Class Methods At Work

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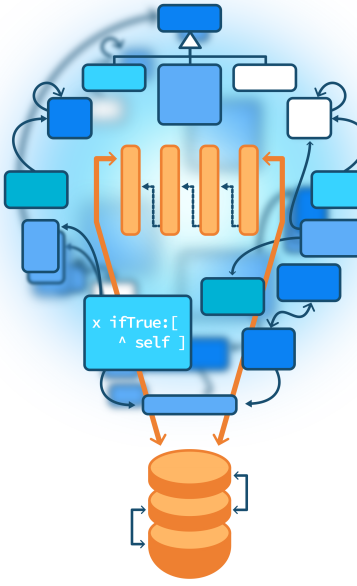


What you will learn

- 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

Case study: parsing a string

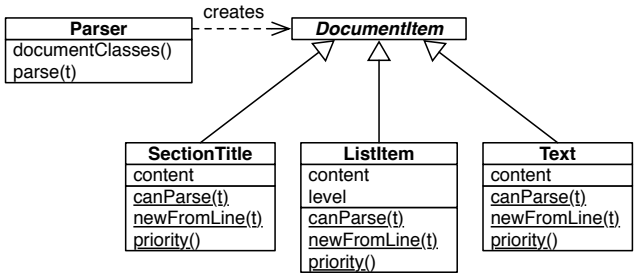
Imagine we want to parse the following string:

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

Any text here
```

and create the corresponding objects.

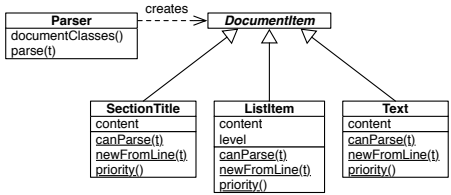
A possible design



Each DocumentItem subclass knows

- if it can parse a line (canParse:)
- how to create an instance of itself (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 Pharo command-line interface (CLI)

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

- it uses the same approach
- each subclass of CommandLineHandler processes one type of command
- the correct subclass is selected by sending messages to the class

The command-line handler

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

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

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

EvaluateCommandLineHandler class >> commandName
  ^ 'eval'
```

Evaluation

Pros:

- Modular design
- Extensible

Cons:

- Checking all subclasses all the times is **costly**
- Do you need such a dynamic behavior?
  - For the command line, each application may define its own commands

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
  - it enables modular and extensible design
  - but this is **costly**
- Related to the lecture on *Registration*

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Advanced Object-Oriented Design and Development with Pharo

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