Learning Object-Oriented
Programming and Design with TDD

Blocks - the Friends of Conditionals and Loops

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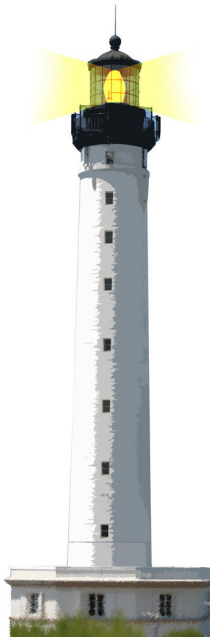


Pharo
http://www.pharo.org

Remember: A Block Definition Freezes its Body

- Defining a block does **not** execute its body
- E block definition returns a block

```
[ 2 + 6 ]
>>> [ 2 + 6 ]
```

Remember: Block Execution

- Executing a Block is explicit

```
[ 2 + 6 ] value
>>> 8
```

- and repeatable

```
| b |
b := [ 2 + 6 ].
b value.
>>> 8
b value
>>> 8
```

Blocks are Used to Express Conditions

```
max: anObject
 "Answer the receiver or the argument, whichever has the greater anObject."

 ^ self > anObject
     ifTrue: [ self ]
     ifFalse: [ anObject ]
```

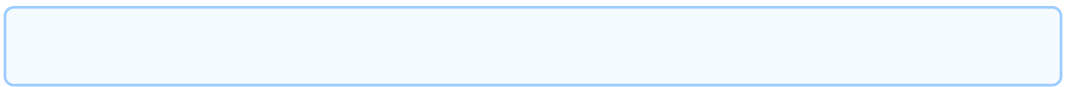
Yes this is a message ifTrue:ifFalse: sent to a Boolean

Blocks are Used to Express Loops

- Some simple loops
- Printing 10 dots

```
10 timesRepeat: [ File stdout << '.' ]
>>> ..........
```

Blocks are Used to Express Loops (2)



Blocks are Used to Express Loops (3)

- A traditional for loop for i=1,100, i++

```
1 to: 100 by: 3 do: [:i | File stdout << i ]
>>> 1471013161922252831343740434649525558616467707376798285889194971 00
```

- The message to:by:do: is sent to an integer
- i will get all the computed values one by one

Blocks are Used For Iterators

- Basis for iterators

```
#(2 4 5 −4 3 −2) collect: [ :each | each abs ]
>>> #(2 4 5 4 3 2)
```

- Here the message is sent to the collection itself
- See Lecture on Iterators

Yes ifTrue:ifFalse: is a message!

```
Weather isRaining
    ifTrue: [ self takeMyUmbrella ]
    ifFalse: [ self takeMySunglasses ]
```

- Conceptually ifTrue:ifFalse: is a message sent to an object: a boolean!
- ifTrue:ifFalse: is in fact radically optimized by the compiler

Implementation Note

- Note that the Virtual Machine shortcuts calls to Boolean such as condition for speed reason
- But you can implement your own conditional methods and debug to see that sending a message is dispatching to the right object
- Implement your own control structure such as siAlors:sinon: (in French) and try it

Summary

- Blocks freeze and control computation
- Basis for
  - conditionals
  - loops / iterators
  - exceptions (see Mooc lectures)
  - concurrence

Resources

- Pharo Mooc - W2S06 Videos
- Pharo by Example `http://books.pharo.org`
- Deep into Pharo `http://books.pharo.org`

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