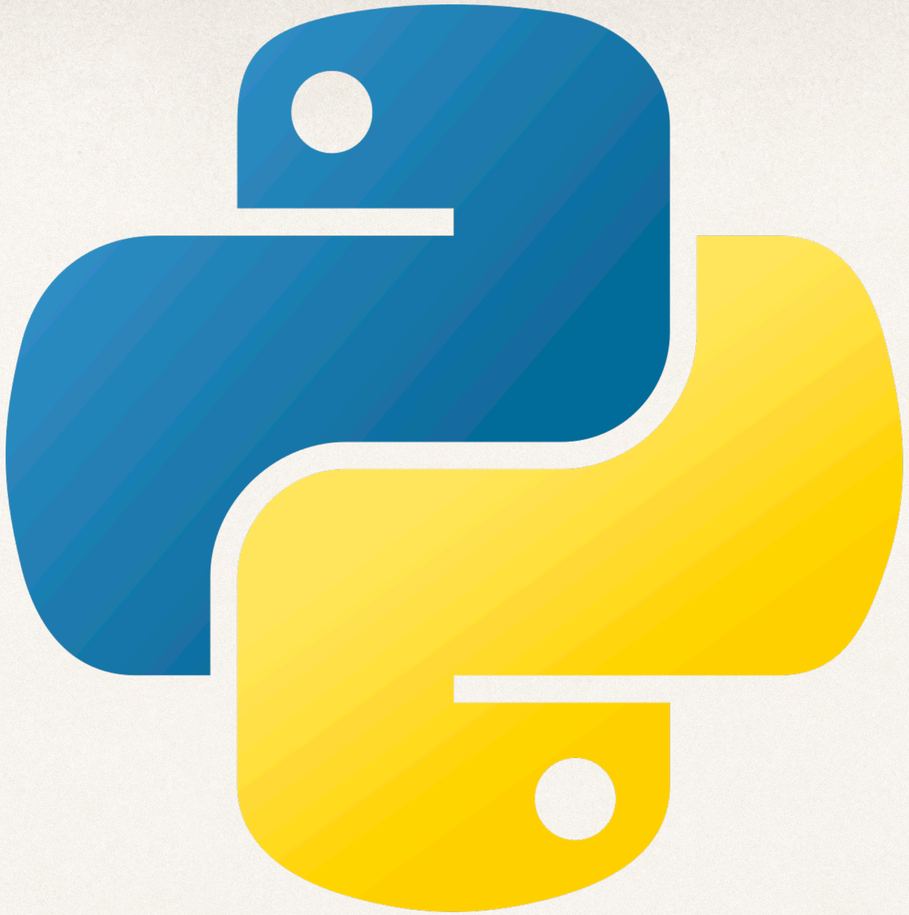

Getting Started with Python

Sandeep Soni

08/23/2023

Class logistics

Class logistics

- Refer to the class website for schedule: https://sandeepsoni.github.io/classes/qtm340.html

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- Hw1 is released and is due on Wednesday

Question for the day

Question for the day

What shape is the distribution of word counts in a text collection?

Agenda

- What are constants, variables and expressions?
- What are the different data types in Python?
- What operations can be done in Python?
- What are the different data structures in standard Python?
- What are the different programming constructs?

Constants and Variables

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- In Python, variables need not be declared or typed

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There are other data types too.

Operators

- Arithmetic operators
- Comparison operators
- Logical operators
- Membership operators
- Identity operators
- Other operators such as assignment and bitwise operators

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Operators have precedence

Comparison Operators

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Comparison Operators

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>	Greater than	`5.14 > 5`
<	Less than	`5.14 < 6`
>=	Greater than or equal	`3 >= len ("the")`

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!=	Not equal	`4!=5, True != False`
>	Greater than	`5.14 > 5`
<	Less than	`5.14 < 6`
>=	Greater than or equal	`3 >= len ("the")`
<=	Less than or equal	`3 <= (1+(2*1))`

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or	Logical or between two boolean expression	`(3==4) or (1==1)`
not	Negation of a boolean expression	`not (3==4)`

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not in	True if specified value not in the sequence	`"Z" not in "abc"`
is	True if two variables being compared are the same object	`"a" is "A"`
is not	True if the two variables being compared are not the same object	`"A" is not "A"`

Class quiz I

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$x=5$

Class quiz I

```
x=5

y=10
```

Class quiz I

```
x=5

y=10

print (x ** 2 > 25 and y < 25)
```

Class quiz I

```
x=5

y=10

print (x ** 2 > 25 and y < 25)
```

False

Class quiz II

Class quiz II

```
print (2 * 4 ** 2 * 4)
```

Class quiz II

```
print (2 * 4 ** 2 * 4)
```

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Protip

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When in doubt, use parenthesis to scope the operations

Data structures

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dict	Key value pairs	`{":-)":"happy",":-(":"sad"}, {}, dict ()`
set	Unordered set of items	`{"a", 1, "abcd"}, {}, set ()`
tuple	Ordered an immutable sequence of items	`(1,2), (1,2,3,4), (), tuple()`

Explore on your own

- Use of operations to add or remove items from list, dict, or set
- Sorting or reversing a list
- Merging two container variables such as concatenating two lists

Conditional Blocks

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Syntax

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```
if <condition>:
  do something
elif <condition>:
  do something else
else:
  do something instead
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else:
  do something instead
```

Example

```
class_year='senior'

if class_year == "freshmen":
  print ("Getting started")
elif class_year == "sophomore" or class_year == "junior":
  print ("Found my safety net")
else:
  print ("Get me out of here!")
```

Loops

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Syntax

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for <var> in <container>:

  do something
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Example

Loops

Syntax

```
for <var> in <container>:

  do something
```

Example

```
fruits=[“grape”, “apple”, “orange”]

for fruit in fruits:

  print (fruit)
```

Functions

Functions

Syntax

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Syntax

```
def <function name> (<args>):
    do something
    return
```

Functions

Syntax

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def <function name> (<args>):
    do something
    return
```

Example

```
def is_even(number):
    return number % 2 == 0
```

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Example

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Explore on your own

- The use of `break` and `continue` keywords in loops
- `while` loop
- `range()` and `enumerate()` functions

Other stuff

- Python has support for many useful libraries that can be accessed by importing them (e.g., `import csv`)
- Support for many advanced features such as decorators, generators, lambda functions, etc
- One can use Python as a scripting language or as an object-oriented language.

In class

- 02_programming.ipynb(or see README.md on class Github)
- 02_moby_dick.ipynb