Advanced Object-Oriented Design

# Class Methods At Work

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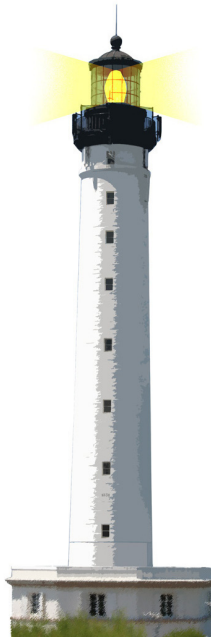


Pharo

http://www.pharo.org

# What you will learn

- In Pharo class methods are normal virtual methods
  - methods are looked up dynamically
- Most class methods create new instances
  - but they can be used for other things

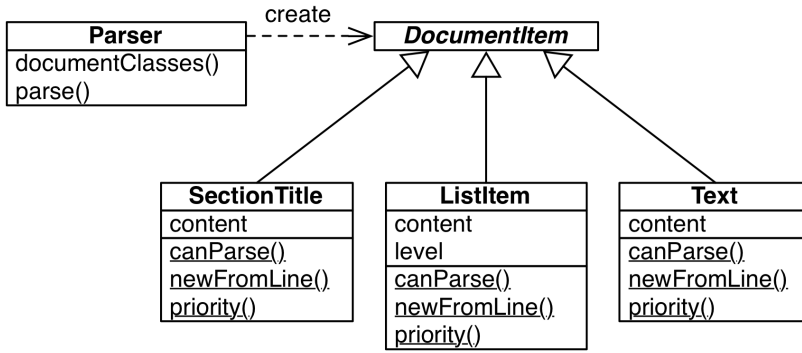
# Example: Creating the right document elements from lines

Imagine we want to parse the following and create the corresponding objects

```
!Section Title
- list item
-- subitem

Any text here
```

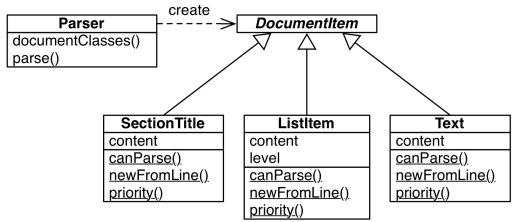
# A possible design




Document item **classes** know

- if they can parse a line (canParse:)
- how to create instances (newFromLine:)

# Parsing lines




```
Parser >> documentClasses
  ^ DocumentItem allSubclasses
      sorted: [ :class1 :class2 | class1 priority < class2 priority ]

Parser >> parse: line
  self documentClasses
    detect: [ :subclass |
      (subclass canParse: line)
        ifTrue: [ ^ subclass newFromLine: line ] ]
```

# The command-line handler

- The Pharo command-line interface (CLI) uses the same approach
- each subclass of CommandLineHandler knows how to deal with one command
- the correct subclass is selected by sending messages to the class

```
$ pharo Pharo.image eval "10 factorial"
3628800
```

# The command-line handler

```
CommandLineHandler class >> isResponsibleFor: arguments
  ^ arguments includesSubCommand: self commandName

EvaluateCommandLineHandler class >> commandName
  ^ 'eval'

CommandLineHandler class >> allHandlers
  ^ self allSubclasses
    reject: [ :handler| handler isAbstract ]

CommandLineHandler class >> handlersFor: arguments
  ^ self allHandlers
    select: [ :handlerClass |
      handlerClass isResponsibleFor: arguments ]
```

# Pay attention

- This is **costly** to check all subclasses all the times
- Do you need such a dynamic behavior?
- Are you loading that many different classes?
  - In pillar this is not really needed
  - For the command line, each application may define its own commandes

# Conclusion

- Classes are objects and can be sent messages
- Method lookup is exactly the same as for all objects:
  - go to the class of the receiver
  - follow inheritance chain
- Pharo makes it easy to iterate over subclasses
  - but this is **costly**
  - check next Lectures on registration

A course by

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