

[320] Special Methods

Tyler Caraza-Harter

Midterm Schedule

Date: **Wednesday, March 11th**

Time: **7:15 pm**

Length: **2 hours**

Room: **Ingraham B10**

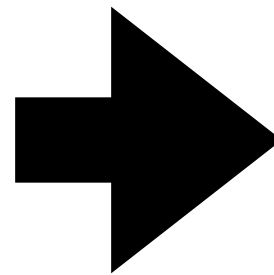
Conflict? Fill this:

<https://forms.gle/Y9xfkBVFy1wgYtDu9>

McBurney Exam: Thursday, March 12th @ 5:30pm

Review Classes

CLASSES AND OTHER TYPES



OBJECTS



Review Classes

```
class Dog:
    def init(dog):
        print("created a dog")
        dog.name = name
        dog.age = age

    def speak(dog, mult):
        print(dog.name + ": " + "bark!"*mult)

fido = Dog()
```

which one is an attribute?

1. dog
2. name
3. mult
4. fido

Review Classes

```
class Dog:
    def init(dog):
        print("created a dog")    is this printed? do we crash?
        dog.name = name
        dog.age = age

    def speak(dog, mult):
        print(dog.name + ": " + "bark!"*mult)

fido = Dog()
```

Review Classes

```
class Dog:
    def __init__(dog, name, age):
        print("created a dog")    is this printed? do we crash?
        dog.name = name
        dog.age = age

    def speak(dog, mult):
        print(dog.name + ": " + "bark!"*mult)

fido = Dog("Fido", 9)
```

Review Classes

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        print(dog.name + ": " + "bark!"*mult)

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```
speak(fido, 5)           # A
fido.speak(5)            # B
Dog.speak(fido, 5)       # C
type(fido).speak(fido, 5) # D
```

which call won't work?

Review Classes

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which one is NOT an example of type-based dispatch?

Review Classes

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```
fido = Dog("Fido", 9)
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Review Classes

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```

```
fido = Dog("Fido", 9)
```

```
speak(fido, 5) # A  
fido.speak(5) # B  
Dog.speak(fido, 5) # C  
type(fido).speak(fido, 5) # D
```

which call style is preferred?

Review Classes

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class Dog:
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        print("created a dog")
        dog.name = name
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    def speak(dog, mult):
        print(dog.name + ": " + "bark!"*mult)

fido = Dog("Fido", 9)

fido.speak(5) # B preferred style
```

Review Classes


```
class Dog:
    def __init__(dog, name, age):
        print("created a dog")
        dog.name = name
        dog.age = age

    def speak(dog, mult):
        print(dog.name + ": " + "bark!" * mult)

fido = Dog("Fido", 9)

fido.speak(5)                                # B
```

what will be passed to the dog param?



Review Classes

what is a better name for the receiver parameter?



```
class Dog:
    def __init__(dog, name, age):
        print("created a dog")
        dog.name = name
        dog.age = age

    def speak(dog, mult):
        print(dog.name + ": " + "bark!" * mult)

fido = Dog("Fido", 9)

fido.speak(5)                                # B
```

Review Classes

what is a better name for the receiver parameter?

answer: self

```
class Dog:
    def __init__(dog, name, age):
        print("created a dog")
        dog.name = name
        dog.age = age

    def speak(dog, mult):
        print(dog.name + ": " + "bark!" * mult)

fido = Dog("Fido", 9)

fido.speak(5) # B
```


Special Methods

`__init__` is a special method,
with non-standard behavior

```
class Dog:
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    def speak(dog, mult):
        print(dog.name + ": " + "bark!" * mult)

fido = Dog("Fido", 9)

fido.speak(5)                                # B
```

Special Methods

There are MANY special method names:

<https://docs.python.org/3/reference/datamodel.html#special-method-names>

We'll learn a few:

`__str__`, `__repr__`, `__repr_html__`

`__eq__`, `__lt__`

`__len__`, `__getitem__`

`__enter__`, `__exit__`

control how an object looks when we print it or see it in Out[N]

generate HTML to create more visual representations of objects in Jupyter. Like tables for DataFrames

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define how `==` behaves for two different objects

`__len__`, `__getitem__`

define how a list of objects should be sorted

`__enter__`, `__exit__`

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`__len__`, `__getitem__`

build our own sequences that we index, slice, and loop over:

`__enter__`, `__exit__`

```
val = obj[idx]  
vals = obj[3:7]  
for x in obj:  
    print(x)
```

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`__enter__`, `__exit__`

context managers

```
with open("file.txt") as f:  
    data = f.read()  
# automatically close
```

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example 1: dogs

`__len__`, `__getitem__`

`__enter__`, `__exit__`

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`__len__`, `__getitem__`

example 2: `range(...)`

`__enter__`, `__exit__`

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`__len__`, `__getitem__`

example 3: make our own Series

`__enter__`, `__exit__`

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`__eq__`, `__lt__`

`__len__`, `__getitem__`

`__enter__`, `__exit__`

example 4: plots inside a "with" block will have extra large font

Demos