Learning Object-Oriented
Programming and Design with TDD

Methods and Messages

How vs. What

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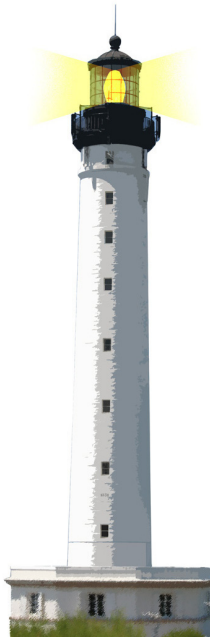


Pharo
http://www.pharo.org

W3S03

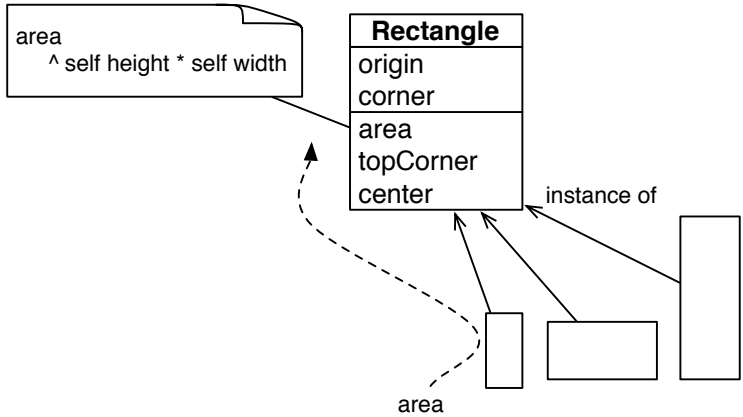
A method

Named sequence of instructions that will be executed on the message receiver

```
FrenchPerson >> makeCrepes
```

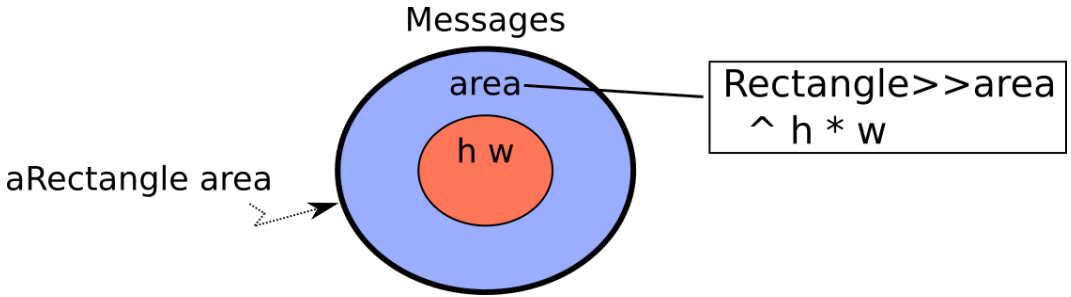
Instances Share the Same Behavior

- All the instances of a class share the same behavior
- A class defines the methods that are executed when an instance receives a message



A method

- Defines **how** to respond to a message
- Is a sequence of executable statements
- Has name that is the same as message name
- Is dynamically selected via method lookup technique
- Returns an object as result of execution



Messages vs. Methods

Message: What to do?

```
stef makeCrepes.
robert makeCrepes.
peter putJamOnCrepes.
```

Methods: How to do it?

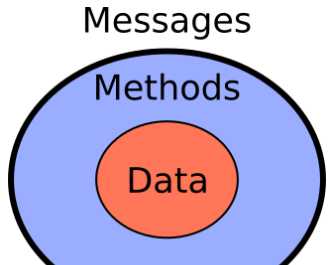
What vs. How

What: Messages

- Specify what behavior objects have to perform
- Details are left to the receiver

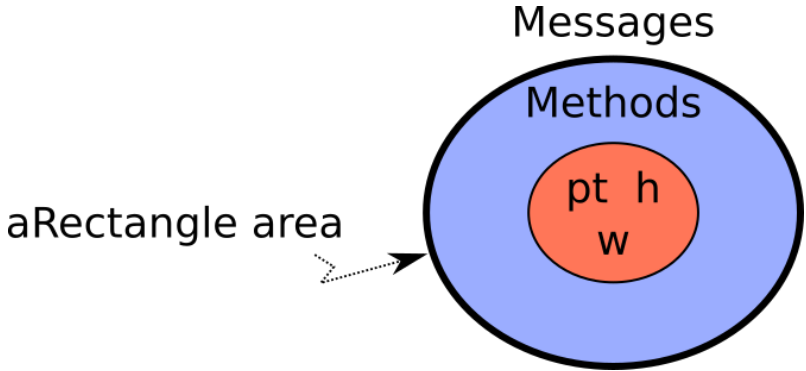
How: Methods

- Specify how an operation is to be performed
- Must have access to data
- Need detailed knowledge of data
- Can manipulate data directly

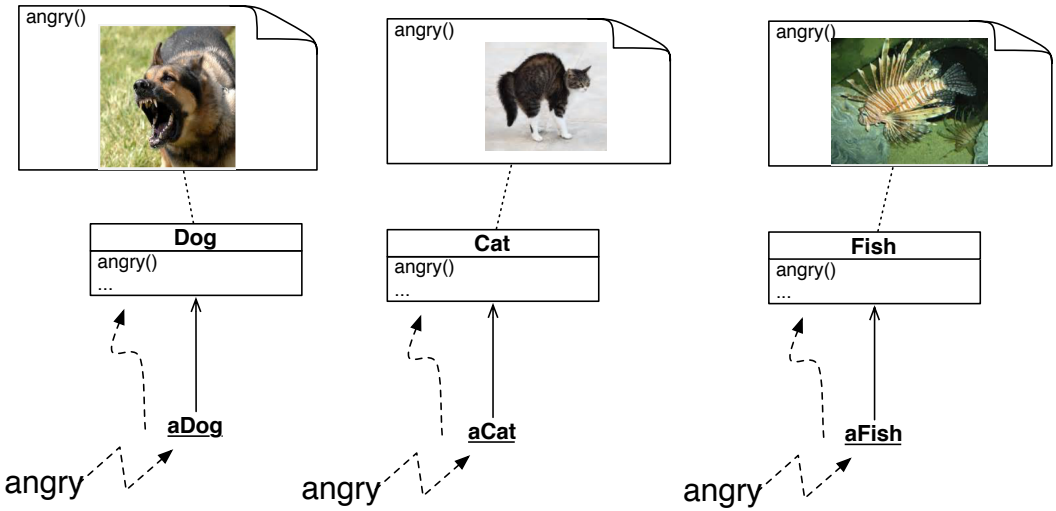


Message

- Sent to an object: The message receiver
- A message may include parameters necessary for performing the action
- Message sends always return a result (an object)
- Only way to communicate with an object and have it perform actions



Methods are looked up dynamically in the class of the receiver



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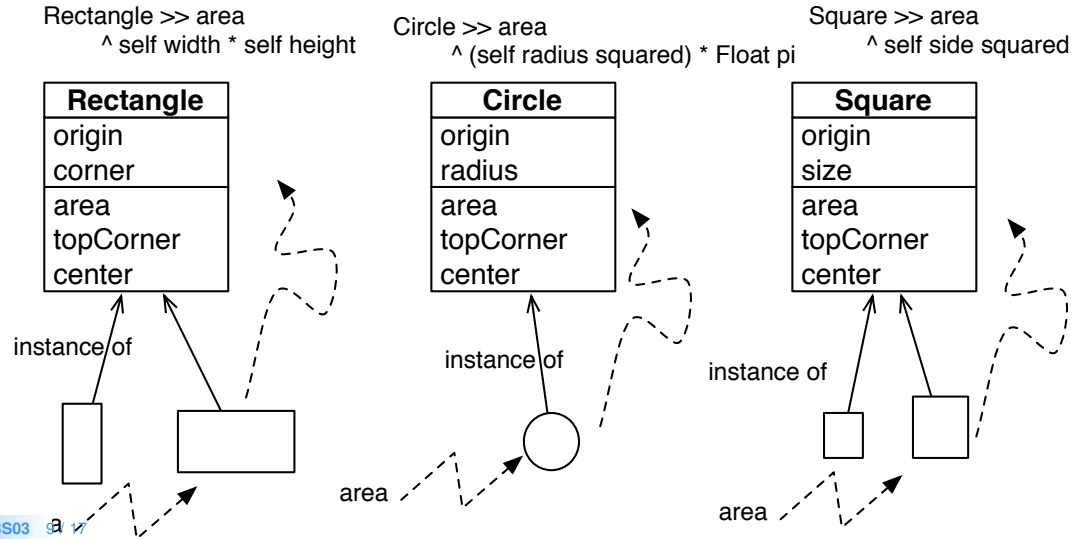


Late binding: The method to be executed depends on the receiver

- The executed method depends on the receiver
- Different receivers of the same message may react differently

```
Rectangle >> area
  ^ self width * self height
```

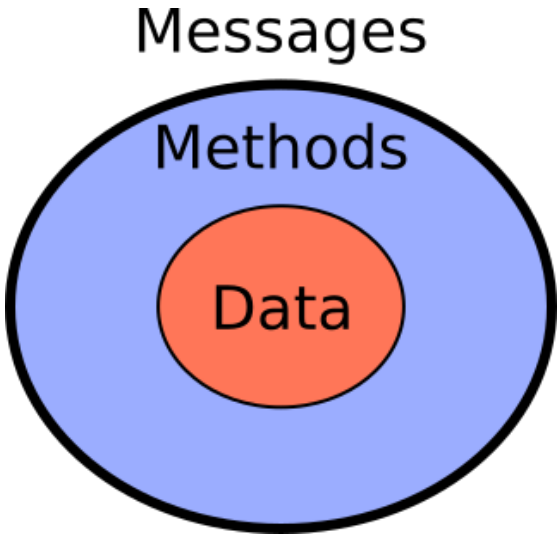
```
Circle >> area
  ^ (self radius squared) * Float pi
```

```
Square >> area
  ^ self side squared
```

Late binding

- The executed method depends on the receiver at runtime
- The receiver is often only known during execution

Data/Messages/Methods

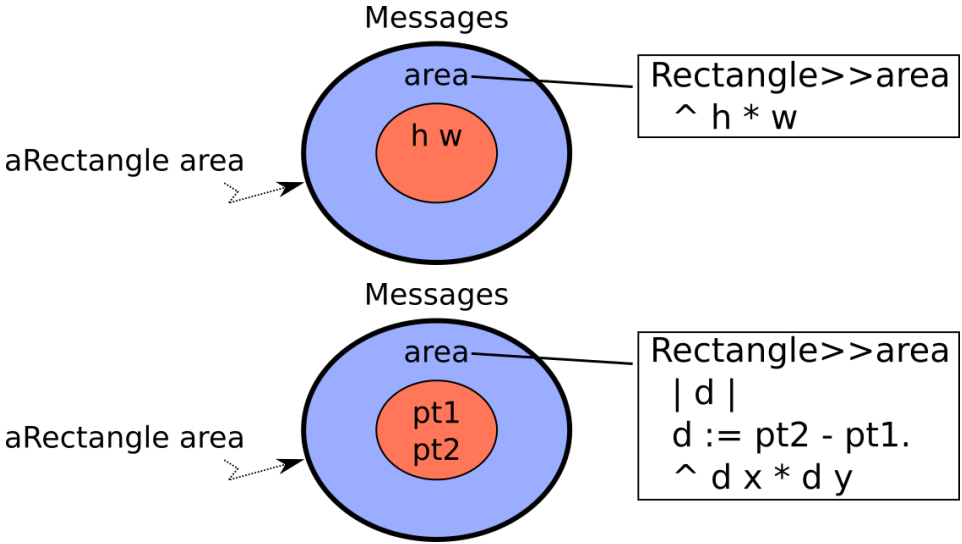


Object Encapsulation

Technique to

- Hide implementation details
- Protect the state of objects from clients
- Communicate/access object via a uniform interface

Object Encapsulation



Object Encapsulation

- Puts objects in control
- Facilitates modularity, code reuse and maintenance
  - External vs. Internal perspective
  - What vs. How
  - Based on Message vs. Method

Summary

- Messages define what should be done.
- Methods define how the computation should be performed.
- The same message sent to different objects may execute different methods.
- Methods are selected dynamically (during execution) based on the receiver.
- Methods are looked up dynamically in the class of the receiver.

A course by Stéphane Ducasse

http://stephane.ducasse.free.fr

Reusing some parts of the Pharo Mooc by

Damien Cassou, Stéphane Ducasse, Luc Fabresse

http://mooc.pharo.org