Pharo Object Model in a Nutshell

Elegance and Simplicity

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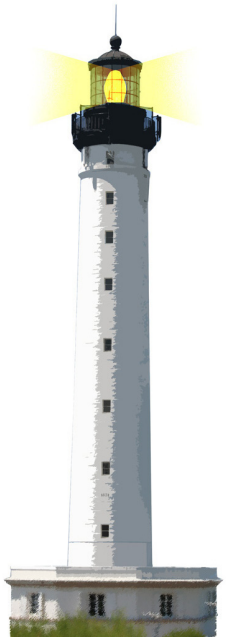
Pharo

http://www.pharo.org



Only Objects, Messages, ...

- **Objects**: mouse pointer, booleans, arrays, numbers, strings, windows, scrollbars, canvas, files, trees, compilers, sound, url, socket, fonts, text, collections, stack, shortcut, streams...
- **Messages** sent to these objects: size, +, at:put:, do:, ...

... and Block Closures

- Messages are **what** (intent)
- Methods are **how** to do it
- Closures are kind of anonymous methods
- Closures are called **blocks** in Pharo

```
4 timesRepeat:
  [ Transcript show: 'Hello World' ]
```

- **[...]** delimits a block

A Simple and Uniform Model

- **Everything** is an object, instance of a class
  - Classes and messages are objects too!
- All computations between objects are done via **message passing**
- We use the term **sending a message** because:
  - methods are always looked up dynamically
  - only late binding, only virtual calls
- Only **ONE** method lookup for all objects

Pharo Object Model

- Instance variables are protected:
  - private to the object
  - accessible from subclasses
- Methods are public and virtually bound
- Single inheritance between classes

Messages

Computation between objects is done via message sends
Example of the cross product of two points:

```
(point1 x * point2 y) − (point1 y * point2 x)
```

Object Creation: Creating a Point

A new object can be created by sending a message to another object

```
10@20
```

A new Point object is created by:

- sending the message @
- to the object 10 (SmallInteger)
- with the argument 20 (SmallInteger)

Object Creation: Creating a String

```
'Pharo', ' is Cool'
> 'Pharo is Cool'
```

A new String is created as the concatenation of two strings by:

- by sending the message ,
- to the string 'Pharo'
- with the string ' is Cool' as argument

Object Creation

Sending the messages new and new: to a class

```
Monster new
> aMonster
```

```
Array new: 6
> #(nil nil nil nil nil nil)
```

Here we get an array of size 6

Object Creation

Sending instance-creation messages to a class

```
Tomagoshi withHunger: 10
```

This executes a class method

Less is More :)

- No constructors
- No static methods
- No type declarations
- No interfaces
- No package/private/protected modifiers
- No parametrized types
- No boxing/unboxing
- still **really** powerful :)

Summary

- Everything is an object
- Computation is done via messages sent to objects
- Methods are late bound (looked up dynamically in the inheritance chain)
- Blocks are kind of anonymous methods
- Instances are created by sending messages to other objects, or classes

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