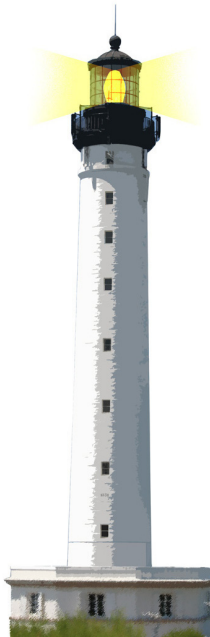
About private methods

S. Ducasse



Pharo

http://www.pharo.org

Private... which one?

- Pay attention languages can have different interpretations...
- Private Ruby metehods are different from private Java ones
- You can have private virtual in CPP but they can be tricky

Are private methods inherited? In Java

```
class A {
  public void m() { this.p(); }
  private void p() { println("A.p()"); }
}
class B extends A {
  private void p() { println("B.p()"); }
}
```

Which is called? A.p() or B.p()?

```
A b = new B();
b.m();
```

Are private methods inherited? In Java

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class A {
  public void m() { this.p(); }
  private void p() { println("A.p()"); }
}
class B extends A {
  private void p() { println("B.p()"); }
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```

```
Which is called? A.p() or B.p()?
A b = new B();
b.m();
>>> A.p()
```

Because private methods in Java are statically bound

- No method lookup
- You cannot call them from subclass

Private in Ruby

- Ruby is one of the few dynamic languages that offers access qualifiers: methods can be qualified as public, protected and private.
- A private method may be made public in subclasses. Private methods can only be invoked by sending a message to an implicit receiver (i.e., no use of self).
- However a call to a private method is not statically bound to the method defined in the class but can be overridden in subclasses.

Private in Ruby

```
class C
  def zork(arg) ; return arg.x ; end
  def foo ; self.x end
  def foo2 ; x; end
  private def x;return1; end
end

class D < C
  public
  def x; return2; end
end
```

Results:

```
C.new.foo ==> failed
C.new.foo2 ==> 1
D.new.foo ==> 2
```

Private in Ruby

- class C defines a private method x.
  - The method foo does not invoke this method since it does not use an implicit receiver but sends the message x to self. This is why C.new.foo raises an error.
- The method foo2 invokes x with an implicit receiver (i.e., no self).
  - C.new.foo2 executes the private method x and returns 1.
- Now this is different if a subclass defines a public method x returning 2.
  - D.new.foo2 returns 2 and not 1 even though the method x is private and the method foo2 calls x with an implicit receiver.
- This shows that Ruby's private methods are dynamically resolved.

Virtual Private in CPP

```
class HTMLDocument : public Document, public CachedResourceClient {
private:
   virtual bool childAllowed(Node*);
   virtual PassRefPtr<Element> createElement(const AtomicString& tagName,
       ExceptionCode&);
};
```

- Derived classes may override the function to customize the behavior as needed.
- But without exposing the virtual functions directly by making them callable by derived classes
- But but if you declare the method private then you cannot invoke it from its overridden versions.
- A virtual protected would let the derived class be callable in derived classes

`https://isocpp.org/wiki/faq/strange-inheritance#private-virtuals`

Better use protected :)

Virtual Private Limit in CPP

```
class Base {
 private:
   int m_data;
   virtual void cleanup() { /*do something*/ }
 protected:
   Base(int idata): m_data (idata) {}
 public:
   int data() const { return m_data; }
   void set_data (int ndata) { m_data = ndata; cleanup(); }
};

class Derived: public Base {
 private:
 void cleanup() override {// do other stuff
  Base::cleanup(); // nope, can't do it }
 public:
 Derived (int idata): base(idata) {}
};
```

What you should know

- Each language has its own definition
- Private methods in Java are statically bound

A course by

S. Ducasse, G. Polito, and Pablo Tesone