Advanced Object-Oriented Design

Essence of Dispatch

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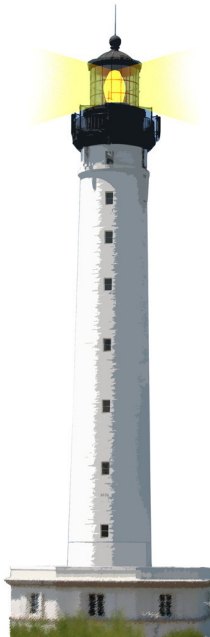
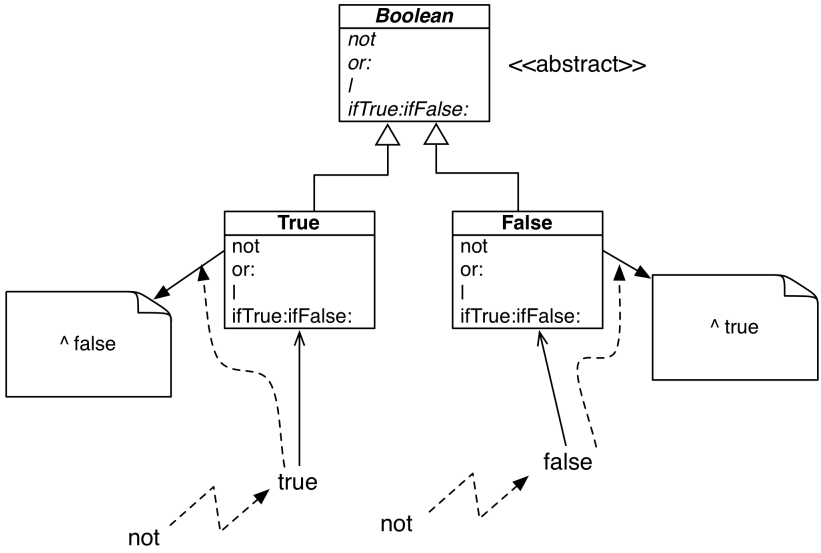


Pharo

http://www.pharo.org

Remember: Implementing not in two methods



Stepping back

- Let the receiver decide
- **Do not ask, tell**

Ok so what?

- You will probably never implement Booleans in the future
- So is it **really** useful?
- What are the lessons to learn?
- What are the properties of the solution?

Imagine having more than two classes

MicAbstractBlock
- MicAbstractAnnotatedBlock
  - MicAnnotatedBlock
- MicContinuousMarkedBlock
  - MicCommentBlock
  - MicQuoteBlock
  - MicTableBlock
- MicIntermediateBlock
- MicListBlock
  - MicOrderedListBlock
  - MicUnorderedListBlock
- MicListItemBlock
- MicParagraphBlock
  - MacParagraphBlock
  - MacRawParagraphBlock
- MicRootBlock
- MicSectionBlock

- MicSingleLineBlock
  - MicAnchorBlock
  - MicHeaderBlock
  - MicHorizontalLineBlock
- MicStartStopMarkupBlock
  - MicEnvironmentBlock
  - ...
  - MicMetaDataBlock
  - MicSameStartStopMarkupBlock
    - MicCodeBlock
    - MicMathBlock
      - MicMathBlockExtensionForTest
      - MicMultilineComment

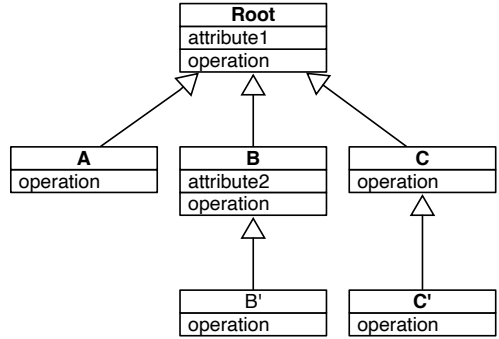
Imagine just a method that would have to have one condition for each of such cases!

A message send is an open conditional

- Sending a message selects the right method
- It can be seen as a condition **without explicit ifs**
- The choice is dynamic
- It selects the method based on the receiver

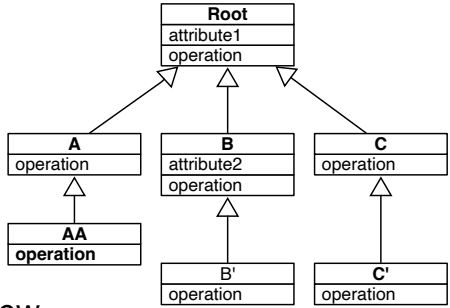
Select the right method

```
collectionOf do: [ :e |
    e operation ]
```



But dynamically: new objects can be chosen

collectionOf do: [:e |
e operation]



collectionOf add: AA new

Sending a message is making a choice

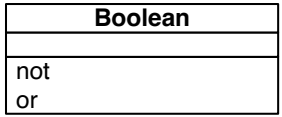
- Each time you send a message, the execution **selects the right** method depending on the class of the receiver
- Sending a message is a **choice** operator

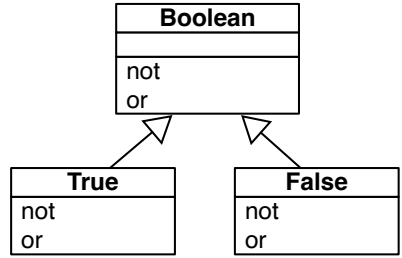
How do we express choices?

- Ok we have a choice operation... then
- **How do we express choices**?

How do we express choices?

Could we have the same solution with a **single** Boolean class?

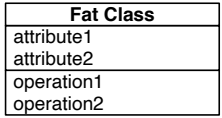


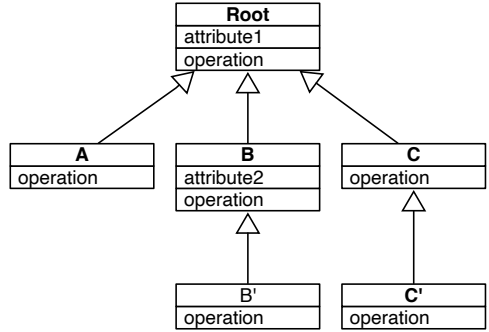


Classes play case roles

- To activate the choice operator we must have **choices**: classes
- A class represents a choice (a case)

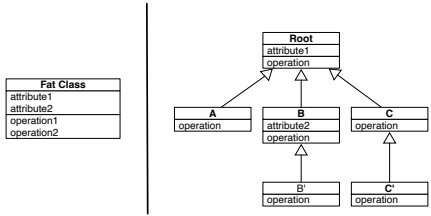
One class vs. a hierarchy



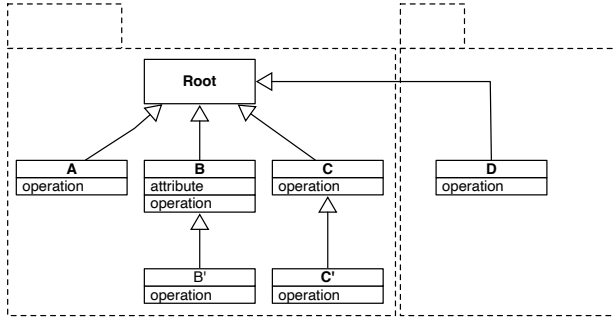


Class hierarchy supports for dynamic dispatch

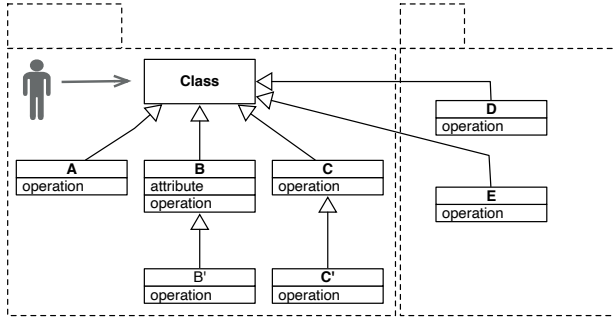
- More modular
- No need to recompile exiting methods
- No need to introduce complex conditions
- An hierarchy provides a way to specialize behavior
- You only focus on one class at a time



Message dispatch supports modularity



Limit impact of changes



Message sends are better than case statements

- Message sends are supporting **a choice**
- You could say: They act as "case statements"
- But with messages, the case statement is **dynamic** in the sense that it depends on the objects to which the message is sent

Let the receiver decide

- Sending a message lets the receiver decide
- Client does not have to decide
- Client code is more declarative: give orders
- Different receivers may be substituted dynamically

Avoid conditionals

- Use objects and messages, when you can
- The execution engine acts as a conditional switch: Use it!
- Check the AntiIfCampaign

Summary: Cornerstone of OOP

- Let the receiver decide
- Message sends act as potential dynamic conditionals
- Class hierarchy: support for dynamic dispatch
- Avoid conditionals

A course by

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