

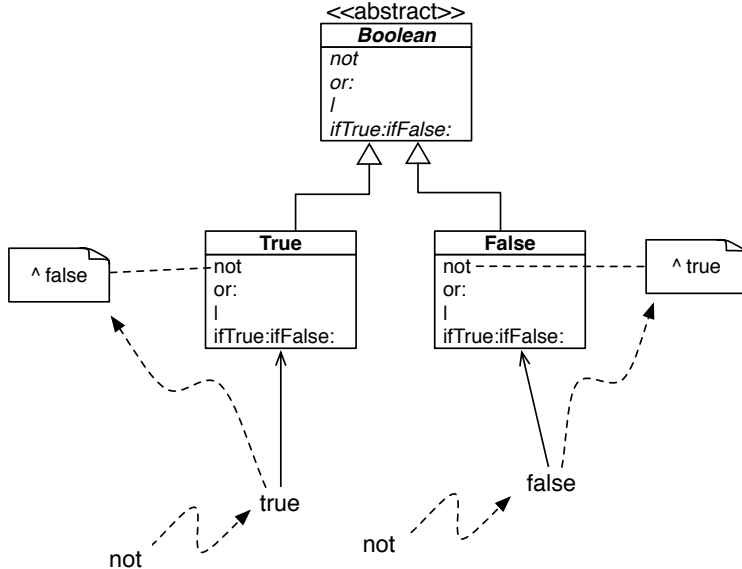
Essence of Dispatch

Let the receiver decide

S.Ducasse, L. Fabresse, G. Polito, and P. Tesone



Remember: Implementing not in two methods



What is the point?

- 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
- MicListBlock
 - MicOrderedListBlock
 - MicUnorderedListBlock
- MicParagraphBlock
 - MacParagraphBlock
 - MacRawParagraphBlock
- MicRootBlock
- MicSectionBlock

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

Imagine a method that has one condition for each of these cases!



A message send is an open conditional

Sending a message

- selects the **right** method to execute based on the class of the receiver
- can be seen as a condition **without explicit ifs**
- is a dynamic choice

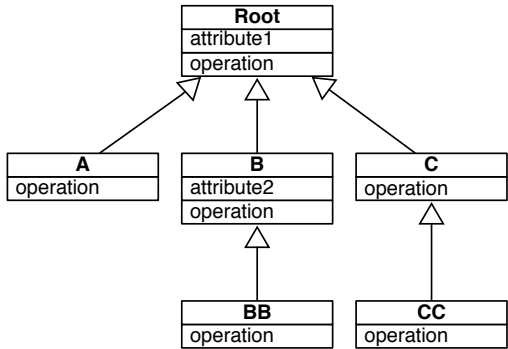


Select the right method

aCollection := {a . bb . c}.

...

aCollection do: [:e |
e operation]

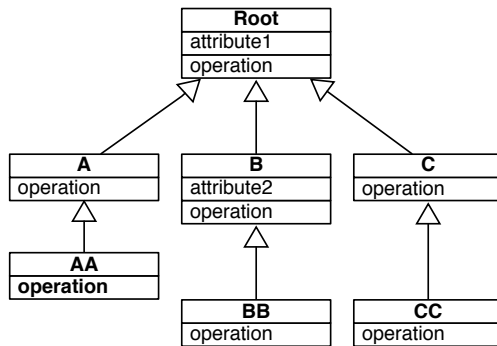


But dynamically: new objects can be chosen

aCollection := {a . bb . c . aa}.

...

aCollection do: [:e |
e operation]



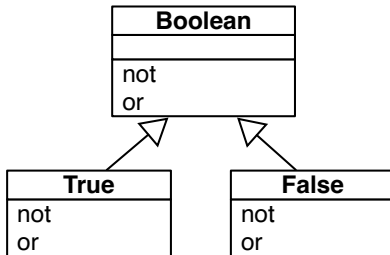
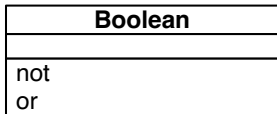
Sending a message is making a choice

- Message sending is a **choice** operator
- Each time you send a message, the execution engine **selects the right method** depending on the class of the receiver
- So, the next question is:
 - **How do we express choices?**



How do we express choices?

- Could we have the same solution for not with a **single** Boolean class?
- No! We would have conditionals in the not and or methods!

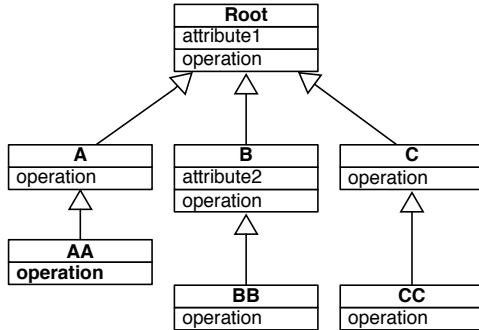
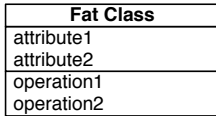


Classes play case distinct choices

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

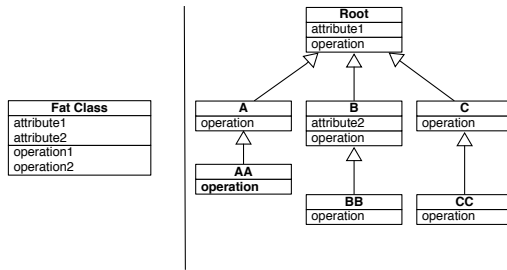


One class vs. a hierarchy

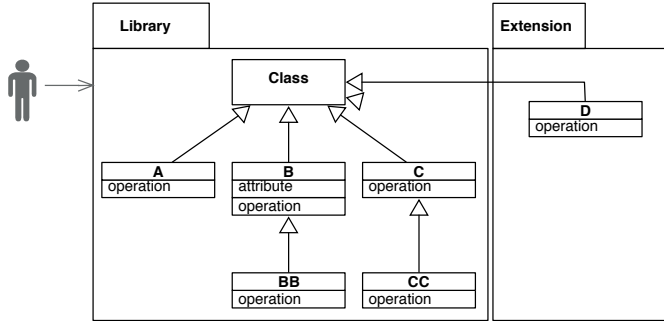


Class hierarchy supports dynamic dispatch

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

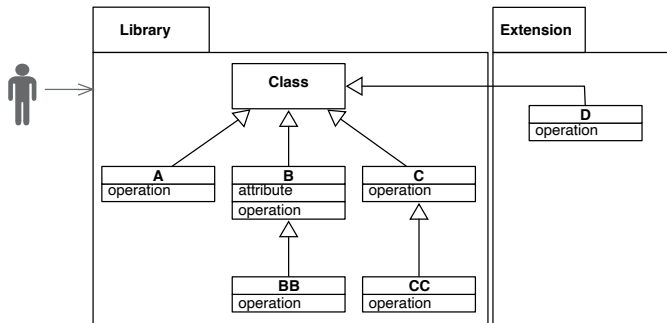


Message dispatch supports modularity



We can package different classes into different packages (better modularity)

Limit impact of changes



- If a client receives instances of **D** (in addition to classes of first package), its code does not have to change
- Method **operation** of **D** instances will be executed naturally

Message send is powerful

- Message sends are supporting **choices**
- The execution engine acts as a conditional switch: Use it!
- Classes act as "cases/choices"
- But with messages, the case statement is **extensible**:
 - adding new classes without breaking client code



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



Summary: a cornerstone of OOP

- Avoid conditionals (see AntifCampaign)
- Use objects and messages whenever you can
- Let the receiver decide: **Do not ask, tell**
- Class hierarchy supports for dynamic dispatch



Produced as part of the course on <http://www.fun-mooc.fr>

Advanced Object-Oriented Design and Development with Pharo

A course by

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