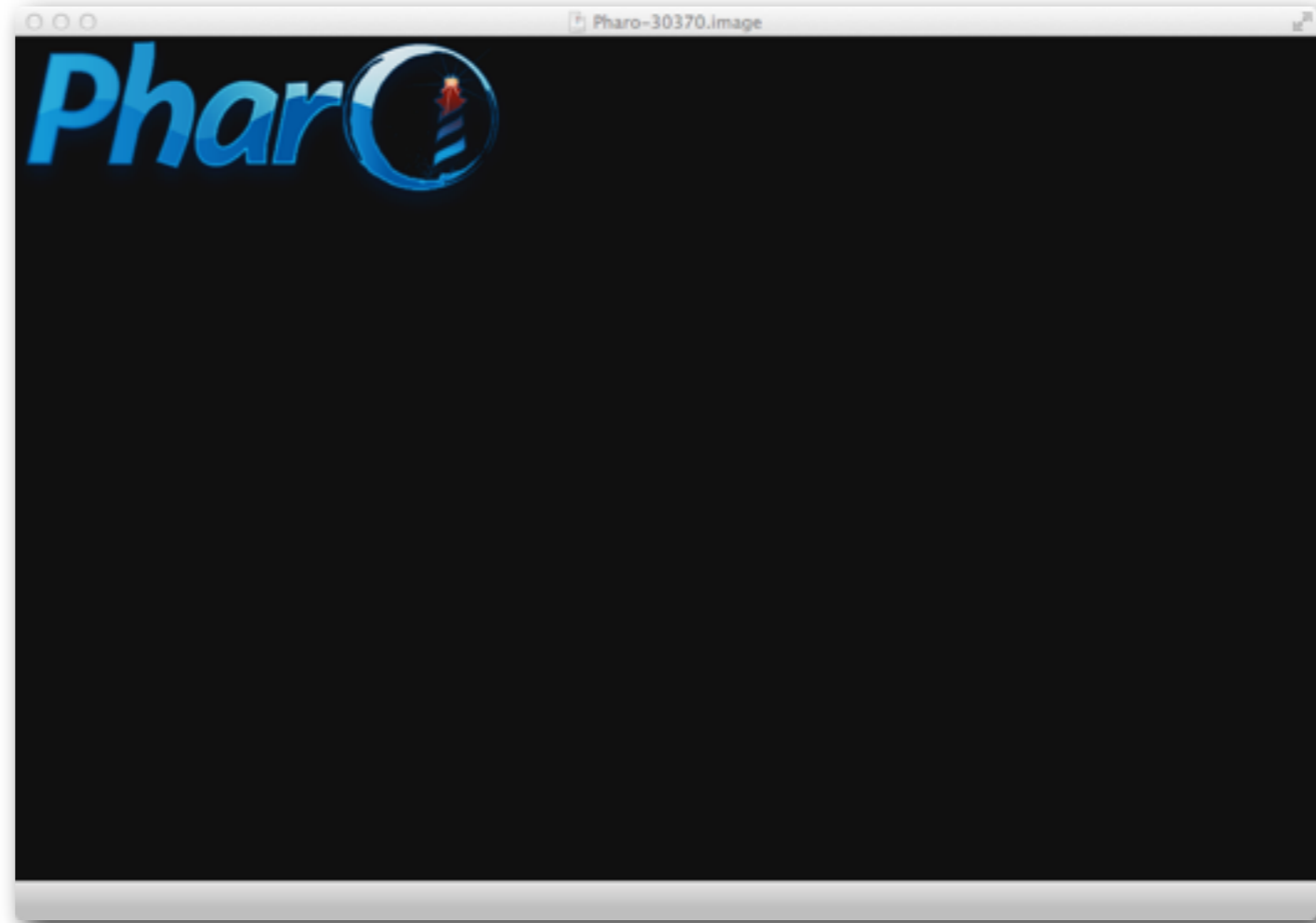
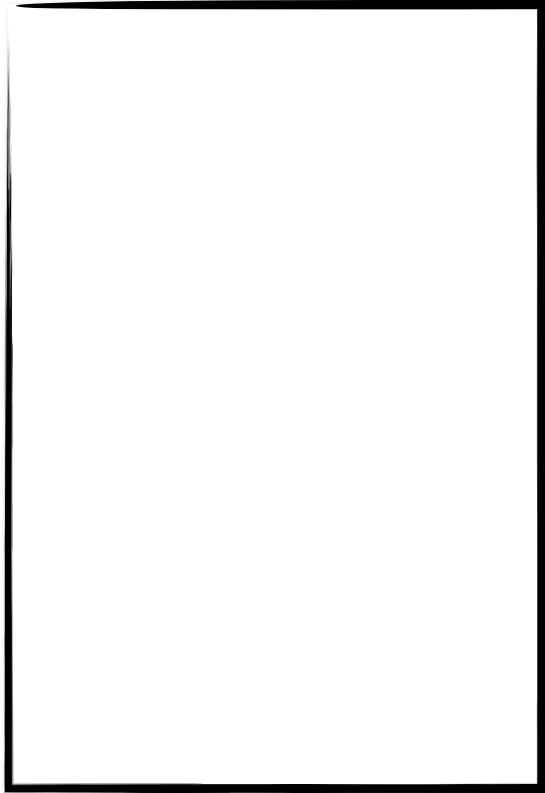
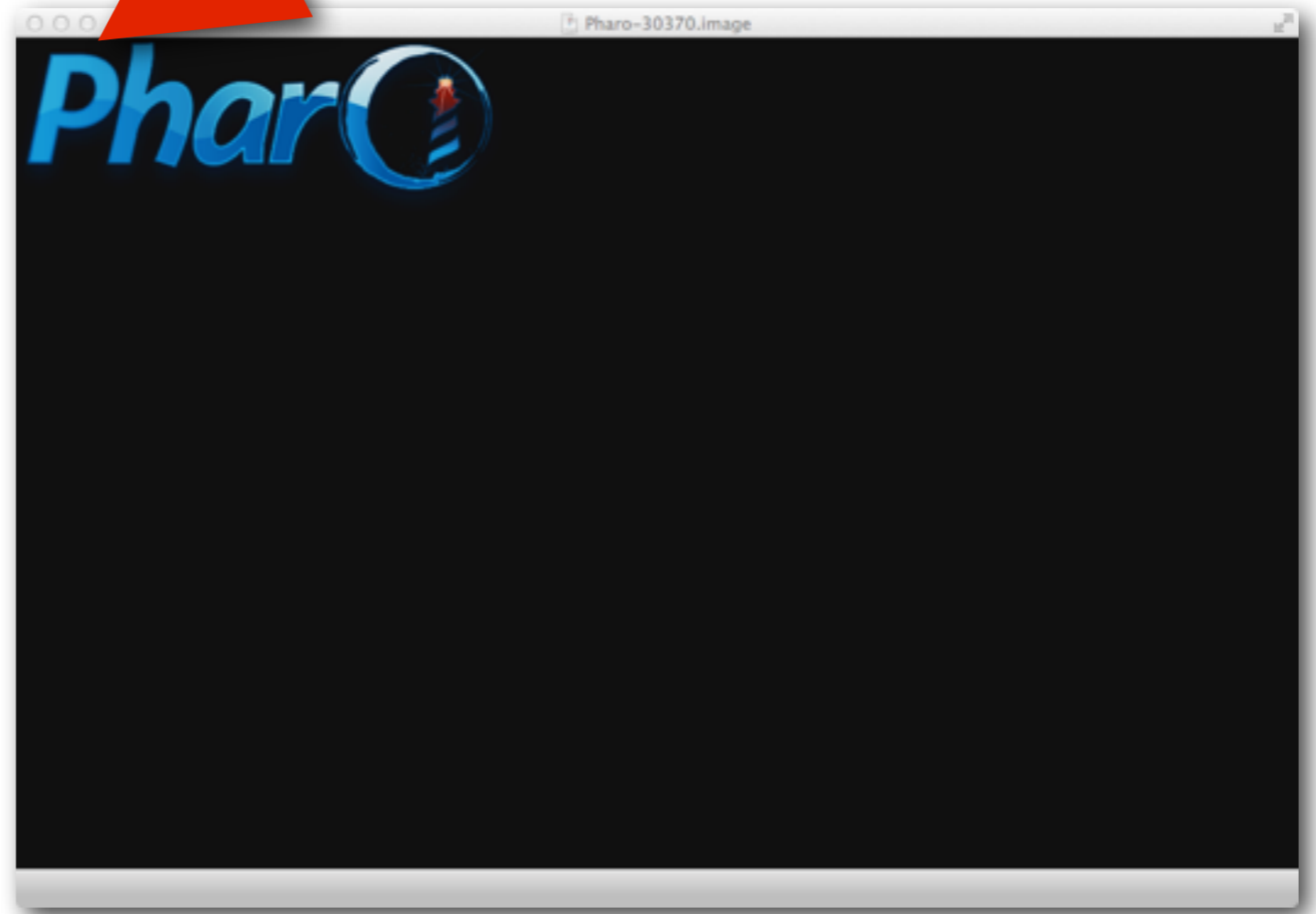
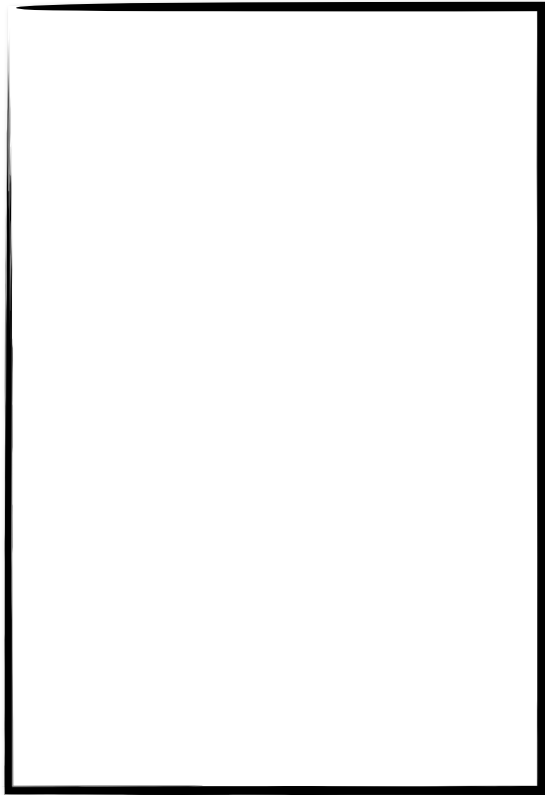
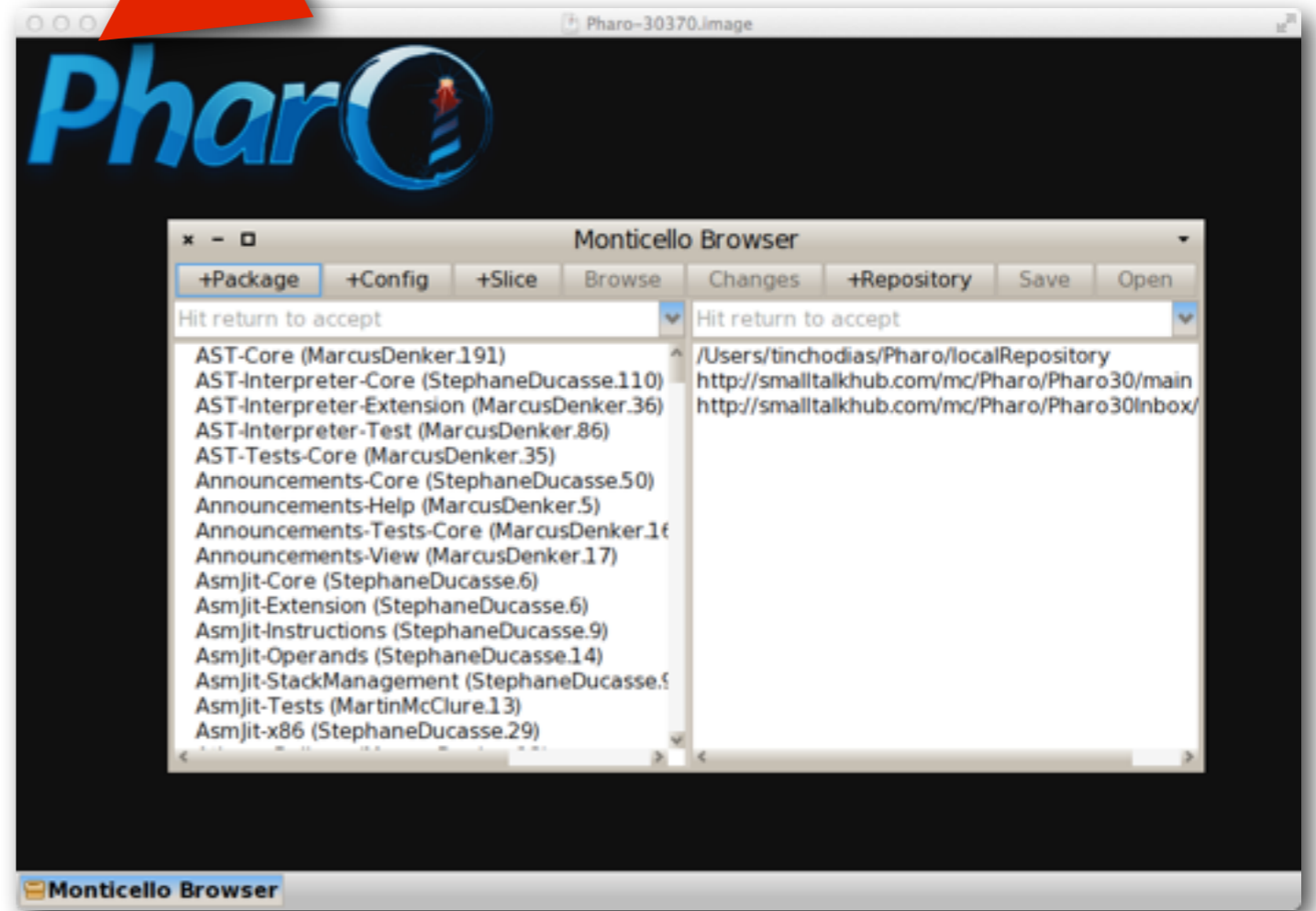
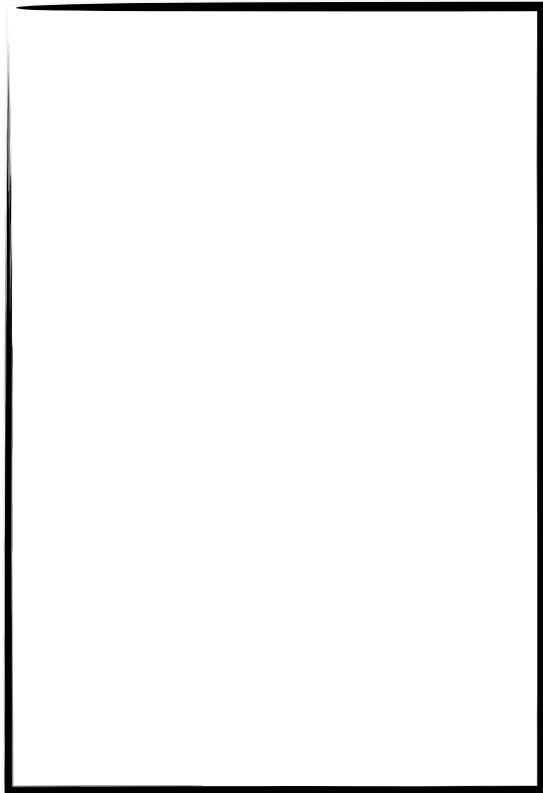


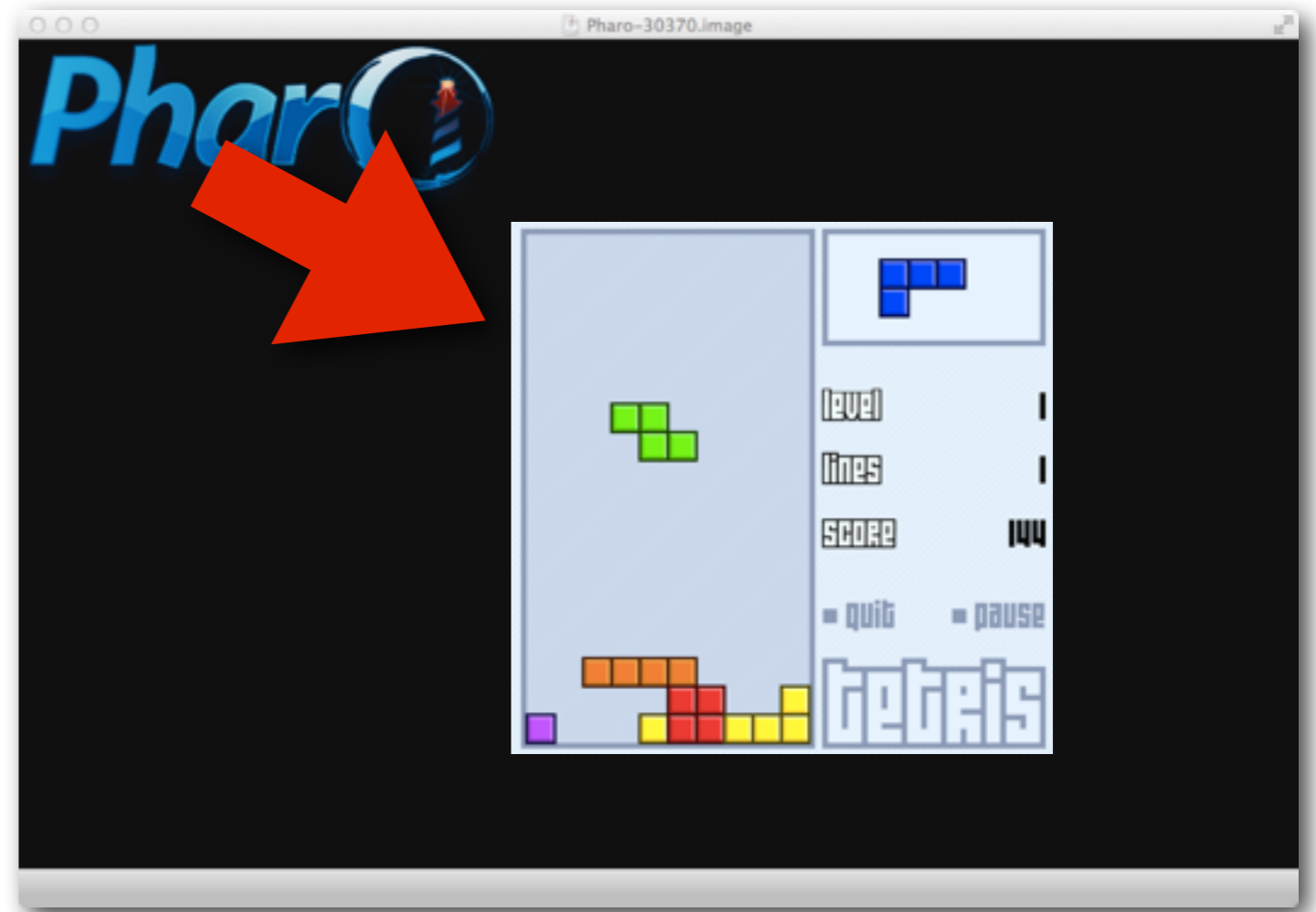
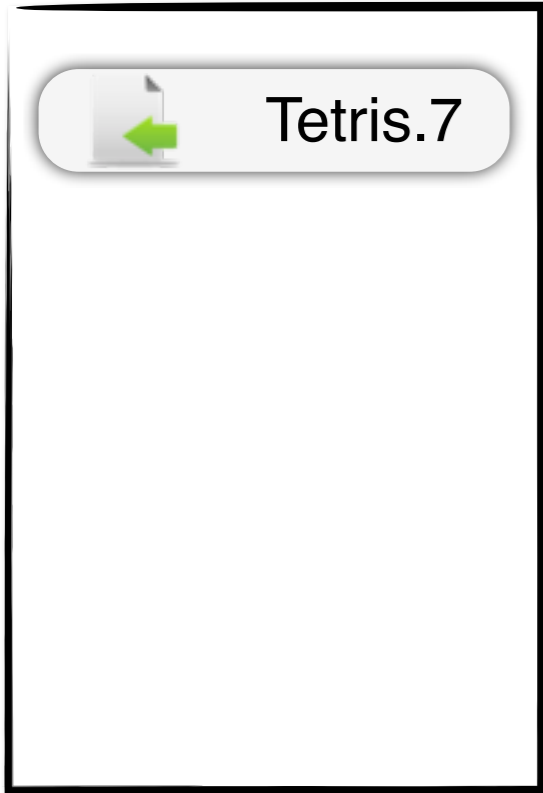
Representing Code History with Development Environment Events

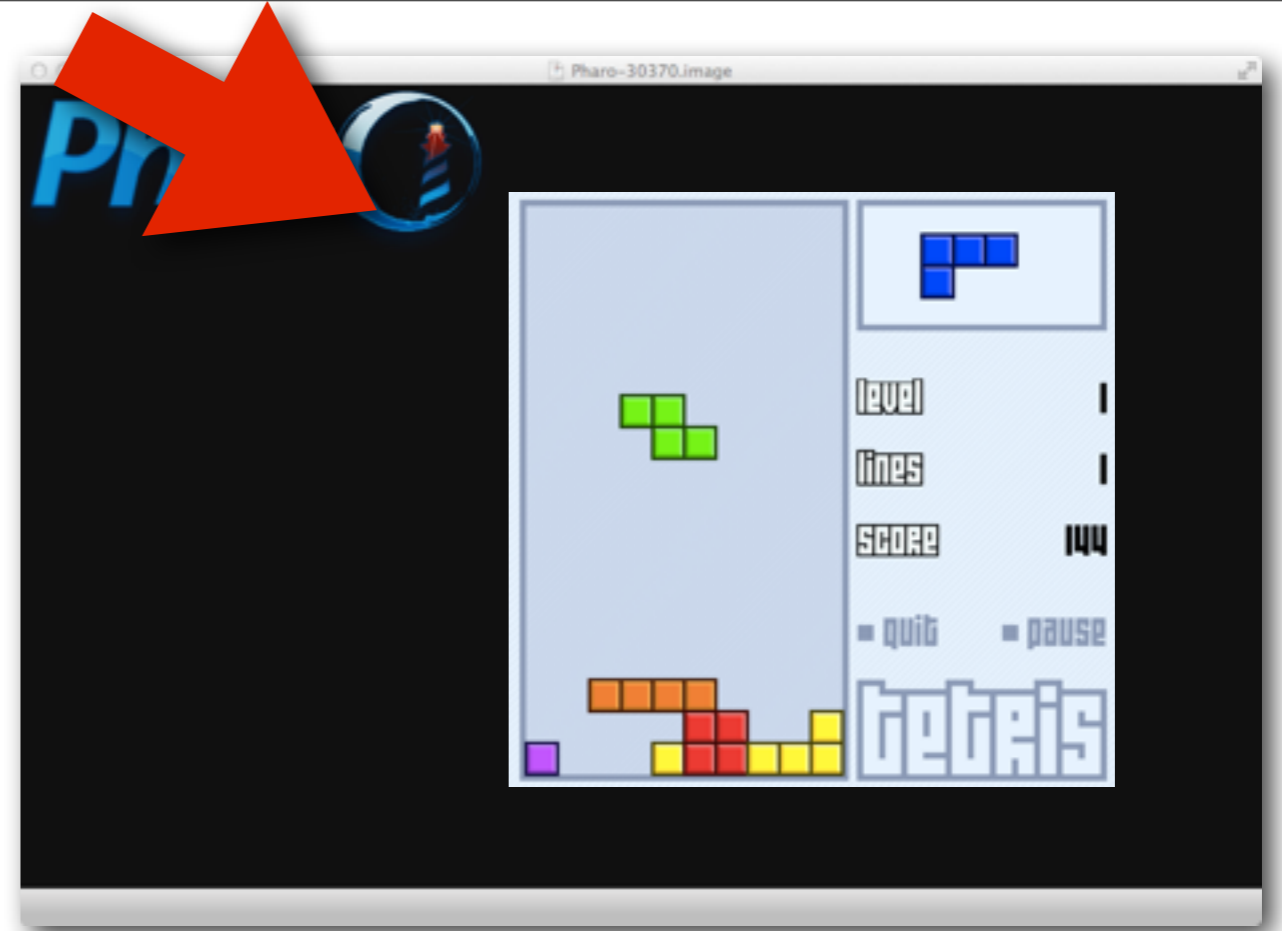
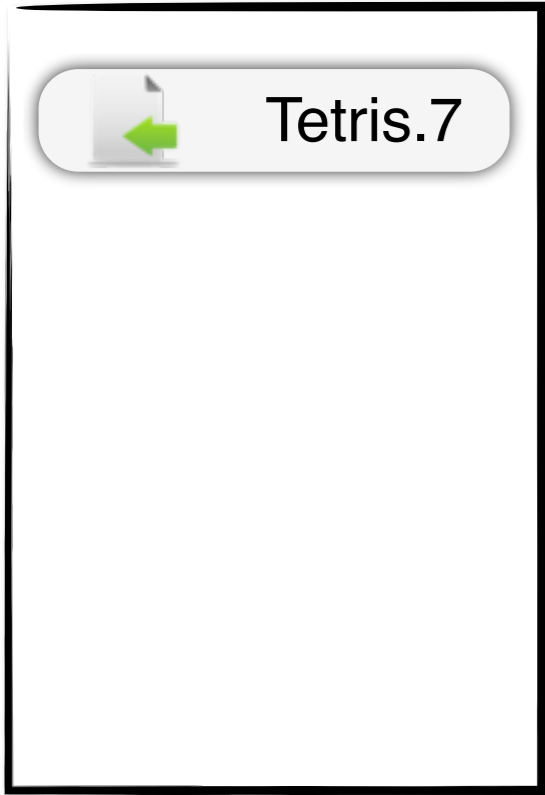
Martín Dias, Damien Cassou, Stéphane Ducasse
RMoD
IWST 2013

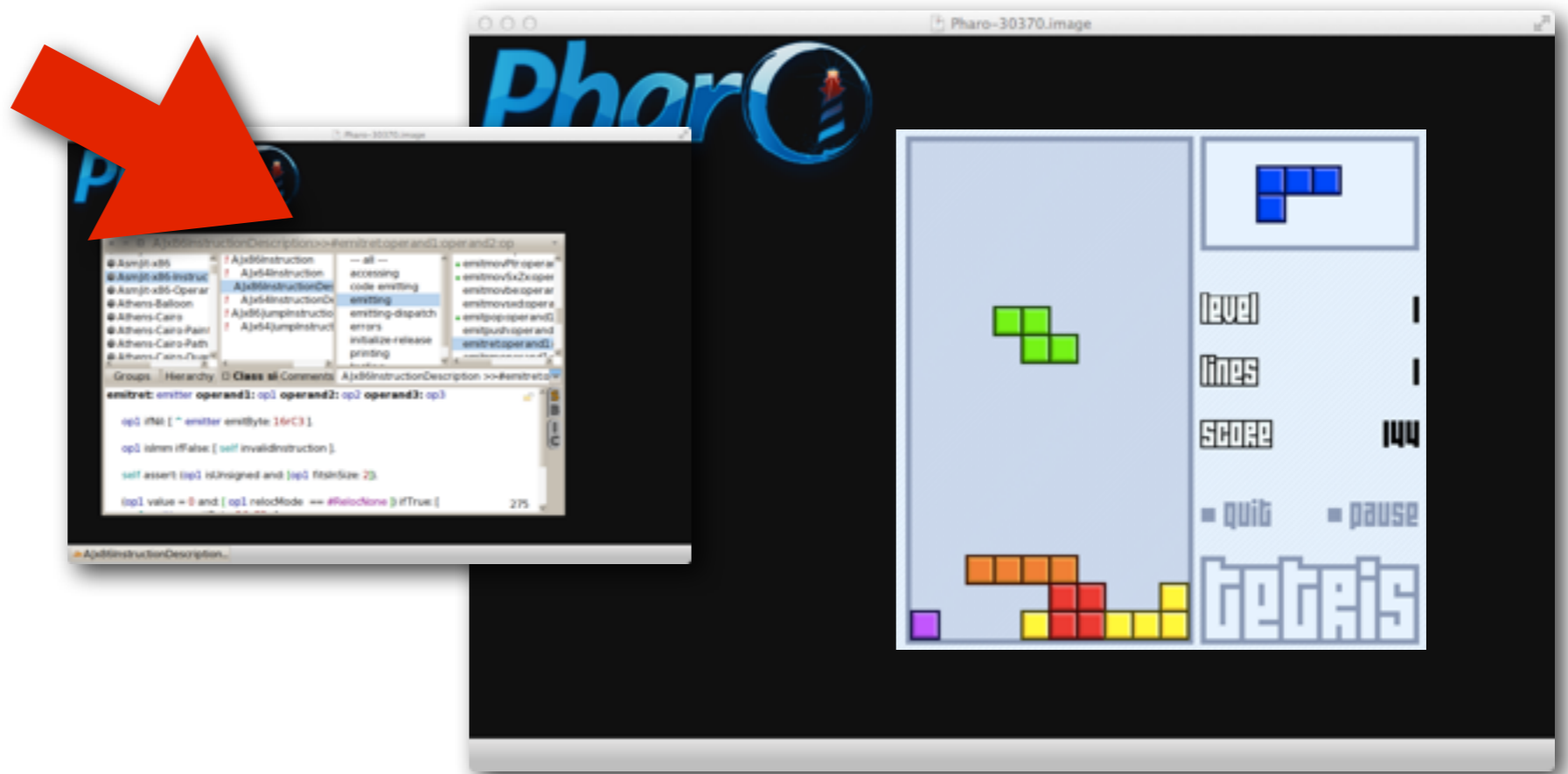
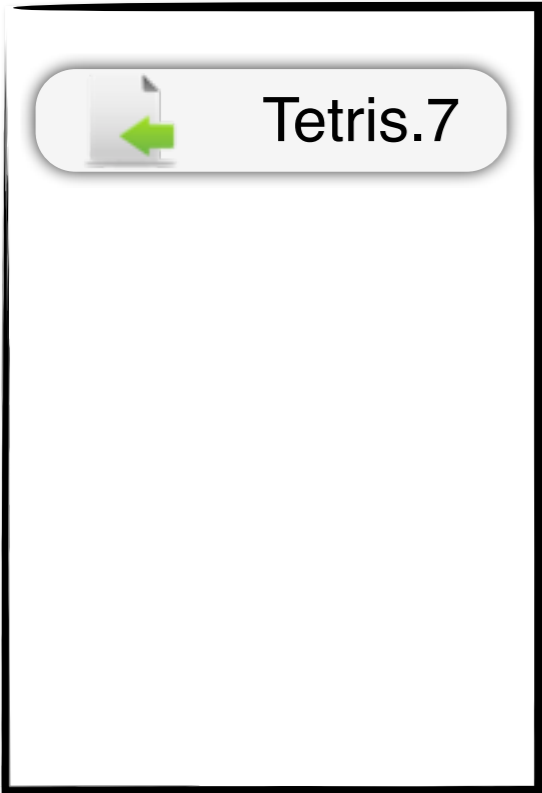















Tetris.7
feature






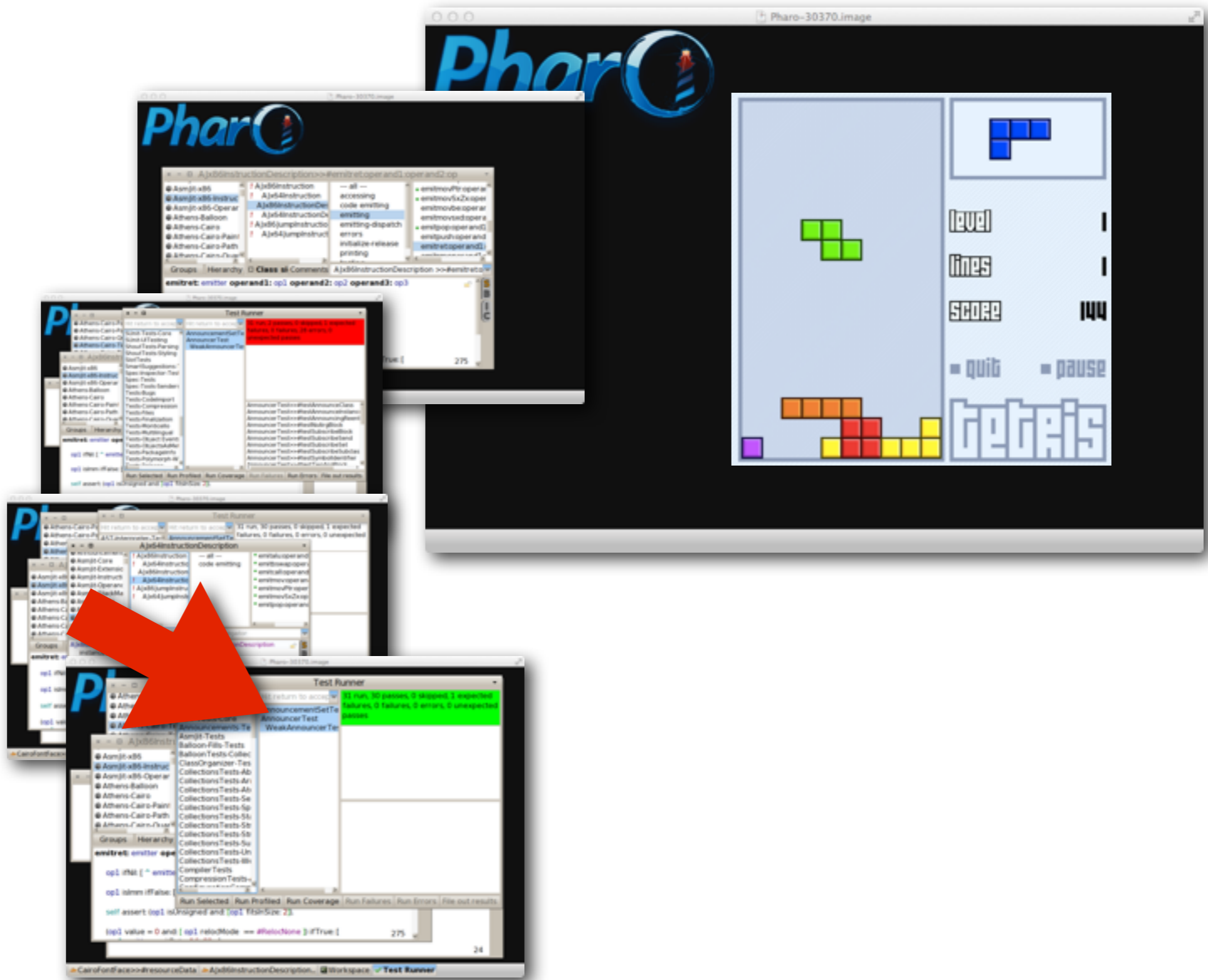
The image displays three overlapping screenshots from the Pharo development environment. The top-left screenshot shows a class browser with a search filter for 'AJv4InstructionDescription'. The top-right screenshot shows a 'Test Runner' window with a red error message: 'Error: TestFailed: 2 passed, 0 skipped, 2 responses, 1 failure, 0 errors, 0 untraced cases'. The bottom-right screenshot shows a Tetris game window titled 'Pharo-30370.image' with a score of 144 and controls for 'quit' and 'pause'.



-  Tetris.7
-  feature
-  typos







-  Tetris.7
-  feature
-  typos

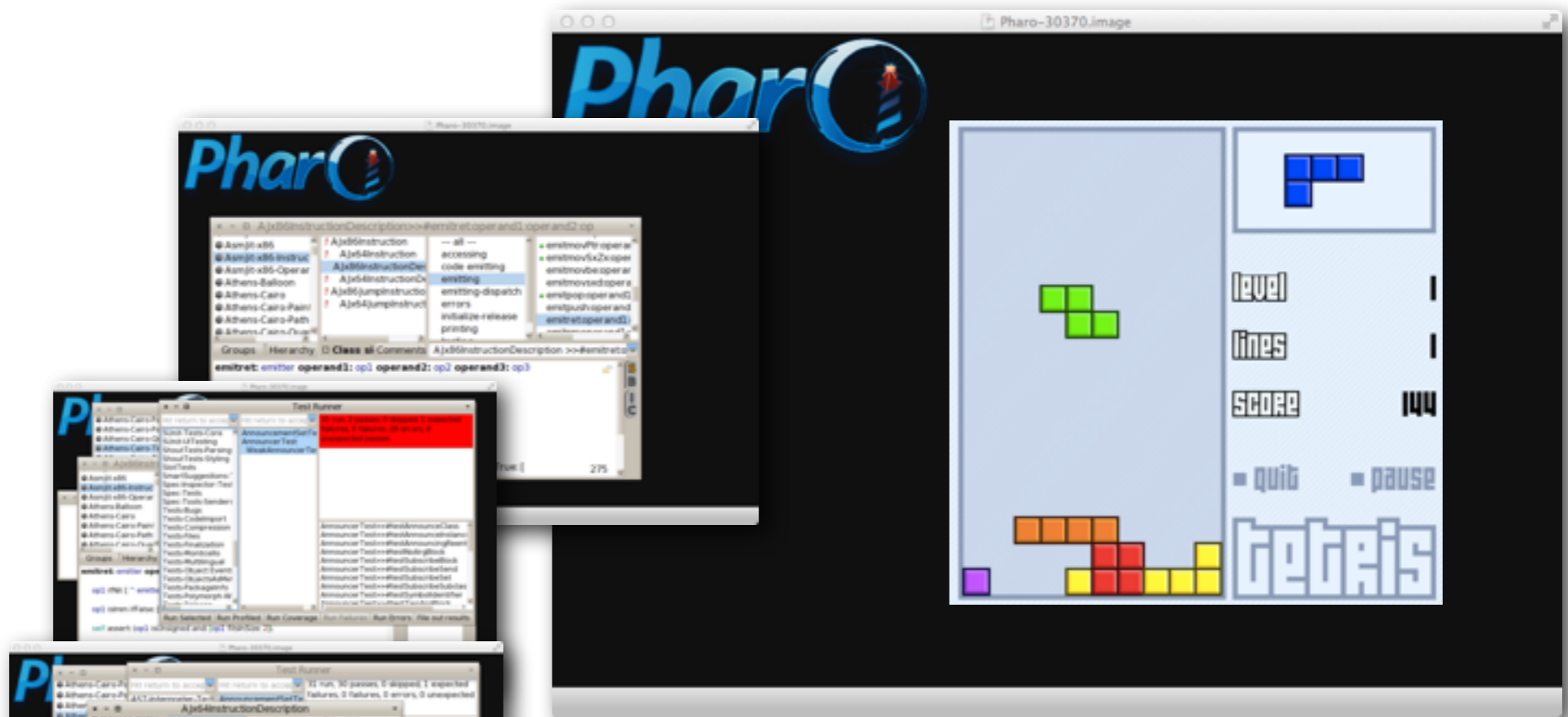


The collage consists of several overlapping windows from the Pharo IDE:

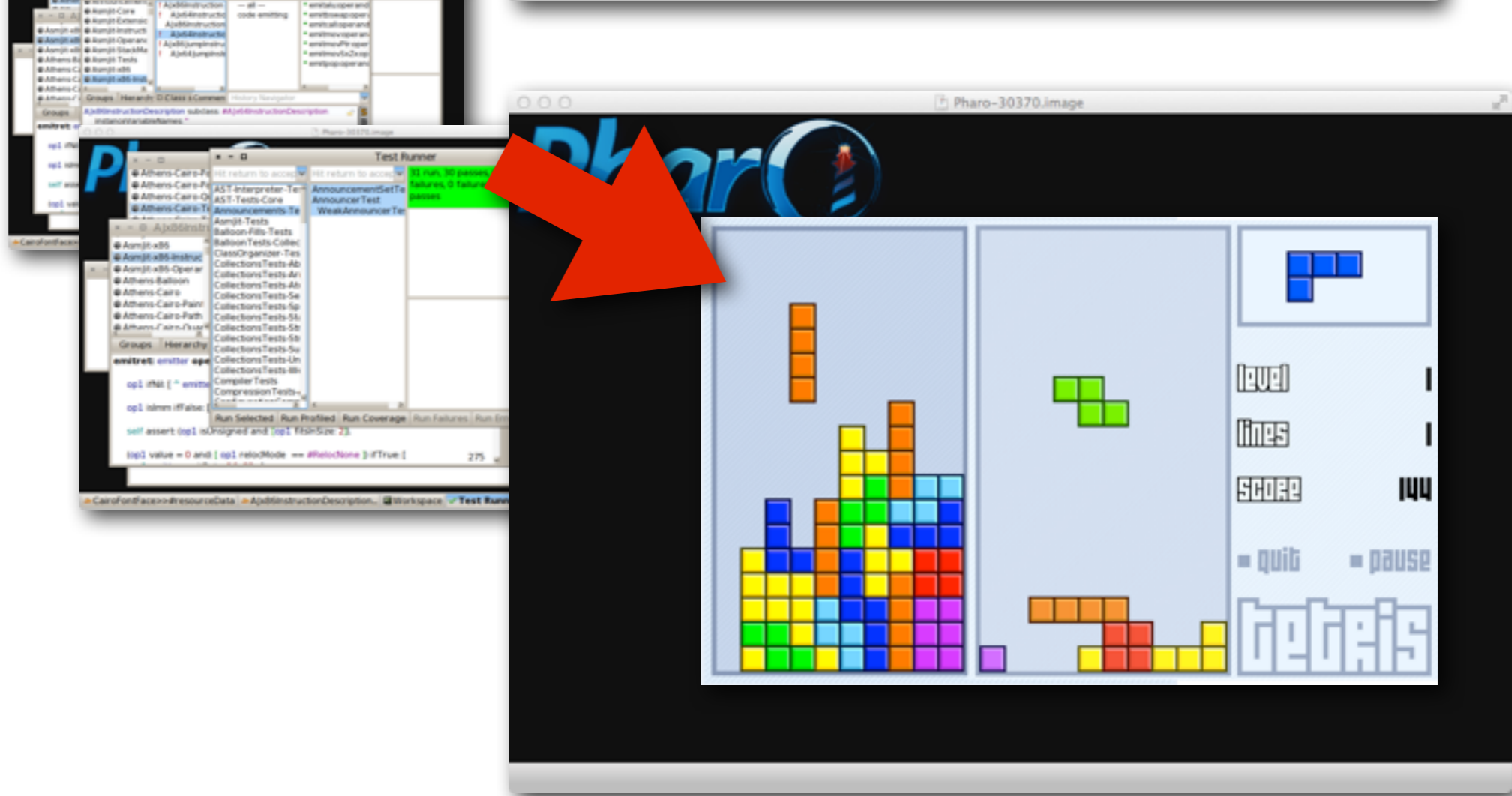
- Top Right:** A Tetris game window titled "Pharo-30370.image". It shows a game board with a score of 144, level 1, and lines 1. The word "tetris" is written in a stylized font at the bottom.
- Top Middle:** A workspace window showing a class hierarchy for "Ajit4InstructionDescription".
- Middle Left:** A workspace window showing a class hierarchy for "Ajit4Instruction".
- Middle Right:** A Test Runner window showing test results. A red banner at the top indicates a failure: "11 run, 30 passes, 0 skipped, 1 expected failure, 0 failures, 0 errors, 0 unexpected passes".
- Bottom Middle:** A Test Runner window showing test results. A green banner at the top indicates success: "11 run, 30 passes, 0 skipped, 1 expected failure, 0 failures, 0 errors, 0 unexpected passes".



-  Tetris.7
-  feature
-  typos






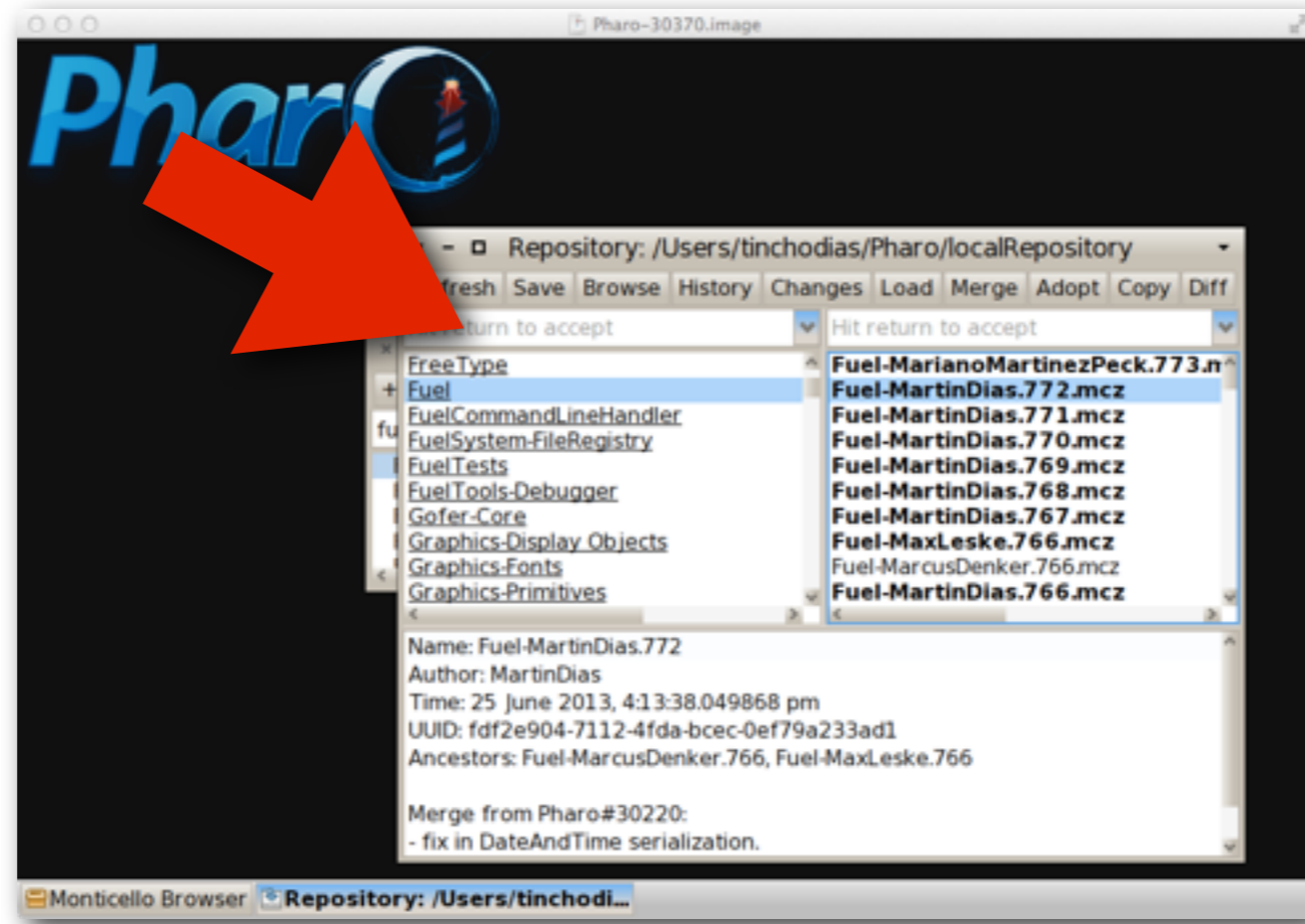
This screenshot shows the Pharo IDE environment. On the right, a Tetris game window titled 'Pharo-30370.image' is visible, displaying a blue tetromino at the top, a score of 144, and the word 'tetris' at the bottom. On the left, the code editor shows a class hierarchy for 'AJx64Instruction' with methods like 'accessing', 'code emitting', and 'emitting-dispatch'. A 'Test Runner' window is also open, showing a list of tests and their results.








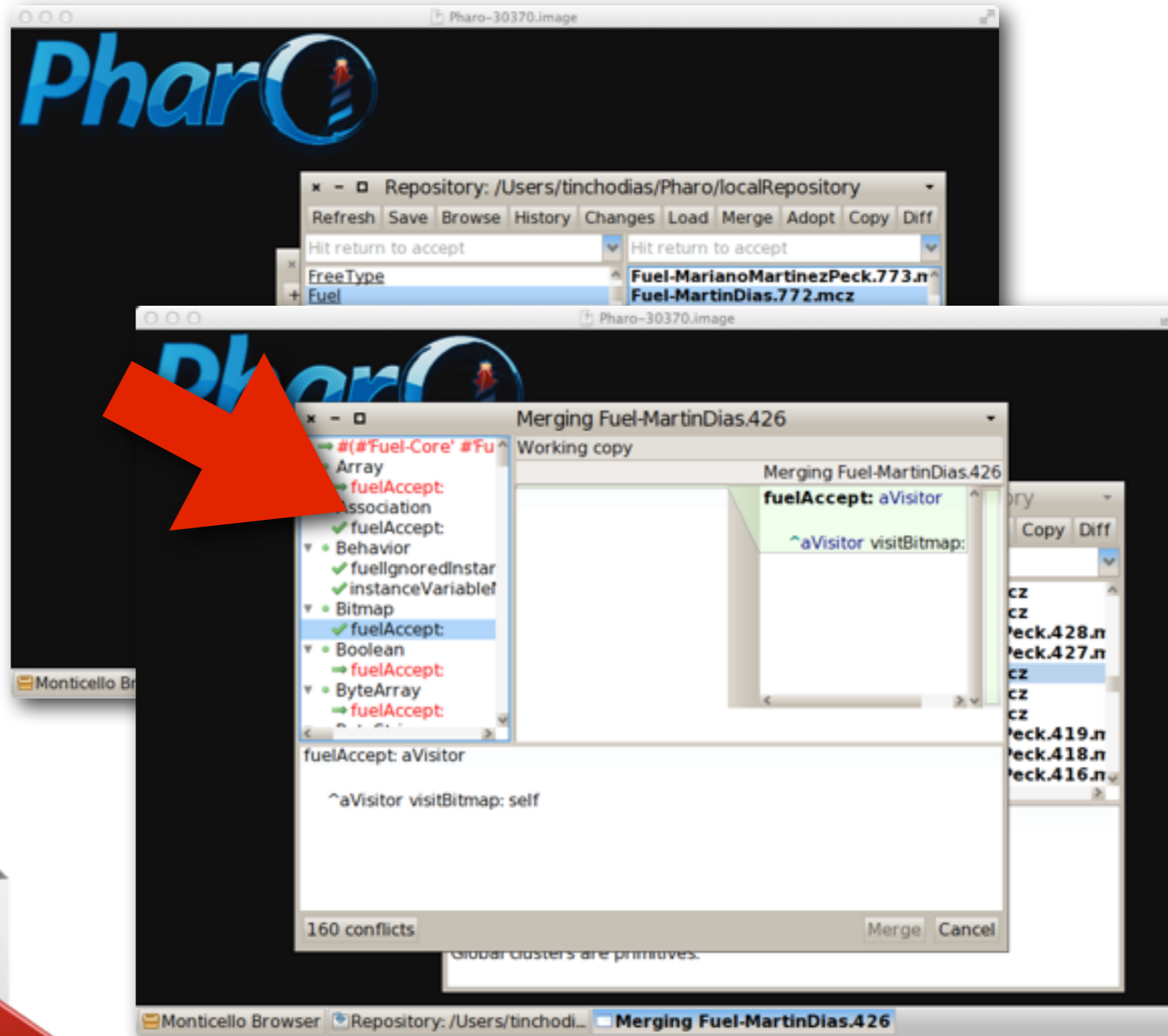
This screenshot is similar to the one above but shows a more advanced state of the Tetris game. The board is filled with various colored tetrominoes. A large red arrow points from the code editor area towards the game window, indicating a transition or focus shift. The 'Test Runner' window shows a green status bar indicating that tests passed.



-  Tetriz.7
-  feature
-  typos



-  Tetris.7
-  feature
-  typos
-   Tetris.8



Repository: /Users/tinchodias/Pharo/localRepository

Refresh Save Browse History Changes Load Merge Adopt Copy Diff

Hit return to accept

FreeType Fuel-MarianoMartinezPeck.773.n
+ Fuel Fuel-MartinDias.772.mcz

Merging Fuel-MartinDias.426






Working copy

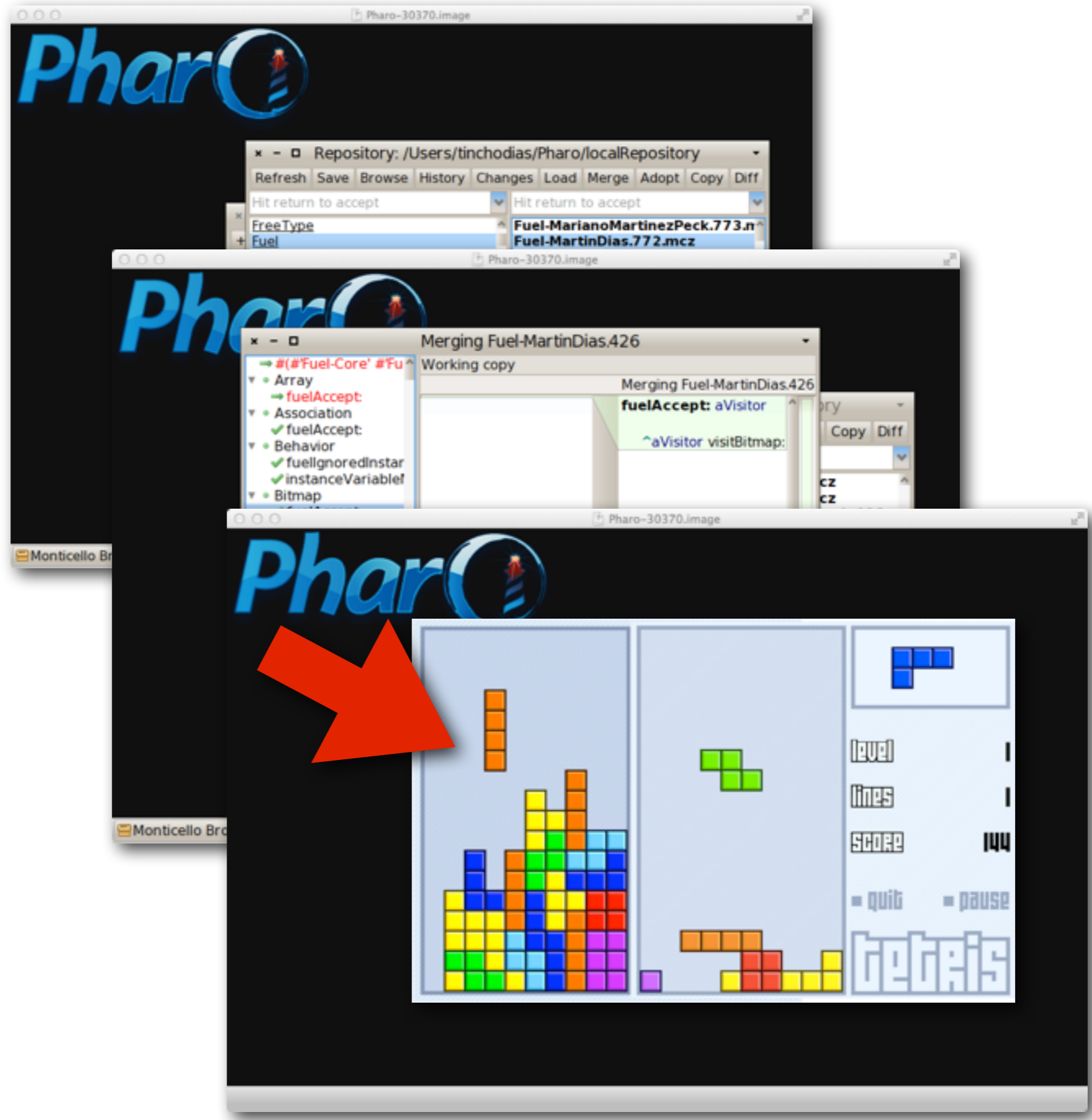
fuelAccept: aVisitor
^aVisitor visitBitmap:

fuelAccept: aVisitor
^aVisitor visitBitmap: self

160 conflicts Merge Cancel



-  Tetris.7
-  feature
-  typos
-   Tetris.8



Pharo

Repository: /Users/tinchodias/Pharo/localRepository

FreeType Fuel

Fuel-MarianoMartinezPeck.773.n Fuel-MartinDias.772.mcz

Merging Fuel-MartinDias.426

Working copy

fuelAccept: aVisitor

aVisitor visitBitmap:

level 1






lines 1

SCORE 144

quit pause

Tetris



-  Tetris.7
-  feature
-  typos
-   Tetris.8



Pharo quit unexpectedly.

Click Reopen to open the application again. Click Report to see more detailed information and send a report to Apple.



- Tetris.7
- feature
- typos
- Tetris.8

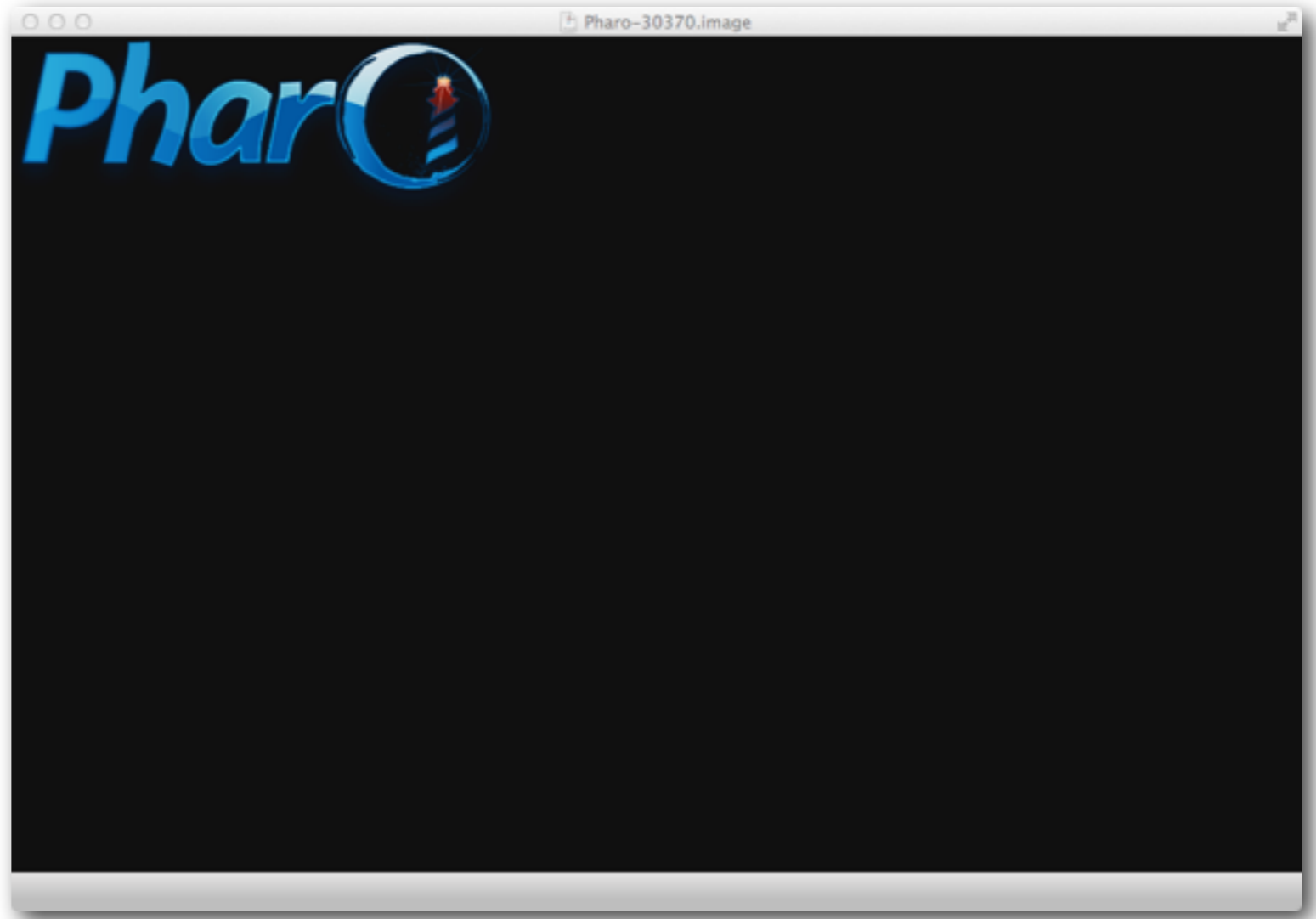


Pharo quit unexpectedly.

Click Reopen to open the application again. Click Report to see more detailed information and send a report to Apple.



- Tetris.7
- feature
- typos
- Tetris.8



Tetris.7

feature

typos

Tetris.8

Pharo-30370-test.image

Pharo

Browse as far back as...

SNAPSHOT----an Array(5 September 2013 11:25:31 pm) Pharo-30370-test.image

SNAPSHOT----an Array(5 September 2013 4:06:58 pm) Pharo-30370-test.image

SNAPSHOT----an Array(5 September 2013 3:20:52 pm) Pharo-30370-test.image

QUIT----an Array(5 September 2013 3:14:32 pm) Pharo.image

SNAPSHOT----an Array(5 September 2013 1:46:38 pm) Pharo-30370-test.image

QUIT----an Array(5 September 2013 1:40:31 pm) Pharo.image

SNAPSHOT----an Array(5 September 2013 10:21:41 am) Pharo-30370-test.image

QUIT----an Array(5 September 2013 10:15:28 am) Pharo.image

SNAPSHOT----an Array(5 September 2013 9:51:42 am) Pharo-30370-test.image

QUIT----an Array(5 September 2013 9:45:34 am) Pharo.image

SNAPSHOT----an Array(3 September 2013 3:00:39 pm) Pharo-30370-test.image






QUIT----an Array(3 September 2013 2:54:23 pm) Pharo.image

SNAPSHOT----an Array(3 September 2013 11:30:14 am) Pharo-30370-test.image

QUIT----an Array(3 September 2013 11:22:46 am) Pharo.image

Cancel

Browse as far back as...

-  Tetris.7
-  feature
-  typos
-   Tetris.8



Pharo-30370.image

Recent changes

```

method: InstructionPrinterTest testInstructions; marcus.denker 8/24/2008 13:19
method: InstVarRefLocatorTest testInstructions; nice 1/5/2010 15:59
method: TimeTest selectorsToBeIgnored; brp 1/30/2005 09:09
method: TimeTest testHumanWordsForSecondsAgo; brp 1/21/2004 18:52
method: TimeTest testHumanWordsForSecondsAgoWithDays; brp 1/21/2004 18:52
method: TimeTest testSqueakInquiries; gk 8/31/2006 00:47
method: FloatTest testDegreeCos; nice 10/31/2010 21:50
method: FloatTest testDegreeSin; nice 10/31/2010 21:51
method: FloatTest testHash; nice 6/11/2009 01:36
method: FloatTest testPrintPaddedWithTo; nice 3/27/2011 19:04
method: FloatTest testStoreOn; jb 7/1/2011 10:52
method: BehaviorTest testAllMethods; AlexandreBergel 10/28/2009 11:02
method: BehaviorTest testBehaviorSubclasses; sd 3/14/2004 18:11
method: BehaviorTest testChange; ar 9/27/2005 21:43
method: BehaviorTest testComposedBy; PavelKrivanek 11/8/2012 20:57
method: BehaviorTest testFormalParameterNames; nice 12/25/2009 19:10
method: ClassBuilderChangeClassTypeTest baseClassName; BG 1/5/2004 22:49
method: ClassBuilderChangeClassTypeTest cleanup; BG 1/5/2004 22:51
method: ClassBuilderFormatTests class isUnitTest; JorgeRessia 3/16/2010 20:23
          
```

Select all Deselect all Select conflicts File in selections diffs prettyDiffs

Recent changes



 Tetris.7



  Tetris.8





just a list
of events

 Tetris.7



  Tetris.8

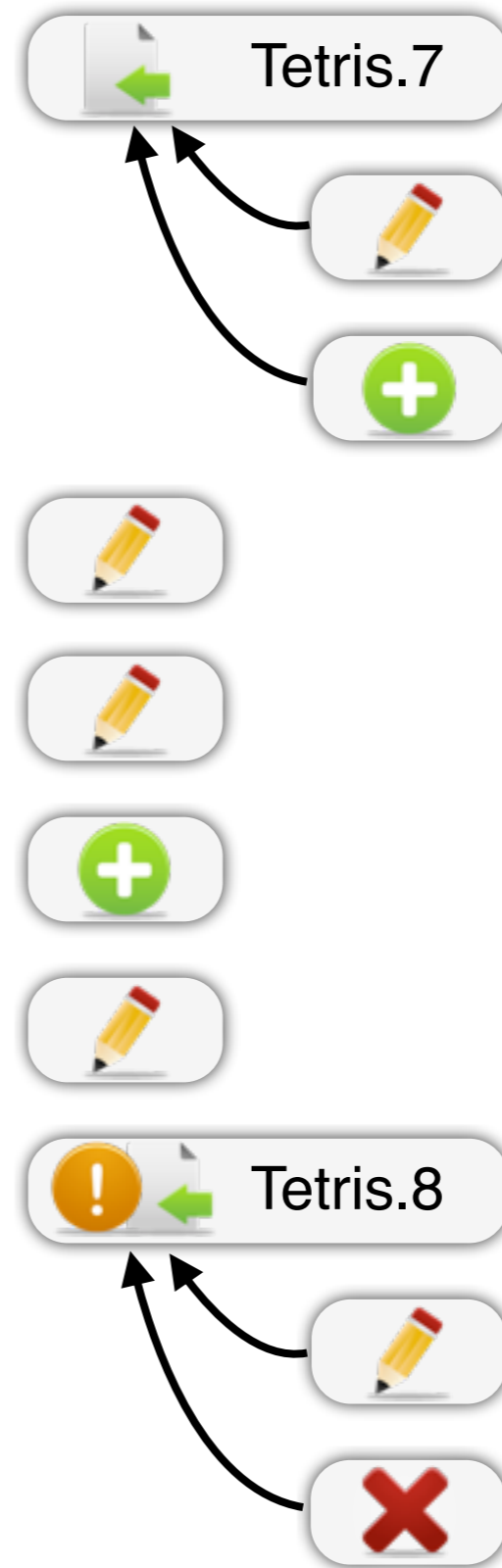




just a list
of events

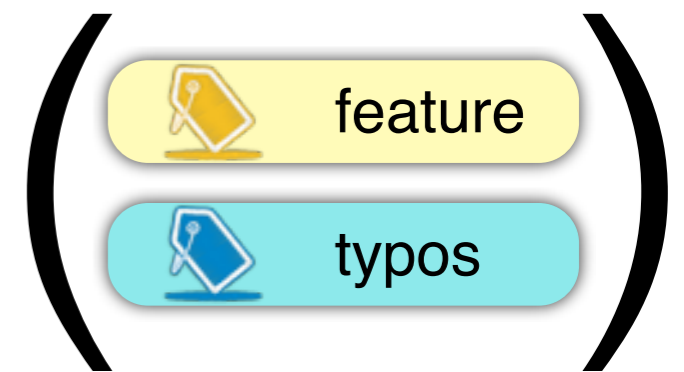
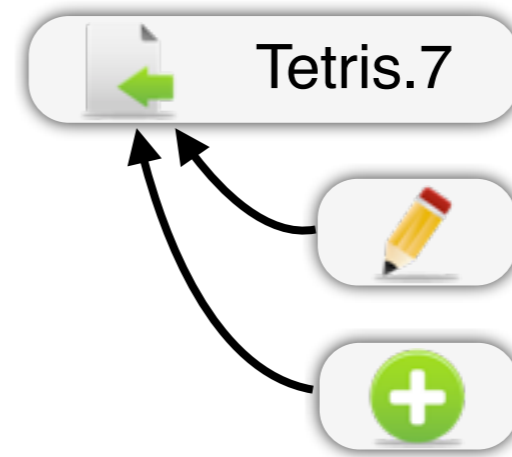


triggering

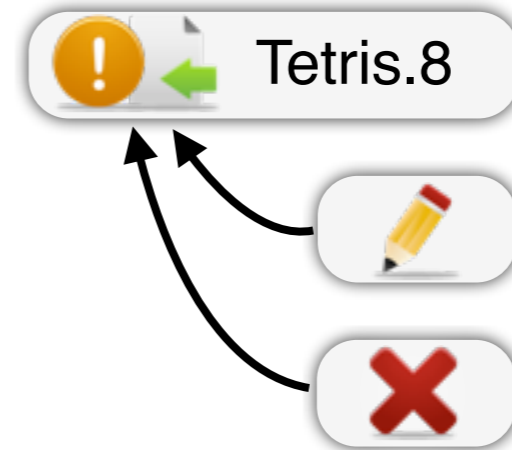




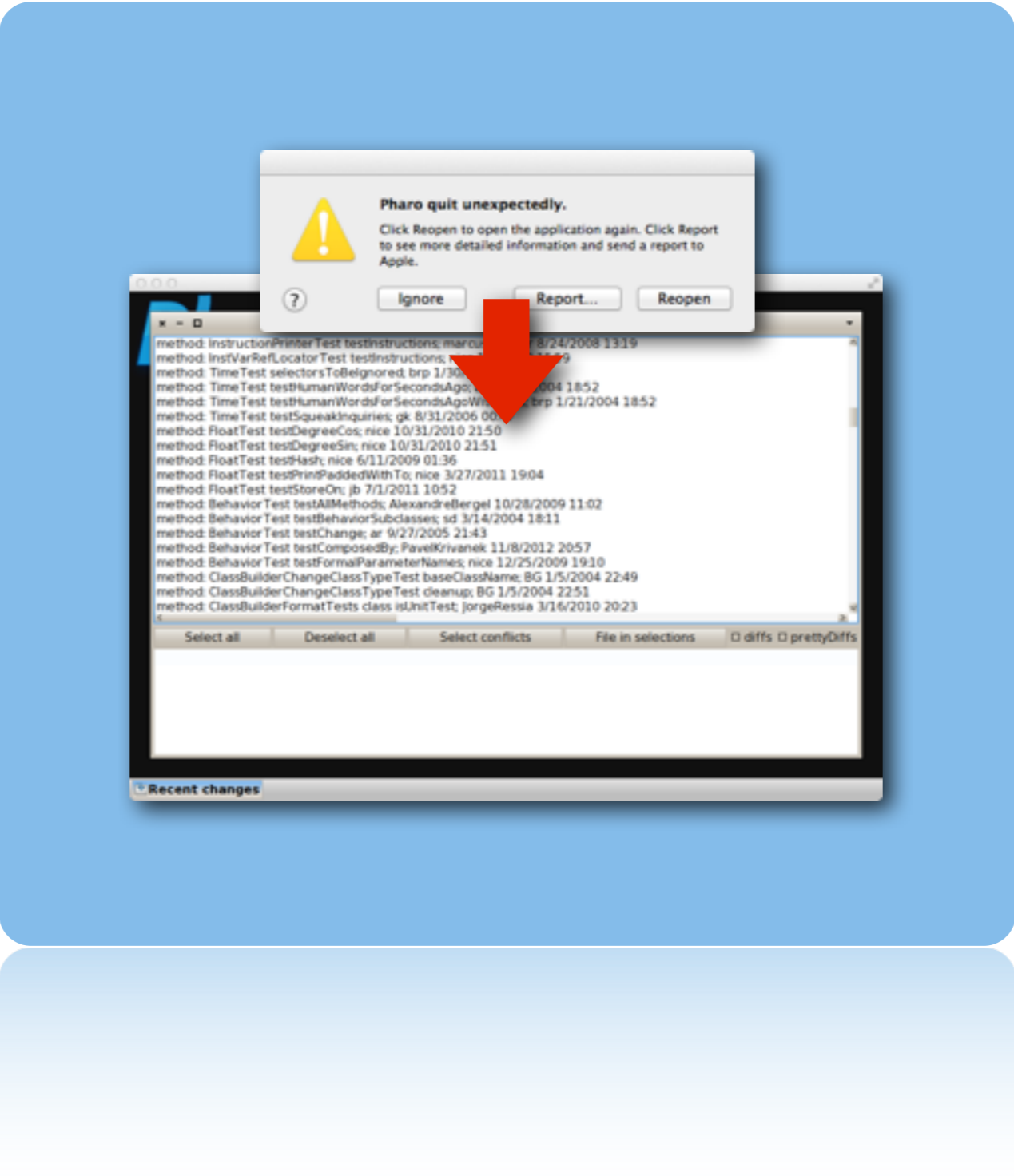
just a list of events

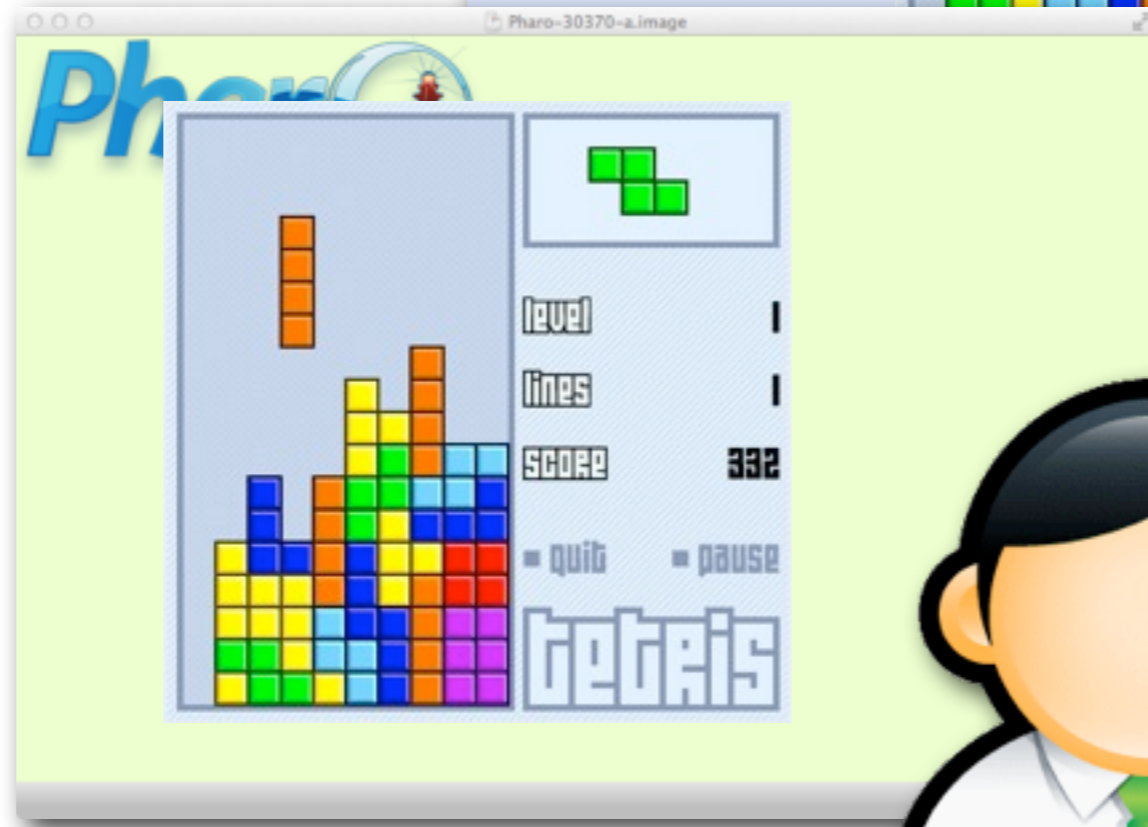
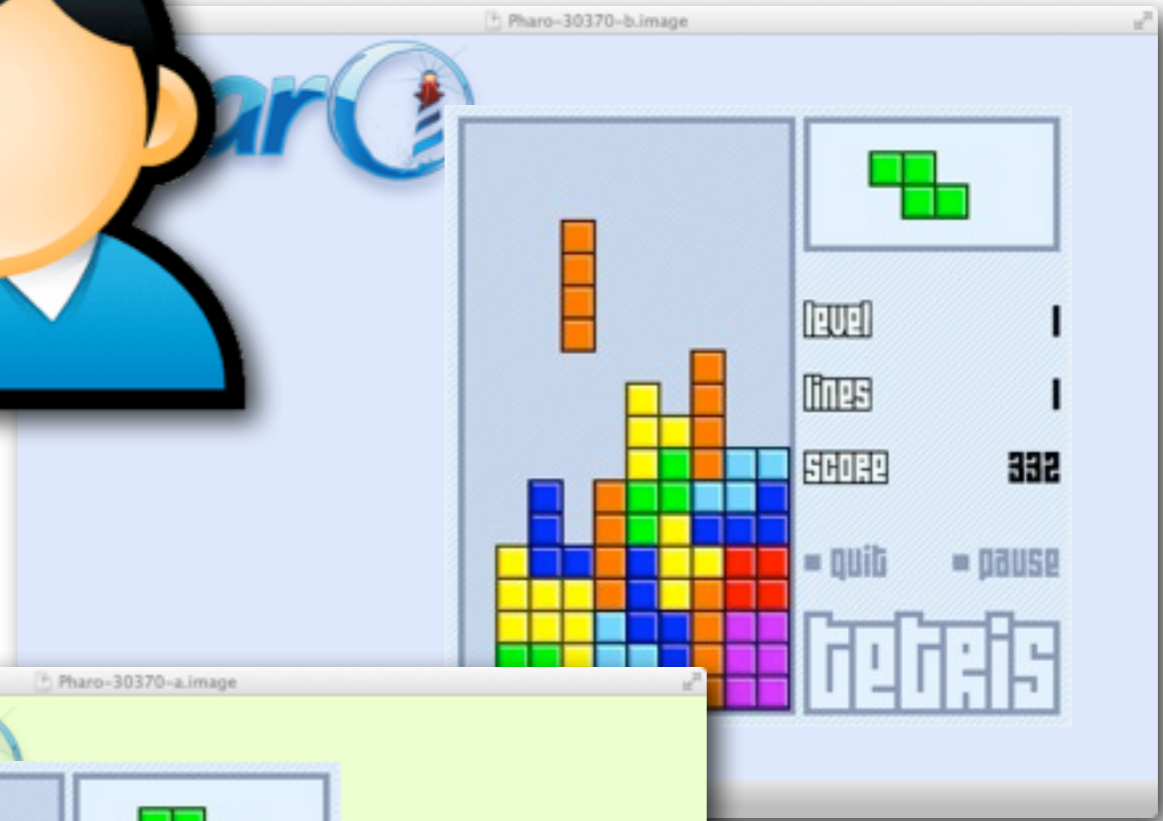
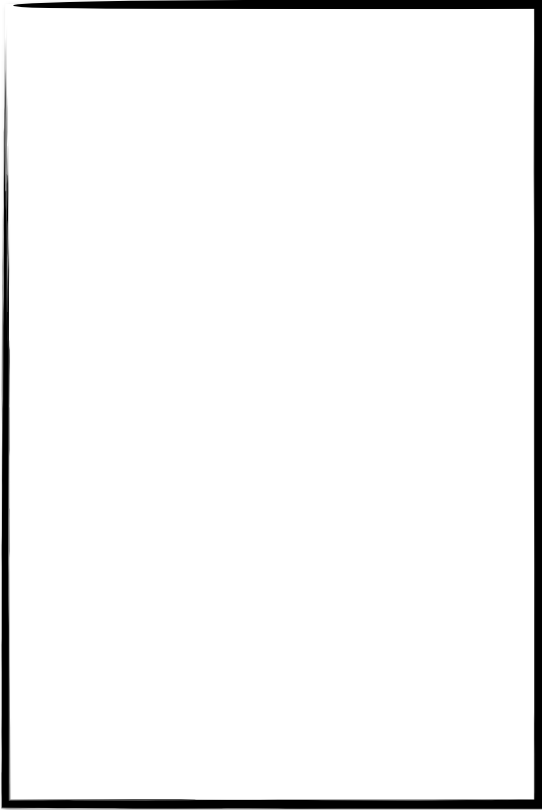


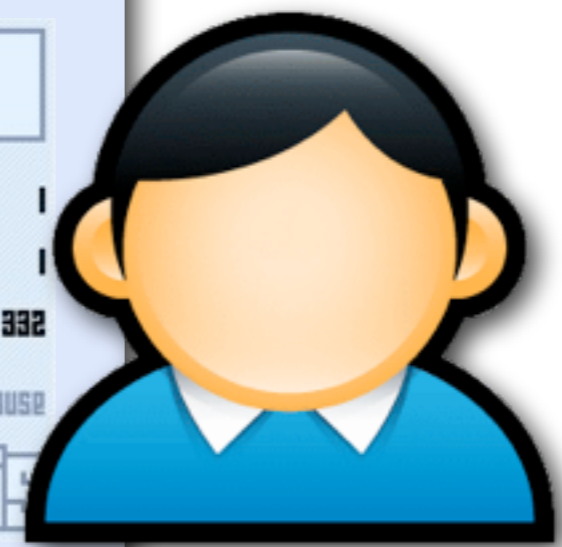
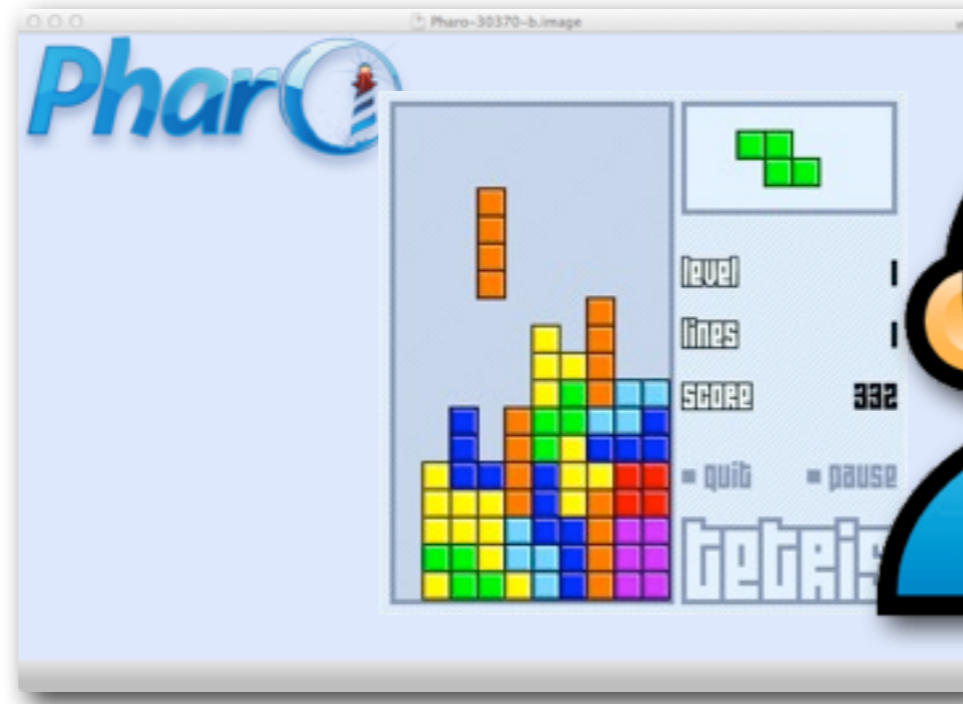
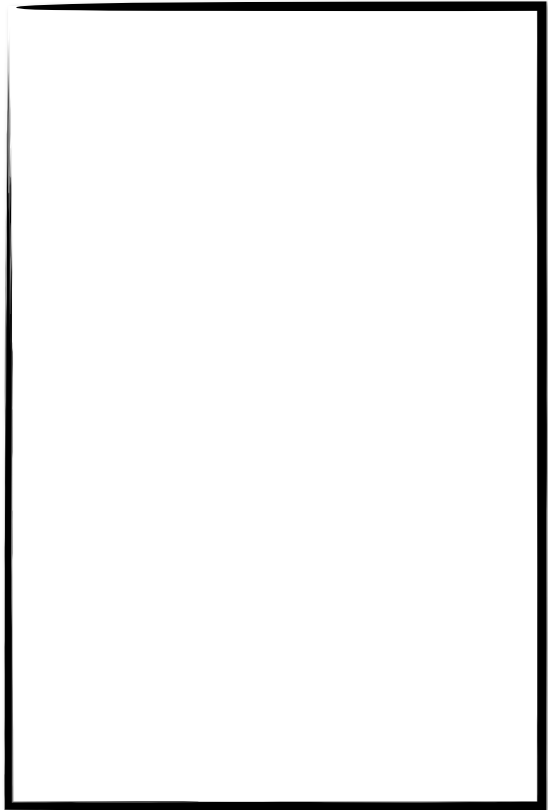
triggering



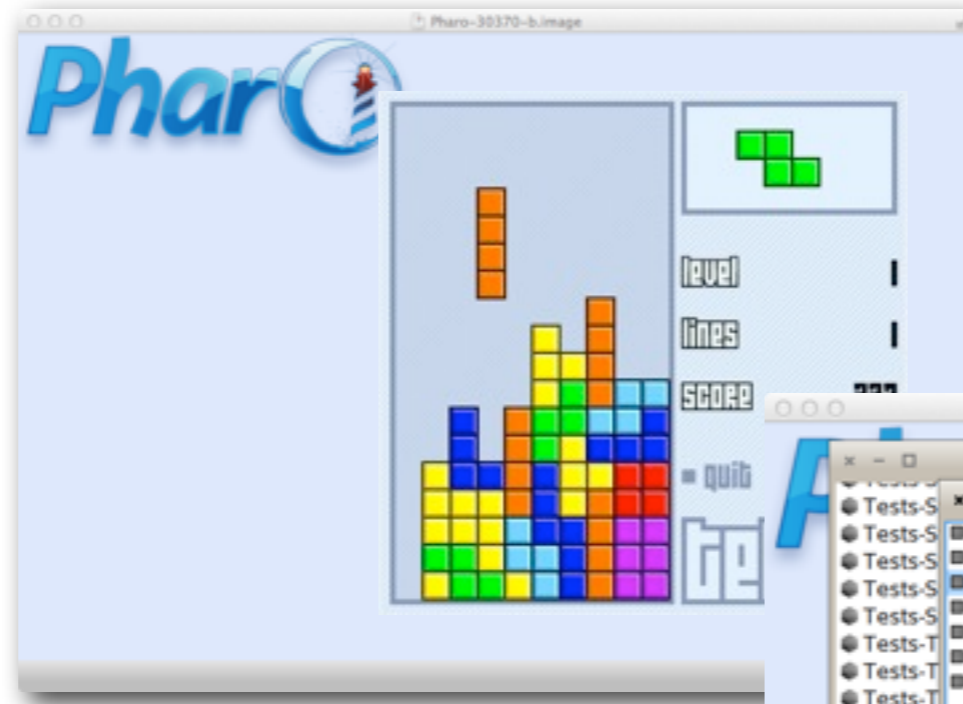
custom marks







#old → #new



TetrisBlock>>#moveDeltaX:deltaY:deltaAngl:

Changes Browser

- TetrisBlock>>moveDeltaX:deltaY:deltaAngle:
- TetrisBoard>>rotateClockWise
- TetrisBoard>>rotateAntiClockWise
- TetrisBoard>>moveLeft
- TetrisBoard>>moveRight
- TetrisBlock>>dropByOne
- Remove TetrisBlock>>#moveDeltaX:deltaY:deltaAngl:

```
rotateAntiClockWise
| delta
delta :
(shape
(bo
].
baseC
angle :
self po
^ true
```

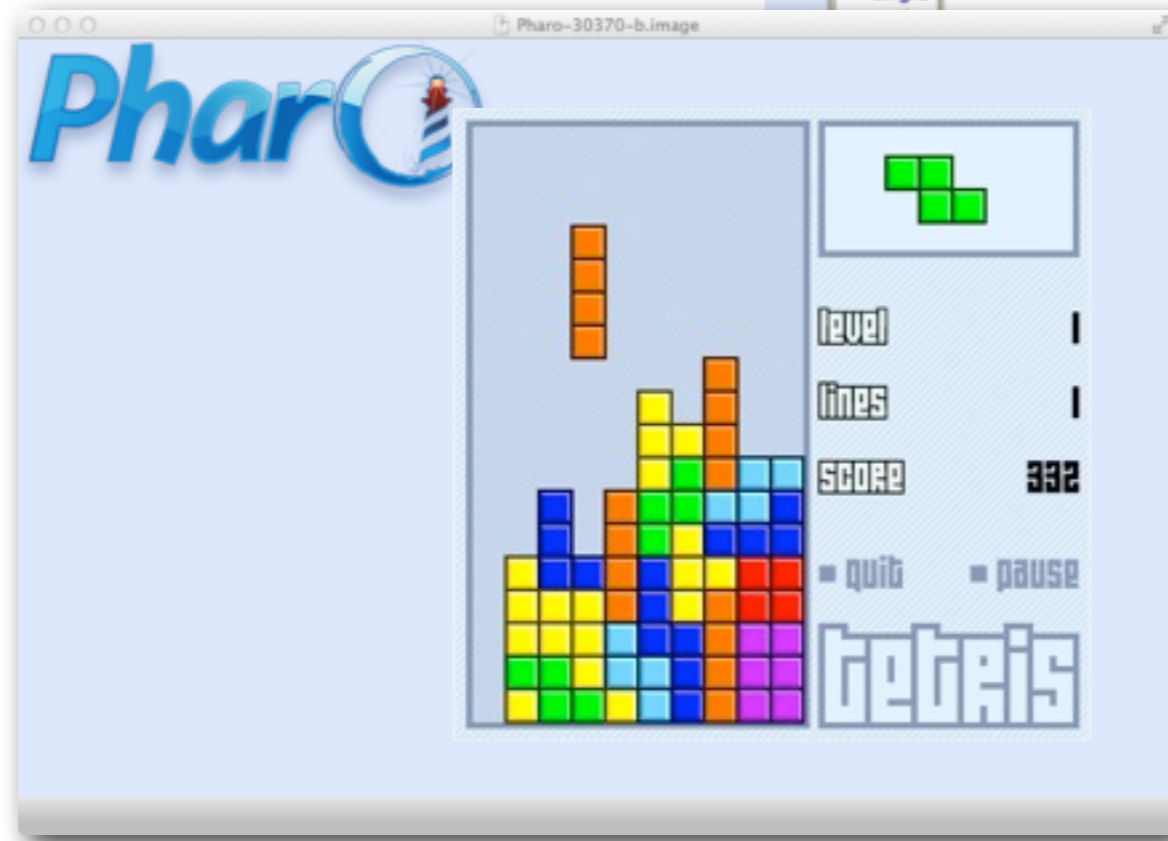
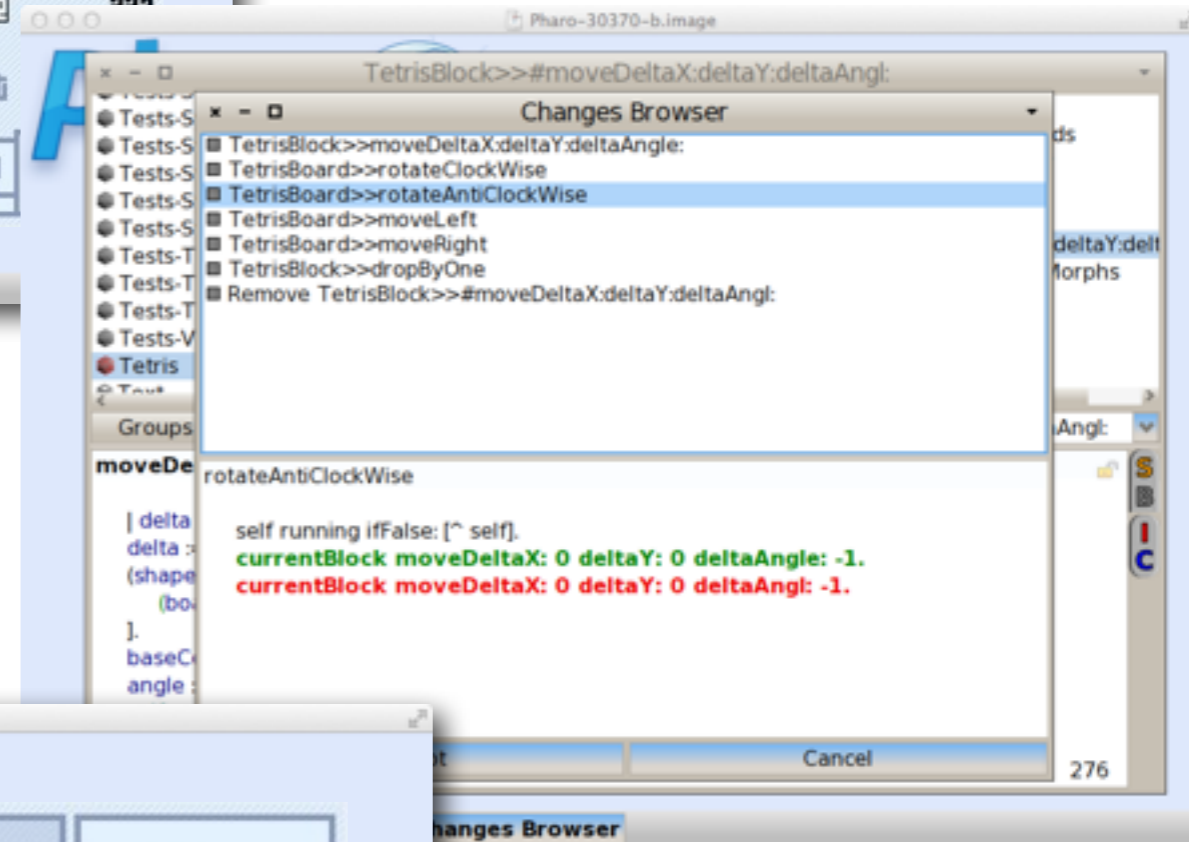
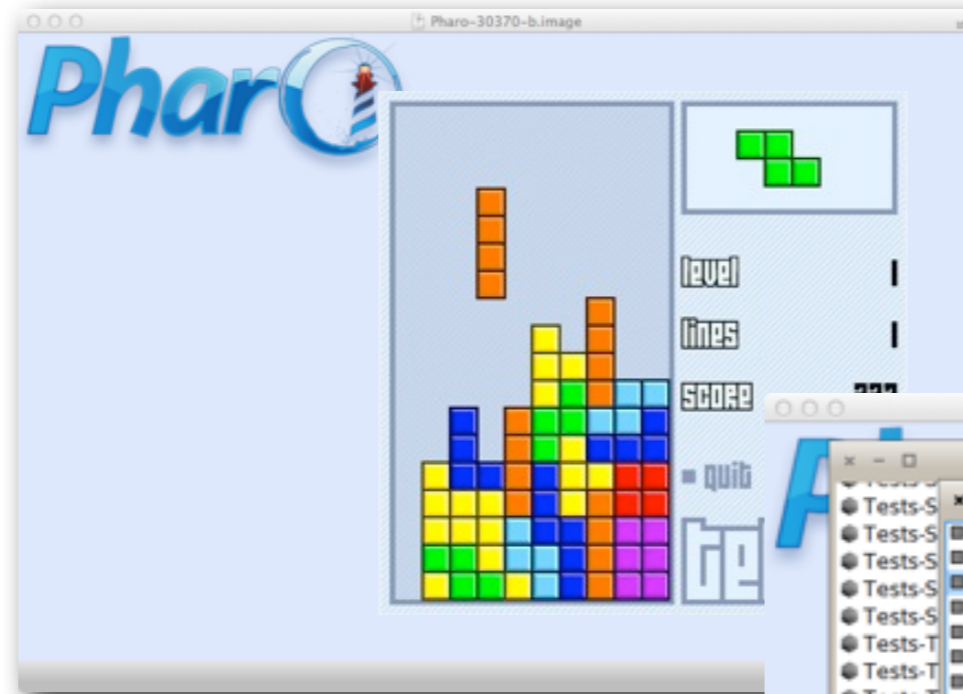
self running ifFalse: [^ self].
currentBlock moveDeltaX: 0 deltaY: 0 deltaAngle: -1.
currentBlock moveDeltaX: 0 deltaY: 0 deltaAngle: -1.

Accept Cancel 276

TetrisBlock>>#moveDeltaX:de... Changes Browser

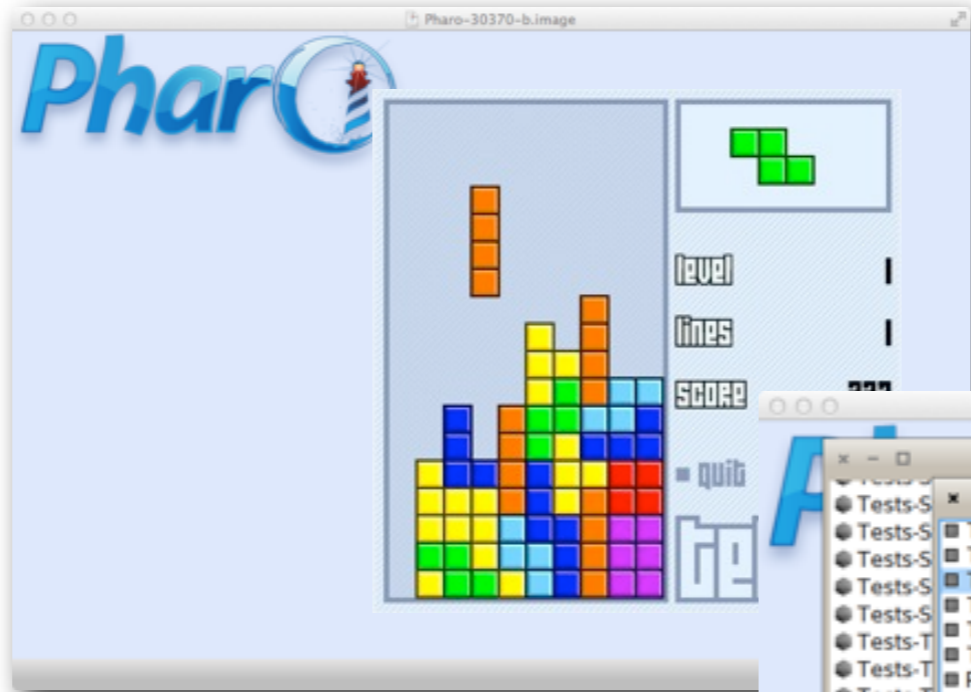


#old → #new



#old → #new

rename.cs



TetrisBlock>>#moveDeltaX:deltaY:deltaAngl:

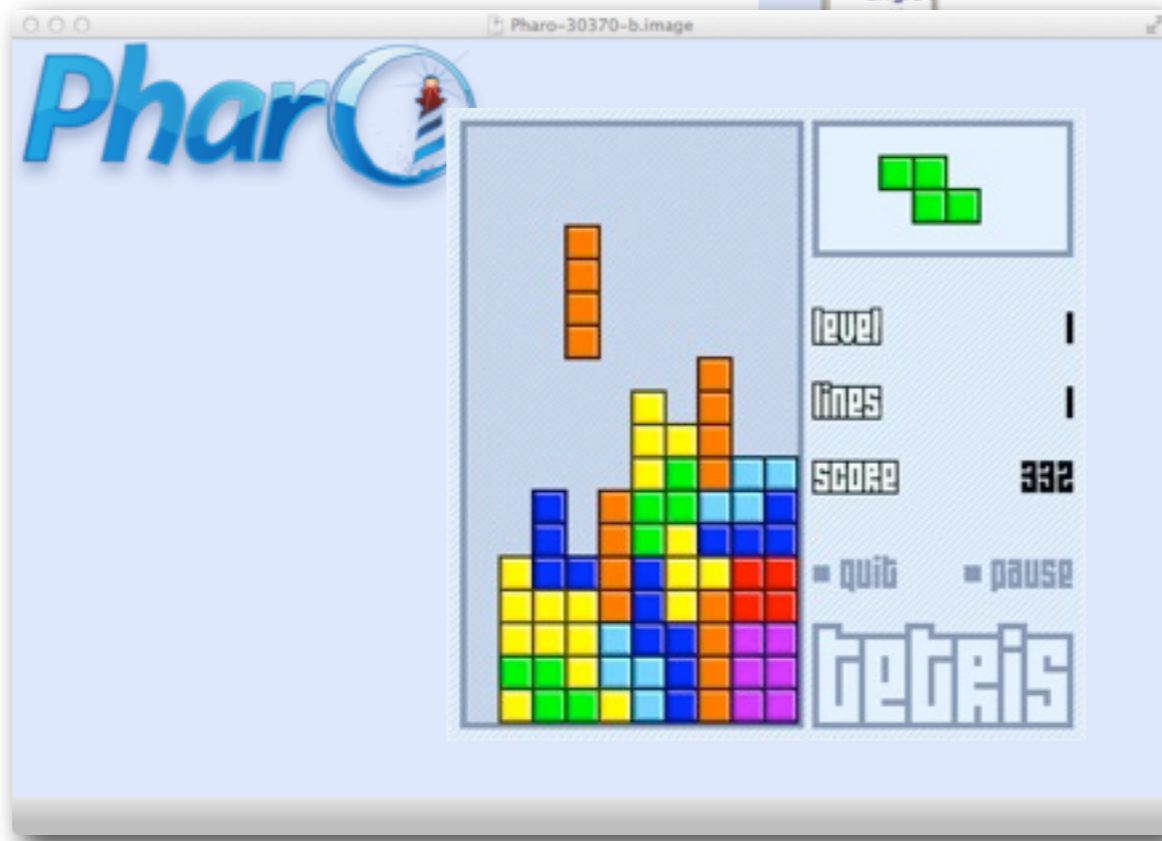
Changes Browser

- TetrisBlock>>moveDeltaX:deltaY:deltaAngle:
- TetrisBoard>>rotateClockWise
- TetrisBoard>>rotateAntiClockWise
- TetrisBoard>>moveLeft
- TetrisBoard>>moveRight
- TetrisBlock>>dropByOne
- Remove TetrisBlock>>#moveDeltaX:deltaY:deltaAngl:

```

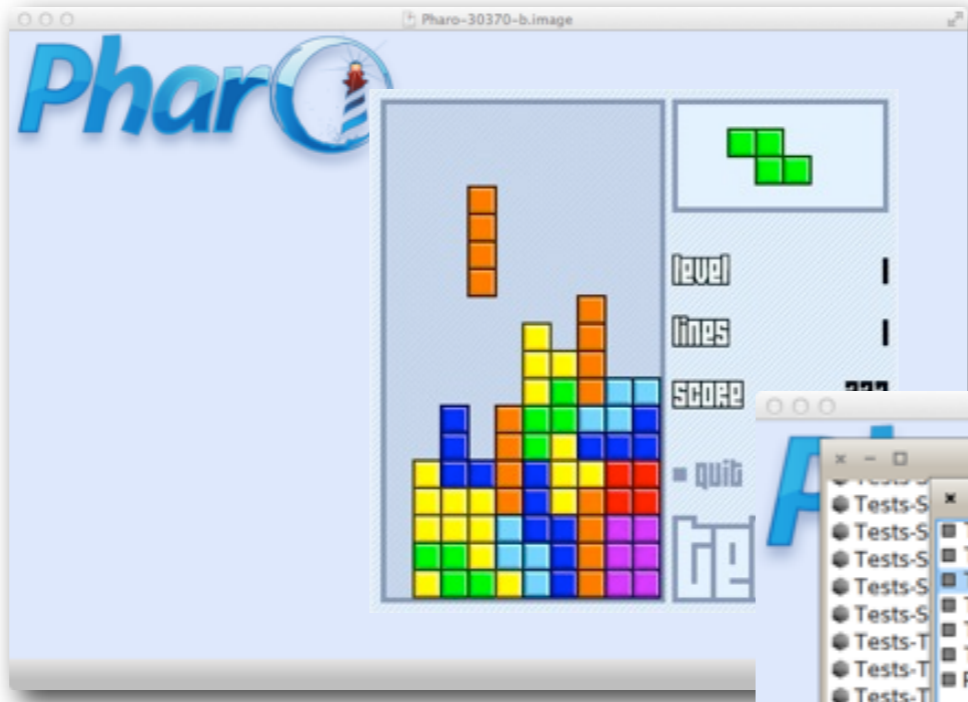
self running ifFalse: [^ self].
currentBlock moveDeltaX: 0 deltaY: 0 deltaAngle: -1.
currentBlock moveDeltaX: 0 deltaY: 0 deltaAngle: -1.

```



#old → #new

rename.cs



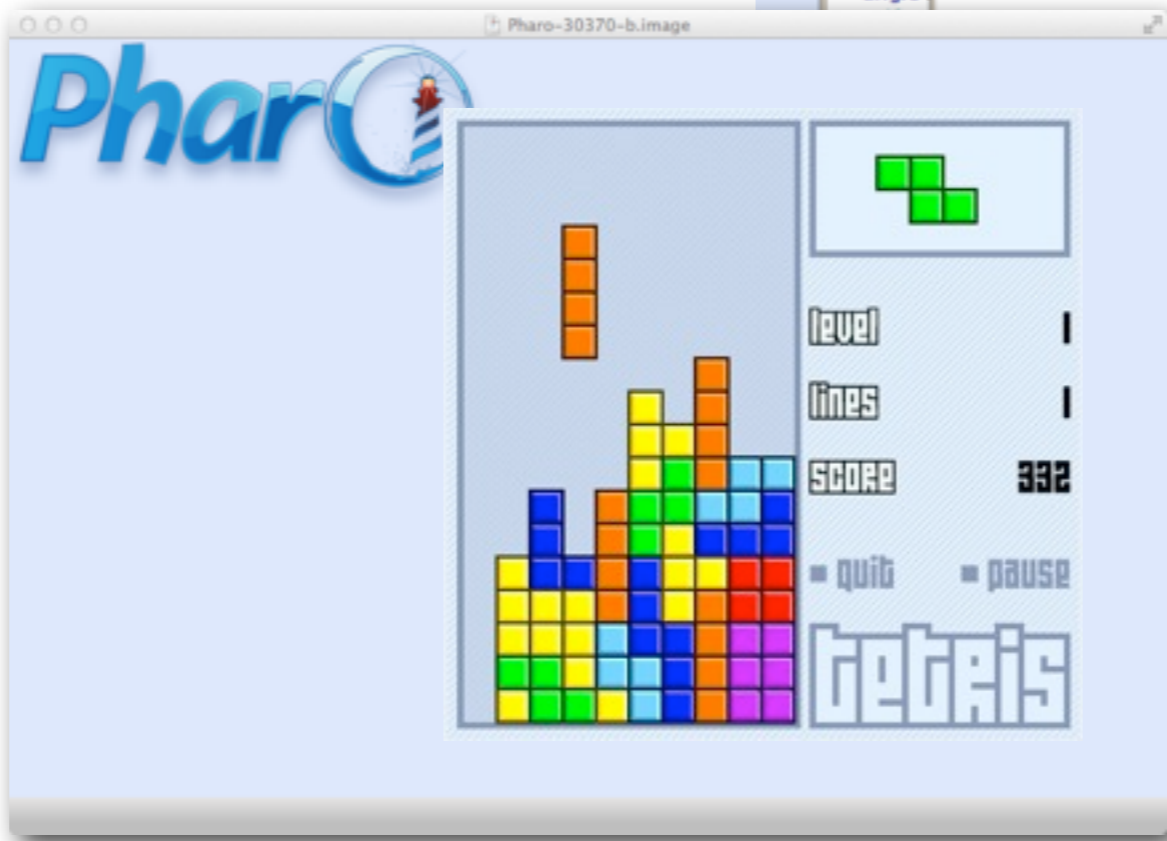
Changes Browser

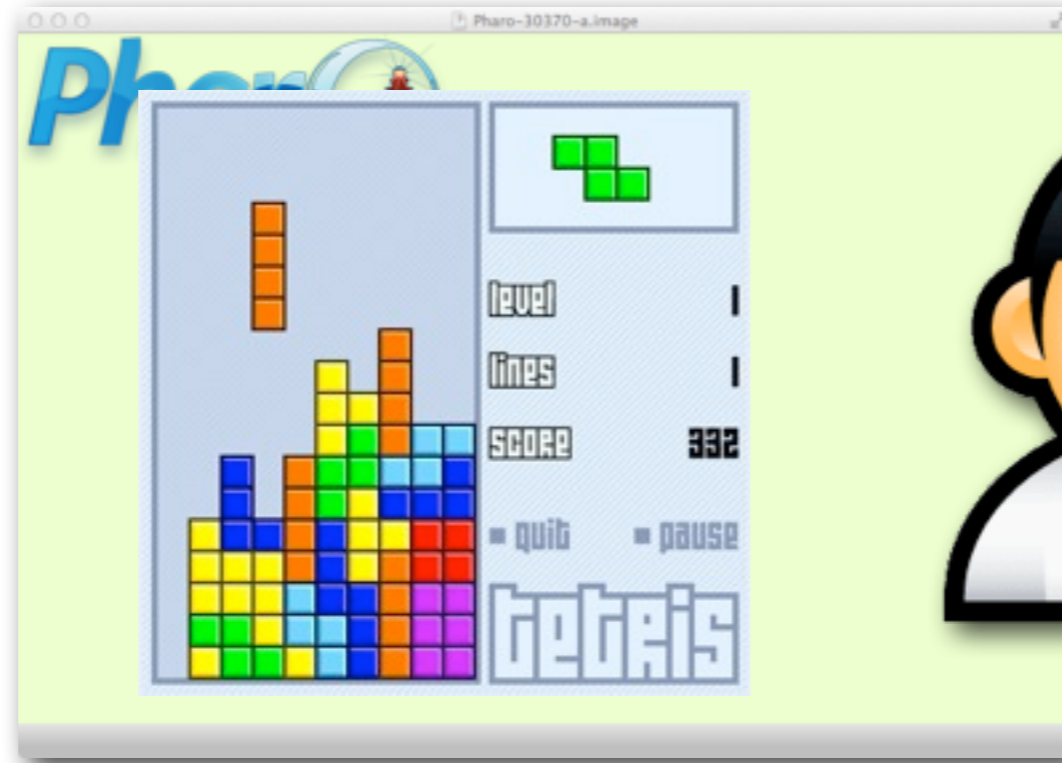
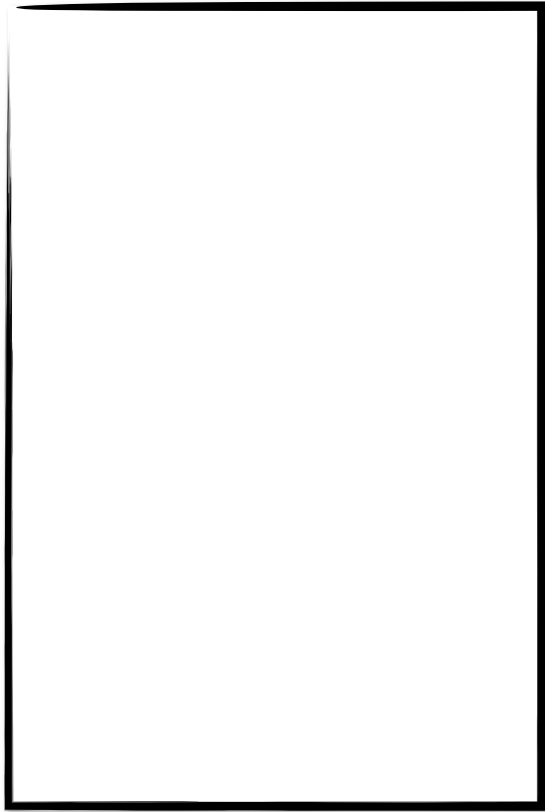
- TetrisBlock>>#moveDeltaX:deltaY:deltaAngl:
- TetrisBoard>>rotateClockWise
- TetrisBoard>>rotateAntiClockWise
- TetrisBoard>>moveLeft
- TetrisBoard>>moveRight
- TetrisBlock>>dropByOne
- Remove TetrisBlock>>#moveDeltaX:deltaY:deltaAngl:

```

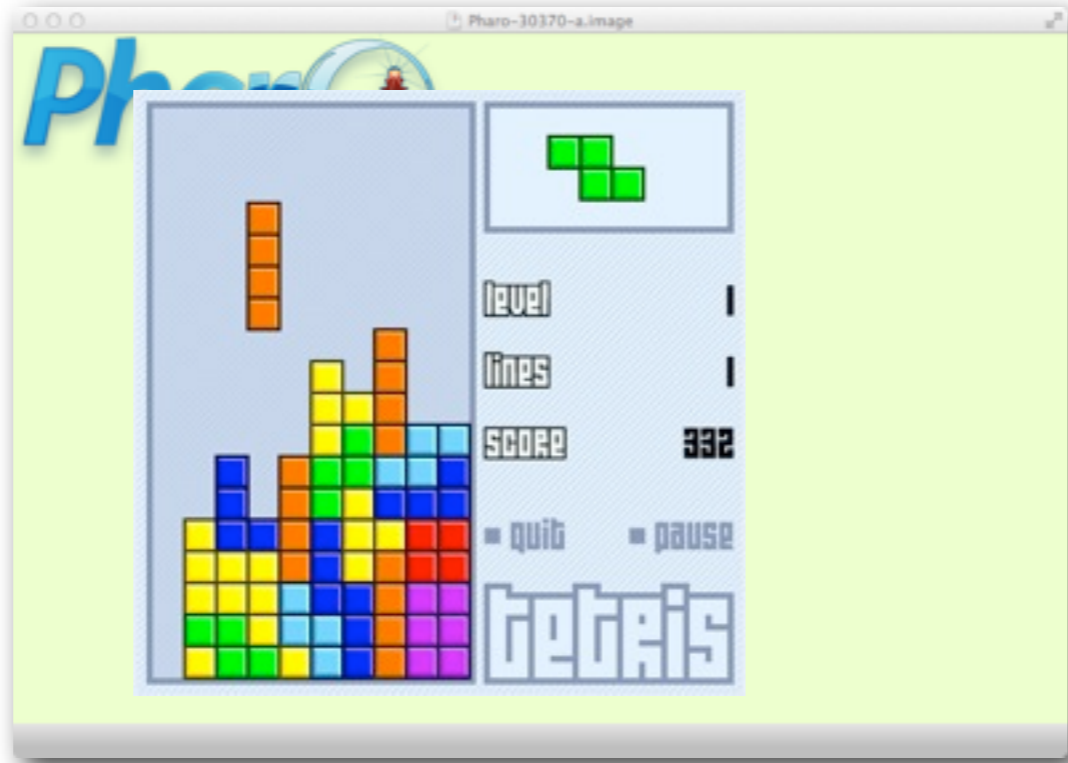
self running ifFalse: [^ self].
currentBlock moveDeltaX: 0 deltaY: 0 deltaAngle: -1.
currentBlock moveDeltaX: 0 deltaY: 0 deltaAngle: -1.

```

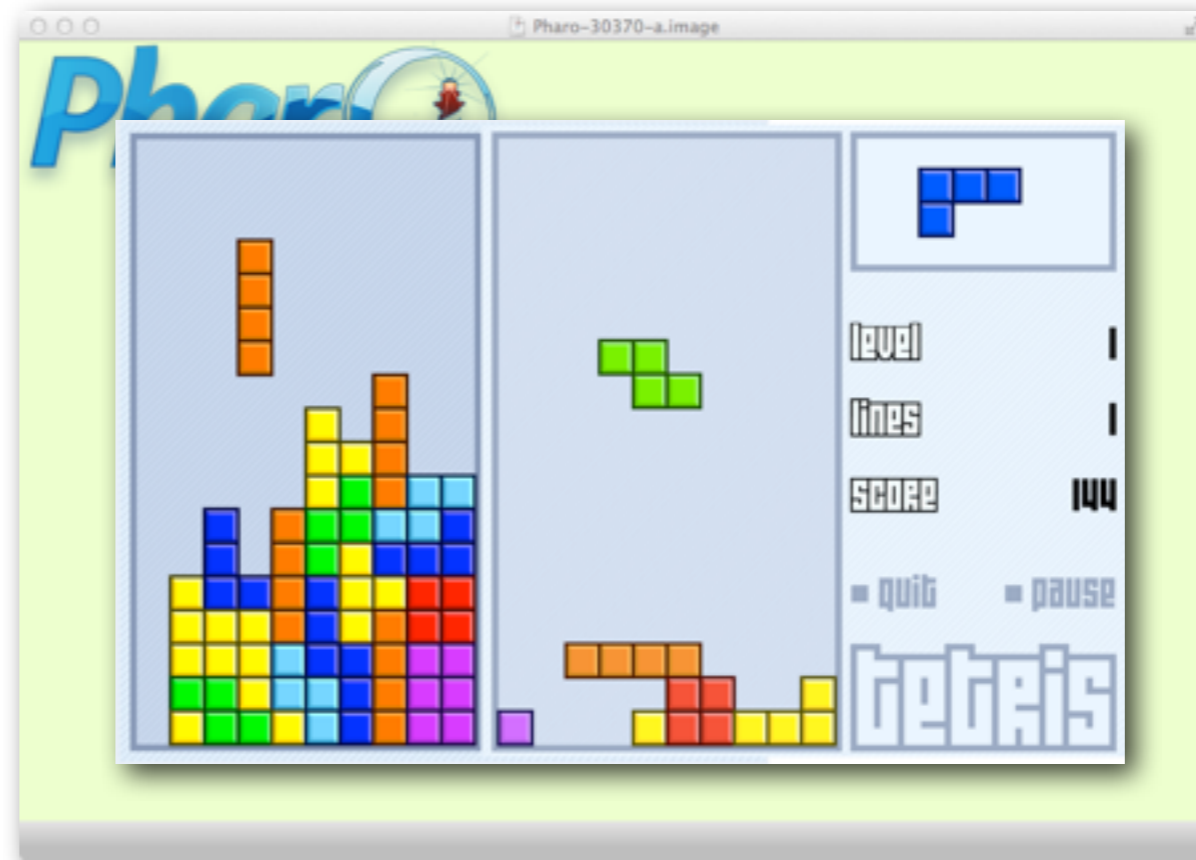
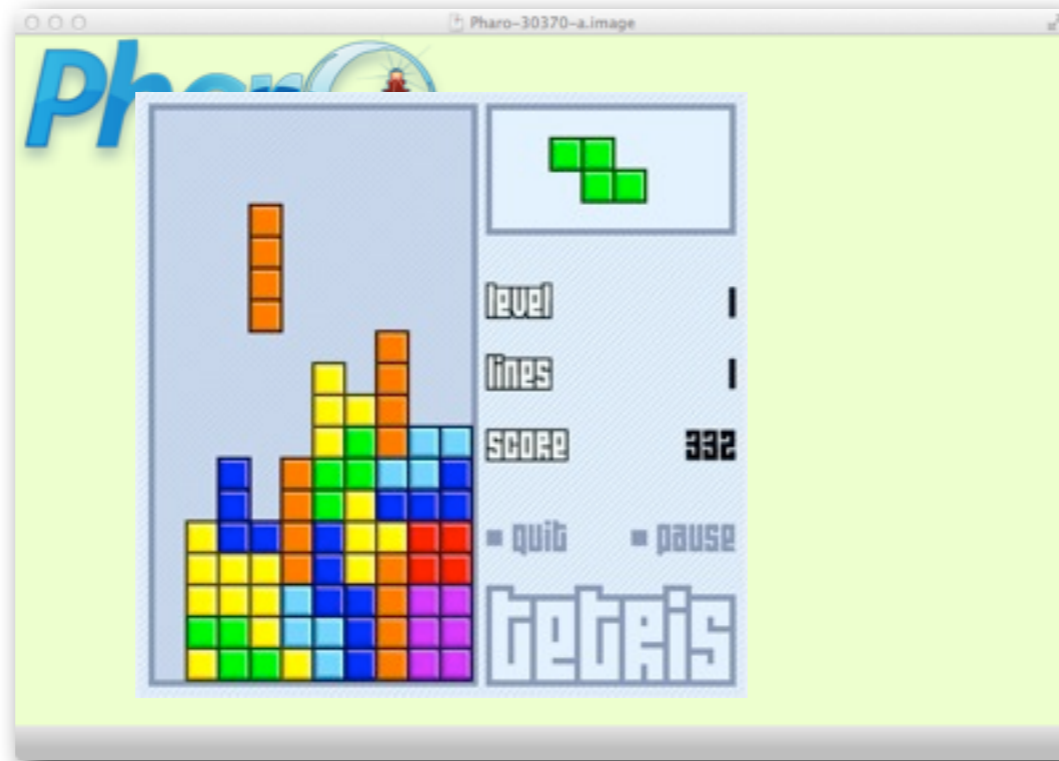


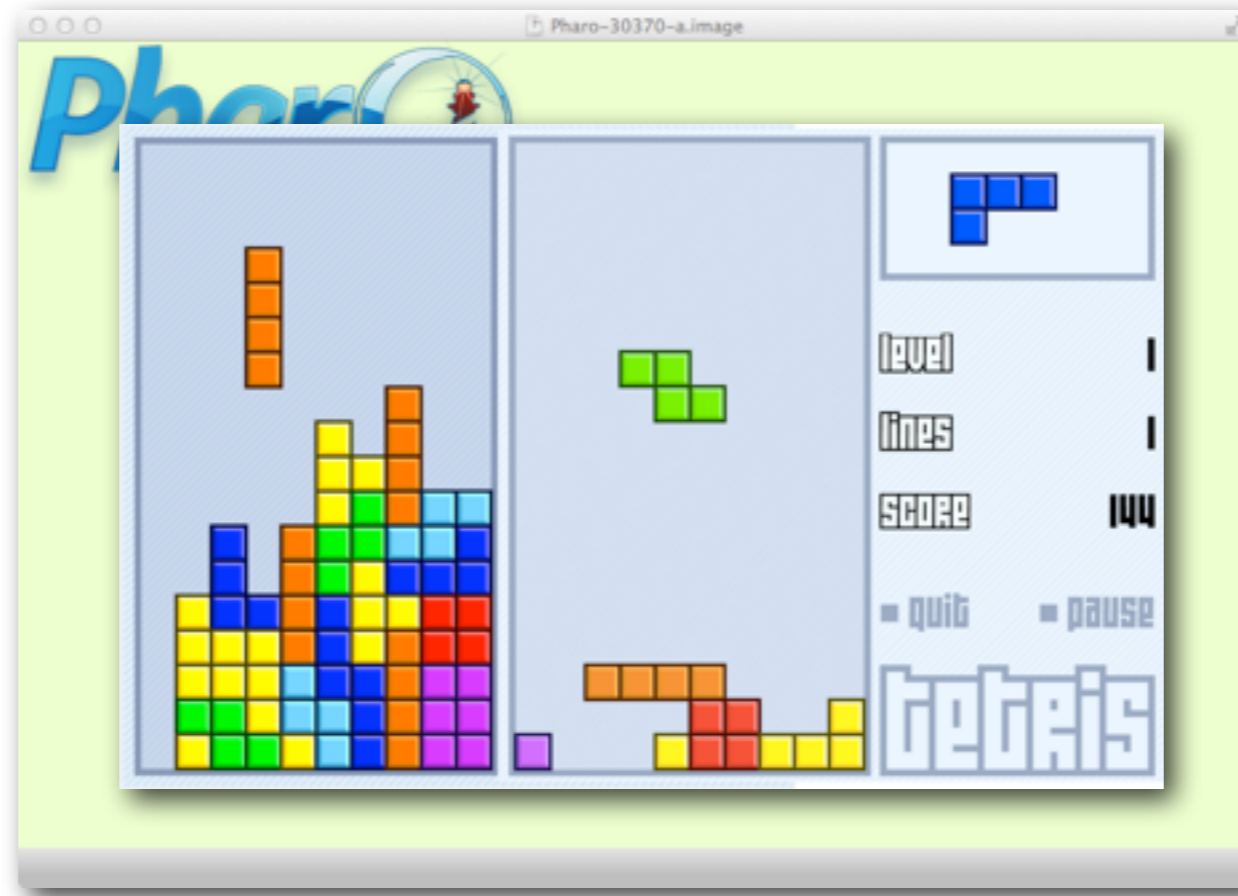
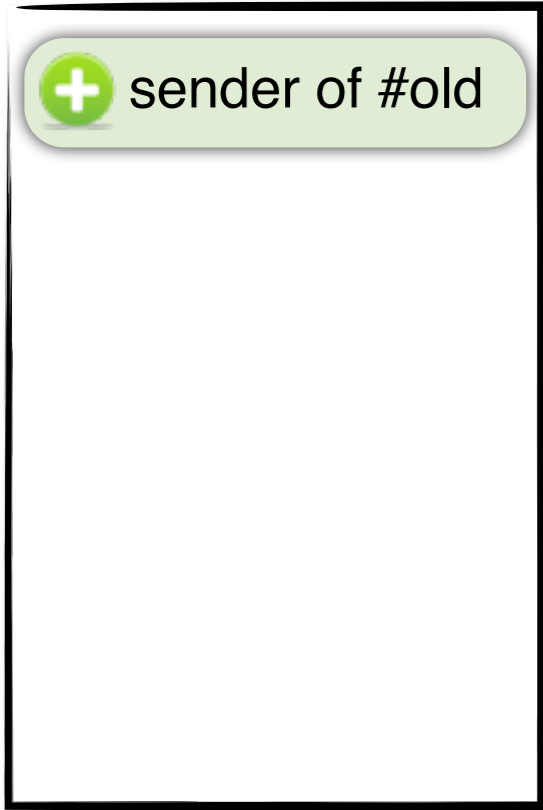


+ sender of #old



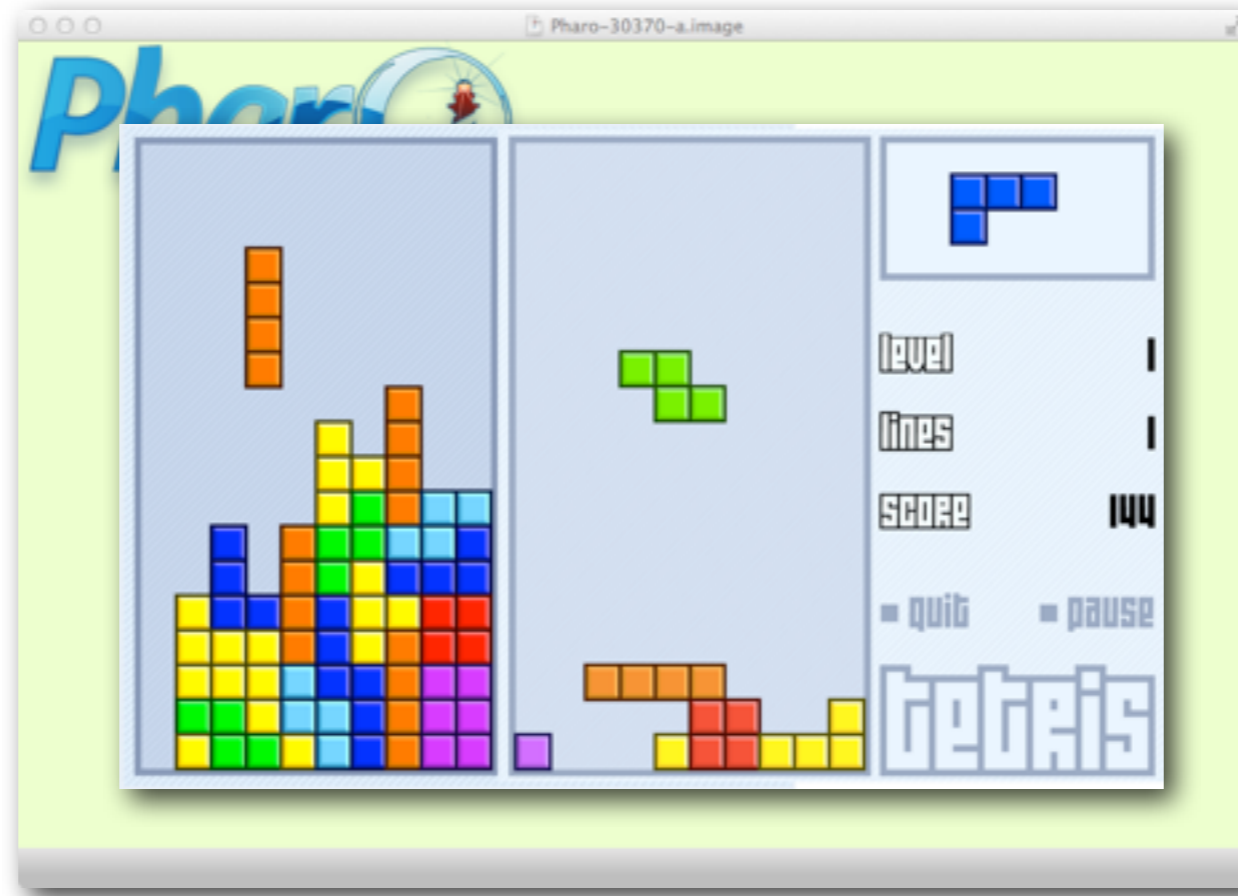
+ sender of #old





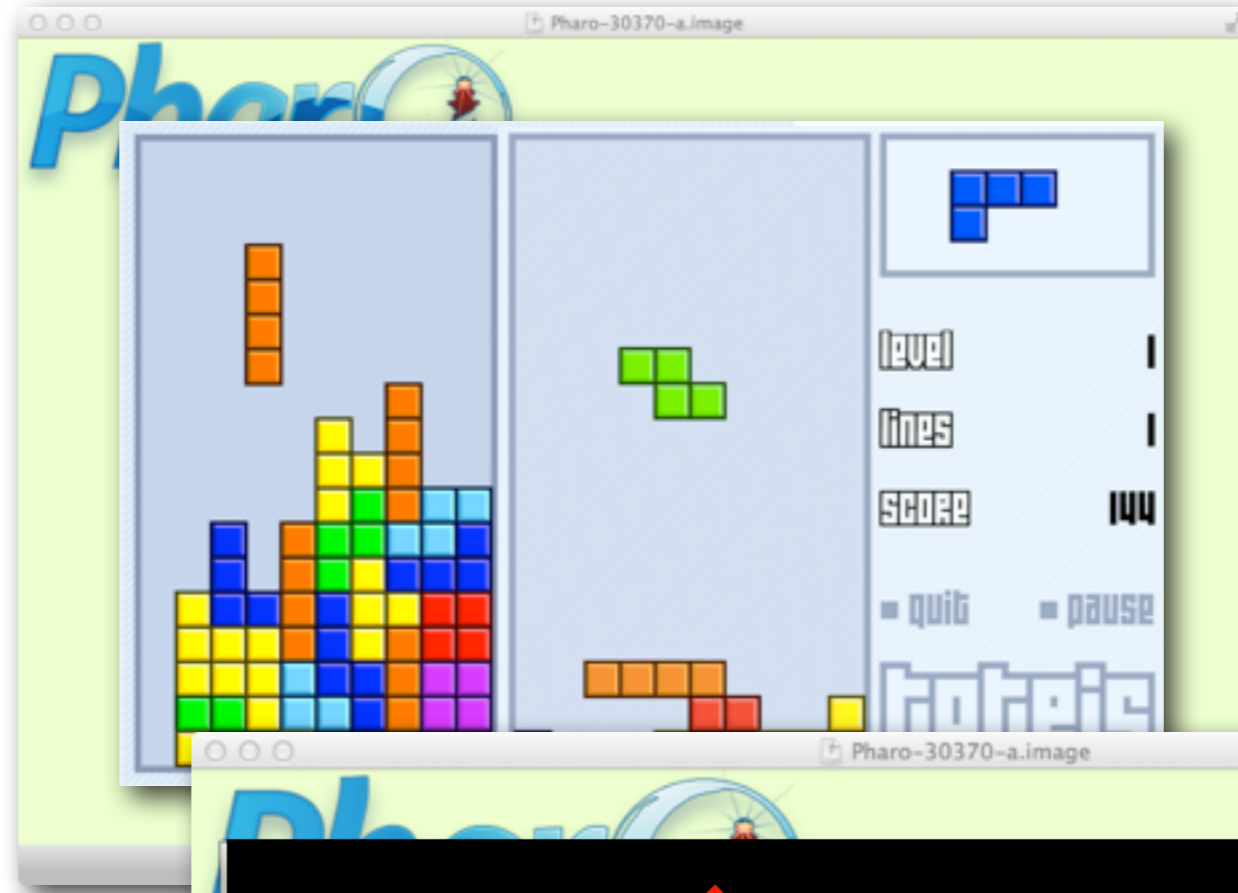
+ sender of #old

← rename.cs



+ sender of #old

← rename.cs



MessageNotUnderstood:
#old

Workspace MessageNotUnderstood: Tetri...





sender of #old



rename.cs

#old  #new



sender of #old



#new



#old



just a list of
concrete
changes



sender of #old



rename.cs

#old  #new



sender of #old



#new

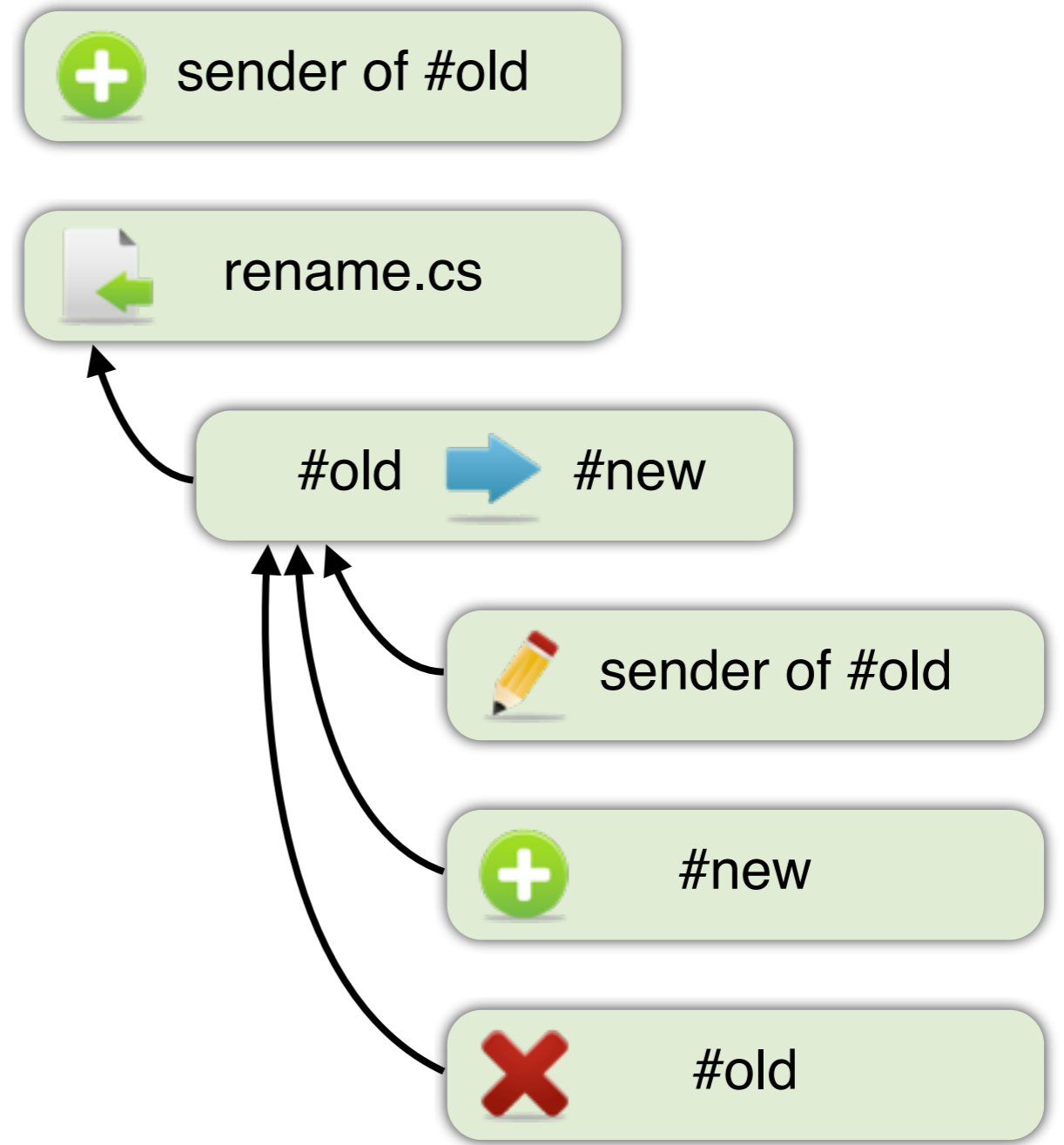


#old

just a list of
concrete
changes



triggering



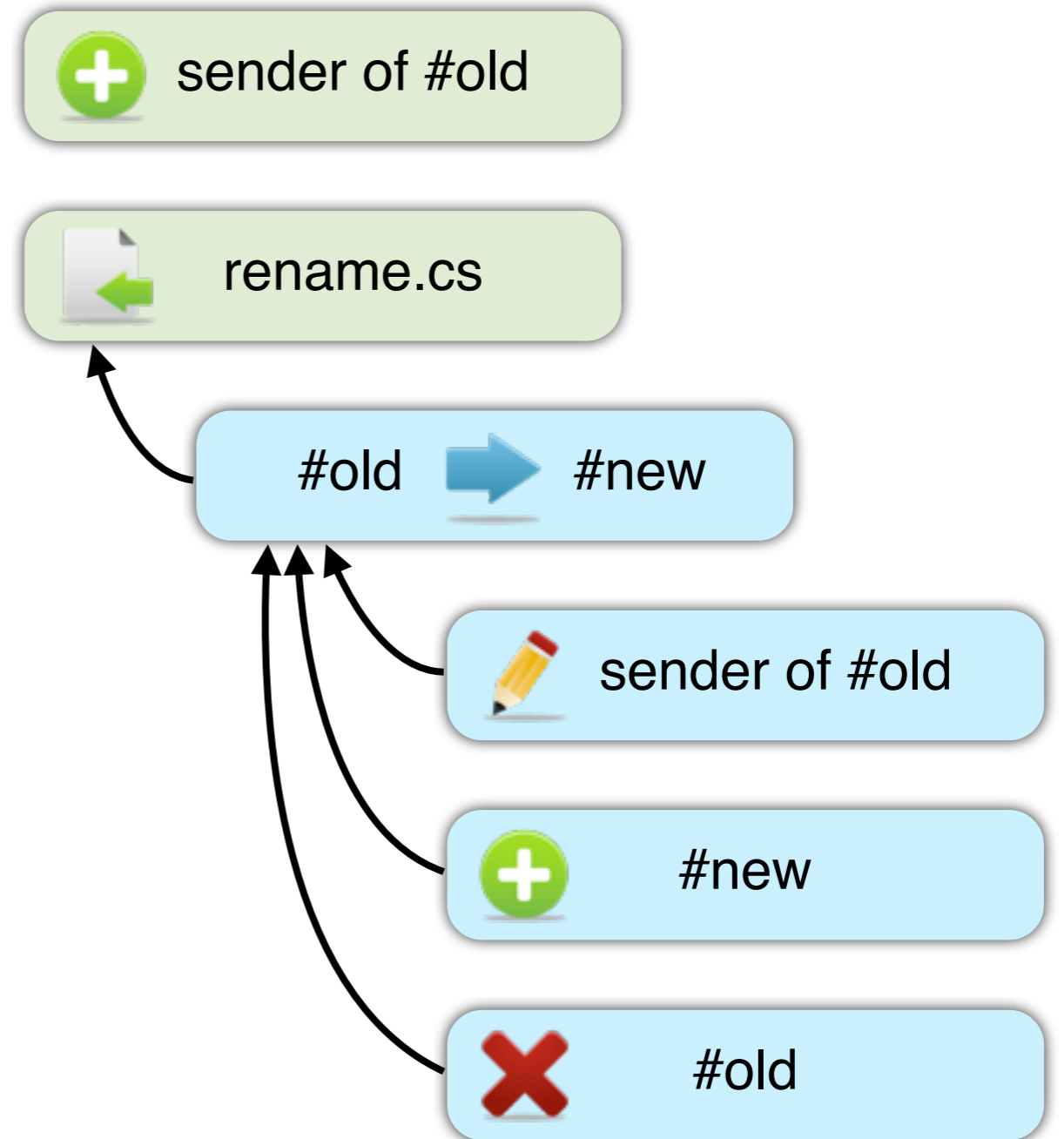
just a list of
concrete
changes



triggering



authors



just a list of
concrete
changes



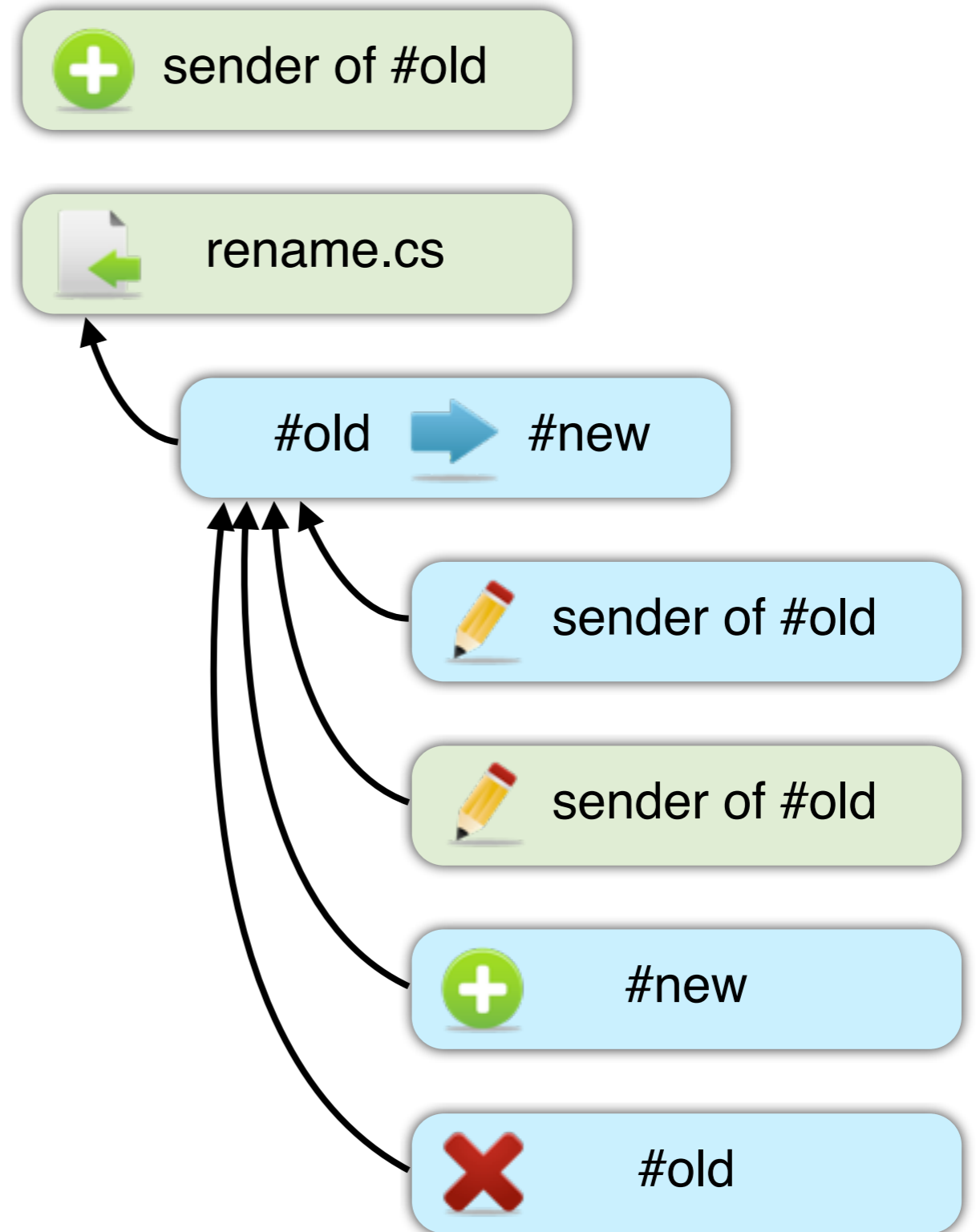
triggering

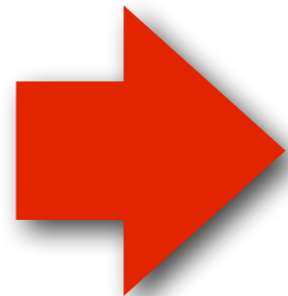
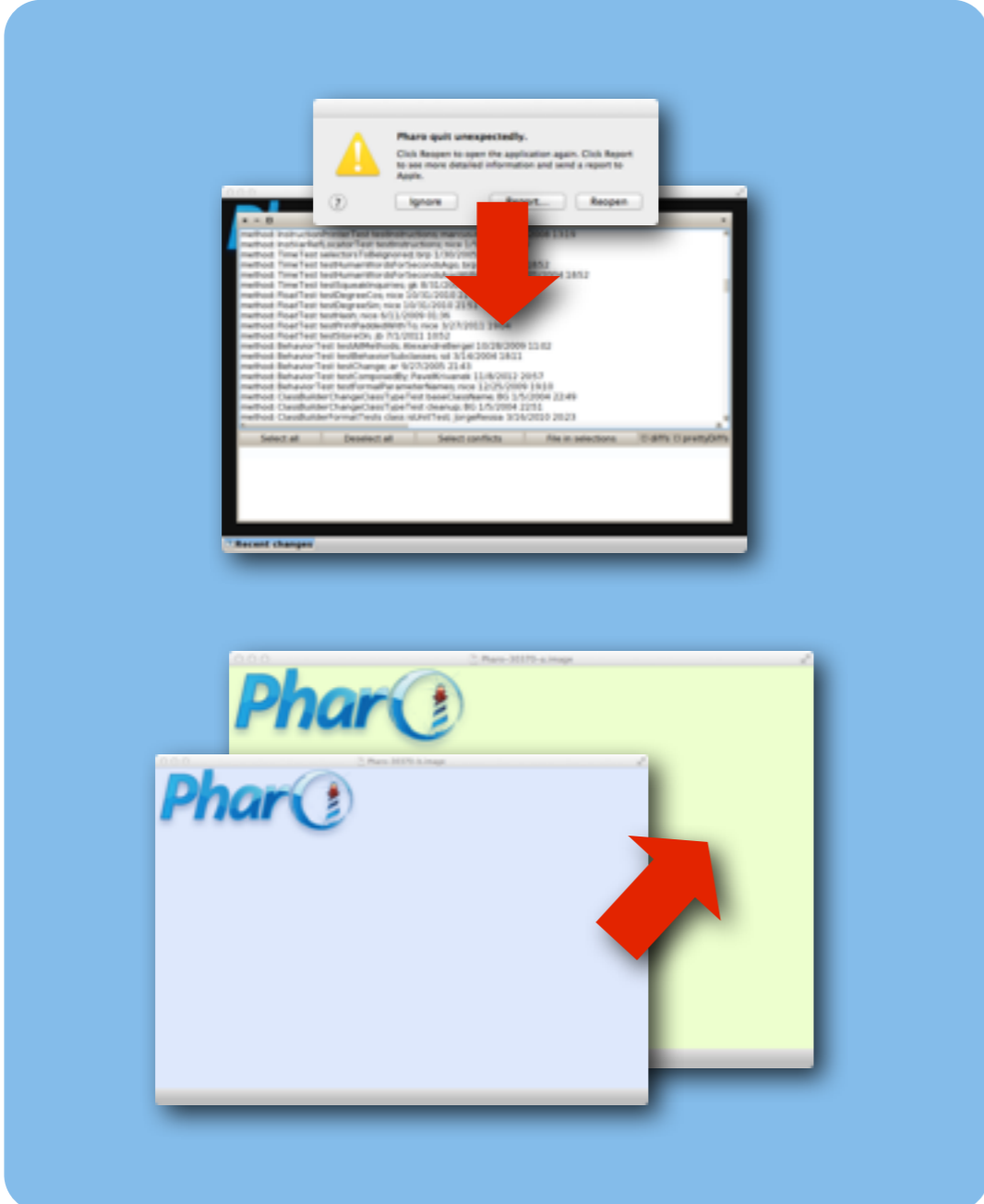


authors



intention



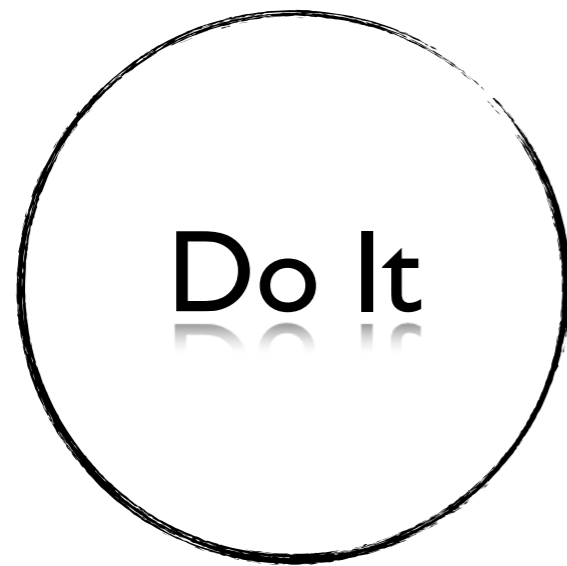


Author Intention

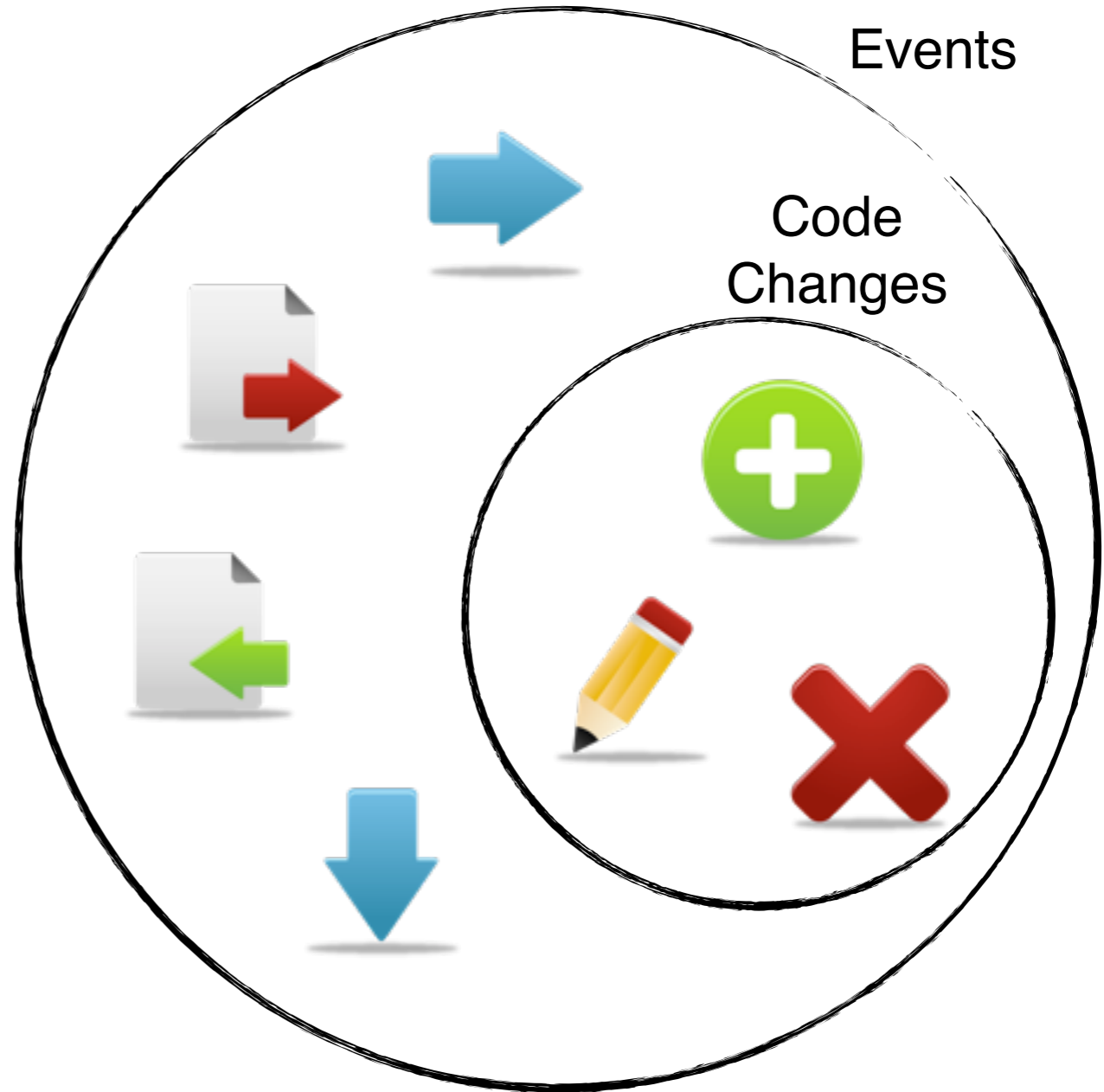
System Events

**Code
Changes**

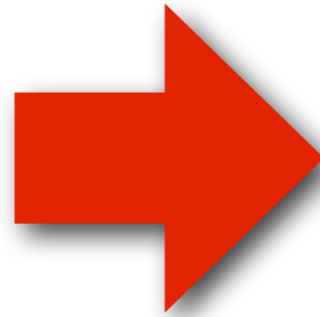
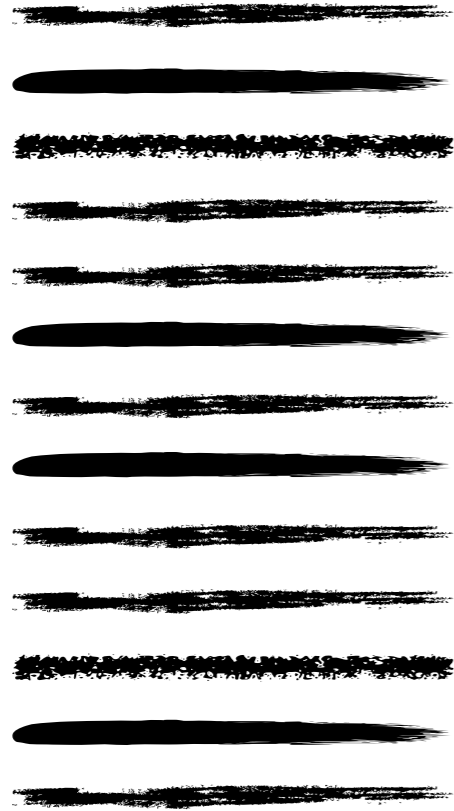
Changes & ChangeSet



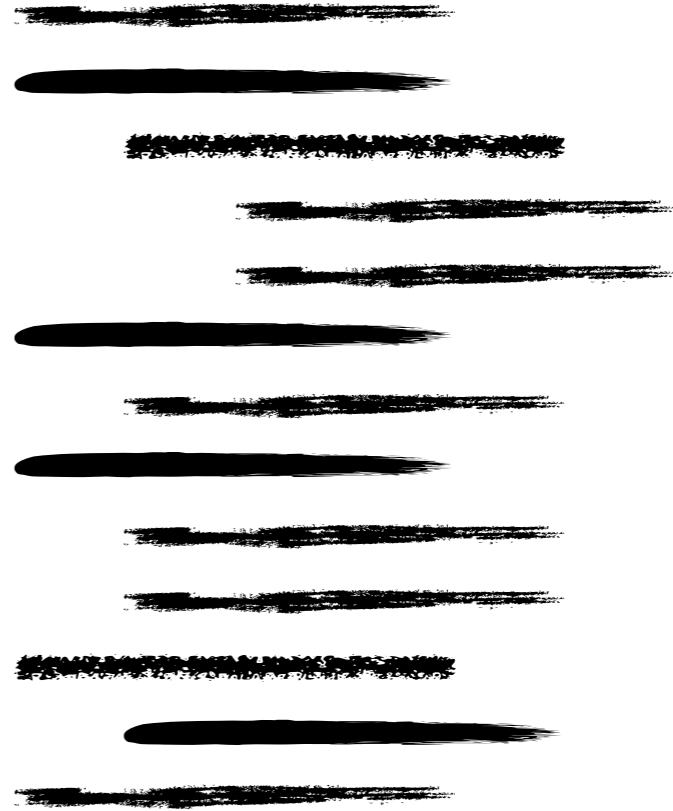
Epicea

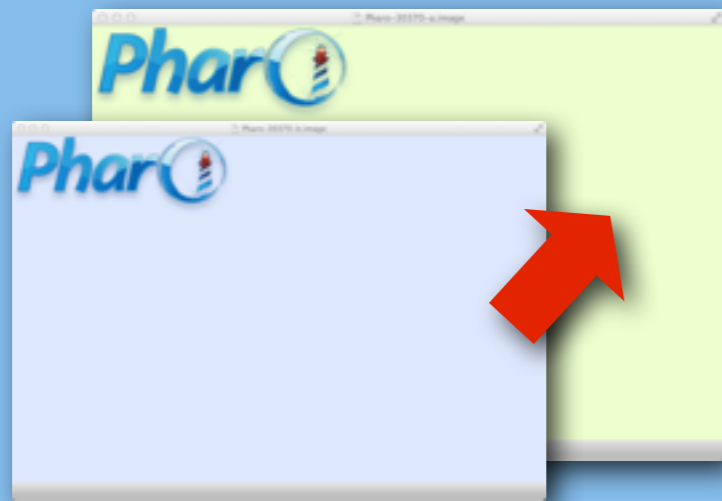
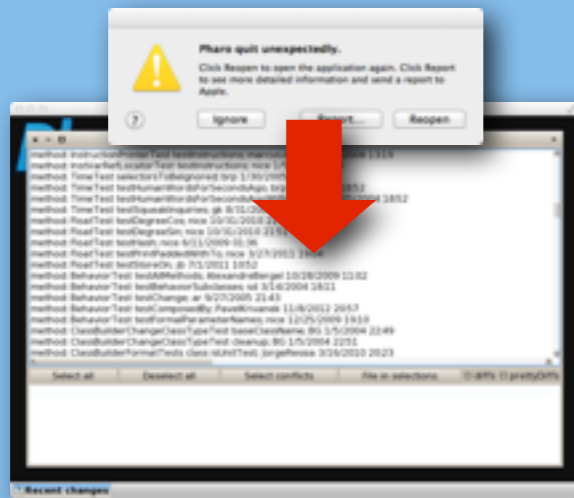


Changes & ChangeSet

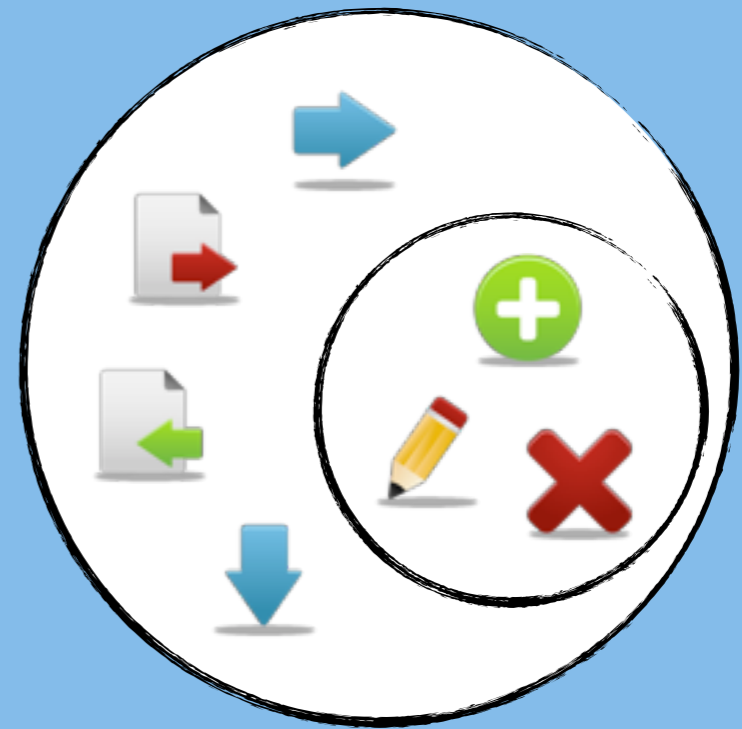


Epicea





Epicea



```
----STARTUP----an Array(  
4 September 2013 4:10:31 pm) as  
/Users/tinchodias/Pharo3.image!
```

```
Object
```

```
  subclass: #Tetris  
  instanceVariableNames: 'player'  
  classVariableNames: ''  
  poolDictionaries: ''  
  category: 'Tetris-Core'!
```

```
Tetris new!
```

```
----SNAPSHOT----an Array(  
4 September 2013 5:18:42 pm) Pharo3.image priorSource: 16186013!
```

```
!Tetris methodsFor: 'as yet unclassified' stamp: 'MartinDias 9/4/2013 17:45'!
```

```
player
```

```
  ^ player! !
```

```
!Tetris methodsFor: 'as yet unclassified' stamp: 'MartinDias 9/4/2013 17:53' prior: 49756251!
```

```
player
```

```
  "Answer the player"
```

```
  ^ player! !
```

Pharo.changes

```
----STARTUP----an Array(  
4 September 2013 4:10:31 pm) as  
/Users/tinchodias/Pharo3.image!  
  
Object  
  subclass: #Tetris  
  instanceVariableNames: 'player'  
  classVariableNames: ''  
  poolDictionaries: ''  
  category: 'Tetris-Core'!  
  
Tetris new  
  
----SNAPSHOT----an Array(  
4 September 2013 5:18:42 pm) Pharo3.image priorSource: 16186013!  
  
!Tetris methodsFor: 'as yet unclassified' stamp: 'MartinDias 9/4/2013 17:45'!  
player  
  ^ player! !  
  
!Tetris methodsFor: 'as yet unclassified' stamp: 'MartinDias 9/4/2013 17:53' prior: 49756251!  
player  
  "Answer the player"  
  
  ^ player! !
```

Pharo.changes

```
----STARTUP----an Array(  
4 September 2013 4:10:31 pm) as  
/Users/tinchodias/Pharo3.image!
```

```
Object
```

```
  subclass: #Tetris  
  instanceVariableNames: 'player'  
  classVariableNames: ''  
  poolDictionaries: ''  
  category: 'Tetris-Core'!
```

```
Tetris new!
```

```
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```

```
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```

```
player
```

```
  ^ player! !
```

```
!Tetris methodsFor: 'as yet unclassified' stamp: 'MartinDias 9/4/2013 17:53' prior: 49756251!
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```
player
```

```
  "Answer the player"
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Pharo.changes

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Tetris methodsFor: 'as yet unclassified' stamp: 'MartinDias 9/4/2013 17:45'!  
player  
  ^ player! !  
  
!Tetris methodsFor: 'as yet unclassified' stamp: 'MartinDias 9/4/2013 17:53' prior: 49756251!  
player  
  "Answer the player"  
  ^ player! !
```

Pharo.changes

Changes/ ChangeSet



Ombu



Changes/ ChangeSet



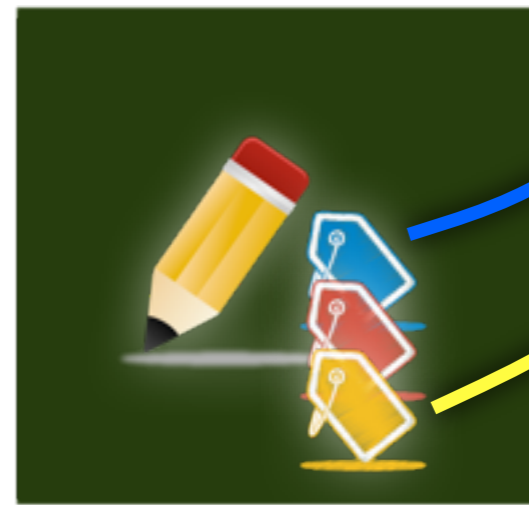
Ombu



Changes/ ChangeSet



Ombu



Requirements

Mini

Macro

Requirements

Mini

Macro

- Simple

Requirements

Mini

Macro

- Simple
- Solid

Requirements

Mini

Macro

- Simple
- Solid
- Distributed

Requirements

Mini

- Simple
- Solid
- Distributed

Macro

- Lightweight

Requirements

Mini

- Simple
- Solid
- Distributed

Macro

- Lightweight
- Stable

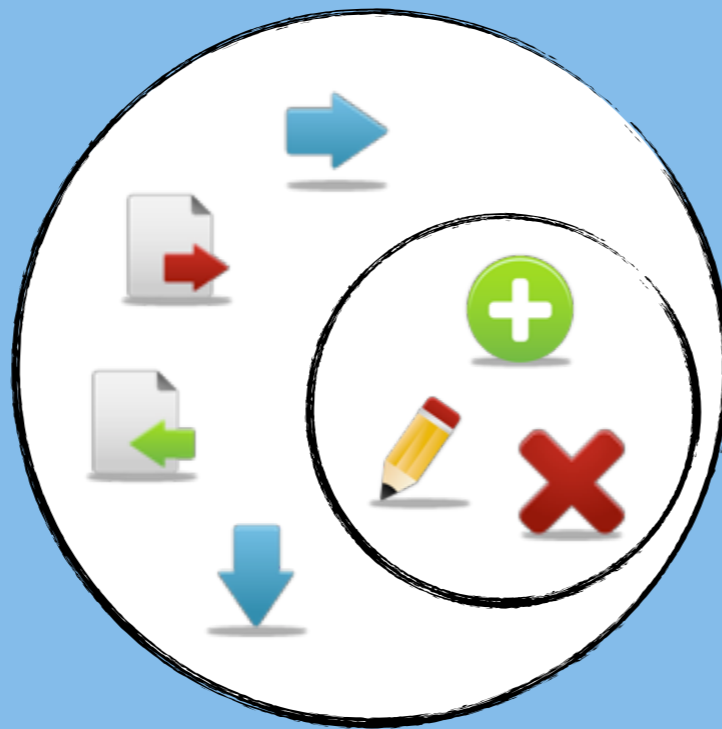
Requirements

Mini

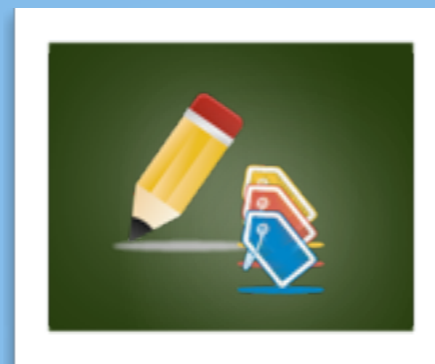
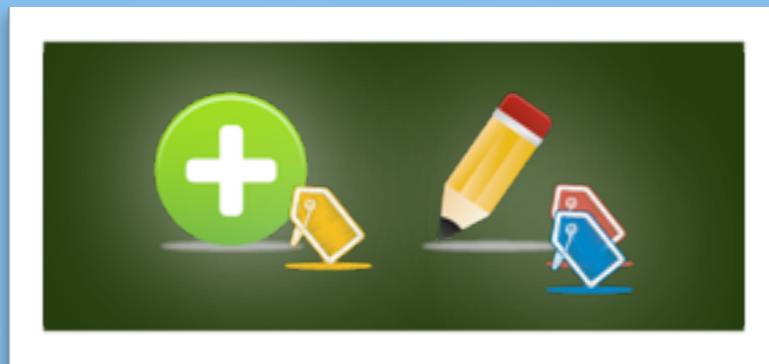
- Simple
- Solid
- Distributed

Macro

- Lightweight
- Stable
- Extensible



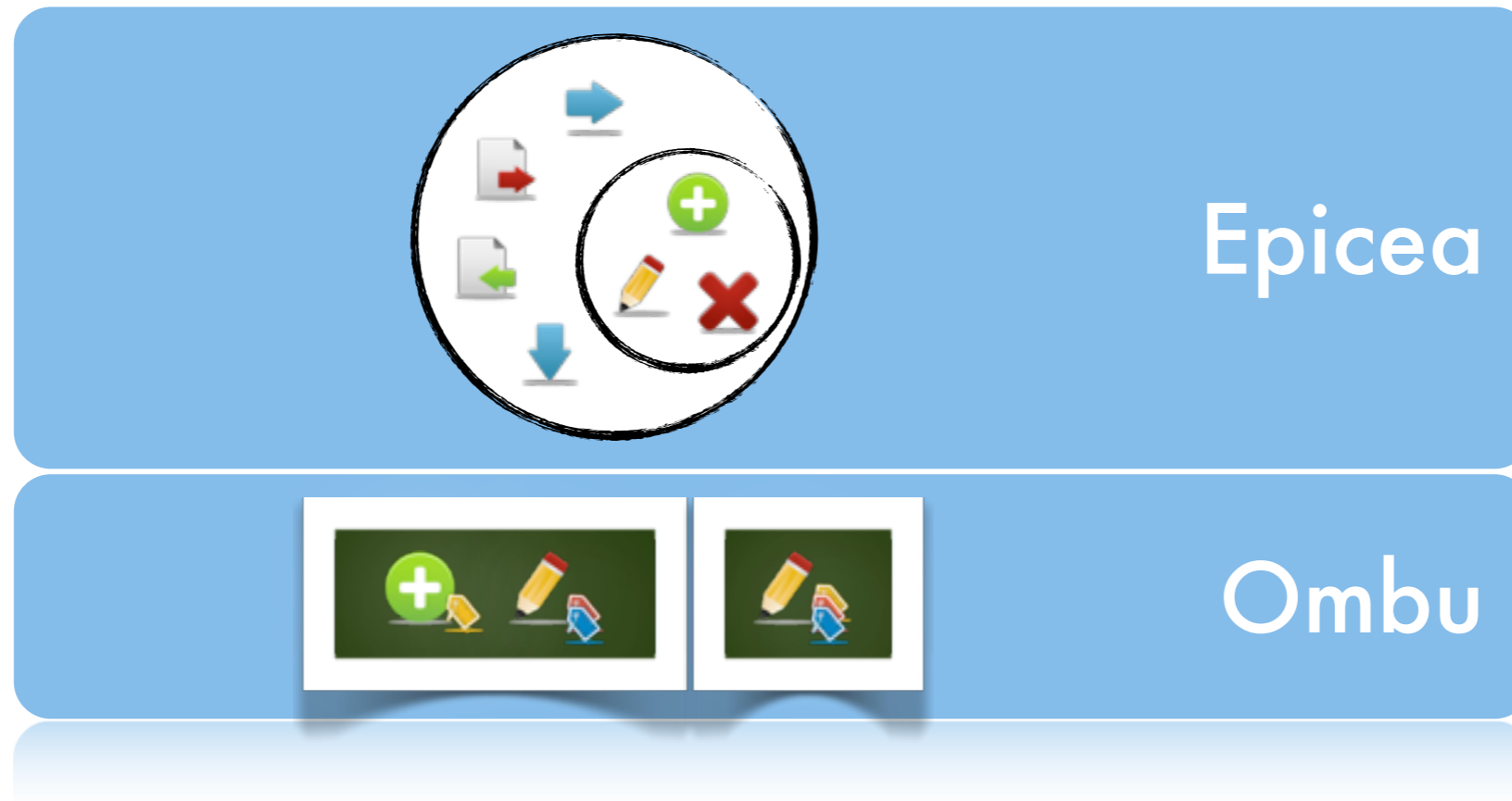
Epicea



Ombu



Representing Code History with Development Environment Events



<http://smalltalkhub.com/#!/~MartinDias/Epicea>

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RMoD
IWST 2013