Class and Method Definitions

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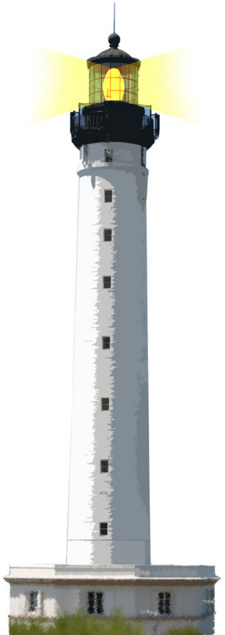
W1S06

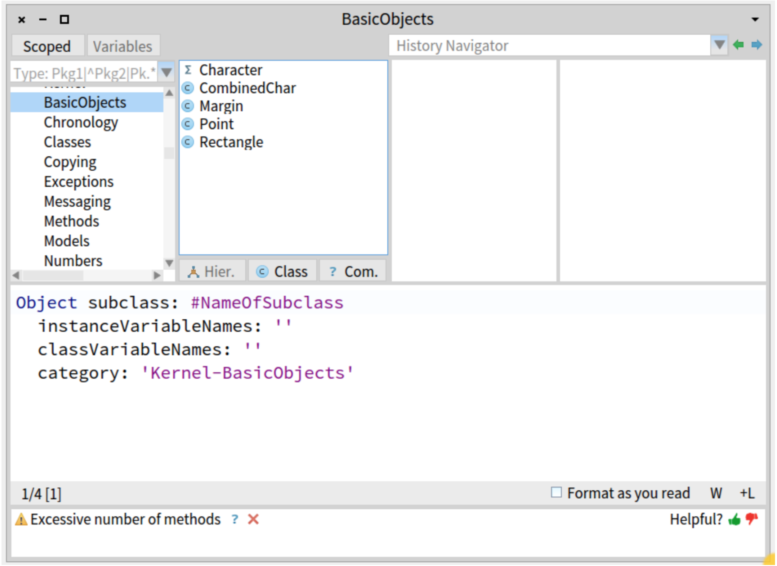
http://www.pharo.org



Class and Method Definitions in Pharo

- classes and methods are defined within tools
- there is no dedicated syntax

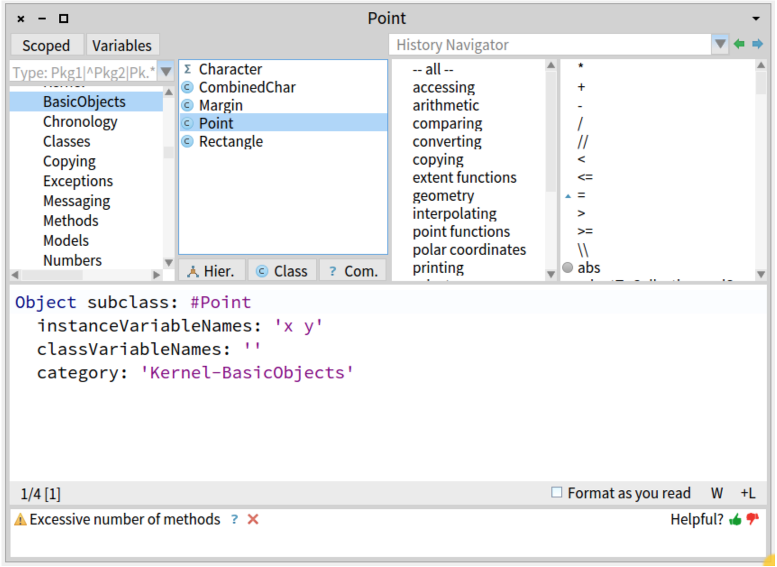
Class Definition Template



```
Object subclass: #NameOfSubclass
  instanceVariableNames: ''
  classVariableNames: ''
  category: 'Kernel-BasicObjects'
```

Excessive number of methods

Class Definition in Pharo



```
Object subclass: #Point
  instanceVariableNames: 'x y'
  classVariableNames: ''
  category: 'Kernel-BasicObjects'
```

Class Definition is a Message

```
Object subclass: #Point
  instanceVariableNames: 'x y'
  classVariableNames: ''
  package: 'Graphics'
```

We send the message subclass:inst.... to the superclass to create the class

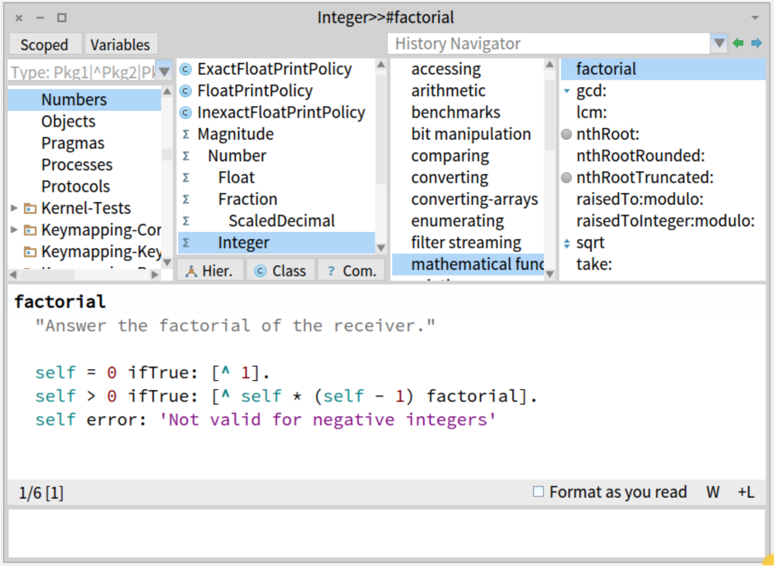
Method Definition

- Methods are public
- Methods are virtual (i.e., looked up at runtime)
- By default return self

```
messageSelectorAndArgumentNames
  "comment stating purpose of message"

  | temporary variable names |
  statements
```

Method Definition in Pharo



```
factorial
  "Answer the factorial of the receiver."

  self = 0 ifTrue: [^ 1].
  self > 0 ifTrue: [^ self * (self - 1) factorial].
  self error: 'Not valid for negative integers'
```

Method Definition in Pharo

```
factorial
  "Answer the factorial of the receiver."
  self = 0 ifTrue: [ ^ 1 ].
  self > 0 ifTrue: [ ^ self * (self – 1) factorial ].
  self error: 'Not valid for negative integers'
```

In which class is factorial defined?

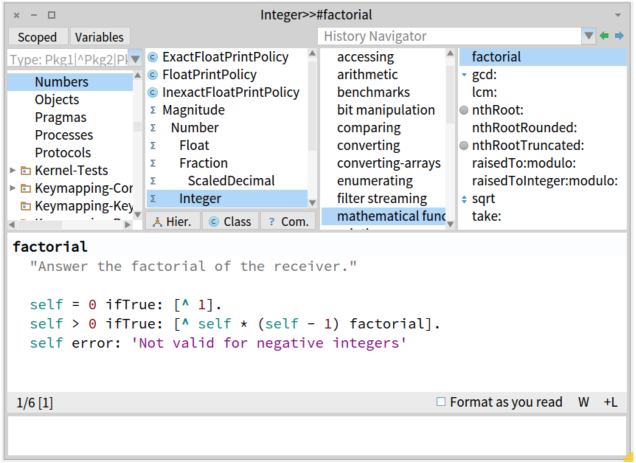
Presentation Convention

In this lecture, a method will be displayed as

```
Integer >> factorial
  "Answer the factorial of the receiver."
  self = 0 ifTrue: [ ^ 1 ].
  self > 0 ifTrue: [ ^ self * (self – 1) factorial ].
  self error: 'Not valid for negative integers'
```

- **Integer >>** is not part of the syntax
  - it tells you the method’s class

Presentation Convention



```
factorial
  "Answer the factorial of the receiver."

  self = 0 ifTrue: [^ 1].
  self > 0 ifTrue: [^ self * (self - 1) factorial].
  self error: 'Not valid for negative integers'
```

In Pharo, the method belongs to the selected class

Remember Messages

```
Integer >> factorial
  "Answer the factorial of the receiver."

  self = 0 ifTrue: [ ^ 1 ].
  self > 0 ifTrue: [ ^ self * (self – 1) factorial ].
  self error: 'Not valid for negative integers'
```

- factorial is the method name
- =, >, * and - are binary messages
- factorial is an unary message
- ifTrue: and error: are keyword messages
- the caret ^ is for returning a value

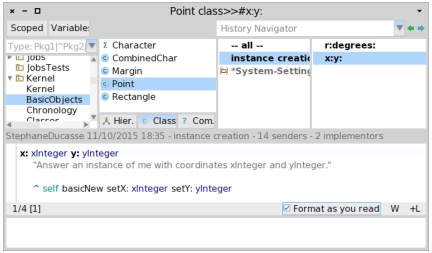
A Method Returns self by Default

```
Game >> initializePlayers
 self players
  at: 'tileAction'
  put: ( MITileAction director: self )
```

is equivalent to

```
Game >> initializePlayers
 self players
  at: 'tileAction'
  put: ( MITileAction director: self ).
 ^ self     "<−− optional"
```

Class Methods



StephaneDucasse 11/10/2015 18:35 - instance creation - 14 senders - 2 implementors

```
x: xInteger y: yInteger
	"Answer an instance of me with coordinates xInteger and yInteger."

	^ self basicNew setX: xInteger setY: yInteger
```

1/4 [1]

- press the button class to define a class method
- in lectures, we add class

```
Point class >> x: xInteger y: yInteger
  "Answer an instance of me with coordinates xInteger and
      yInteger."

  ^ self basicNew setX: xInteger setY: yInteger
```

What You Should Know

- A class is defined by sending a message to its superclass
- Classes are defined inside packages
- Methods are public
- By default a method returns the receiver, self
- Class methods are just methods of the class side

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