Recall: Classes are Types for Objects

- Values must have a type
  - An object is a value
  - Object type is a class

- Classes are how we add new types to Python

<table>
<thead>
<tr>
<th>id2</th>
<th>Point3</th>
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<tbody>
<tr>
<td>x</td>
<td>2.0</td>
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<tr>
<td>y</td>
<td>3.0</td>
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<tr>
<td>z</td>
<td>5.0</td>
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Types

- int
- float
- bool
- str

Classes

- Point3
- RGB
- Turtle
- Window

Classes Have Folders Too

Object Folders

- Separate for each instance

Class Folders

- Data common to all instances

Name Resolution for Objects

- (object).(name) means
  - Go the folder for object
  - Find attribute/method name
  - If missing, check class folder
  - If not in either, raise error

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<tr>
<td>x</td>
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<td>y</td>
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<tr>
<td>z</td>
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The Class Definition

- Goes inside a module, just like a function definition.

class <class-name>(object):

"""Class specification"
"""

...<function definitions>
...<assignment statements>
...<any other statements also allowed>

Example

Example(object):

"""The simplest possible class"
"""
pass

Instances and Attributes

- Assignments add object attributes
  - <object>.<att> = <expression>
  - Example: e.b = 42

- Assignments can add class attributes
  - <class>.<att> = <expression>
  - Example: Example.a = 29

- Objects can access class attributes
  - Example: print a.a
  - But assigning it creates object attribute
  - Example: e.a = 10

- Rule: check object first, then class

The Class Specification

class Worker(object):

"""An instance is a worker in an organization.

Instance has basic worker info, but no salary information.

ATTRIBUTES:

- iname: Worker's last name. (str)
- ssn: Social security no. [int in 0.0000000000 to 9.9999999999]
- boss: Worker's boss. [Worker, or None if no boss]"""
Method Definitions

- Looks like a function def
  - But indented inside class
  - The first parameter is always called self
- In a method call:
  - Parentheses have one less argument than parameters
  - The object in front is passed to parameter self
- Example: a.distanceTo(b)

Example: a.distanceTo(b)

Methods Calls

Example: a.distanceTo(b)

Special Method: __init__

Called by the constructor

Aside: The Value None

Making Arguments Optional