

Discussion 04

Sequences

Aditya Balasubramanian

`aditbala [at] berkeley [dot] edu`

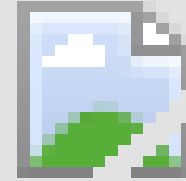
Announcements

- Hog due TODAY for EXTRA CREDIT (7/5)
- No extensions for EC unless you have specific accommodations
- HW2 due Thursday (July 7th)
- Cats (Project 2!) begins Thursday
 - Checkpoint next Tuesday (July 12th)
 - Due following Tuesday (July 19th)
- Instructor OH - conceptual help; super useful!

Questions from last discussion

- What is in-scope for the exam
 - All lecture prior to the week of the exam
 - Practice exams until Summer 2019
 - Would personally recommend doing more if you feel shaky (start soon)
- Video for `count_k(n, k)`
 - Delayed
 - Will try to get done today
 - Rough(ish) weekend

Lists



Lists

- An indexed collection of any data type
- Examples of valid lists:
 - `[1, 2, 3]`
 - `[True, False, 'boo']`
 - `[[4], [3, 6, 7], [8]]`
- Environment diagrams

Creation and Usage

- In order to access the values in our list, we have to use the index
- Python lists are zero indexed, so the first element is at index 0
- `n` element is at `n-1` index
- Can also access elements in reverse order through negative index
 - Last element is accessed through index `-1` or `len(list) - 1`

```
>>> a = [1, 2, [3, 4]]
>>> a[0]
1

>>> a[2]
[3, 4]

>>> a[2][0]
3
```

What questions do we have?

Q3: WWPD (Lists)

List Slicing

- How do you access a subset of the list?
- List slicing: creating a copy of part of the list
 - Syntax: `list[<start index>: <non inclusive end index>: <step size>]`
 - step size by default is 1
 - negative step size means list is reversed

List Slicing Examples

```
>>> a = [7, 89, True, ['cat']]
```

```
>>> a[1:3]  
[89, True]
```

```
>>> a[:3:2]  
[7, True]
```

```
>>> a[::-1]  
[['cat'], True, 89, 7]
```

```
>>> a[:3:-1]  
[]
```

What questions do we have?

List Comprehension

- How do you create a list that fits some criteria?
e.g. How would you create a list with numbers 1 - 4, but squared
`[1, 4, 9, 16]`
- List Comprehension: creating a list based on expressions filtering other lists
- Syntax: `[<expression> for <value> in <sequence> [if <filter>]]`
- `if` condition is optional

List Comprehension Examples

```
>>> a = [x**2 for x in range(1, 5)]
```

```
>>> a  
[1, 2, 9, 16]
```

```
>>> [x/2 for x in [x for x in a if x % 2 == 0]]  
[1, 8]
```

What questions do we have?

Q4: Even weighted

Q5: Max Product

Sequences 1 2 3

Sequences

- Many languages provide `map`, `filter`, `reduce` functions for sequences (lists in Python)
- Help manipulate lists with built-in functions

Q1: Map, Filter, Reduce

Q2: Count Palindromes

Dictionaries

- Maps `keys` to `values`
- Doesn't really have an order
- Access elements using `keys` rather than indices

Dictionaries

- Maps `keys` to `values`
- Doesn't really have an order
- Access elements using `keys` rather than indices
- Defined with curly braces (`{}`)
 - `{key: value}`

Demo:

```
pokemon = {'pikachu': 25, 'dragonair': 148, 25: 'hello'}  
pokemon['pikachu'] # 25  
pokemon['hello'] = 'hi'  
pokemon # {'pikachu': 25, 'dragonair': 148, 25: 'hello', 'hello': 'hi'}
```

Q6: WWPD (Dictionaries)

Thank you

Attendance Form -> <https://tinyurl.com/adit-disc04>

Anon Feedback -> <https://tinyurl.com/adit-anon>