

# Pharo: an immersive object-oriented system

<http://www.pharo.org>

D.Cassou - S. Ducasse - L. Fabresse  
Inria / MinesTelecom / Univ. Lille



# Pharo?



# Pharo!

- <http://www.pharo.org>
- Pure object language + IDE
- Inspired by Smalltalk
- Great community
- Powerful, elegant and fun to program
- Living system under your fingers



# Elegant!

- Full syntax on a postcard
- Simple but powerful object model

# Complete Syntax on a Postcard

```
exampleWithNumber: x
```

“A method that illustrates every part of Smalltalk method syntax”

```
<menu>
```

```
| y |
```

```
true & false not & (nil isNil) ifFalse: [self halt].
```

```
y := self size + super size.
```

```
#($a #a 'a' 1 1.0)
```

```
do: [ :each | Transcript
```

```
    show: (each class name);
```

```
    show: (each printString);
```

```
    show: ' '].
```

```
^ x < y
```



# Object Model

- Dynamically typed
- **\*\*Everything\*\*** is an instance of a class
- All methods are public and virtual
- Attributes are protected
- Single Inheritance

2007

# Immersive?



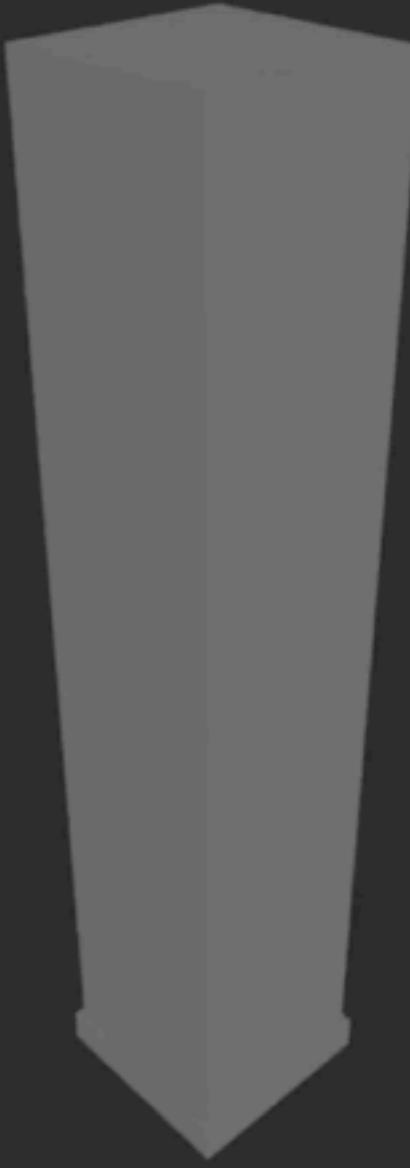
# Immersive!

- Deep contact with objects
- Highly interactive programming sessions
- Reflective, inspectable

Workspace

```
| elements lay |  
  
elements := (1 to: 5) collect: [ :ob |  
  (R3CubeShape new) elementOn: ob ].  
  
I  
  
lay := R3WallLayout new.  
lay on: elements.  
  
UberPresenter present: elements
```

Uber Presenter



## Workspace

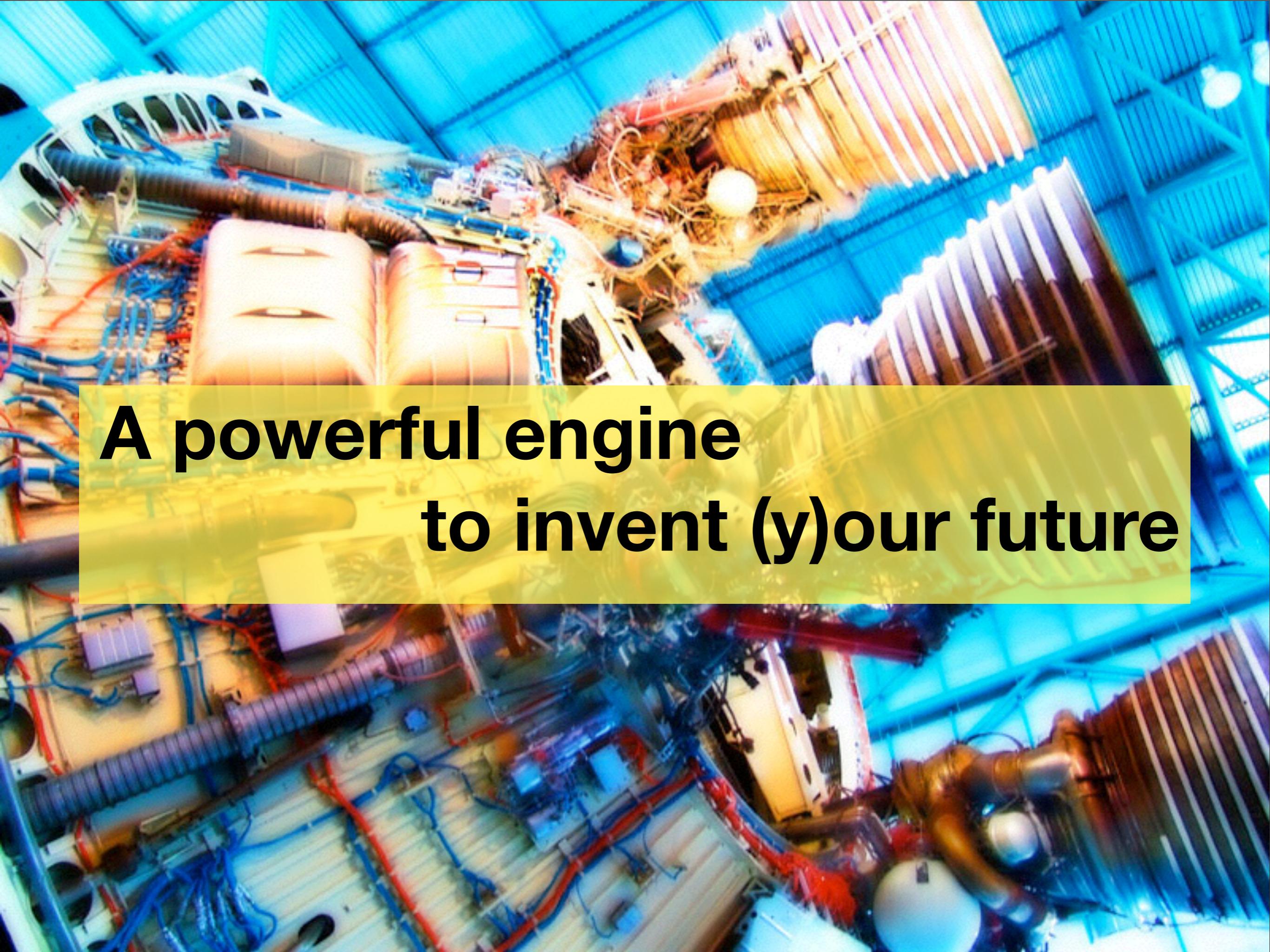
```
| elements lay |  
  
elements := (1 to: 5) collect: [ :ob |  
  (R3CubeShape new) elementOn: ob ].  
    
lay := R3WallLayout new.  
lay on: elements.  
  
UberPresenter present: elements
```

## Uber Presenter

Any object can be lively updated  
3D  
Network connection  
Dynamic web applications  
GPU  
Code

# Pharo vision





A powerful engine  
to invent (y)our future



An ecosystem where  
innovation/business bloom

# Pharo's Teachers

- Uni. of Buenos Aires • Uni. of Bern • Uni. of Maroua • Uni. of Brussels • Ecole des Mines de Douai • Uni. de Savoie • Ivan Franko Nat. Uni. of Lviv • Czech Technical Uni. • CULS Prague
- Uni. of Quilmes • Uni. of La Plata • Northern Michigan Uni. • Uni. Technologica Nacional (UTN) • Uni. Catholic of Argentina • Uni. of Santiago • Uni. Policnica de Catalunya • Uni. de Bretagne Occidentale • Uni. of Tomsk • Uni. of Fernhagen • IT University of Copenhagen • Uni. Cat del Sacro Cuore of Brescia

# Research Groups

Lafhis (AR)

Software Composition Group (CH)

CAR (FR)

RMOD (FR)

Ummisco (IRD)

Reveal (CH)

Lysic (FR)

Pleiad (CL)

CEA-List (FR)

Uqbar (AR)

# Companies

www.2denker.de

www.agilitic.com

www.airflowing.com

www.anymorphic.com

www.ardishealth.com

www.beta9.be

www.bombardier.com

www.cmsbox.com

www.finworks.biz

seaside.gemstone.com

www.ibizlog.com

www.inceptive.be

www.jooshr.com

www.majcon.de

www.mindclue.ch

www.miriamtech.com

www.myneat.org

www.netstyle.ch

www.panasoft.com

www.pinesoft.co.uk

www.promedmedical.net

www.sharedlogic.ca

www.smallworks.com.ar

www.10pines.com

www.trantaria.com

www.yesplan.be

www.synectique.eu

www.sorabito.com

objectprofile.com



**PharoCloud**

pharocloud

Overview Pricing Blog Login Sign Up

Pharo platform as a Service: put your Smalltalk web-application online at Pharocloud in just 3 clicks

Try it for FREE Watch how it works

Ramex

Wind Energy

Pioneering new ways of maximizing sustainable wind energy yields. Our products and services optimize asset availability, wind turbine performance and drivetrain reliability. We work with owners, operators, manufacturers, insurers and service providers worldwide.

Get in touch:

Related links:

Wind Energy

Wind industry solutions

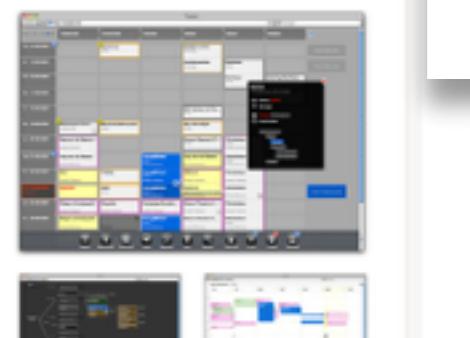
## Web-To-Print Solution

- Design and create individual printed matter
- eShop with credit card payment
- High quality PDF output with Printing Process integration
- Thousands of orders for seven Swiss printing companies



Yesplan is veelzijdige software voor het efficiënt plannen van evenementen.

Yesplan is uitstekend gebruiksvriendelijk, flexibel en makkelijk te koppelen met andere software.



iBizLog - <http://www.ibizlog.com>

A product by Smallworks

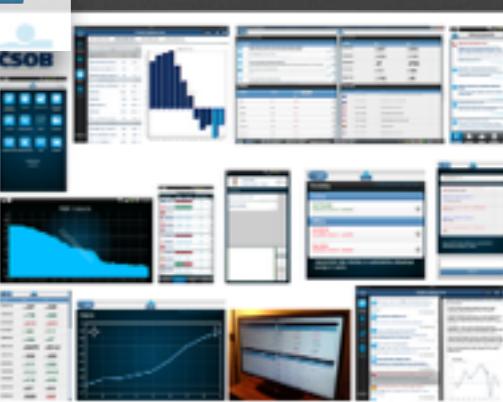
# Some Success Stories

Lumina

data analysis

CSOB

Bank



airflowing

Organize your creative work

Plans and Pricing

Manage your simple way

Object PROFILE

Das Content Management mit System

Das Content Management mit System

100% inline-Editor

Copy / Paste

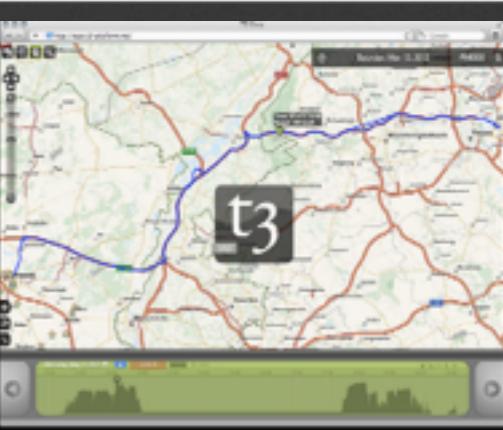
Continuous API Testing

Keep your services under control 24/7

z2denker

Continuous API Testing

Keep your services under control 24/7



# Pharo Web Stack is Gorgeous

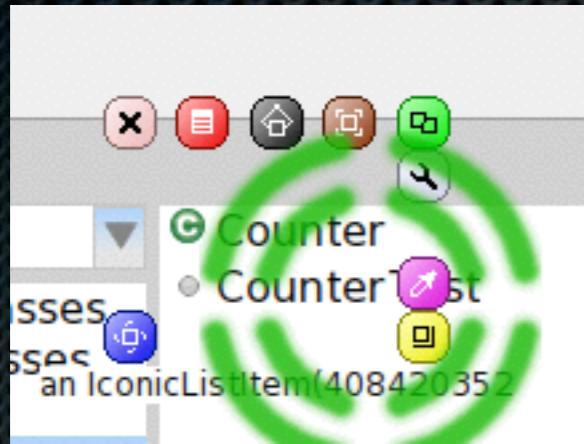
- Seaside (component, Javascript, REST)
- Zinc (HTTP, HTTPS, REST)
- Magritte Metamodelling
- Protocols/Encoding: Oauth, JSON, STON,...
- Database: noSql, mongoDB, riak, relational database

seaside 

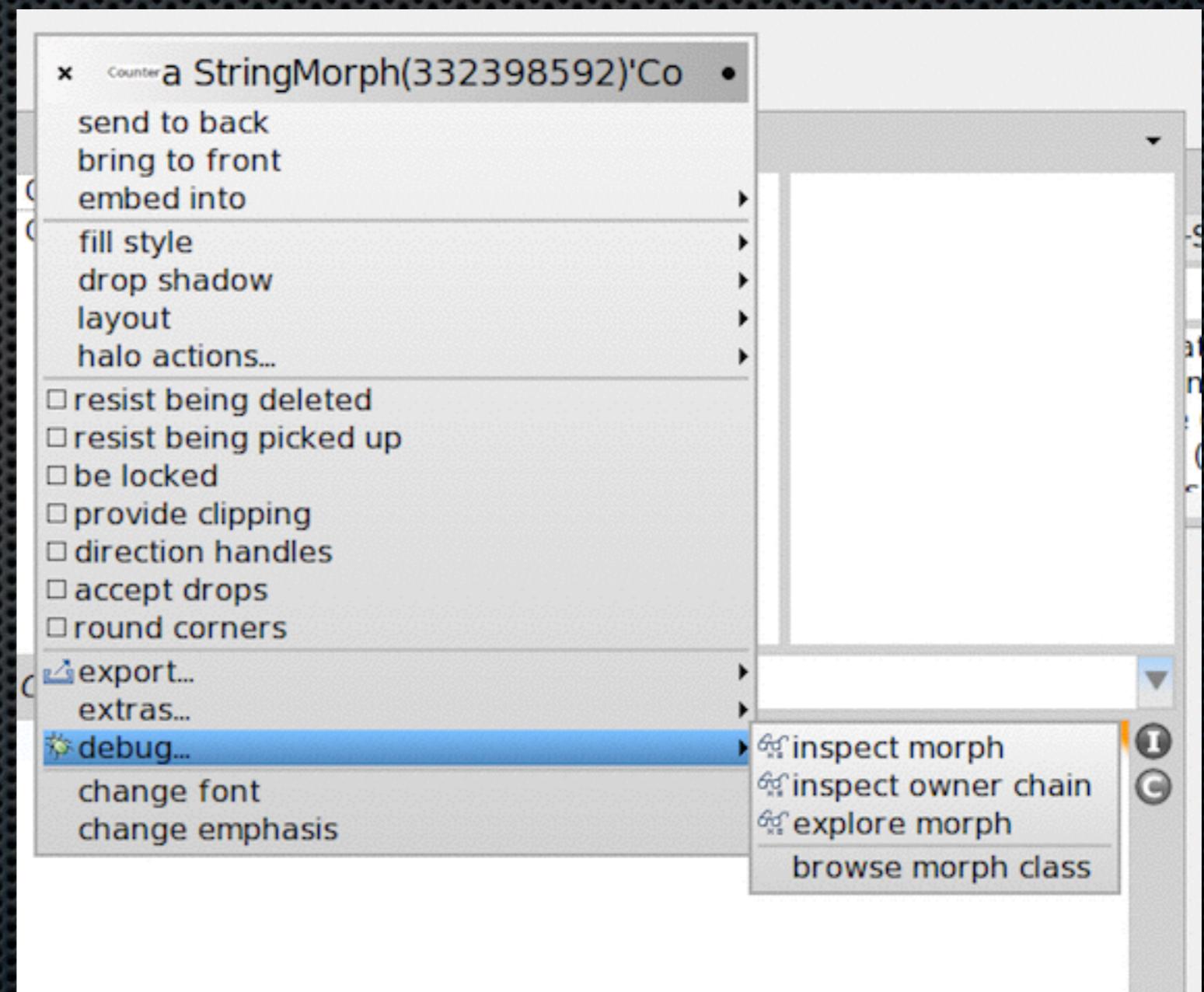
**Learning from the  
system...**

# Click on it :)

## Cmd+shift+option



- Cmd-Shift+option



# Finder :)

Finder

match Search  Regexp Selectors Packages... All Packages

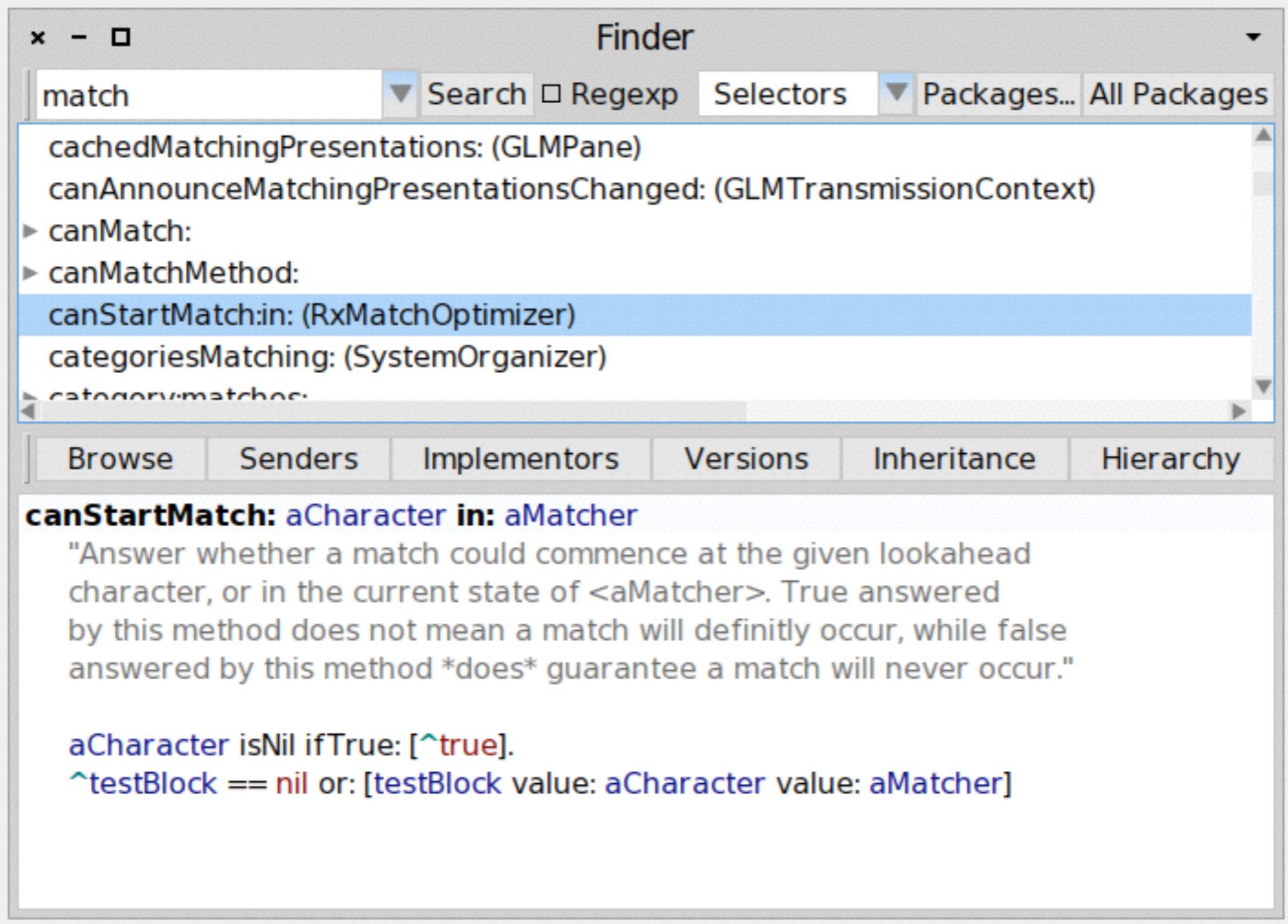
cachedMatchingPresentations: (GLMPane)  
canAnnounceMatchingPresentationsChanged: (GLMTransmissionContext)  
► canMatch:  
► canMatchMethod:  
canStartMatch:in: (RxMatchOptimizer)  
categoriesMatching: (SystemOrganizer)  
► categoriesMatching:

Browse Senders Implementors Versions Inheritance Hierarchy

**canStartMatch:** aCharacter in: aMatcher

"Answer whether a match could commence at the given lookahead character, or in the current state of <aMatcher>. True answered by this method does not mean a match will definitely occur, while false answered by this method \*does\* guarantee a match will never occur."

aCharacter isNil ifTrue: [^true].  
^testBlock == nil or: [testBlock value: aCharacter value: aMatcher]



# Finder: \*give\* examples

The screenshot shows the Pharo Smalltalk Finder interface. The search bar at the top contains the query `'ab' . 'c' . 'abc'`. The "Examples" tab is selected. The results list includes:

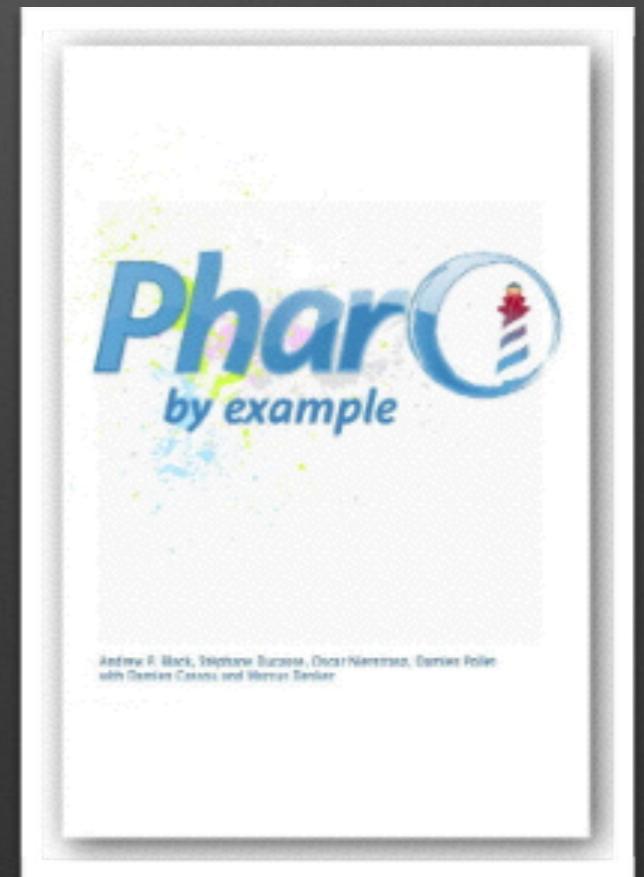
- KMNoShortcut
- KMStorage
- Matrix
- Path
- RunArray
- \*SequenceableCollection** (highlighted in blue)
- SortAlphabeticallyClassList

Below the results, there are tabs for `Browse`, `Senders`, `Implementors`, `Versions`, `Inheritance`, and `Hierarchy`. The `Senders` tab is selected. The detailed view for `*SequenceableCollection` shows:

```
, otherCollection
"Concatenate two Strings or Collections."
^ self copyReplaceFrom: self size + 1
   to: self size
   with: otherCollection
"
#(2 4 6 8) , #(who do we appreciate)
((2989 storeStringBase: 16) copyFrom: 4 to: 6) , ' boy!
"
```

# Pharo by Example

- ❖ Pharo by example <http://www.pharobyexample.org>
  - ❖ translated to french, merci!
  - ❖ translated to spanish, gracias!
  - ❖ translated to japanese, ありがとう!
- ❖ Currently updated to Pharo 40



# Deep into Pharo



ALEXANDRE BERGEL - DAMIEN CASSOU  
STÉPHANE DUCASSE - JANNIK LAVAL

Foreword by Dave THOMAS

# Enterprise Pharo: a Web perspective

# Other books

- Numerical Methods in Pharo
- Dynamic Web Development with Seaside
  - <http://book.seaside.st>

seaside 

Learning OO advanced  
design  
from the system...

# Booleans

&, |, not, or: ,and:, xor:

ifTrue:ifFalse:, ifFalse:ifTrue:

3 > 0

ifTrue: ['positive']

ifFalse: ['negative']

-> ‘positive’

ifTrue:ifFalse is sent to an object: a boolean!

# How to implement not?

- false not -> true
- true not -> false

**Let the receiver decide!**

# Not implementation

Boolean>>not

self subclassResponsibility

False>>not

^true

True>>not

^false

# Check in the system

x - □ Implementors of not [9]

Boolean (logical operations)	not [Kernel]
False (logical operations)	not [Kernel]
True (logical operations)	not [Kernel]

Browse Senders Implementors Version Source

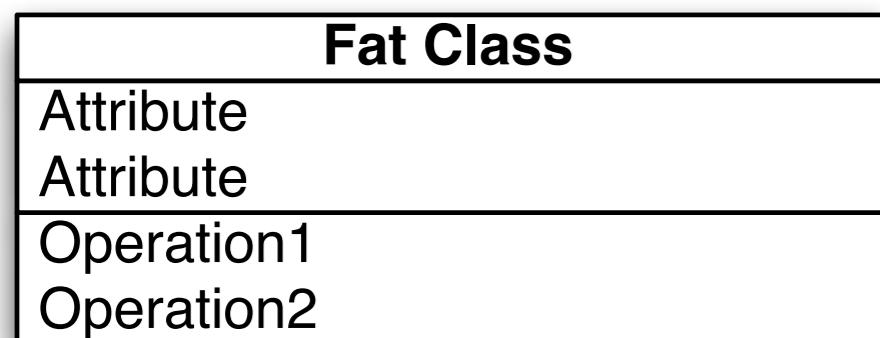
**not**  
"Negation -- answer true since the receiver is  
false."

^true

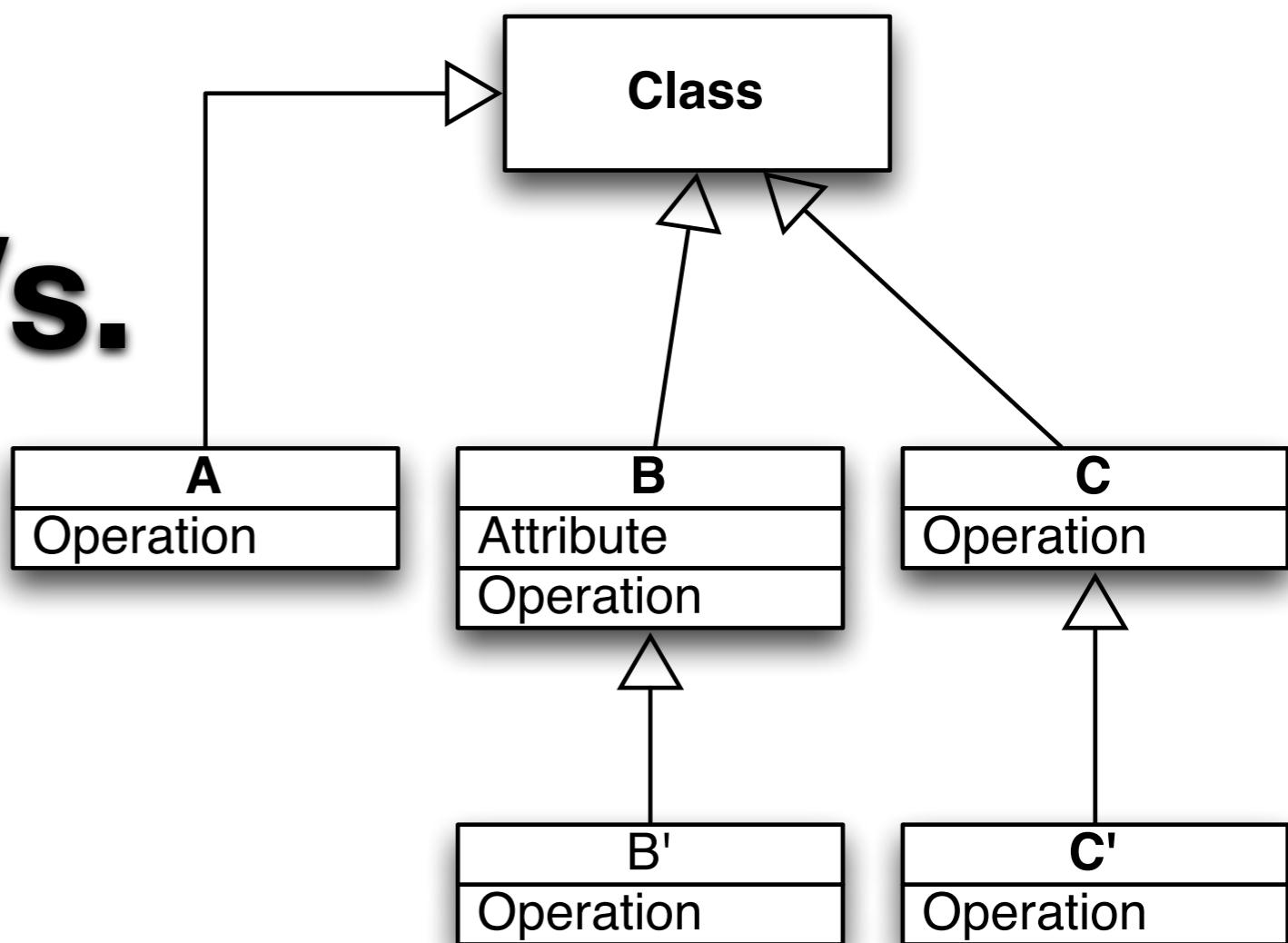
# Message sends act as case statements

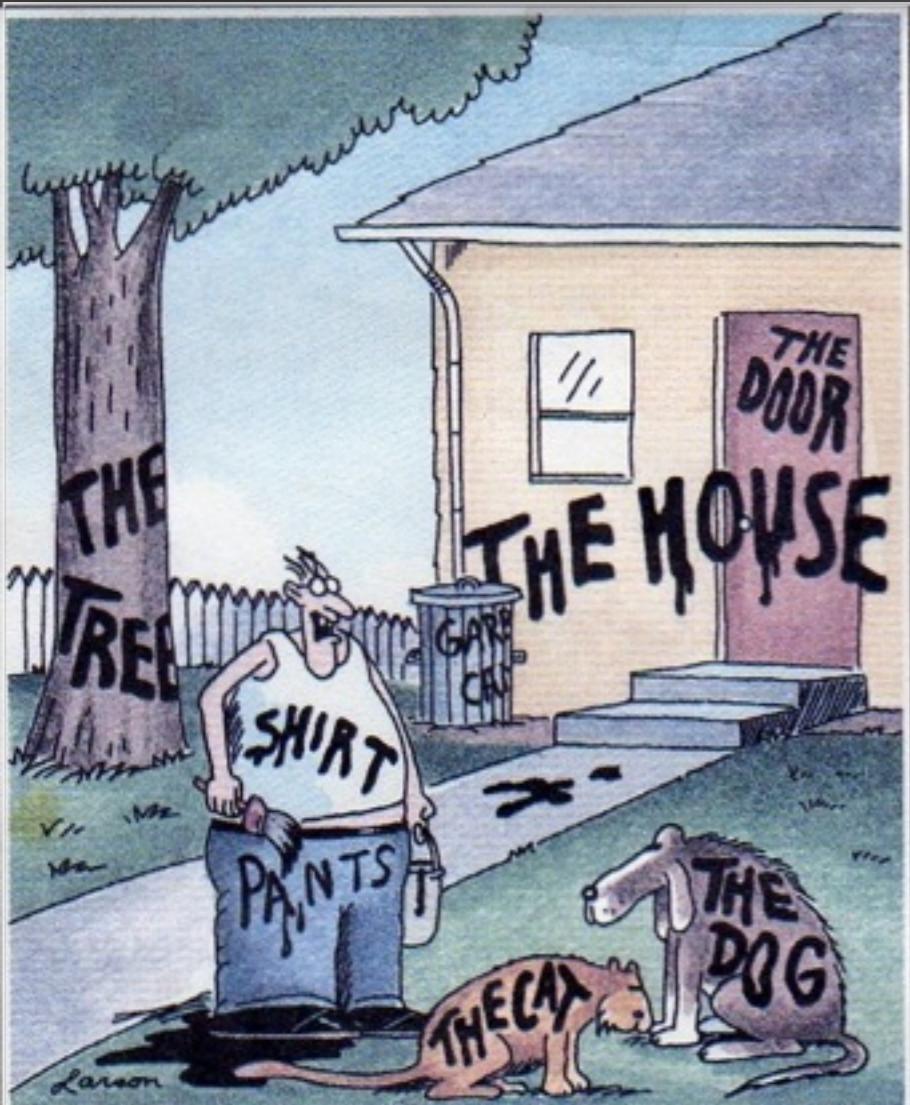
- But dynamic and open
- Can add a branch (define a subclass)
- Branches can be defined in different packages

# OOP: the Art of Dispatching



**Vs.**





"Now! ... That should clear up  
a few things around here!"

# Pharo Humour

<http://pharo.org>

Fun, simple  
Excellent for teaching  
Pure & elegant  
Productive  
Empowering Tools  
Full access



