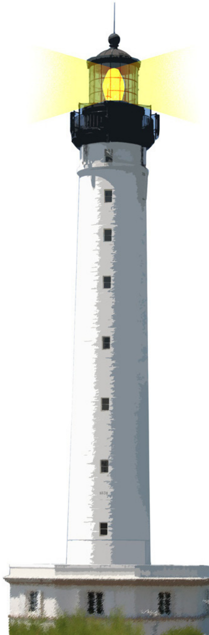
Learning Object-Oriented
Programming and Design with TDD

About Cast of Java

S. Ducasse
http://stephane.ducasse.free.fr

http://www.pharo.org

Core



Objectives

- Casts

About Casts

- Tell the compiler that the type of the object is another one...
- you cannot downcast to a type lower than the runtime type of the instance.

```
B b = new B();
A upcasted = (A) b;  <=== this is the "upcast"
B downcasted = (B) upcasted; <=== this is the downcast
```

About Casts: the runtime errors

```
A upcasted = new A();
B downcasted = (B) upcasted; <=== this is an invalid downcast that compiles but does
      not run
```

- but it does not run
- because at runtime it checks "is the object a B?" NO => boom
- a runtime check is necessary
- You cannot downcast to a lower type than the object dynamic type

The case of equals

The only place where you should use a downcast is equals(Object o)

```
public class Person
{
   String firstName;
   String lastName;
   public String getFirstName() { return firstName; }
   public String getLastName() { return lastName; }

   @Override
   public boolean equals(Object o) {
      if(o instanceof Person)
         return isSamePerson((Person)o);
      return false;
   }
  public  boolean isSamePerson(Person o) {
      return firstName.equals(o.firstName) && lastName.equals(o.lastName);
   }
}
```

The case of equals

In the case of equals, it's to compare this with the parameter. The signature says the parameter that represents the other object that you will compare yourself against is an instance of Object, then in your equals, if you need to compare specific result of methods (or fields), you need to downcast

```
Class B {
  public boolean equals(Object o) {
    if (this == o) return true;
    if (! (o instanceof B)) return false;
    B other = (B) o;
    // Do stuffs with other and this to compare getter/fields...etc
}
```

Kind of Summary

- Static types are known by the compiler.
- Dynamic types are the variable values known at execution.

Method lookup

- The compiler choses one signature (with static types)
- The runtime uses dynamic types and looks for a method compatible with the signature

What you should know

- Dynamic / static types
- equals(Object o)