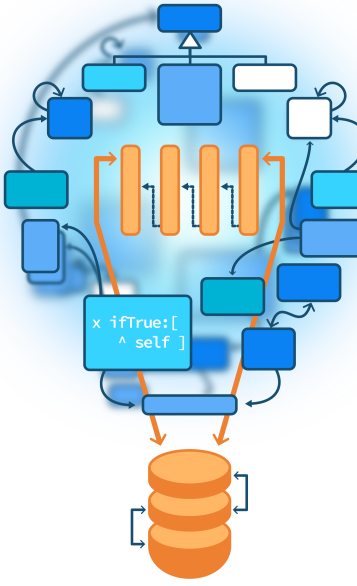
DieHandle new vs. self class new

When classes are first class citizen

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



Pharo

http://www.pharo.org

Goal

- self represents the receiver
- Classes receive messages too

Context

To support

```
(DieHandle new add: (Die faces: 4); yourself)
  + (DieHandle new add: (Die faces: 6); yourself)
```

We defined + as

```
DieHandle >> + aDieHandle
  | handle |
  handle := DieHandle new.
  self dice do: [ :each | handle addDie: each ].
  aDieHandle dice do: [ :each | handle addDie: each ].
  ^ handle
```

What happens when subclassing?

```
DieHandle << #MemoDieHandle
  ...
```

```
(MemoDieHandle new add: (Die faces: 4); yourself)
  + (MemoDieHandle new add: (Die faces: 6); yourself)
> aDieHandle
```

- We get a DieHandle instance back and not a MemoDieHandle instance!
- Current DieHandle»+ always returns an instance of DieHandle (**hardcoded class use**) even if the receiver is a subclass

Solution 1: Creating a hook method

```
DieHandle >> + aDieHandle
  | handle |
  handle := self handleClass new.
  self dice do: [ :each | handle addDie: each ].
  aDieHandle dice do: [ :each | handle addDie: each ].
  ^ handle
```

```
DieHandle >> handleClass
  ^ DieHandle
```

A subclass may redefine handleClass

```
MemoDieHandle >> handleClass
  ^ MemoDieHandle
```

Solution 1: Creating a hook method

```
(MemoDieHandle new add: (Die faces: 4); yourself)
  + (MemoDieHandle new add: (Die faces: 6); yourself)
> aMemoDieHandle
```

We get an instance of the subclass!

But we can do better!

Pros:

- Extensibility

Cons:

- In each subclass we should redefine the hook method handleClass
- This is tedious and error prone (developper might forget)

Solution 2

```
DieHandle >> + aDieHandle
  | handle |
  handle := self handleClass new.
  self dice do: [ :each | handle addDie: each ].
  aDieHandle dice do: [ :each | handle addDie: each ].
  ^ handle

DieHandle >> handleClass
    ^ self class
```

- self class always returns the class of the receiver (it works for subclasses too!)
- We get instances of the same kind of the receiver

Summary

- Do not hardcode class use

```
DieHandle >> + aDieHandle
 | handle |
 handle := DieHandle new.
 ...
```

- Encapsulate class use in a self send (a **hook**)
- Extensible solution but requires redefinition

```
 ...
 handle := self handleClass new.
 ...

DieHandle >> handleClass
  ^ DieHandle
```

- Return the class of the receiver
- Gracefully adapt to future subclasses
- Still extensible by redefinition

```
DieHandle >> handleClass
 ^ self class
```

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

Advanced Object-Oriented Design and Development with Pharo

A course by
S.Ducasse, L. Fabresse, G. Polito, and P. Tesone

Inria
LearningLab

2023