AL NAFI,
A company with a focus on education,
wellbeing and renewable energy.

Python Primer 105

Python Classes and Objects

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Dua of the day

The righteous dua that Abu Bakr (r) made at the end of his lifetime.

اللَّهُمَّ اجْعَلْ خَيْرَ زَمَانِيْ آخِرَهُ، وَخَيْرَ عَمَلِيْ خَوَاتِمَهُ، وَخَيْرَ أَيَّامِيْ يِوْمَ أَلْقَاكَ

"O Allah, let the best of my lifetime be its ending, and my best deed be that which I seal [my life with], and the best of my days the day I meet You."

Reference: The Dua is taken from Sheikh Omer Sulaiman Dua Compilation.

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Objects in Python

Objects are a way of organizing code in a program and breaking things down to make it easier to think about complex ideas.

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Objects explanation

A giraffe is a type of mammal, which is a type of animal. A giraffe is also an animate object—it's alive. Now consider a sidewalk.

There's not much to say about a sidewalk other than it's not a living thing. Let's call it an inanimate object (in other words, it's not alive).

The terms mammal, animal, animate, and inanimate are all ways of classifying things.

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Objects into classes

In Python, objects are defined by classes, which we can think of as a way to classify objects into groups.

Here is a tree diagram of the classes that giraffes and sidewalks would fit into based on our preceding definitions:

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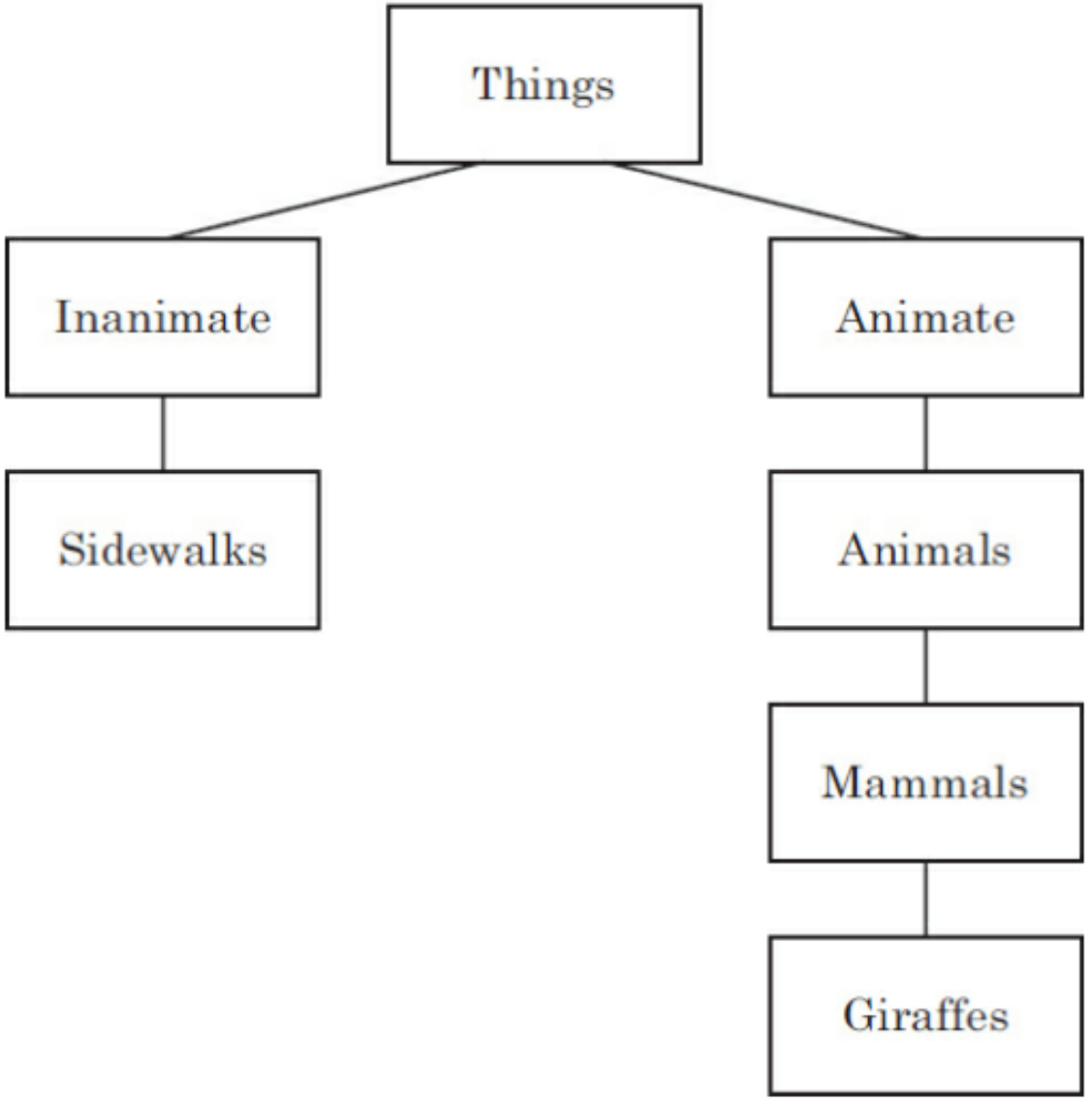

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Creating a class

```
class Things:
    pass
class Inanimate(Things):
    pass
class Animate(Things):
    pass
class Sidewalks(Inanimate):
    pass
class Animals(Animate):
    pass
class Mammals(Animals):
    pass
class Giraffes(Mammals):
    pass
```

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Adding objects to classes

Qamoo = Giraffes()

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Defining functions of Classes

Functions are a way to reuse code ☺

code. When we define a function that is associated with a class, we do so in the same way that we define any other function, except that we indent it beneath the class definition. For example, here's a normal function that isn't associated with a class:

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```
def this_is_a_normal_function():
    print('I am a normal function')

class ThisIsMySillyClass:
    def this_is_a_class_function():
        print('I am a class function')
    def this_is_also_a_class_function():
        print('I am also a class function. See?')
```

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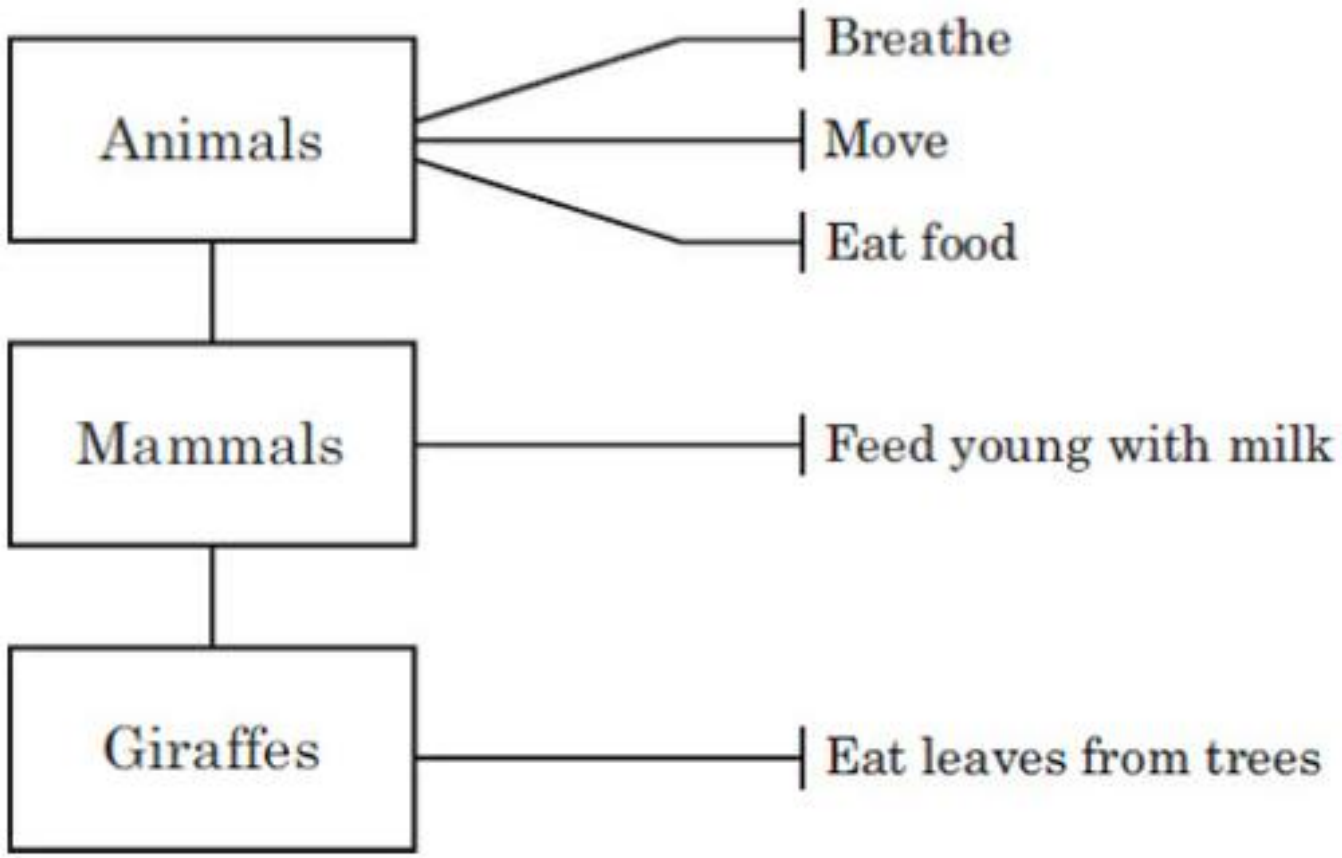
Adding class characteristics as functions



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```
class Animals(Animate):
    def breathe(self):
        pass
    def move(self):
        pass
    def eat_food(self):
        pass
```

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Why use classes and objects?

We’ve now added functions to our classes, but why use classes and objects at all, when you could just write normal functions called breathe, move, eat_food, and so on?

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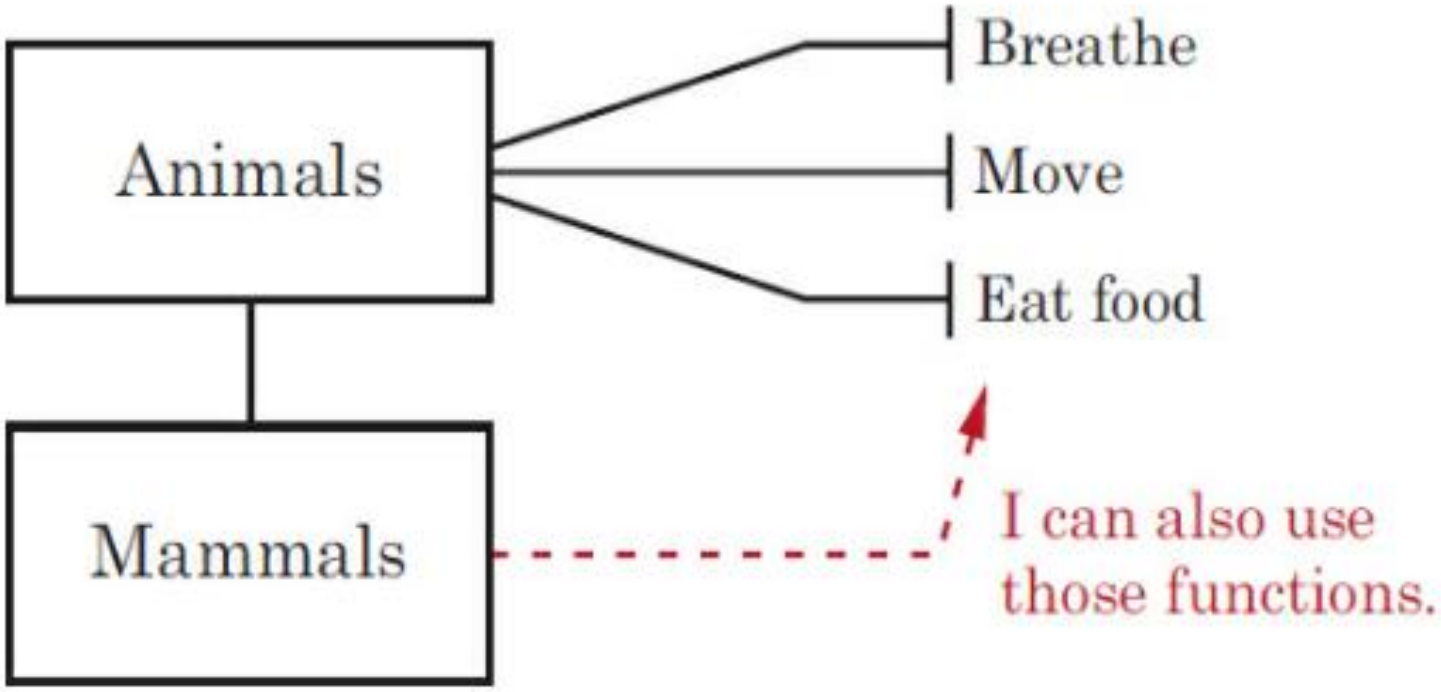
Inherited Functions



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Functions calling other functions

We have now created a function that combines two other functions, which is quite common in programming.

Often, you will write a function that does something useful, which you can then use inside another function.

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Initializing an object

Sometimes when creating an object, we want to set some values (also called properties) for later use. When we initialize an object, we are getting it ready to be used.

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جزاك اللهُ

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