

# Object Oriented Programming

WTP 2010  
Computer Science  
Day 7: Tuesday, July 6

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## Introduction

- We've seen that functions are useful for:
  - Simple scrips
  - Numerical calculations
  - String manipulations, etc...
- This lecture introduces to OOP. We use it for:
  - better program design, and
  - better modularization

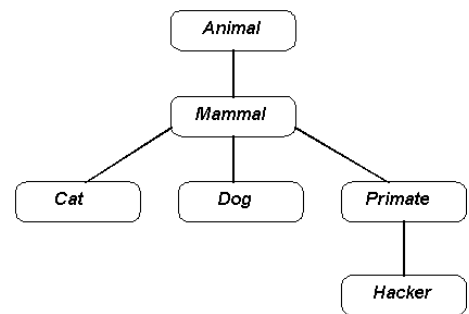
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## Classes and Objects

- What is a Class?
  - A software item that contains variables and methods
- What is an object?
  - An instance of a class

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## An example: Zoo



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## Classes vs Objects

- Class: Animal

|             |
|-------------|
| Attributes: |
|             |
| Methods:    |
|             |

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## Classes vs Objects

- Class: Mammal

|             |
|-------------|
| Attributes: |
|             |
| Methods:    |
|             |

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## Classes vs Objects

- Class: Cat

Attributes:

Methods:

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## Classes vs Objects

- Class: Dog

Attributes:

Methods:

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## Classes vs Objects

- Class: Primate

Attributes:

Methods:

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## Classes vs Objects

- Class: Hacker

Attributes:

Methods:

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## Classes vs Objects

- Class: Hacker

Attributes:

Methods:

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## Basic Class Format

```
class ClassName(object):  
    ''' Class Description  
        Attributes: atr1, atr2  
        ...  
    def __init__(self,...):  
        CONSTRUCTOR_BODY  
  
    def method1(self, ...):  
        METHOD_BODY  
  
    def method2(self, ...):  
        METHOD_BODY
```

Good practice:  
Add class description  
Describe the attributes

Special method for  
constructing the object  
Defines and initializes  
the attributes

Methods implementing  
the capabilities of the  
object  
You can define as many  
as you need

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## Let's implement the Hacker class in python

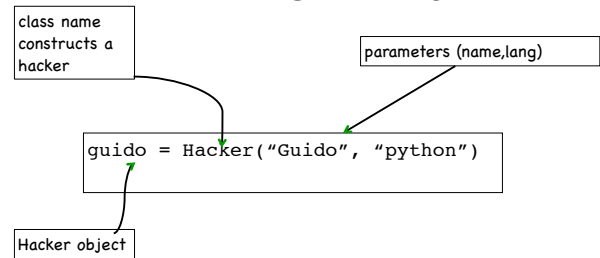
- Class: Hacker

```
class Hacker:
    def __init__(self,name,lang)
        self.name = name
        self.programming_language = lang

    def speak(self):
        print "Hello World"
```

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## Creating an object



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## Accessing attributes and methods

- Using dot (.)

```
guido = Hacker("Guido", "python")
guido.speak()
```

attributes or instance variables

call the method using the dot (.)

"Hello World"

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## Today's Exercises

- Write python code to implement Animal, Mammal, Cat, Dog and Primate classes
- Create instances for these classes
- Using those instances access the attributes and methods defined in the classes
- Finish ps6 if you haven't already
- Please do the readings we have given you on Classes, Objects and Inheritance!

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