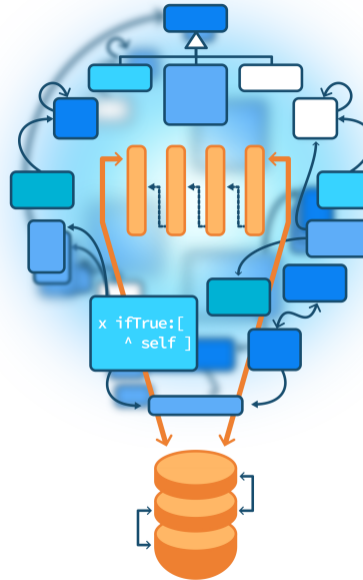


Methods: the elementary unit of reuse

Obvious but important

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



Executing a method is reusing its code

Obvious but it is always good to hear it again

- Defining a method enriches the API of an object
- Calling a method is the first level of reuse



Case Study

```
PRTree >> inpectionPresenter
<inspectorPresentationOrder: 35 title: 'PillarTree'>
^ SpTreePresenter new
  roots: { self };
  children: [ :aNode | aNode children ];
  display: [ :each |
    String streamContents: [ :stream |
      stream nextPutAll: each class name.
      each class = PRHeader ifTrue: [
        stream
          nextPutAll: '( level ';
          nextPutAll: each level asString;
          nextPutAll: ')' ] ] ];
  yourself
```



Case Study: client side complexitiy

```
...  
String streamContents: [ :stream |  
    stream nextPutAll: each class name.  
    each class = PRHeader ifTrue: [  
        stream  
        nextPutAll: '( level '  
        nextPutAll: each level asString;  
        nextPutAll: ') ' ].  
...  
...
```

Why the client of a document is forced to define this behavior?



Better define two methods

```
PROject>>displayStringOn: stream  
stream nextPutAll: self class name
```

```
PRHeader>>displayStringOn: stream  
super displayStringOn: stream.  
stream  
  nextPutAll: '( level '  
  nextPutAll: self level asString;  
  nextPutAll: ')'
```

see Hook and Template Lecture!



And send a message

Sending a message will call a method (reuse its code)!

```
PRTree>>inpectionPresenter  
<inspectorPresentationOrder: 35 title: 'PillarTree'>  
^ SpTreePresenter new  
  roots: { self };  
  children: [ :aNode | aNode children ];  
  display: [ :each |  
    String streamContents: [ :stream |  
      each displayStringOn: stream ] ];  
  yourself
```



Another example: logic repetition

```
...  
stream := WriteStream on: (String new: 1000).  
#(1 2 3) printOn: stream.  
stream contents
```

```
...  
stream := WriteStream on: (String new: 1000).  
... printOn: stream.  
stream contents
```



streamContents: to the rescue

```
String streamContents: [:stream | #(1 2 3) printOn: stream ]
```

- Encapsulates string creation
- Optimized
- Hides details
- Encapsulates termination



Encapsulate actions using blocks

```
SequenceableCollection class >> streamContents: blockWithArg  
  ^ self new: 100 streamContents: blockWithArg
```

```
SequenceableCollection class >> new: newSize streamContents: blockWithArg
```

```
| stream |  
stream := WriteStream on: (self streamSpecies new: newSize).  
blockWithArg value: stream.  
"If the write position of stream is at the end of the internal buffer of stream (  
  originalContents),  
we can return it directly instead of making a copy as contents would do"  
^ stream position = stream originalContents size  
  ifTrue: [ stream originalContents ]  
  ifFalse: [ stream contents ]
```



Another example of action encapsulation

```
'tintin' asFileReference readStreamDo: [:s | s next... ]
```

```
AbstractFileReference>> readStreamDo: aBlock  
| stream |  
stream := self readStream.  
^ [ aBlock value: stream ]  
ensure: [ stream close ]
```

- Initialize
- and gracefully terminates



Stepping back

- Avoid spreading knowledge in clients
- Avoid duplication of logic in clients
- Encapsulate logic in the API
- Blocks (closure) helps building powerful API
 - but don't abuse them! (see Blocks vs Objects lecture)



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A course by

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