Inheritance and Lookup

2: Lookup

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W4S02

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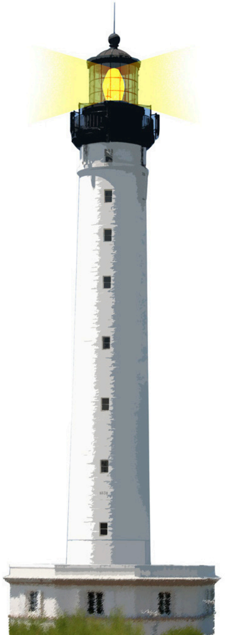


Goal

- Understanding
  - message sending
  - method lookup
  - semantics of self

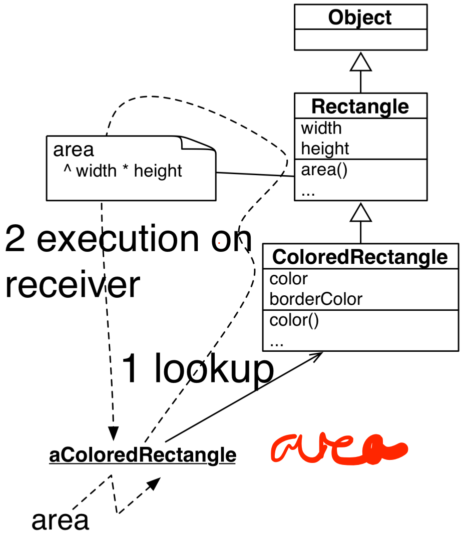
Inheritance

- Inheritance of state is static
- Inheritance of behavior is dynamic

Message Sending

Sending a **message** is a two-step process:

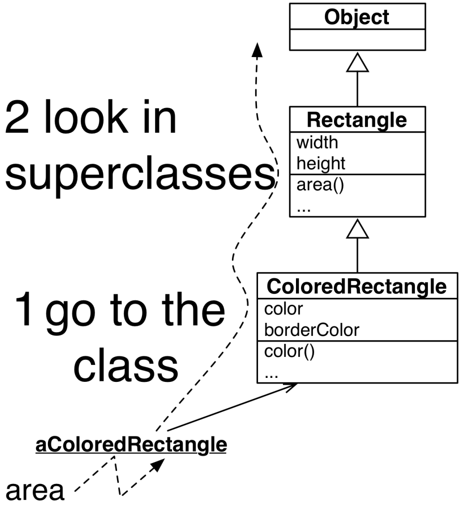
1. **look up** the **method** matching the message
2. execute this method on the **receiver**



Method Lookup

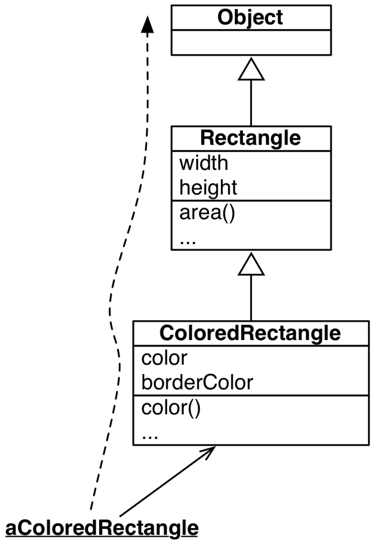
The lookup starts in the **class** of the **receiver** then:

- if the method is defined in the class, it is returned
- otherwise the search continues in the superclass



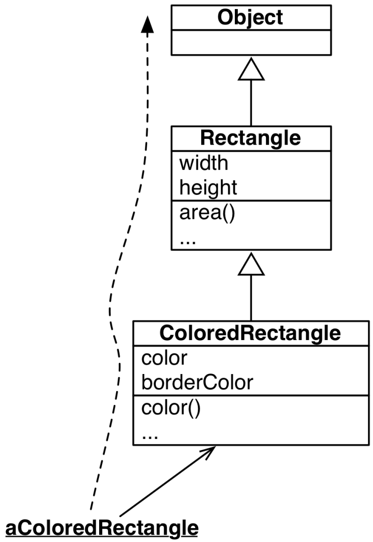
Some Lookup Cases

Sending the message color to aColoredRectangle

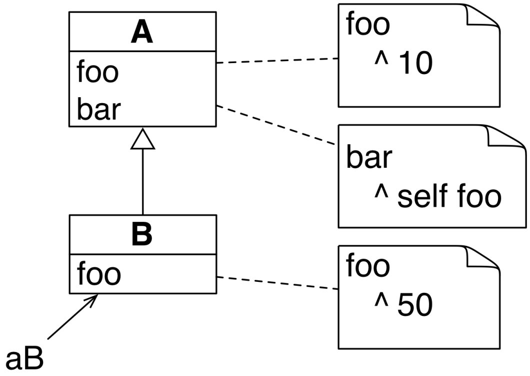


Some Lookup Cases

Sending the message area to aColoredRectangle

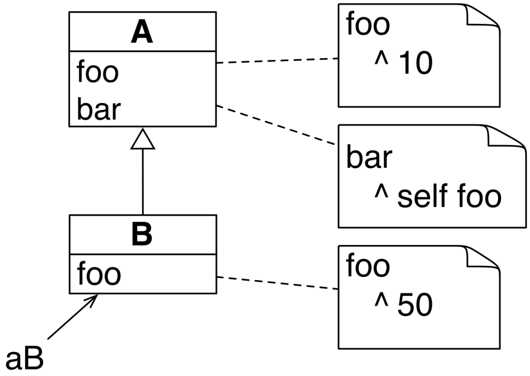


self Always Represents the Receiver



```
A new foo
> ...
B new foo
> ...
```

self Always Represents the Receiver

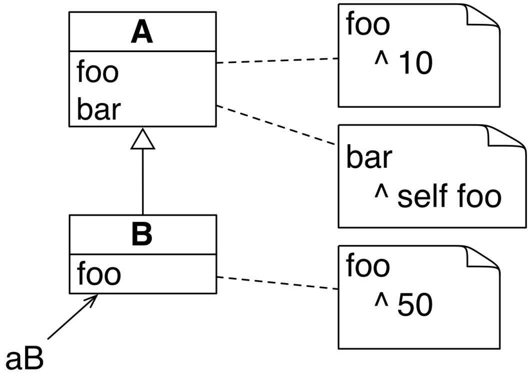


```
A new foo
> 10
B new foo
> 50
```

self/this

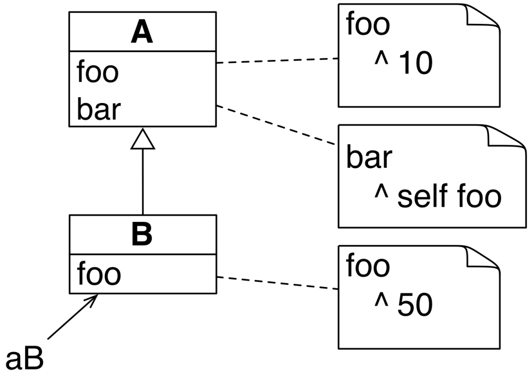
- self represents the receiver of the message
- self in Pharo, this in Java
- The method lookup starts in the class of the receiver

self Always Represents the Receiver



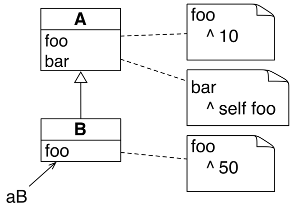
```
A new bar
> ...
B new bar
> ...
```

self Always Represents the Receiver



```
A new bar
> 10
B new bar
> 50
```

self Always Represents the Receiver

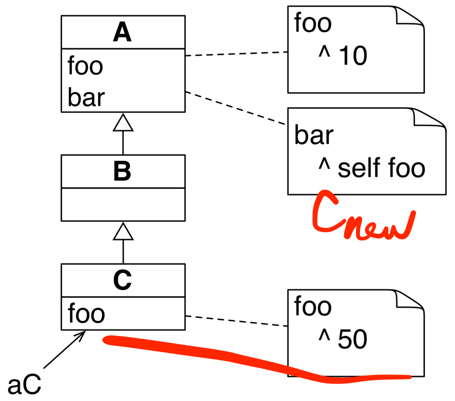


```
B new bar
> 50
```

Evaluation of aB bar

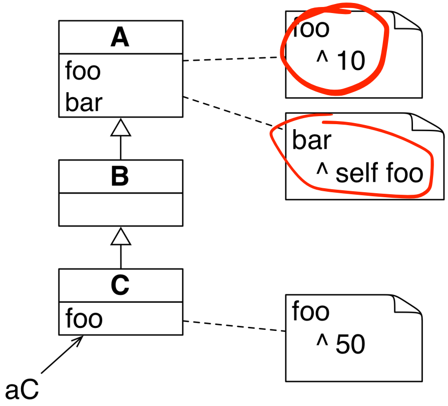
1. aB's class is B
2. no method bar in B
3. look up in A - bar is found
4. method bar is executed
5. self refers to the receiver aB
6. foo is sent to self
7. look up foo in the aB's class: B
8. foo is found there and executed

self Always Represents the Receiver



```
A new bar
> ...
B new bar
> ...
C new bar
> ...
```

self Always Represents the Receiver



```
A new bar
> 10
B new bar
> 10
C new bar
> 50
```

What You Should Know

- self always represents the receiver
- Sending a message is a two-step process:
  1. Look up the method matching the message
  2. Execute this method on the receiver
- Method lookup maps a message to a method
- Method lookup starts in the class of the receiver
  - ...and goes up in the hierarchy

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