Streams

Stéphane Ducasse
Stephane.Ducasse@univ-savoie.fr
http://www.listic.univ-savoie.fr/~ducasse/

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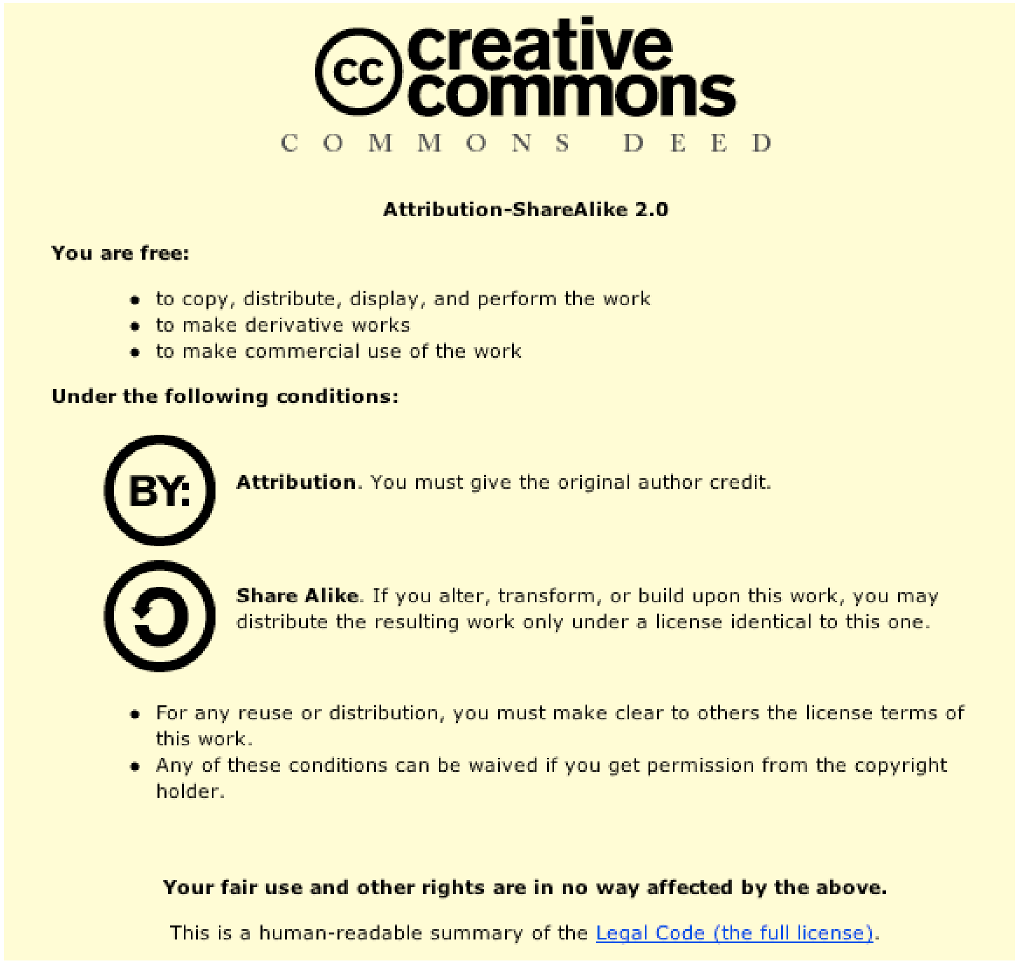
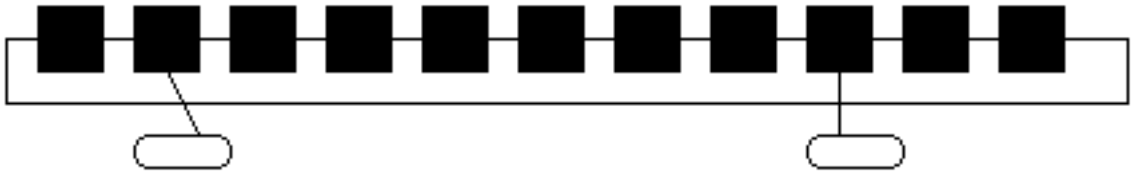


Streams

- Allows the traversal of a collection
- Associated with a collection
  - If the collection is a Smalltalk collection: InternalStream
  - If the collection is a file or an object that behaves like a collection: ExternalStream
- Stores the current position

```
Stream (abstract)
  PeekableStream (abstract)
    PositionableStream (abstract)
      ExternalStream
        ExternalReadStream
          ExternalReadAppendStream
          ExternalReadWriteStream
        ExternalWriteStream
      InternalStream
```



Example

```
|st|
st := ReadWriteStream on: (Array new: 6).
st nextPut: 1.
st nextPutAll:  (4 8 2 6 7).
st contents. PrIt->  (1 4 8 2 6 7)
st reset.
st next. -> 1
st position: 3.
st next. -> 2
st :=  (1 2 5 3 7) readStream.
st next. -> 1
```

printString, printOn:

```
Object>>printString
 "Answer a String whose characters are a description of the
receiver."
	| aStream |
	aStream := WriteStream on: (String new: 16).
	self printOn: aStream.
	^aStream contents
```

printOn:

```
Node>>printOn: aStream
	super printOn: aStream.
	aStream nextPutAll: ' with name:'; print: self name.
	self hasNextNode  ifTrue: [
    aStream nextPutAll: ' and next node:'; print: self nextNode
    name]
```

Stream Classes

Stream

next returns the next element

next: n returns the n next elements

contents returns all the elements

nextPut: anElement inserts anElement at the next position

nextPutAll: aCollection inserts the collection element from the next position

atEnd returns true if at the end of the collection

Stream Classes (ii)

PeekableStream: Access to the current without passing to the next

peek

skipFor: anArgument

skip: n increases the position of n

skipUpTo: anElement increases the position after anElement

on: aCollection, creates a stream

on: aCol from: firstIndex to: lastIndex (index elements included)

Stream Classes (iii)

PositionableStream

- skipToAll: throughAll: upToAll:
- position
- position: anInteger
- reset setToEnd isEmpty

InternalStream

- size returns the size of the internal collection

Creation: method with: (without reinitializing the stream)

Stream Tricks

Transcript is a TextCollector that has aStream

```
TextCollector>>show: aString
   self nextPutAll: aString.
   self endEntry
```

endEntry via dependencies asks for refreshing the window. If you want to speed up a slow trace, use nextPutAll: + endEntry instead of show:

```
|st sc|
st := ReadStream on: ‘we are the champions’.
sc := Scanner new on: st.
[st atEnd] whileFalse: [ Transcript nextPutAll: sc scanToken, ‘ * ‘].
              Transcript endEntry
```

Streams, Blocks, and Files

How to ensure that the open files are closed

```
MyClass>>readFile: aFilename
        |readStream|
        readStream := aFilename readStream.
        [[readStream atEnd] whileFalse: [....]]
        valueNowOrOnUnwindDo: [readStream close]
```

How to find open files (VW specific)

```
(ExternalStream classPool at:  OpenStreams) copy inspect
```

Streams, Blocks, and Files (ii)

Filename

appendStream (addition + creation if file doesnot exists)

newReadAppendStream, newReadWriteStream (if receiver exists, contents removed)

readAppendStream, readWriteStream, readStream, writeStream

Removing Smalltalk comments from a file

```
|inStream outStream |
inStream := (Filename named: '/home/ducasse/test.st') readStream.
outStream := (Filename named: '/home/ducasse/testout.st') writeStream.
                    "(or '/home/ducasse/ducasse' asFilename)"
[inStream atEnd] whileFalse:
   [outStream nextPutAll: (inStream upTo: $").
   inStream skipTo: $"].
   ^outStream contents
```

"do not forget to close the files too"