

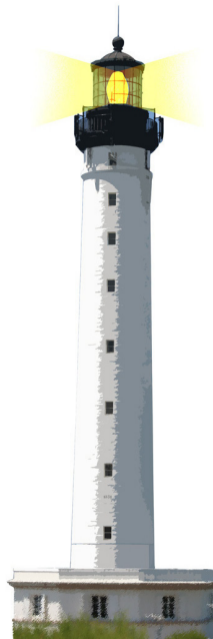


Learning Object-Oriented Programming and Design with TDD

Messages: Composition and Precedence

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Composition: from Left to Right!

What happens when we have two messages of the same kind?

- Execution from left to right

```
1000 factorial class name  
> 'LargePositiveInteger'
```

is equivalent to

```
((1000 factorial) class) name)
```

- Ease the composition of messages



Complete Message Precedence

- (Msg) > Unary > Binary > Keywords
- From left to right



Precedence Example

```
2 + 3 squared  
>>> 2 + 9  
>>> 11
```

- unary (squared) first
- then binary (+)

Precedence Example

```
2 raisedTo: 3 + 2  
>>> 2 raisedTo: 5  
>>> 32
```

- binary (+) first
- then keyword-based (raisedTo:)

Precedence Example

```
Color gray – Color white = Color black  
>>> aGray – aWhite = aBlack  
>>> aBlack = aBlack  
>>> true
```

- unary messages
- then binary from left to right



Parentheses take Precedence!

```
0@0 extent: 100@100 bottomRight  
>>> Message not understood  
>>> 100 does not understand bottomRight
```

Should use ()

```
(0@0 extent: 100@100) bottomRight  
>>> (aPoint extent: anotherPoint) bottomRight  
>>> aRectangle bottomRight  
>>> 100@100
```



The Price for Simplicity

Only messages:

- +
 - is a message, no precedence
 - can be redefined in domain classes
- Simple
- One limit: no mathematical precedence



No Mathematical Precedence

```
3 + 2 * 10  
>>> 5 * 10  
>>> 50
```

- should be rewritten using parentheses

```
3 + (2 * 10)  
>>> 3 + 20  
>>> 23
```



No Mathematical Precedence

```
1/3 + 2/3  
>>> 7/3 /3  
>>> 7/9
```

- should be rewritten using parentheses

```
(1/3) + (2/3)  
>>> 1
```

Summary

- Three kinds of messages: unary, binary and keywords
- (...) > unary > binary > keywords
- Then from left to right
- There is no mathematical precedence because mathematical operations are plain messages
- Arguments are placed inside message structure:
 - 2 between: 0 and: 5 (the message is between:and:)



Resources

- Pharo Mooc - W2S03 Videos <http://mooc.pharo.org>
- Pharo by Example <http://books.pharo.org>



A course by Stéphane Ducasse
<http://stephane.ducasse.free.fr>

Reusing some parts of the Pharo Mocc by

Damien Cassou, Stéphane Ducasse, Luc Fabresse
<http://mocc.pharo.org>



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