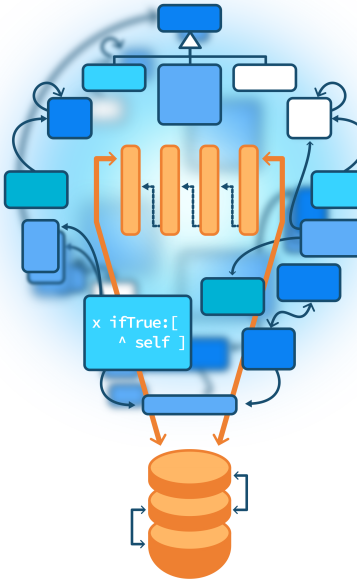
Shared Pools

Static sharing between hierarchies

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



Pharo

Goals

- Revisit sharing
- Understand shared pools (SharedPools)

A question:

- Using shared variables, we can share values over multiple subclasses within the **same** hierarchy.
- How can we share objects between **different** hierarchies?

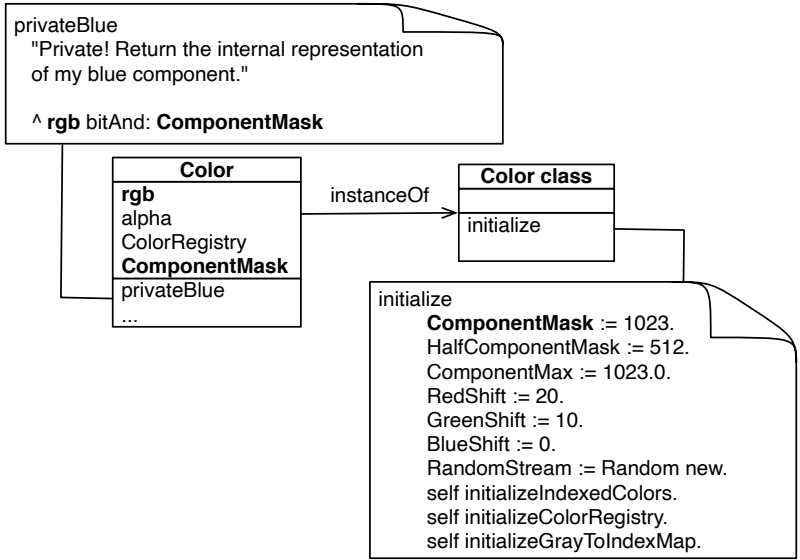
Remember: Sharing within a hierarchy

A shared variable can be accessed from

- Instance methods
- Class methods of the class defining it
- From its subclasses

Usually initialized from the class side of a root

Remember ComponentMask



Need for sharing between different hierarchies

- Need to share values (generally constants) between **multiple** hierarchies:
  - For example LF, CR, ... between the hierarchies of String and Text
- Don’t want to repeat the shared variables and their initialization

SharedPools to the rescue

A SharedPool is a **group of shared variables** contains

- the shared pools definition
- the initialization of shared variables

Users (classes) just declare that they use a shared pool to access **its** shared variables

A SharedPool definition

```
SharedPool << #ChronologyConstants
  slots: {};
  sharedVariables: { #NanosInSecond . #MonthNames . #SecondsInHour .
      #SecondsInDay . #DayNames . #DaysInMonth . #HoursInDay . #NanosInMillisecond
      . #SecondsInMinute . #SqueakEpoch . #MinutesInHour . #MicrosecondsInDay };
  tag: 'Chronology';
  package: 'Kernel'
```

A SharedPool initialization

```
ChronologyConstants class >> initialize

  SqueakEpoch := 2415386.      "Julian day number of 1 Jan 1901"
  SecondsInDay := 86400.
  MicrosecondsInDay := SecondsInDay * 1e6.
  SecondsInHour := 3600.
  SecondsInMinute := 60.
  MinutesInHour := 60.
  HoursInDay := 24.
  NanosInSecond := 10 raisedTo: 9.
  NanosInMillisecond := 10 raisedTo: 6.
  DayNames := #(Sunday Monday Tuesday Wednesday Thursday Friday Saturday).
  MonthNames := #(January February March April May June July
      August September October November December).
  DaysInMonth := #(31 28 31 30 31 30 31 31 30 31 30 31).
```

Shared pools are initialized at class load time.

SharedPool users

```
Magnitude << #DateAndTime
  slots: { #seconds . #offset . #julianDayNumber . #nanos };
  sharedVariables: { #ClockProvider . #LocalTimeZoneCache };
  sharedPools: { ChronologyConstants };
  package: 'Kernel'
```

DateAndTime

- defines some shared variables
- uses the shared pool ChronologyConstants

SharedPool's sharedVariable access

A shared variable defined in a shared pool is accessed as if defined in the class itself

```
DateAndTime >> secondsSinceMidnightLocalTime
  ^ self localSeconds \\ SecondsInDay
```

```
Duration class >> days: aNumber
  ^ self seconds: aNumber * SecondsInDay nanoSeconds: 0
```

SecondsInDay is just accessed directly both from instance and class side

SharedPool users (2)

```
Timespan << #Week
  slots: {};
  sharedVariables: { #StartDay };
  sharedPools: { ChronologyConstants };
  package: 'Kernel−Chronology−Extras'
```

```
Week class >> indexOfDay: aSymbol
  ^ DayNames indexOf: aSymbol
```

Mixing shared variables and sharedPools

There is no problem mixing shared variables and shared pools

```
Timespan << #Week
  sharedVariables: { #StartDay };
  sharedPools: { ChronologyConstants };
  package: 'Kernel−Chronology−Extras'
```

```
Week class >> startDay
  ^ StartDay ifNil: [ StartDay := DayNames first ]
```

Warning! Only for constants

- Should only store **constant** objects in shared pools
- Else you are creating global variables and you are breaking testability in isolation

Conclusion

Shared pools are:

- Handy to **share constants** between multiple classes (potentially in different inheritance trees)
- Handy to manage constants for bindings to C-libraries
- **Only** use them to share constants

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

Except where otherwise noted, this work is licensed under CC BY-NC-ND 3.0 France
https://creativecommons.org/licenses/by-nc-nd/3.0/fr/

2023