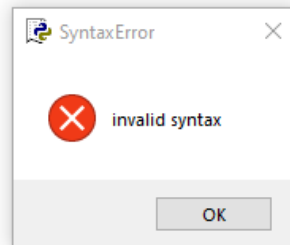
# Debugging

- Find the errors in your program
- Three kinds of errors
  - Runtime error

```
nums = [1, 2, 0]
for i in nums:
  print(5/i)
```

```
5.0
2.5
Traceback (most recent call last):
  File "C:/Users/yic24/Desktop/test.py", line 3, in <module>
    print(5/i)
ZeroDivisionError: division by zero
```

# Debugging

- Find the errors in your program
- Three kinds of errors
  - Logical error

```
nums = [1, 2, 0, 15, 2, 9]
ave = 1
for i in nums:
  ave += i
print(ave / len(nums))
```

It prints 5.0

# How to find the bugs in my code



picture credit: link here

# How to find the bugs in my code

- Trace your program
  - python tutor
  - print statement
- Examine the value of variables as you step through your code
- Is the value of the variable correct?
  - If not, then you may have found the bug

Remember:

Your code makes sense to you even if it is buggy! ¯\_(ツ)_/¯

```python
def find_min(nums):
    result = -1
    for val in nums:
        if result < val:
            val = result
    return result


values = [1, 3, 9, -2, 10]
print(find_min(values))
```

# Coding Challenge

Return the sum of the numbers in the array, except ignore sections of numbers starting with a 6 and extending to the next 7 (every 6 will be followed by at least one 7). Return 0 if the list is empty

```
sum67([1, 2, 2]) → 5
sum67([1, 2, 2, 6, 99, 99, 7]) → 5
sum67([1, 1, 6, 7, 2]) → 4
```