Introduction to Computation for the Humanities and Social Sciences

CS 3

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Lecture 12

Ready, `Set`, Go!

Lecture 12

- My Project Demo
- New Data Structure: Set()
- Scope

Sets

New Data Structure!

- very similar to `Lists`
- `A Set is` an unordered collection of items
- Collections which don't preserve the order in which elements are added are called **unordered**
- Doesn't support indexing

```
a = {1,2,3}
a.add(4)
if 2 in a:
  print(a)
```

Sets

New Data Structure!

- very similar to `Lists, but`
- is incapable of storing duplicate items (maintains just 1 copy)

```
students = set()
students.add("jackie")
students.add("emily")
students.add("hank")
students.add("emily")
print(students)
```

```
>>> students = {'emily', 'jackie', 'hank'}
```

Sets

New Data Structure!

- checking if an item is contained in the Set happens instantly (doesn't need to check each item one by one)

```
students = set()
students.add("jackie")
students.add("emily")
students.add("hank")
students.add("emily")

if cur_student in students:
    print(student + "is present!")
else:
    print(student + "is NOT present!")
```

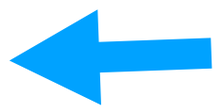
Sets

New Data Structure!

- The downside: `Sets` have no indices and no order!

- So, you can't access specific items. If you need to maintain an order for your items, use a `List`.

```
students = set()
students.add("jackie")
students.add("emily")
students.add("hank")
students.add("emily")
students[0]
```



CRASHES

When to use a Set()?

- Use a **`Set()`** when you only care about storing a collection of unique values (i.e., don't care about duplicates) and the order doesn't matter to you.

- e.g., store license plate #s or list of senator names.

What is Scope?

- Each variable has its own scope.
- Scope refers to the places in your code which has access to the variable.
- You've encountered scope before. Where?

What is Scope?

- A variable's scope starts when it's first declared/ initialized.

- A variable's scope terminates once your code has *less* indentation than that of when it was declared.

What is Scope?

- The concept we saw with the scope within functions continues on a smaller scale, too: if we define a variable within a **`for-loop`** or **`if-statement`**, it's like its own private room, and things outside the room shouldn't try to access these variables.

- Variables inside the room (i.e., inside the for-loop or if-statement) can access variables that were declared outside of it — as long as they were executed earlier

In Summary

- It's okay to access/use/update a variable if it's:
    - your code already executed the line that declares/ initializes it
    - the variable was declared with indentation that's either (1) **equal** or (2) **less** than the line in question.

Otherwise, you can't rely on the variable's value, and often Python won't even let you run such code.

Scope

```
1    names = ["malik", "stephanie", "ellie", "rico"]
2    for name in names:
3        print(“list’s length:” + str(len(names)))
4        if name[0] == “e”:
5            starts_with_e = True
6        else:
7            starts_with_e = False
8
9    print(starts_with_e)
10   print(names)
```

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LAB TIME