



**Learning Object-Oriented  
Programming and Design with TDD**

# Messages for Java Programmers

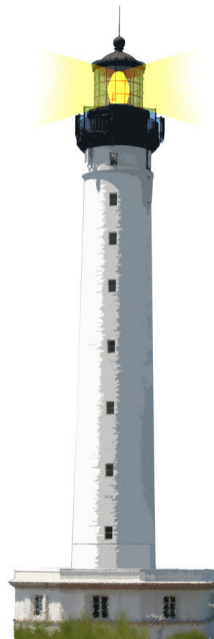
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<http://www.pharo.org>

**W2S02**



# Only Objects, Messages and Closures

- code in Pharo **only** manipulates objects: mouse, booleans, arrays, numbers, compressed, strings, windows, scrollbars, canvas, files, trees, compiler, sound, url, socket, fonts, text, collections, stack, shortcut, streams, ...
- messages and assignments are the only way to do something



# Equivalence

In Java

```
ArrayList<String> strings = new ArrayList<String>();
```

In Pharo

```
strings := OrderedCollection new.
```

- 1 assignment, 1 message sent
- new is a message sent to a class
- no static typing
- no generics



# Equivalence

In Java

```
Thread regThread = new Thread(  
    new Runnable() {  
        @Override  
        public void run() {  
            this.doSomething();  
        }  
    });  
regThread.start();
```

In Pharo

```
[ self doSomething ] fork
```



# Equivalence

In Java 8

```
new Thread(() -> this.doSomething()).start();
```

In Pharo

```
[ self doSomething ] fork
```

# Three Kinds of Messages

- Unary

5 factorial  
Transcript cr

- Binary

3 + 4  
5 → 10

- Keyword-based

Transcript show: 'hello world'  
2 between: 0 and: 5



# Keyword Messages for Java developers

In Java

```
receiver.keyword1keyword2(arg1, arg2)
```

In Pharo

```
anObject keyword1: arg1 keyword2: arg2
```

# Keyword Messages for Java developers

In Java

```
postman.send(mail,recipient);
```



# Keyword Messages for Java developers

```
postman.send(mail,recipient);  
postman . send ( mail , recipient );
```

# Keyword Messages for Java developers

```
postman.send(mail,recipient);  
postman . send ( mail , recipient );  
postman send mail recipient
```

# Keyword Messages for Java developers

```
postman.send(mail,recipient);  
postman . send ( mail , recipient );  
postman send mail recipient  
postman send mail to recipient
```

# Keyword Messages for Java developers

```
postman.send(mail,recipient);  
postman . send ( mail , recipient );  
postman send mail recipient  
postman send mail to recipient  
postman send: mail to: recipient
```

# Keyword Messages for Java developers

In Java

```
postman.send(mail,recipient);
```

In Pharo

```
postman send: mail to: recipient
```

The message

- is named `send:to:`
- is sent to `postman`
- includes two arguments (`mail` and `recipient`)



# Conditionals are Just Messages

- in Java, if, else, for, while, do, ... are language keywords
- in Pharo, conditional expressions are messages
- booleans are objects

```
fullName isEmpty  
  ifTrue: [ 'FirstnameLastname' ]  
  ifFalse: [ fullName ]
```



# Loops are Just Messages

```
4 timesRepeat: [ self doSomething ]
```

```
0 to: 100 do: [ :i | ... ]
```

```
0 to: 100 by: 3 do: [ :i | ... ]
```

```
aCollection do: [ :each | ... ]
```

# Summary

- Three kinds of messages: unary, binary and keywords
- $() > \text{unary} > \text{binary} > \text{keywords}$
- Conditionals are messages
- Loops too





# Resources

- Pharo Mooc - W2S02 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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