PIC 16, Winter 2018

Week: 1, Day: Friday

Lecture 1F: Introduction to Python

Friday, January 12, 2018

Matt Haberland

Announcements

- Preparation 2W posted on CCLE
- Choose to complete one of the following:
  - Assignment 1F (already posted).
  - Assignment 2W (will be posted next time).
- Office Hours were before class today (none after)

Intended Learning Outcomes

- By the end of today, I want you all to be able to:
  - write Python programs using the equivalents of all your favorite control flow statements from C++ or Java (`for`, `if`, `break`, `continue`),
  - use the range function to compactly define an arithmetic sequence of numbers,
  - write and call functions that accept a variable number of arguments and can have default values for the “formal parameters”,
  - create lambda expressions to compactly define simple functions, and
  - follow recommended coding style, including writing descriptive documentation strings.

Thoughts from readings

- You don't know what tuples or dictionaries are yet – don't worry
- You don't know how to take command line input yet
- I'll explain lambda functions
- The meaning of slicing in Python is totally different from the meaning of slicing in C++

Lambda Expressions

A regular function:

keyword function name parameter colon

```
def f(x):
    return x**2 + 1
```

keyword

What you want to return

```
print f(2)
```

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The equivalent lambda expression:

function name keyword parameter

```
f = lambda x: x**2 + 1
```

colon

What you want to return

References and Mutability

Similar code can behave differently depending on whether the variable is:

- a value or a pointer/reference
- mutable or immutable

a)

```
int  x = 1
int& y = x
y = 10
cout << x
```

b)

```
x = [1,2]
y = x
y[1] = 10
print x
```

c)

```
x = 1
y = x
y = 10
print x
```

In Python, all variables are references to objects. Even an `int` is an object, under the hood.
However, some types – like ints, floats, and strings - are immutable. This makes them behave like primitives in other languages.

Questions?

Quiz 1F

- Please complete Quiz 1F on CCLE
- Please *do not* refer to the preparation document or other materials. Answers are to come from your brain only.

Activity

- Start Assignment 1F, or
- If it's too mathy, try this:

Exercise (not for credit):
Write a function to translate a string into Pig Latin.
(If you're not familiar with "Pig Latin", all the rules are on Wikipedia.)

Consider "a", "e", "i", "o", and "u" to be the only vowel sounds.
Consider "y" to be a consonant; ignore special cases like "pylon".

1) assume string is a single word.
2) Use your function for converting one word to convert all the words in a sentence. (Look up the `split` member function. It will help.)
3) Write an Oppish to English translator. Yes, it should work correctly for English words that already have "op" in them, like "lopsided".