



Toplo, Bloc & Spec

A Graphic Layer for the Future

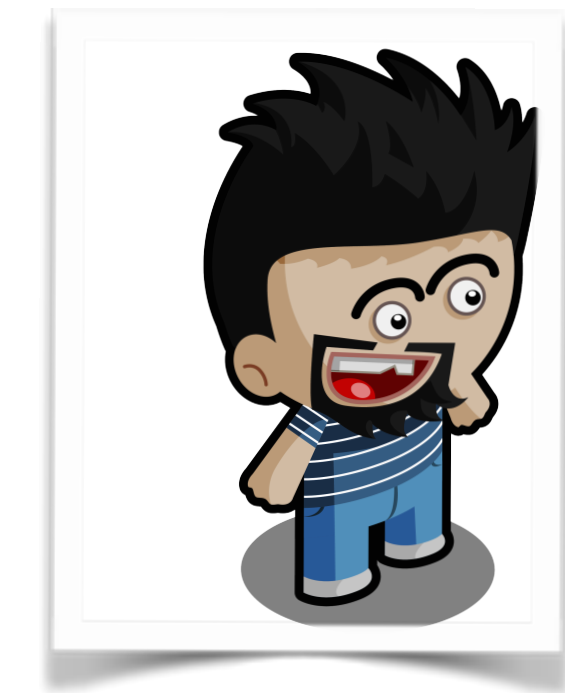


Pablo Tesone & Martín Dias - ESUG 2024 - Lille



It's us!

Pablo Tesone
Pharo Consortium
Engineer



@tesonep  

Martín Dias
Pharo Consortium
Engineer



@tinchodias  

**Just in the
presentation effort...
a lot of development
behind**

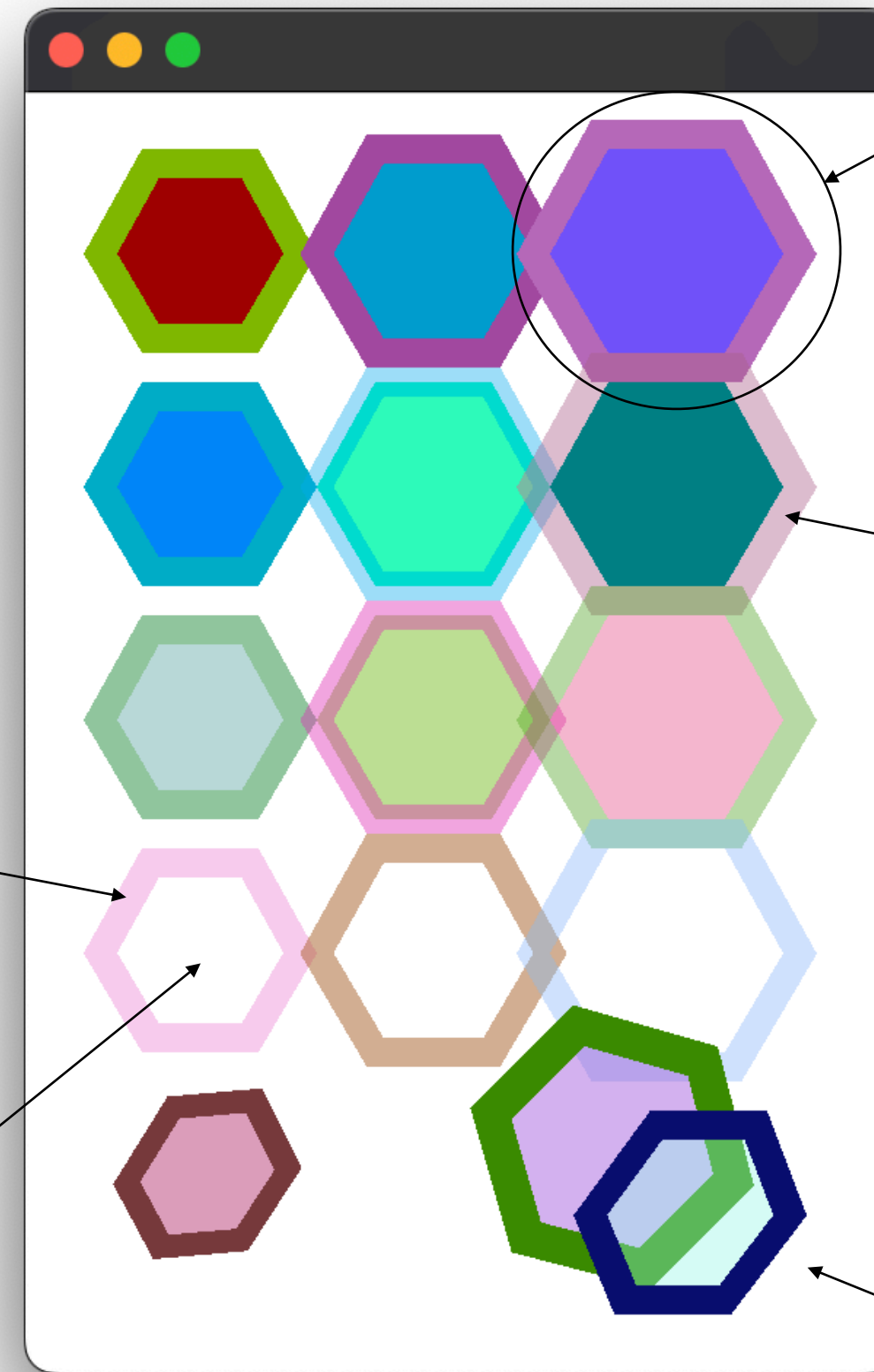
What is Bloc?

a low-level UI
infrastructure &
framework for Pharo



border

background



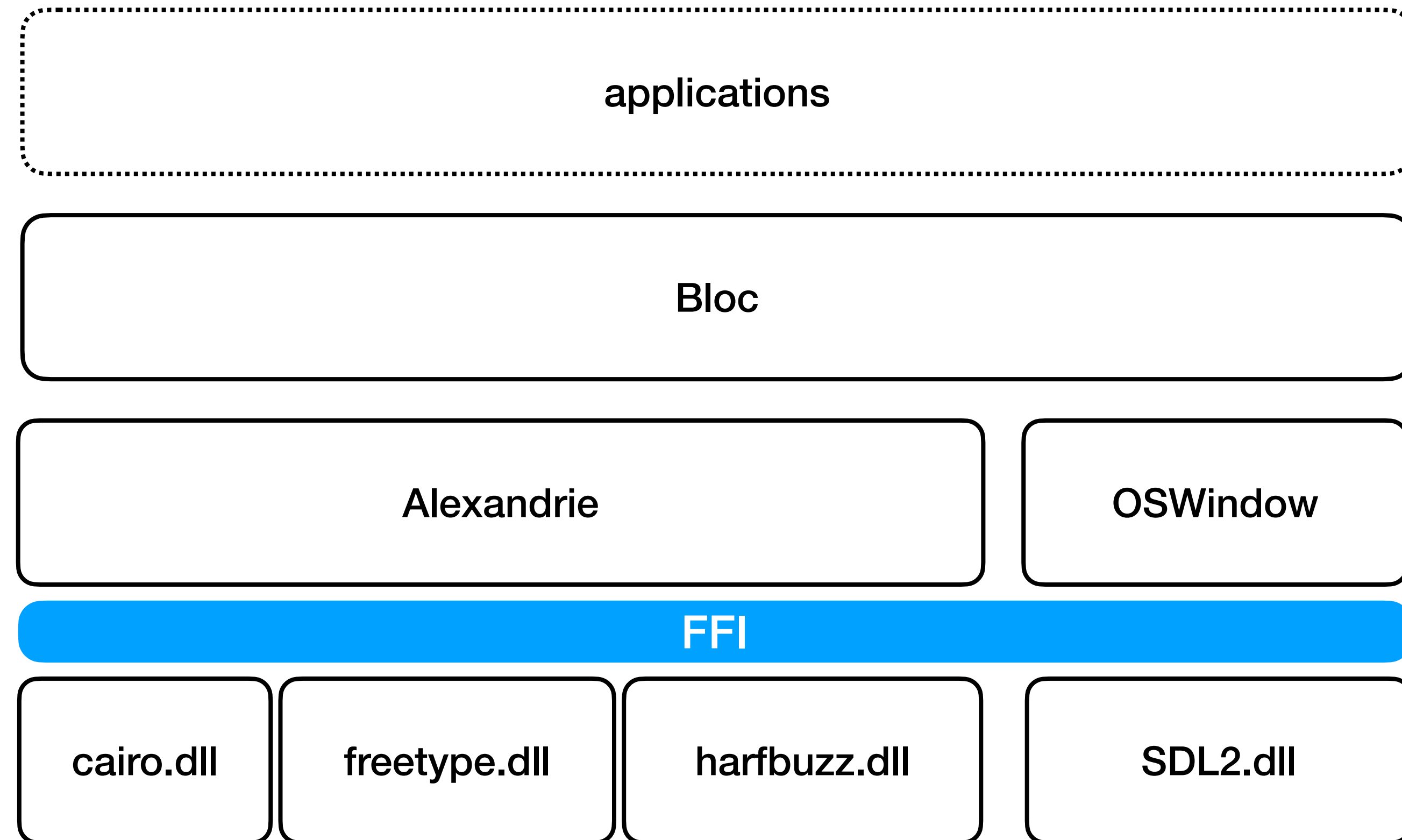
a BIElement

geometry
(polygon)

transformation
(a matrix with
skew and translation)

What is Bloc?

Architecture



Why Cairo and SDL2?

Stay with simple FFI bindings to C libraries



- Works on all Pharo's platforms
- GPU acceleration
- Active gamer community
- Stable with active development. Support by gnome community (it's the way to draw custom widgets in gtk 3 and 4).
- Not GPU-optimized but we can use buffering, layer composition and other techniques to mitigate.



Improvements

- SVG importer bugfixing
- Cleanup (#Classes / Methods, Lines of code)
- Documentation improvements
- Improved Text Rendering
- Nicer Shadows, Polygons and Rounded figures

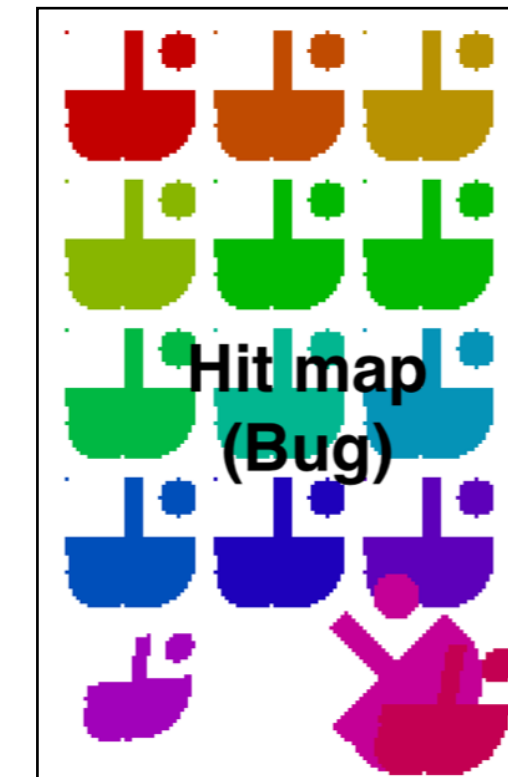
Performance & Stability

Running Faster and Reliable

- Performance Improvement
- Regression Testing
- CI Integration
- Correct Versioning & Repeatable Builds



How you see the test fixture



Mouse events were only dispatched on the colored regions

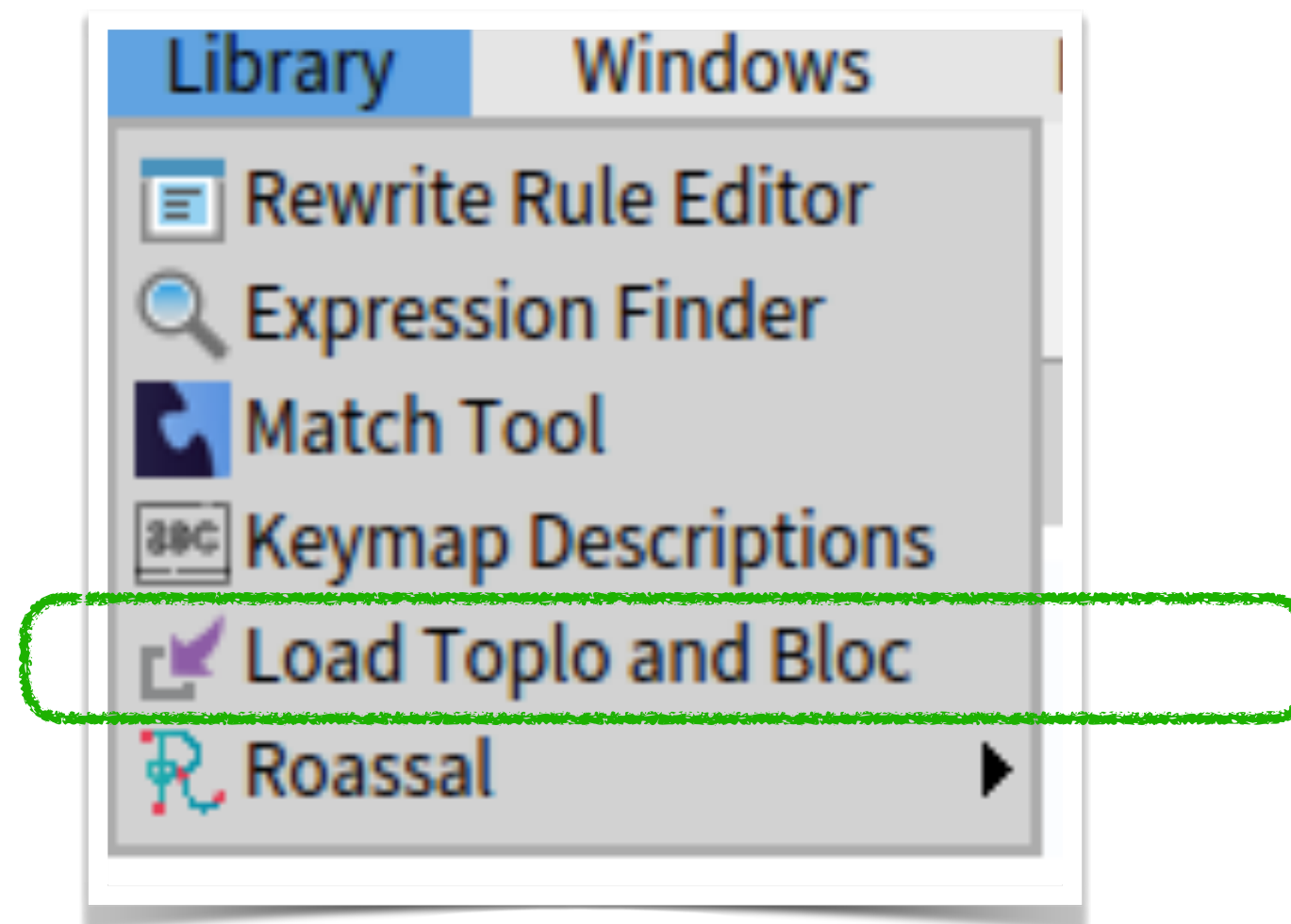


After the fix



Stable and Ready to Use

- Loadable from the menu in P12 & P13
- Compatible Versions for P11 / P12 / P13



Toplo

Widget Framework on Top of Bloc

The screenshot displays the Toplo IDE interface. At the top, a code editor window shows Dart code for a widget, with lines 17-19 highlighted in yellow:

```
17 model withSaveCapability.  
18 model withRowNumbers.  
19 model whenSaveRequestedDo: [ :saveRequested
```

. Below the code editor is a class browser window titled "Mini browser" showing a tree view of classes and methods. The "Toplo" package is selected, and the "preInitializeDresser" method is highlighted. Below the class browser is a code editor window showing the implementation of the "preInitializeDresser" method:

```
1 preInitializeDresser  
2  
3 super preInitializeDresser.  
4  
5 self initializePair
```

. To the left of the code editor is a login dialog box with "Login:" and "Password:" labels, an "Accept" button, and a "Cancel" button. To the right of the code editor is a settings panel titled "File" with various options like "Open file", "Export", "Radio button icon first", "Radio button label first", "Radio buttons label first and Justified", "Yourname", "Cheesecake" (with a toggle switch), and "Saving stuffs" (with "Save All" and "Locally" buttons).



Toplo

Widget Framework on Top of Bloc

- No New Revolutionary Concepts
 - Keep it Simple
 - Bloc has many of the features
- Bloc + Element States and Skins
- + 18 Widgets ready to use
- Collaboration with

THALES



UBO

Université de Bretagne Occidentale



Toplo

Widget Framework on Top of Bloc

- No New Revolutionary Concepts
 - Keep it Simple
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Widgets: 600 Classes
~ 3000 Methods
Core: 200 Classes ~
2000 Methods
Tests: +1000

THALES



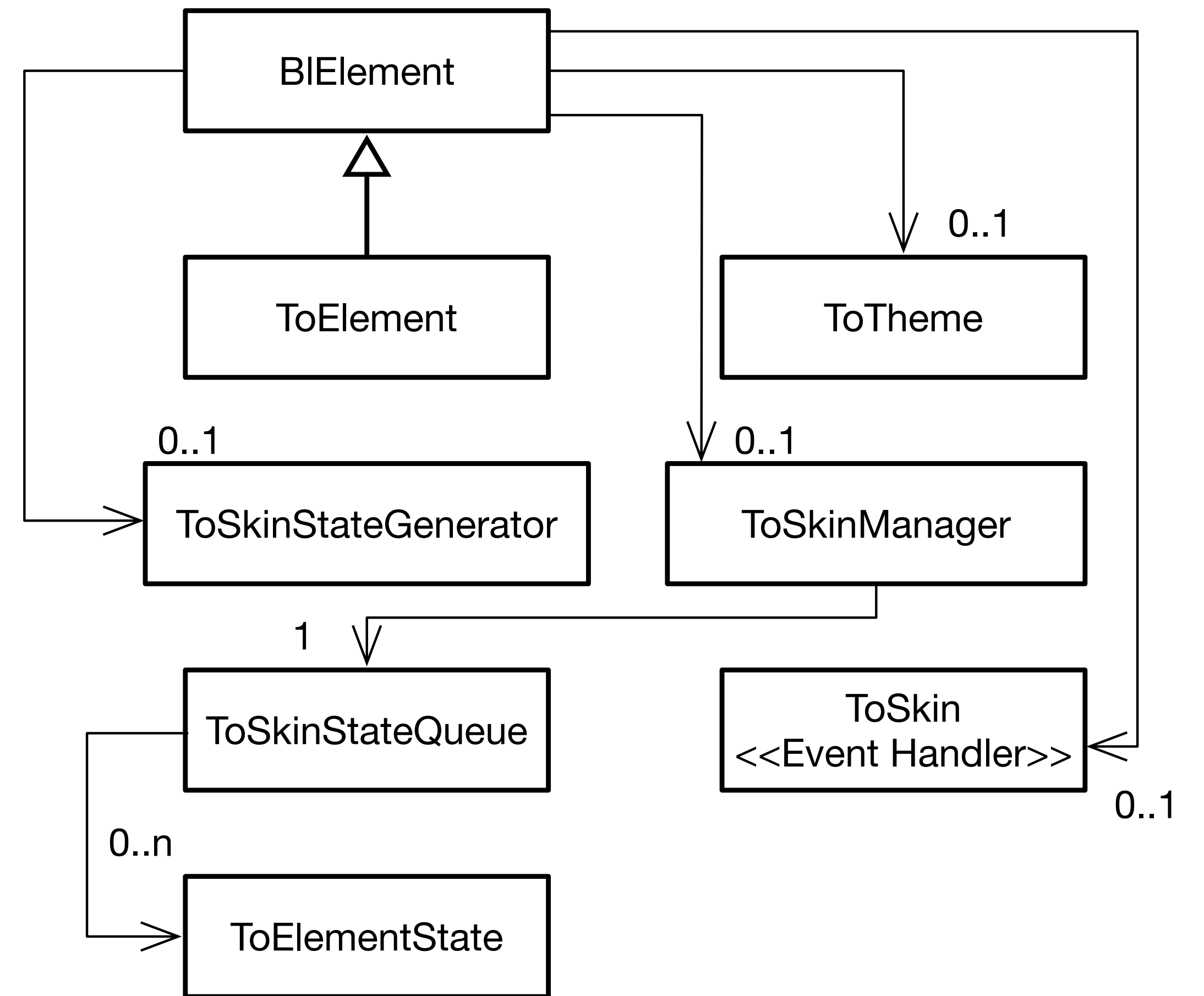
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Toplo

Architecture Overview

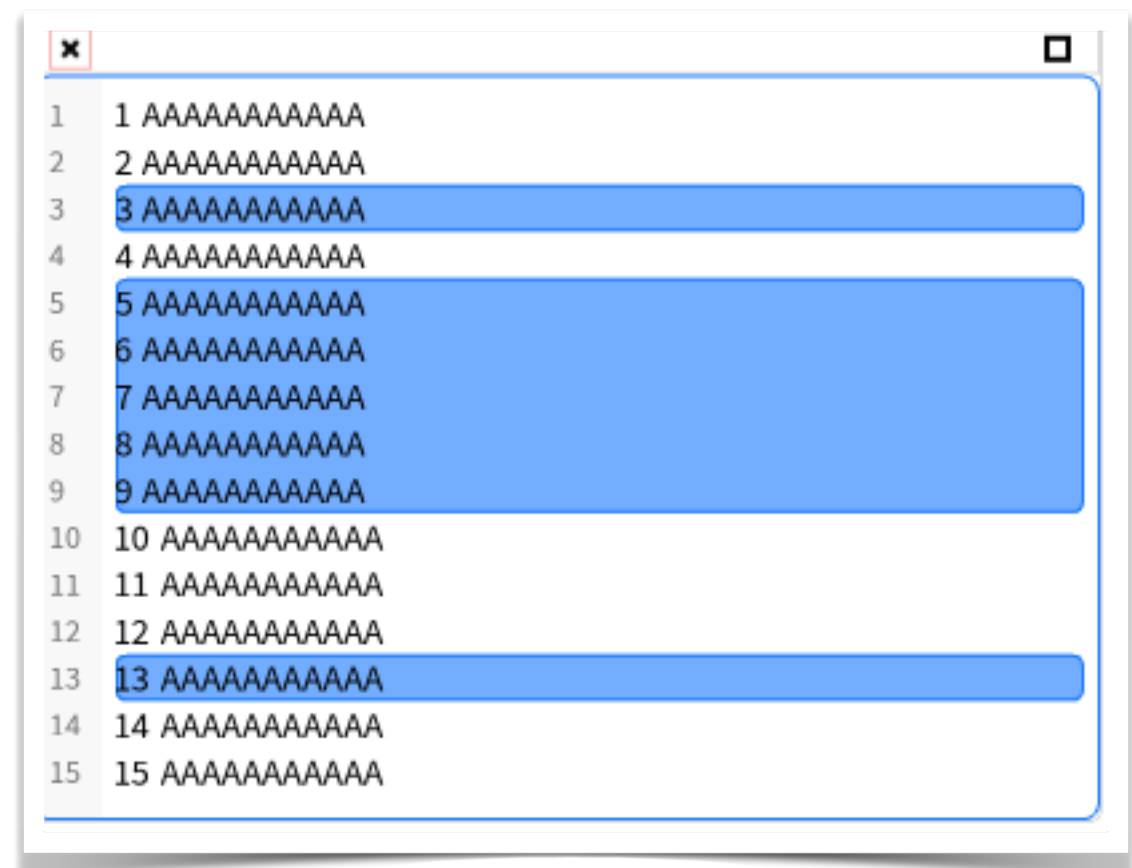
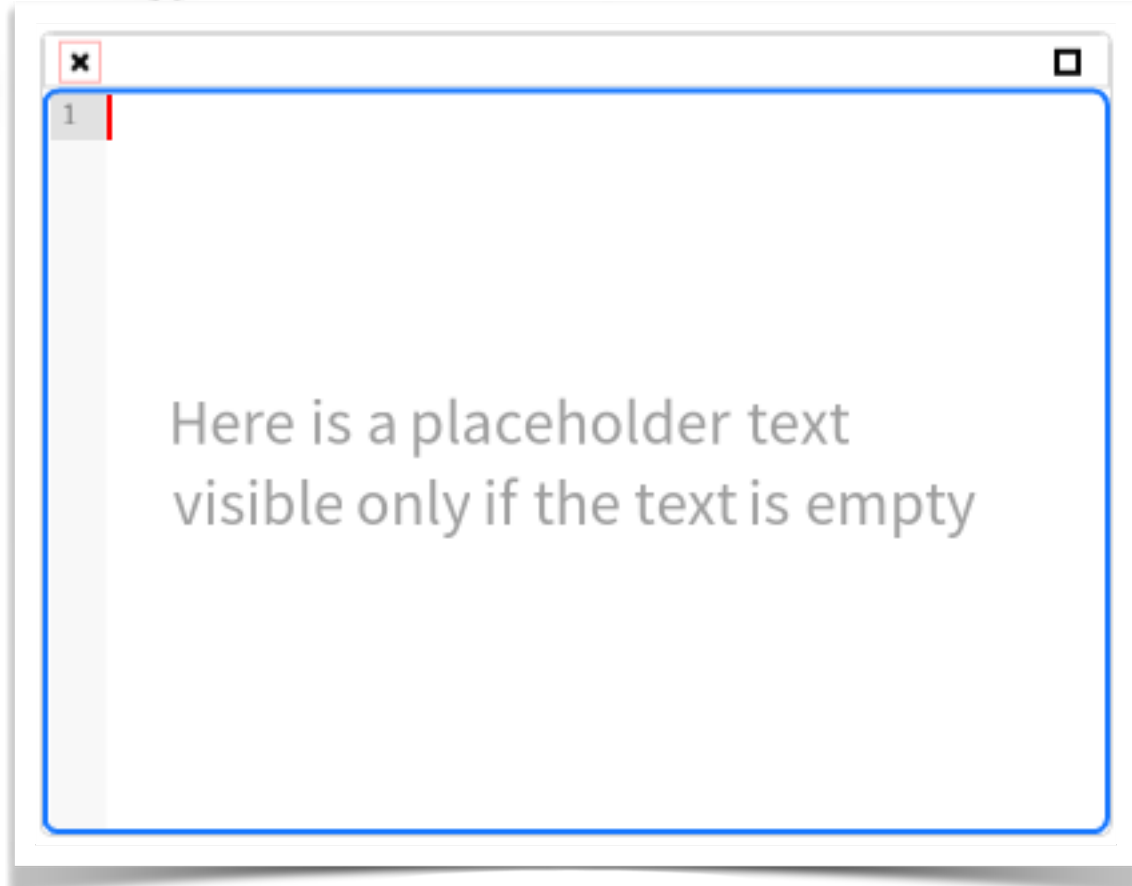
- Extending Bloc
- Adding Skin & States



Beautiful and Powerful



Monday
Tuesday
Wednesday
Thursday
Friday



Inspect

- Vertical
- Wrapping
- Uniform element width
- Scrolling
- Auto-distribution
- Animate selection transition
- Select on mouse down

Selection mode

- Multiple
- Single
- Disabled

File

- Open file
- Export
- Right
- Center
- Left
- Save All >
- Locally
- Externally >

- 1: Alabama
- 3: Arizona
- 5: California
- 7: Connecticut
- 9: Florida
- 11: Hawaii
- 13: Illinois Indiana
- 15: Kansas
- 17: Louisiana
- 19: Maryland
- 21: Michigan
- 23: Mississippi
- 25: Montana
- 27: Nevada
- 29: New Jersey
- 31: New York
- 33: North Dakota
- 35: Oklahoma
- 37: Pennsylvania Rhode Island
- 39: South Dakota
- 41: Texas
- 43: Utah
- 18: Maine
- 20: Massachusetts
- 22: Minnesota
- 24: Missouri
- 26: Nebraska
- 28: New Hampshire
- 30: New Mexico
- 32: North Carolina
- 34: Ohio
- 36: Oregon
- 38: South Carolina
- 40: Tennessee

Beautiful and Powerful (2)

Alaska + 3 ...

West

Hawaii

Alaska

Washington

Middle-west

Montana

Wyoming

Middle

North Dakota

South Dakota

Nebraska

Middle-east

Minnesota

Wyoming
North Dakota
Washington

example_CodeEditor

```
1 | text album menuBuilder |
2 text := self methodText asRopedText fontName: 'Source Code Pro'.
3 album := ToAlbum new.
4 album inspect.
5 album stycler: (BlPharoCodeStycler new
6 classOrMetaClass: self class;
7 yourself).
8 album text: text copy.
9 album withSaveCapability.
10 album withRowNumbers.
11 album whenSaveRequestedDo: [ :saveRequested |
12 saveRequested accepted: true ].
13 album whenCancelRequestedDo: [ :cancelRequested |
14 cancelRequested client text: text copy ].
15
16 menuBuilder := [ :menu :request |
17 | element |
18 element := request currentTarget.
19 menu addItem: (ToMenuItem new
20 labelText: 'Select all';
21 whenClickedDo: [ :event |
22 element selector
23 all;
24 apply ];
25 yourself).
26 menu addItem: (ToMenuItem new
27 labelText: 'Copy';
28 whenClickedDo: [ :event |
29 element editor copySelected ];
30 yourself).
31 menu addItem: (ToMenuItem new
32 labelText: 'Cut':
```

Mini browser

1 BaselineOfToplo
2 Toplo
3 Toplo-Demo
4 Toplo-Examples

1 ManifestToploDem
2 TToElementWithCo
3 TToElementWithLa
4 TToElementWithPl
5 TToElementWithTc
6 TToEnableableTes
7 TToLookEventListe
8 TToOrientableTest
9 TToStyleRulesHolc
10 ToAdjacentRectangl
11 ToAnchorEventHar

1 -- all --
2 tests

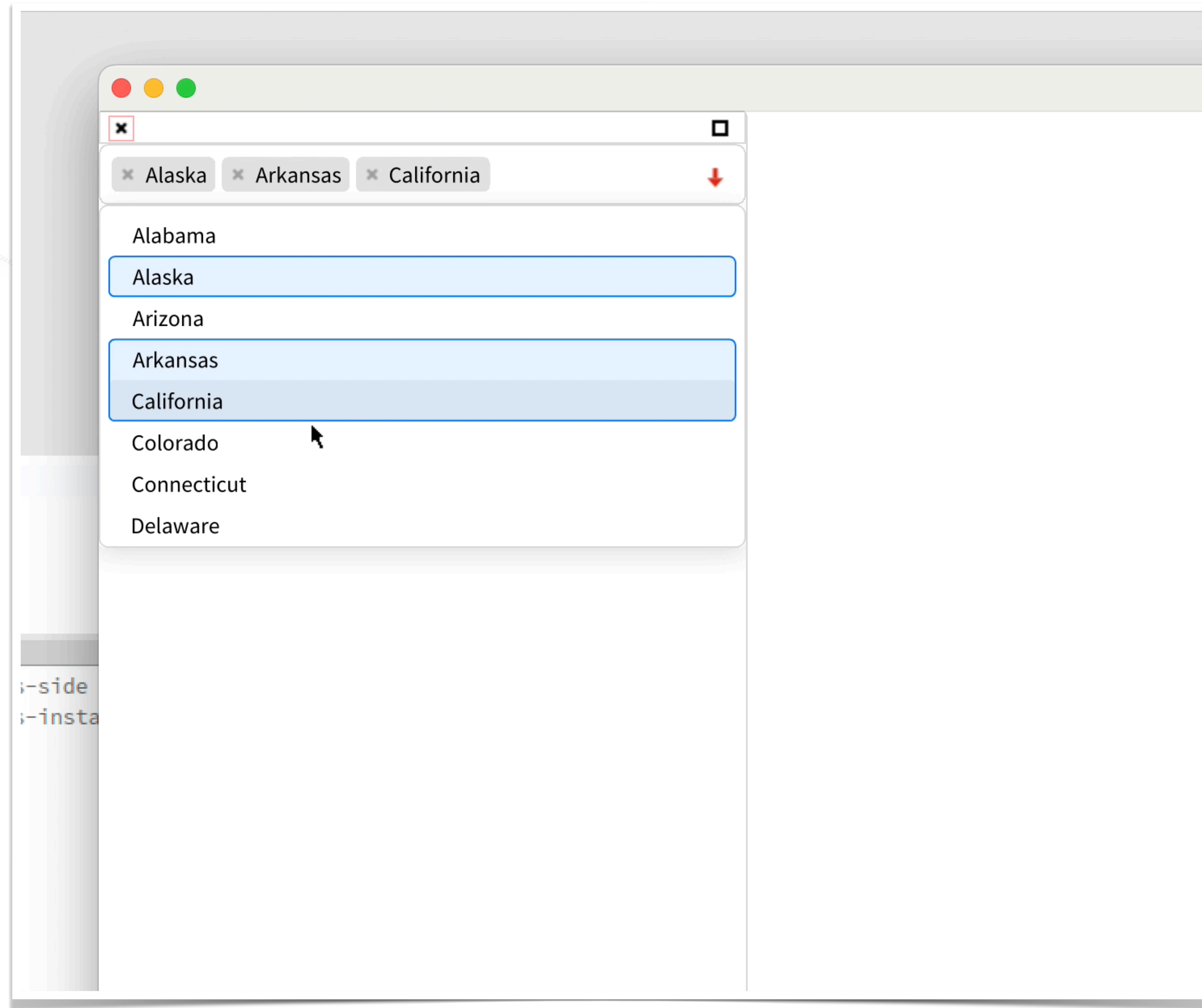
1 testCurrentPlaceholder
2 testHidePlaceholder
3 testIsShowingPlaceholder
4 testNewPlaceholder
5 testPlaceholderBuilder
6 testPlaceholderClass
7 testPlaceholderElevatic
8 testPlaceholderText
9 testPlaceholderText2
10 testRawPlaceholderBui
11 testShowPlaceholder

hidePlaceholder

```
e ph |
:= ToElementWithPlaceholderForTest new size: 100 asPoint.
rawPlaceholderBuilder: [ :thePlaceholder :theElement |
thePlaceholder addChild: (BlElement new id: #child) ].
showPlaceholder.
ph := e currentPlaceholderLayer.
self assert: ph notNil.
self assert: ph parent identicalTo: e.
hidePlaceholder.
self assert: e currentPlaceholderLayer isNil.
self assert: ph parent isNil.
```

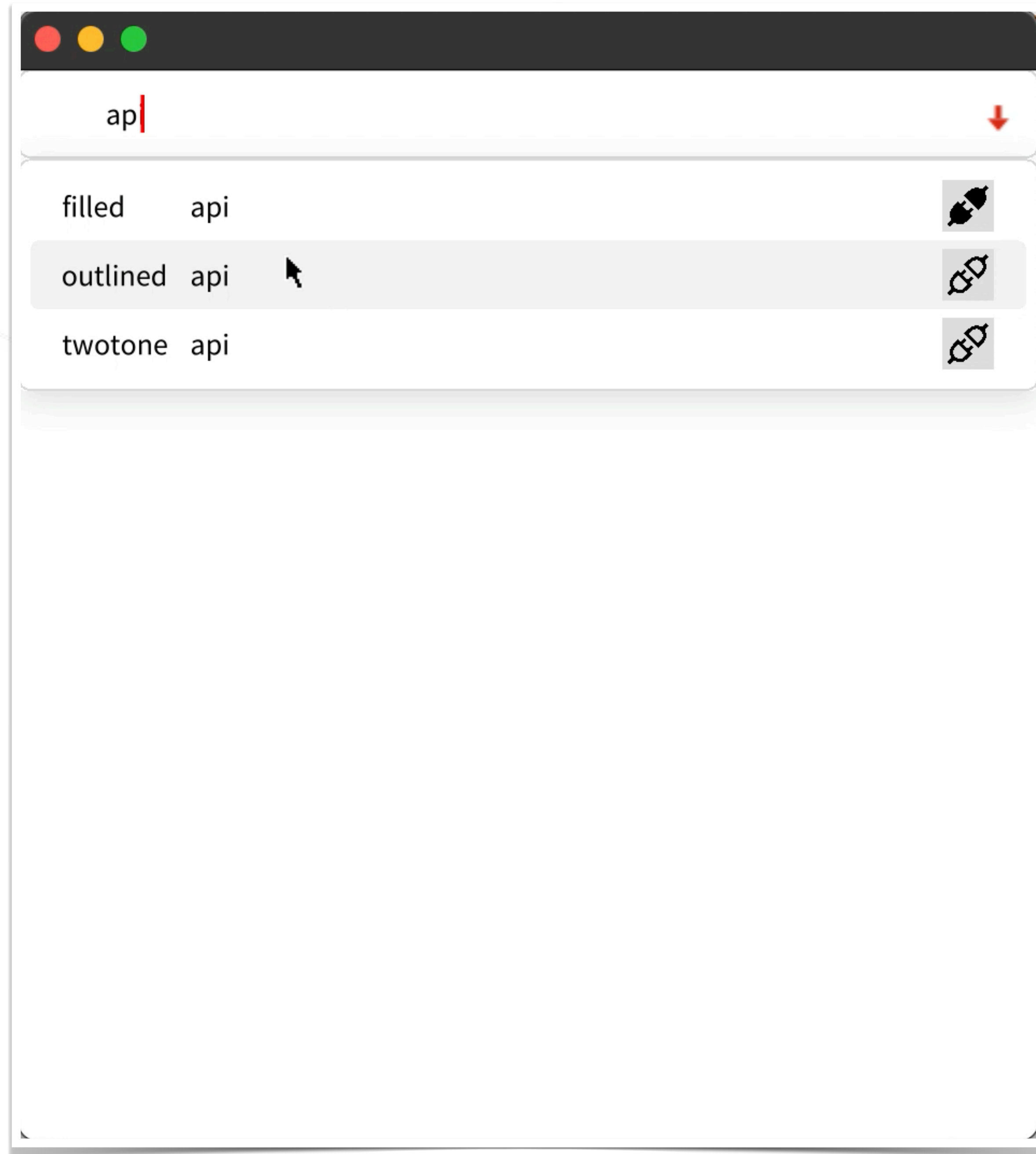


Toplo





Toplo





Toplo

A screenshot of a web application interface. The main content area displays a list of 46 US states, each preceded by a small 'x' icon. The states are: 1: Alabama, 2: Alaska, 3: Arizona, 4: Arkansas, 5: California, 6: Colorado, 7: Delaware, 8: Florida, 9: Georgia, 10: Hawaii, 11: Idaho, 12: Illinois, 13: Indiana, 14: Kansas, 15: Kentucky, 16: Louisiana, 17: Maine, 18: Maryland, 19: Massachusetts, 20: Minnesota, 21: Mississippi, 22: Missouri, 23: Montana, 24: Nebraska, 25: Nevada, 26: New Hampshire, 27: New Jersey, 28: New Mexico, 29: New York, 30: North Carolina, 31: North Dakota, 32: Ohio, 33: Oklahoma, 34: Oregon, 35: Pennsylvania, 36: Rhode Island, 37: South Carolina, 38: South Dakota, 39: Tennessee, 40: Texas, 41: Vermont, 42: Virginia, 43: Washington, 44: West Virginia, 45: Wisconsin, 46: Wyoming. The state '44: West Virginia' is highlighted with a blue background. On the left side, there is an 'Inspect' panel with several toggle switches: 'Vertical' (off), 'Wrapping' (on), 'Uniform element width' (off), 'Scrolling' (off), 'Auto-distribution' (off), 'Animate selection transition' (off), and 'Select on mouse down' (off). At the bottom of the interface, there is a 'Selection mode' section with three radio buttons: 'Multiple' (selected), 'Single', and 'Disabled'.



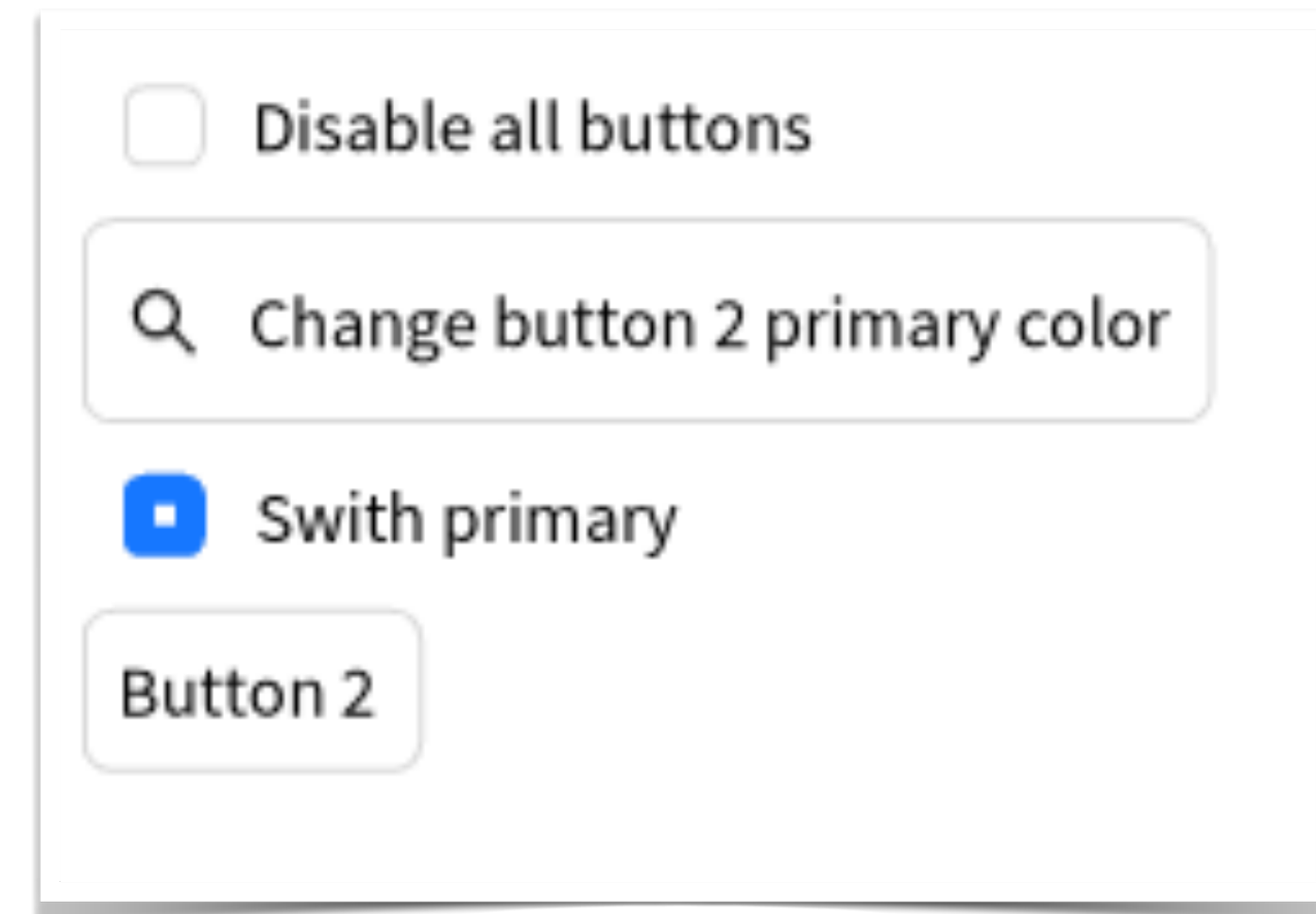
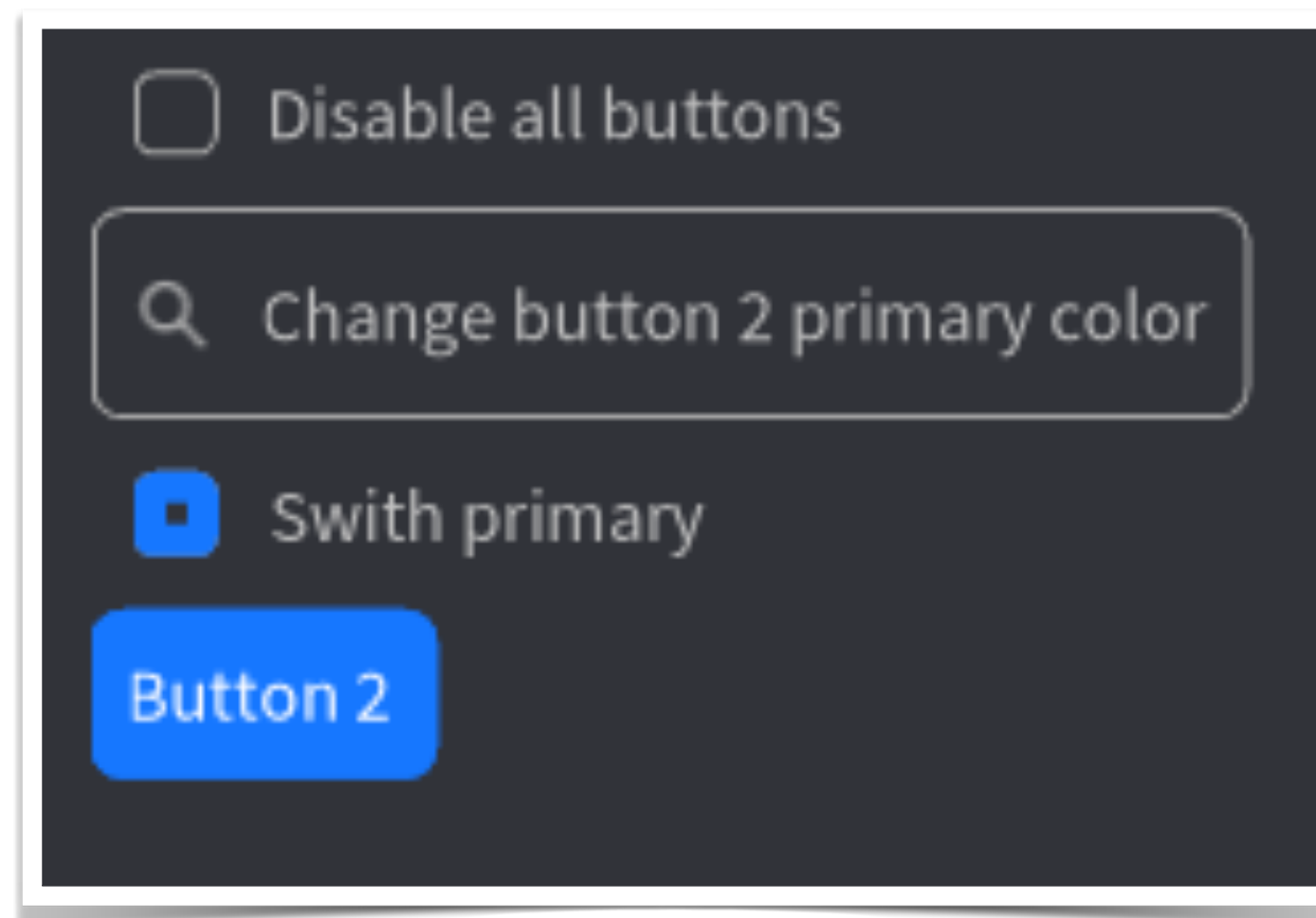
Based in ANT Design

 <https://ant.design/>

- Rich Components
- UI / UX Designed
- Validated design values & guidelines
- Intended for Theming and Customization

What is a Skin in Toplo?

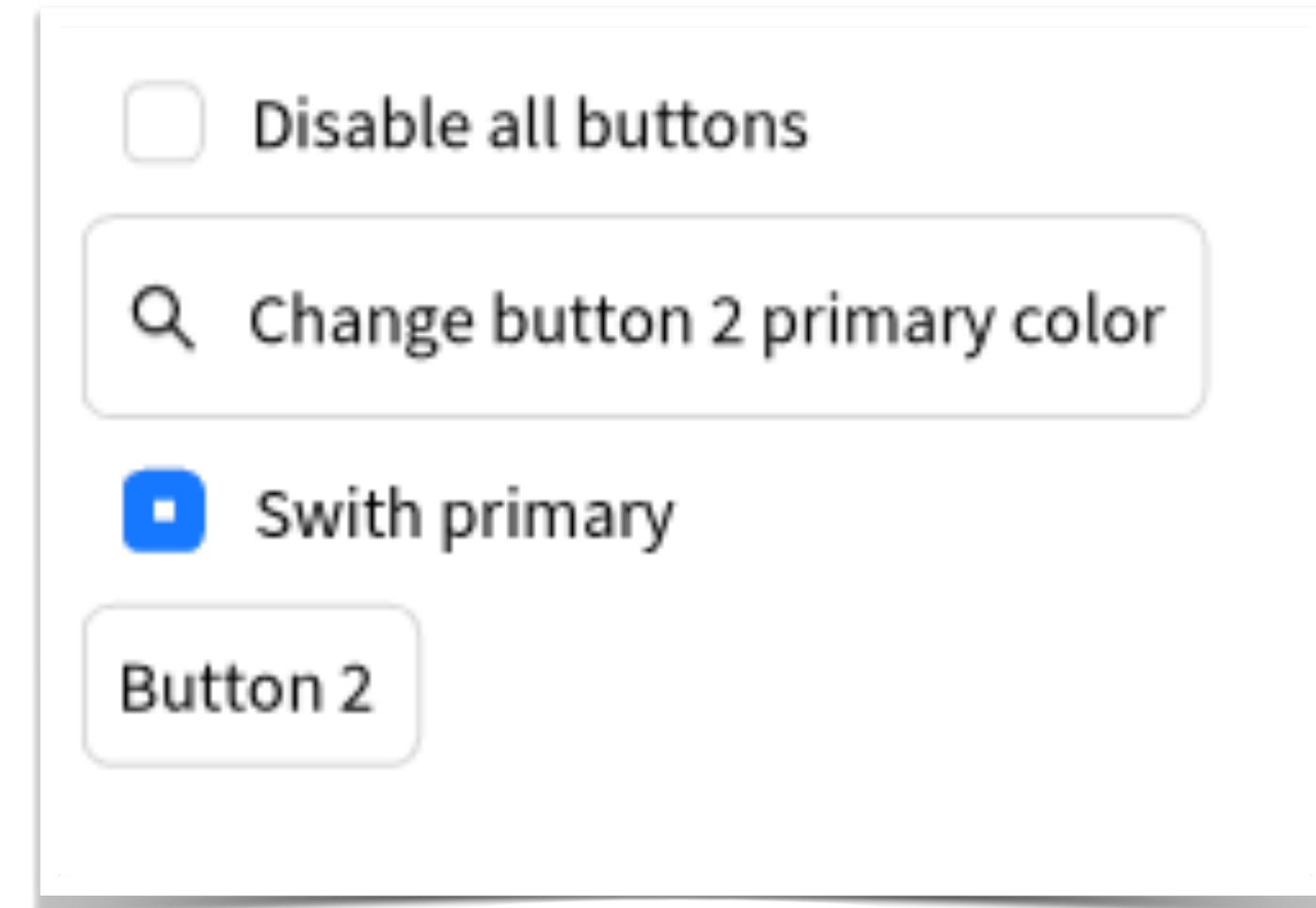
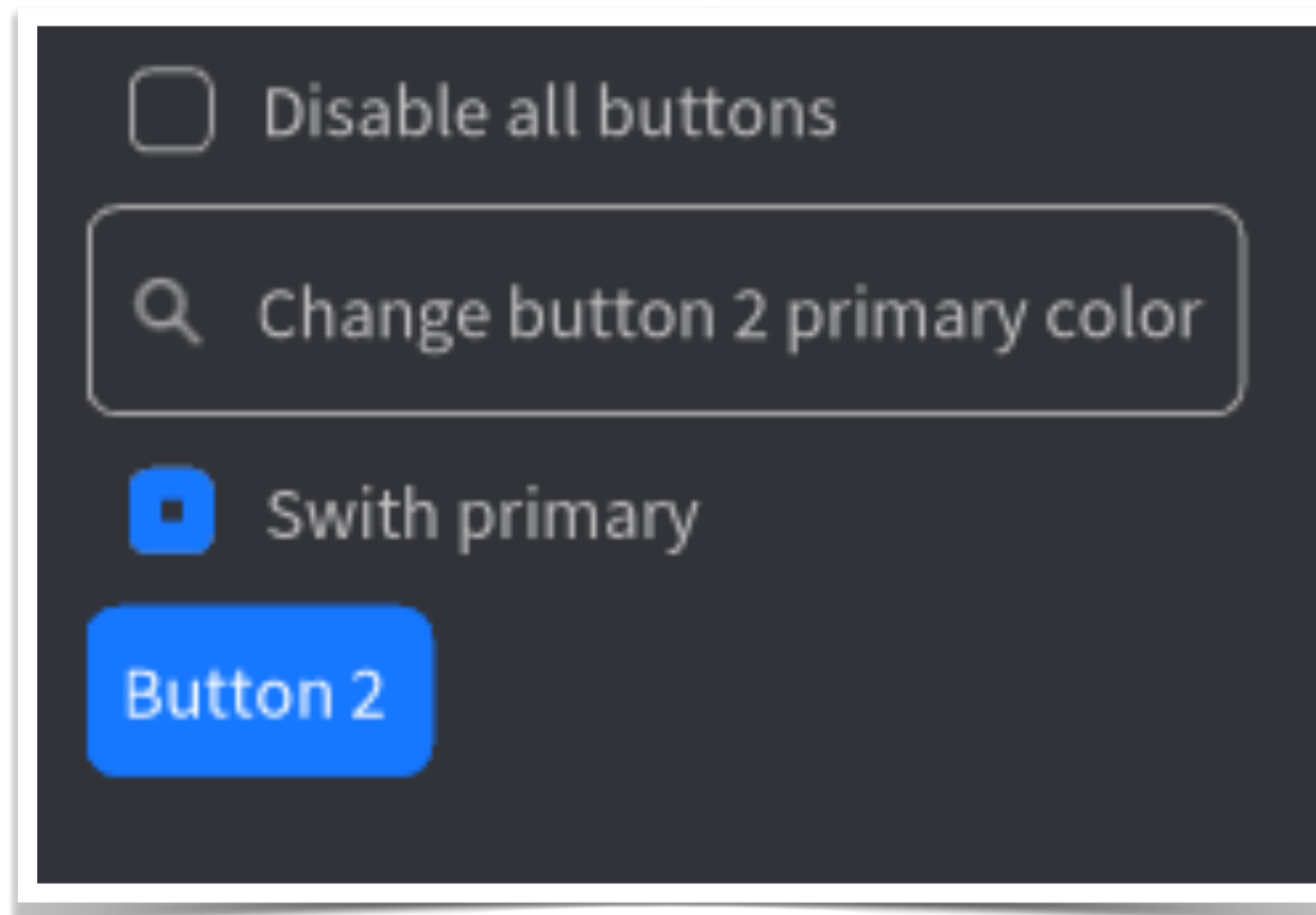
- Adapt properties of BIElements
 - Visual (background, border, font, ...)
 - Structural (Layout, alignment, margin, padding)
 - Composition (Adding / Removing Children)





When adaptations occur?

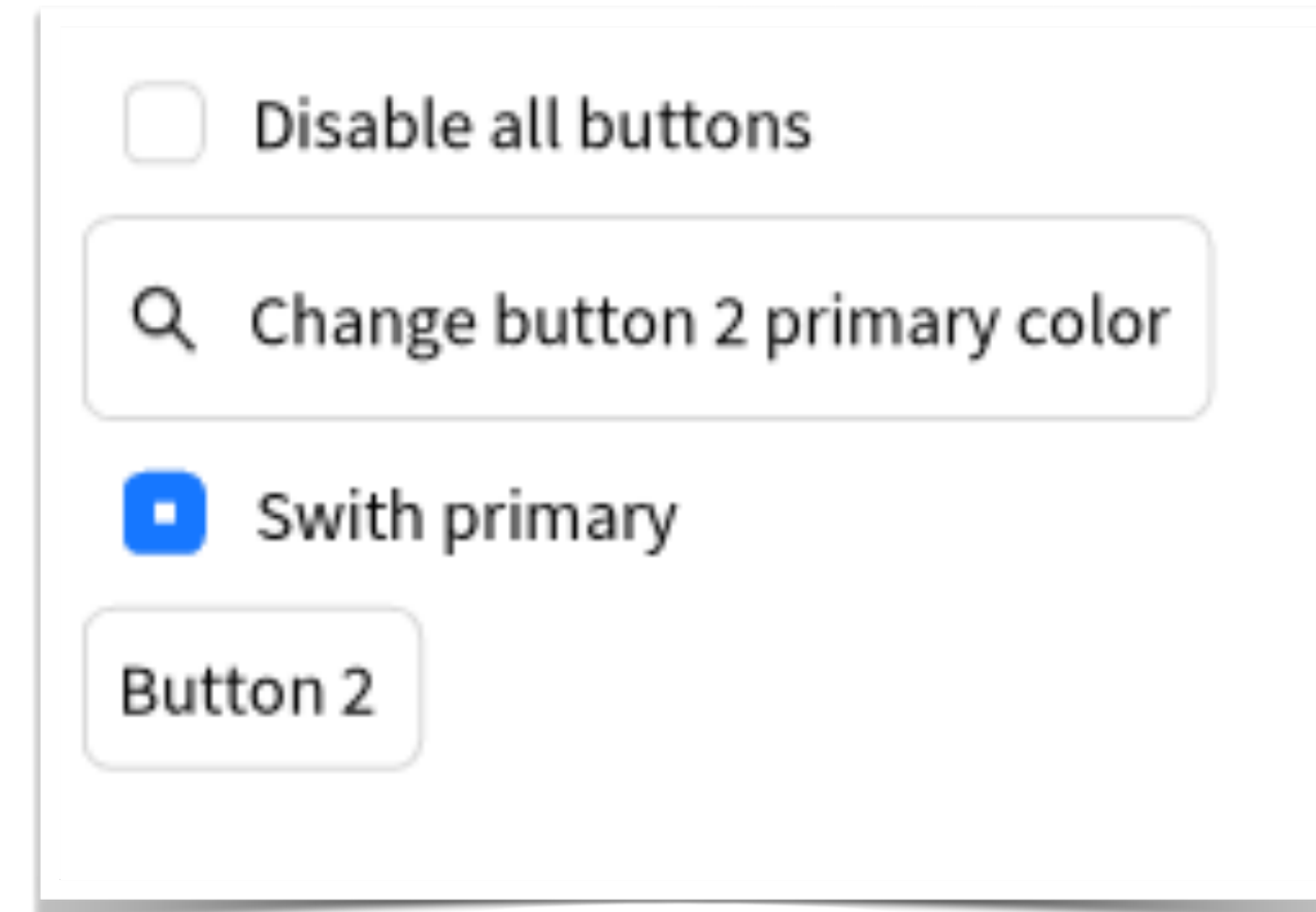
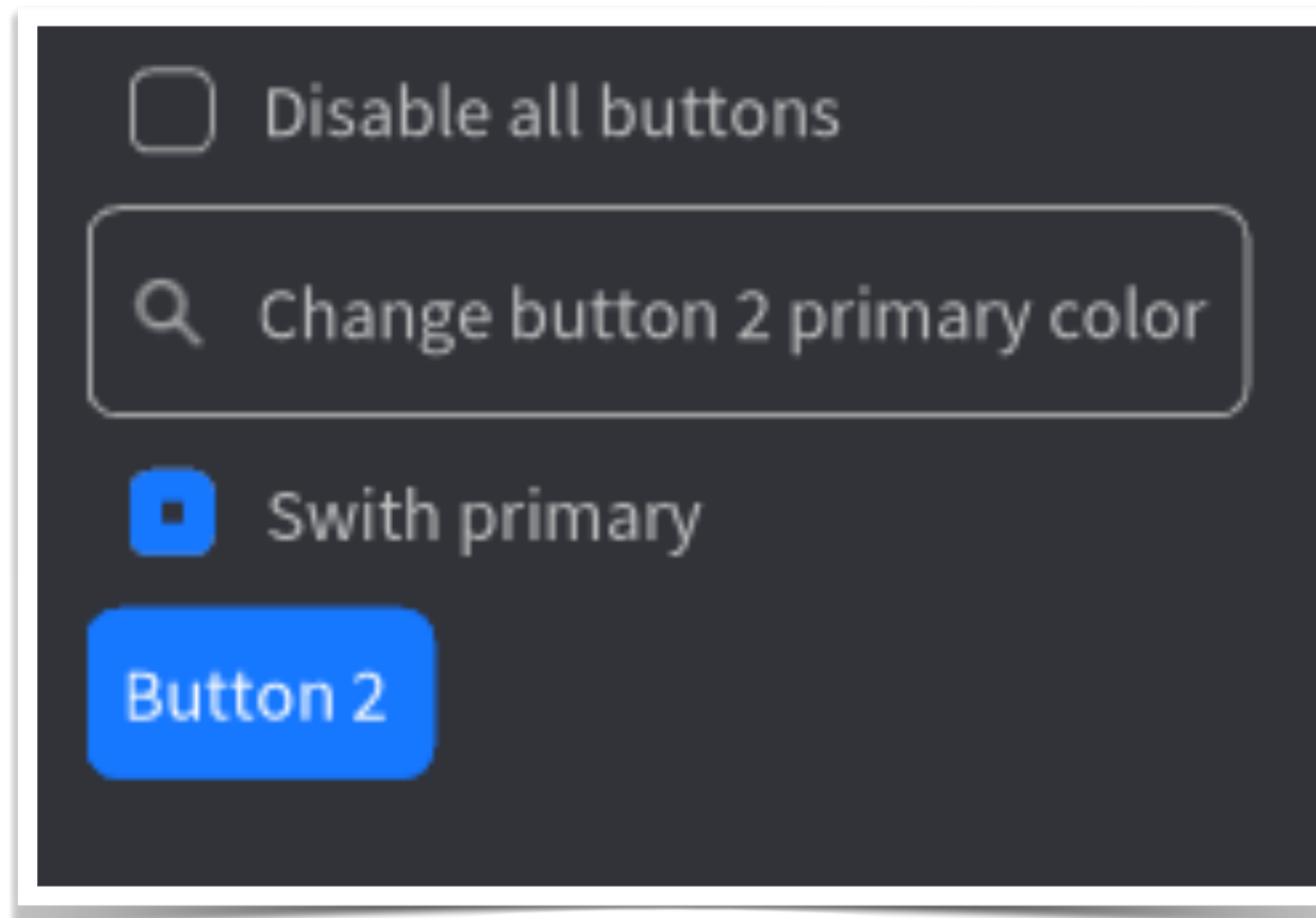
- On Skin Installation / Uninstallation
- On state changes
 - Hovered, pressed, leave, ...
 - Checked, enabled, selected, ...



When adaptations occur?

- On Skin Installation / Uninstallation
- On state changes
 - Hovered, pressed, leave, ...
 - Checked, enabled, selected, ...

**Driven by Events.
A skin is a event
handler**

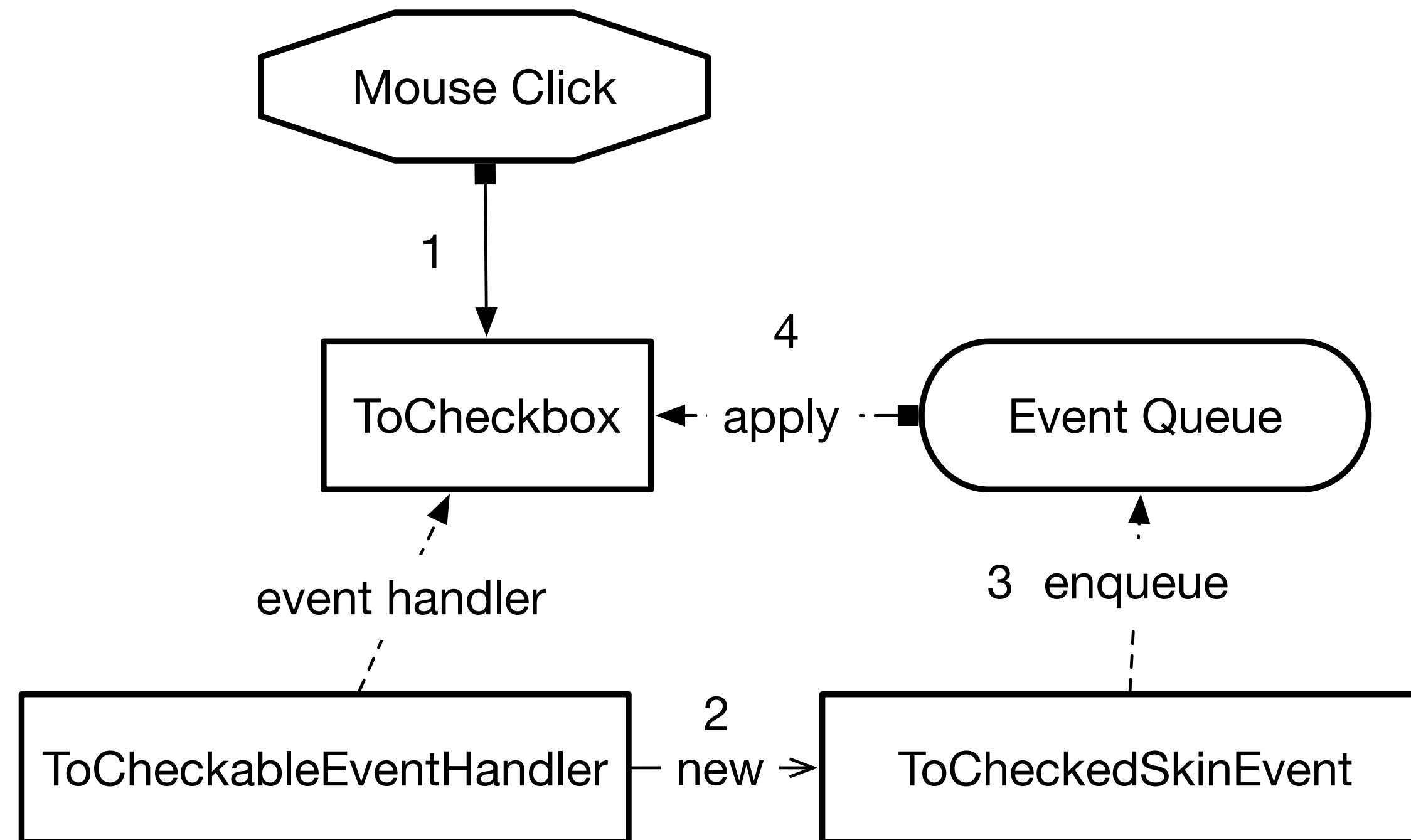




Element State

- Dynamically created
- 3 Kinds of States
 - Skin Management (Install / Uninstall)
 - Intrinsic States (checked, selected, focused, ...)
 - Transient States (Hovered, leave, enter, ...)
- Skin contributes new states (ToSkinStateGenerator)

Element State Generation



- Extends Bloc Events
- Events are handled in the correct rendering stage



Toplo StyleSheets

Declarative Skins

- A nice script version
- CSS Like rules

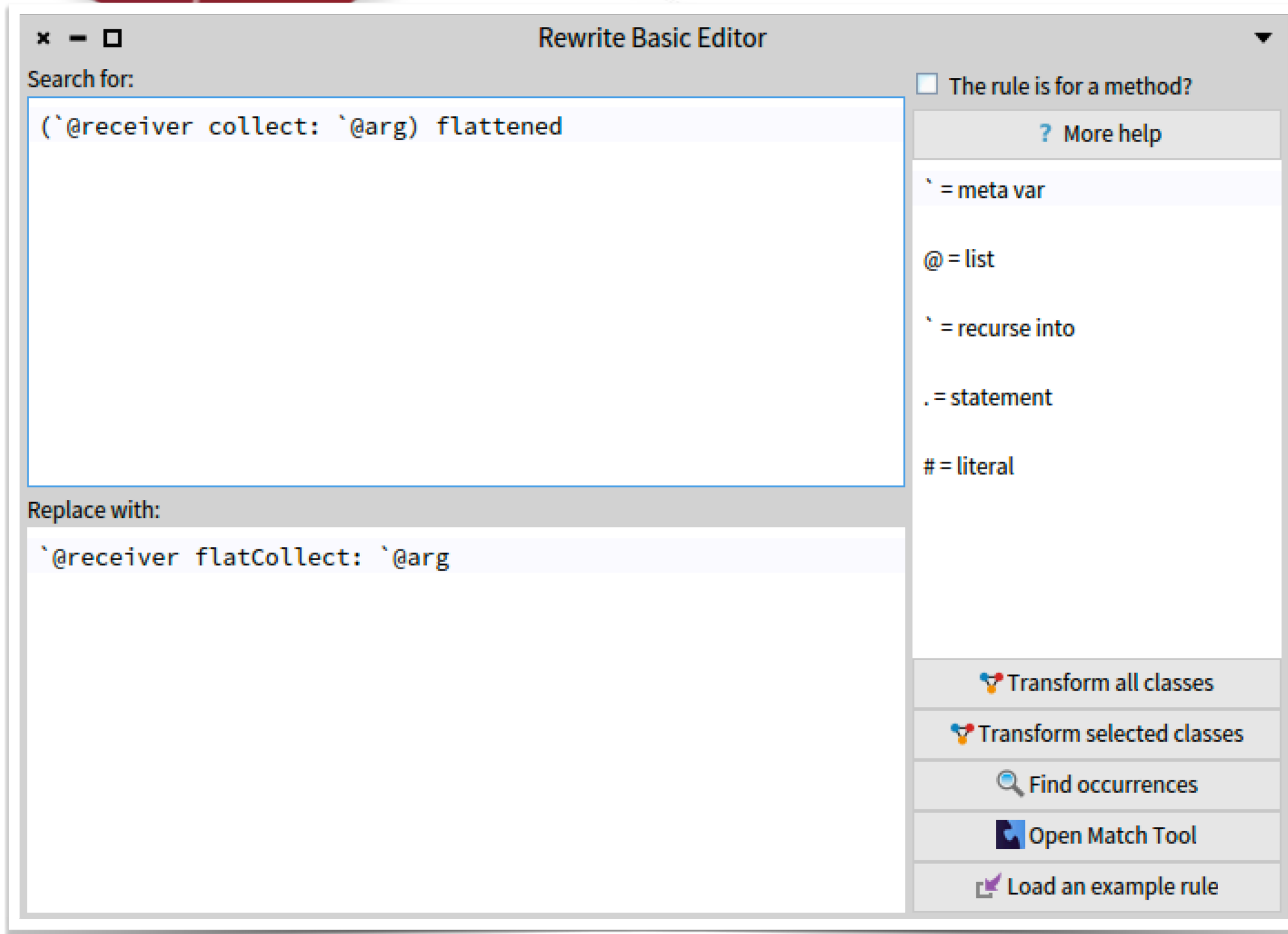
script = rule*
rule = selector property*
property = event_class property value

```
self
  select: ToPane asTypeSelector || (self id: #'space-root')
  style: [
    self
      write: (self property: #background)
      with: Color blue ]
```

**Still in
Development**

Toplo - Spec

The power of Toplo, the ease of Spec



Rewrite Basic Editor

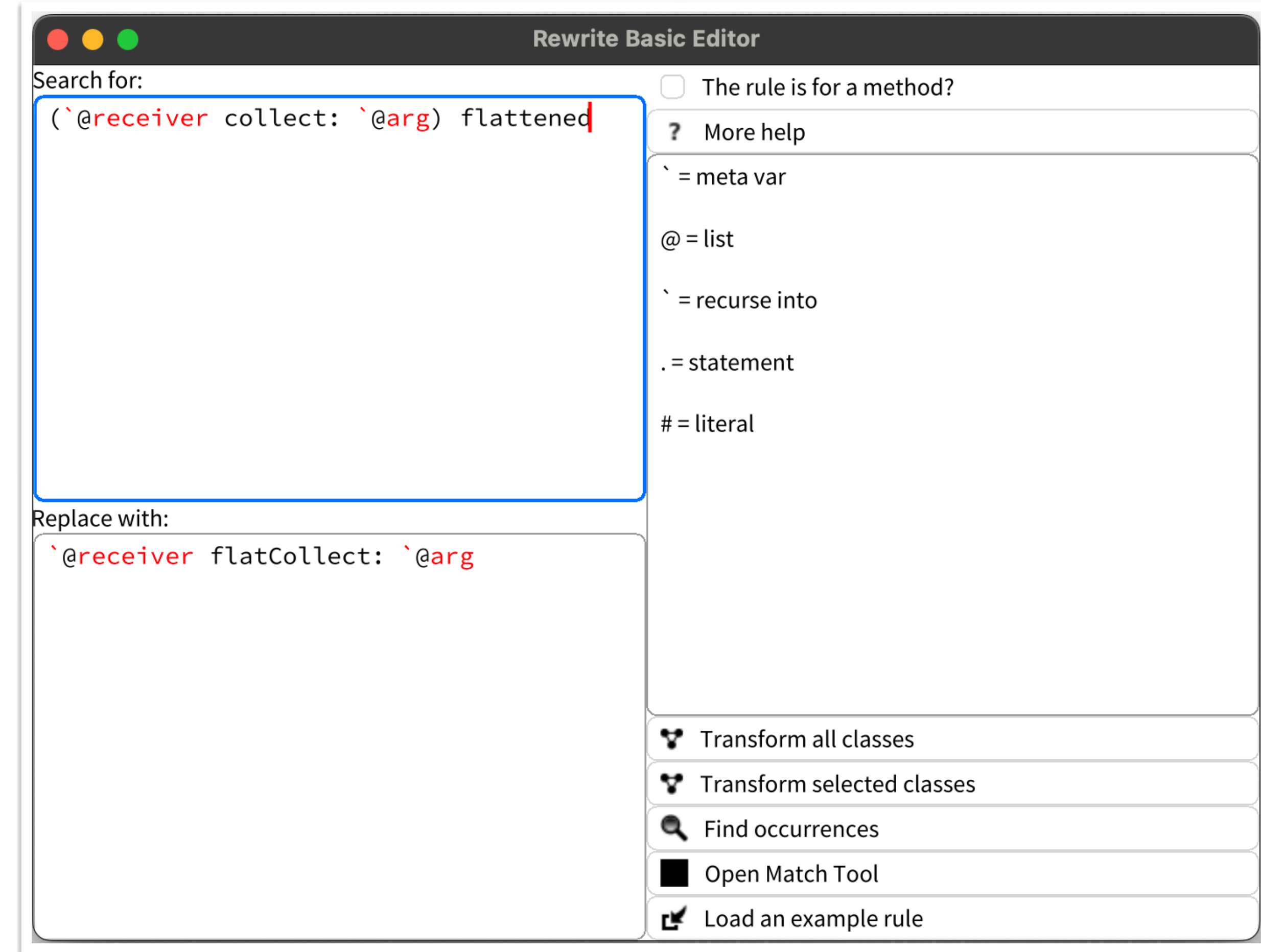
Search for:
`(`@receiver collect: `@arg) flattened`

Replace with:
``@receiver flatCollect: `@arg`

The rule is for a method?
[? More help](#)

- ``` = meta var
- `@` = list
- ``` = recurse into
- `.` = statement
- `#` = literal

[Transform all classes](#)
[Transform selected classes](#)
[Find occurrences](#)
[Open Match Tool](#)
[Load an example rule](#)



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- ``` = meta var
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Toplo & Spec

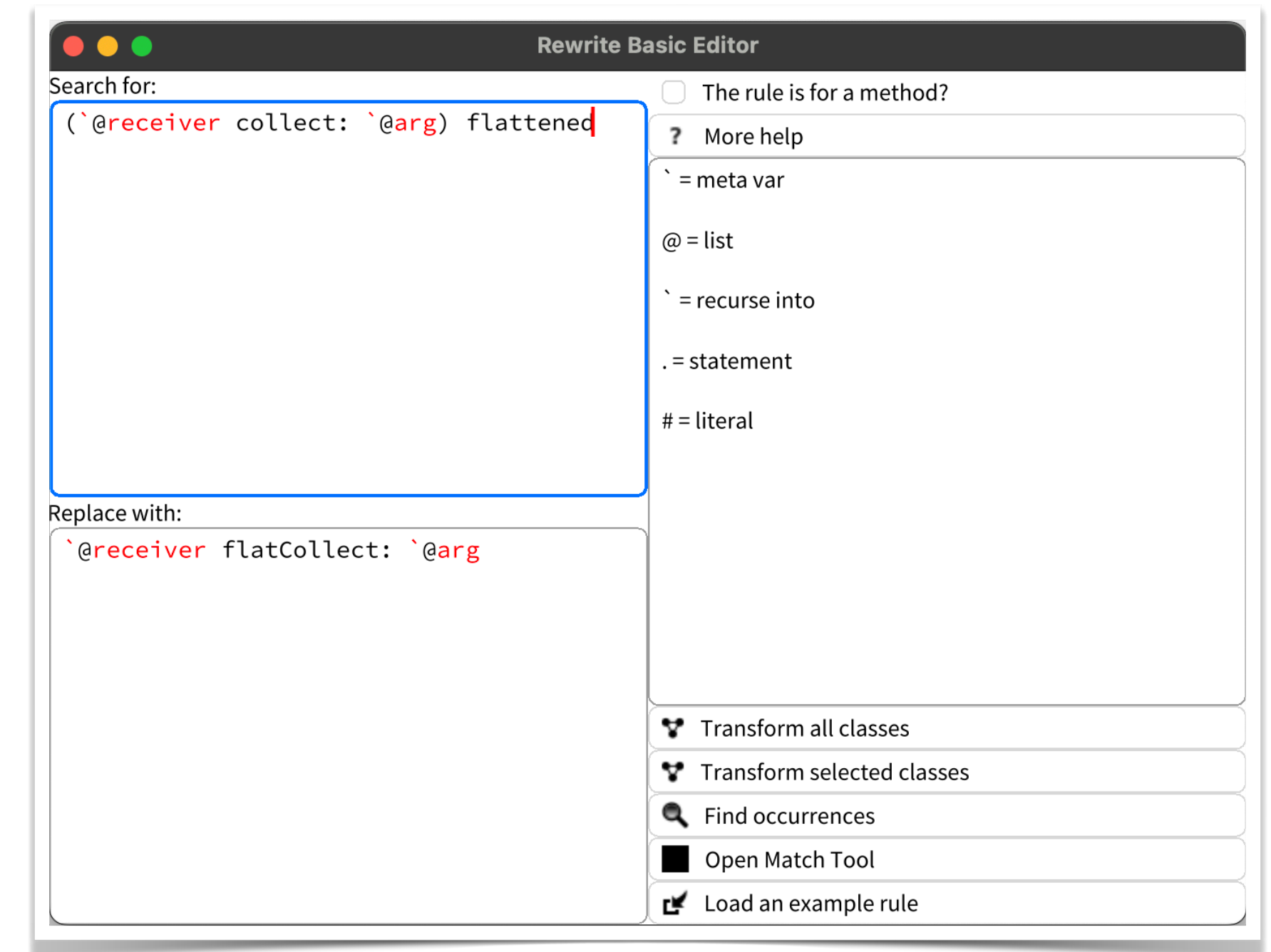
```
todo list demo
Do it Publish Bindings Versions Pages
1 app := SpApplication new.
2 app useBackend: #Toplo.
3 model := SpToDoList exampleWithSomeTasks.
4 presenter := SpToDoListPresenter newApplication: app model: model.
5 presenter open.
6
Line: 6:1 +L
```



Toplo - Spec

The power of Toplo, the ease of Spec

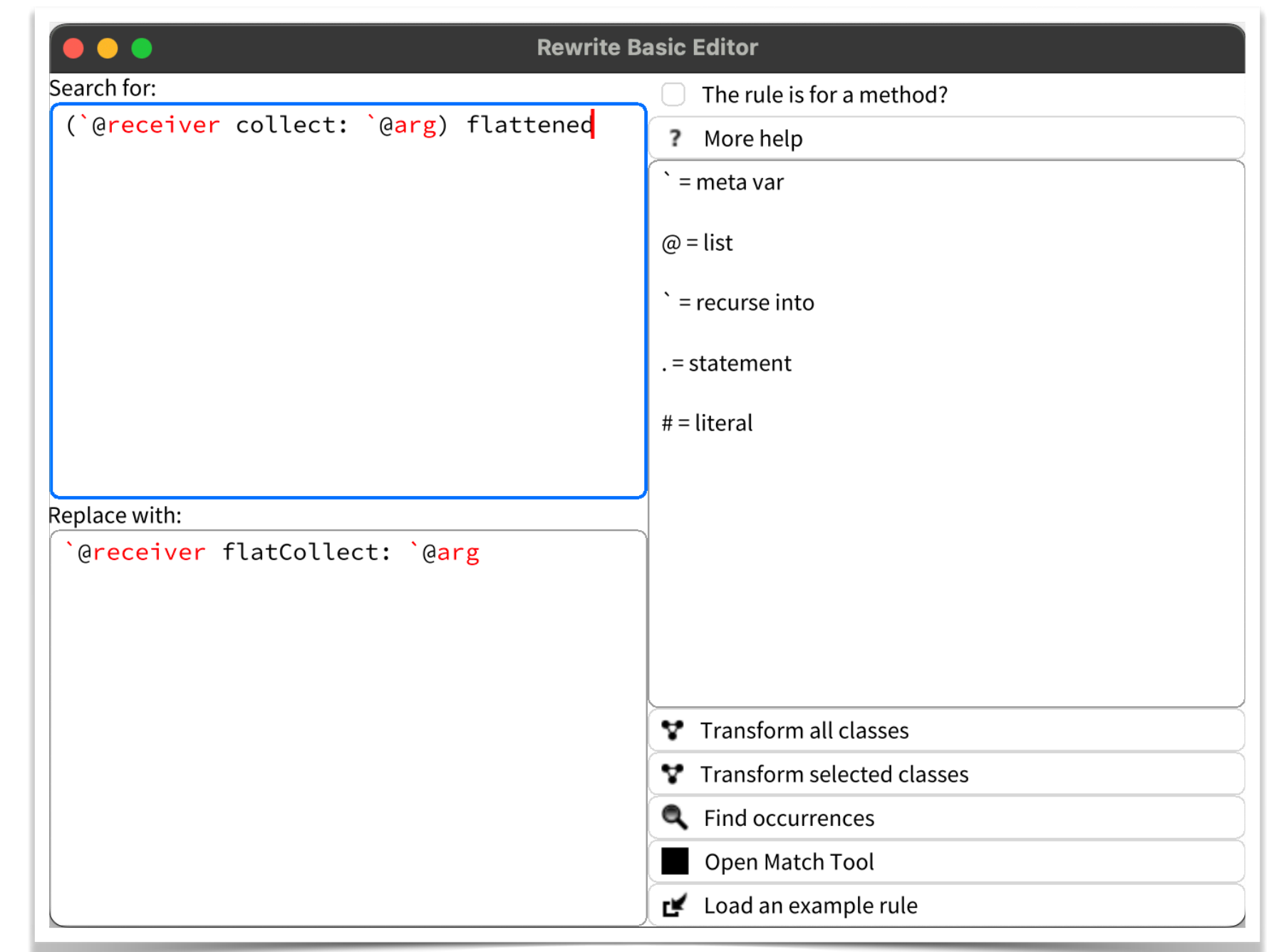
- A new Backend for Spec
- Transparent
- Full support



Toplo - Spec

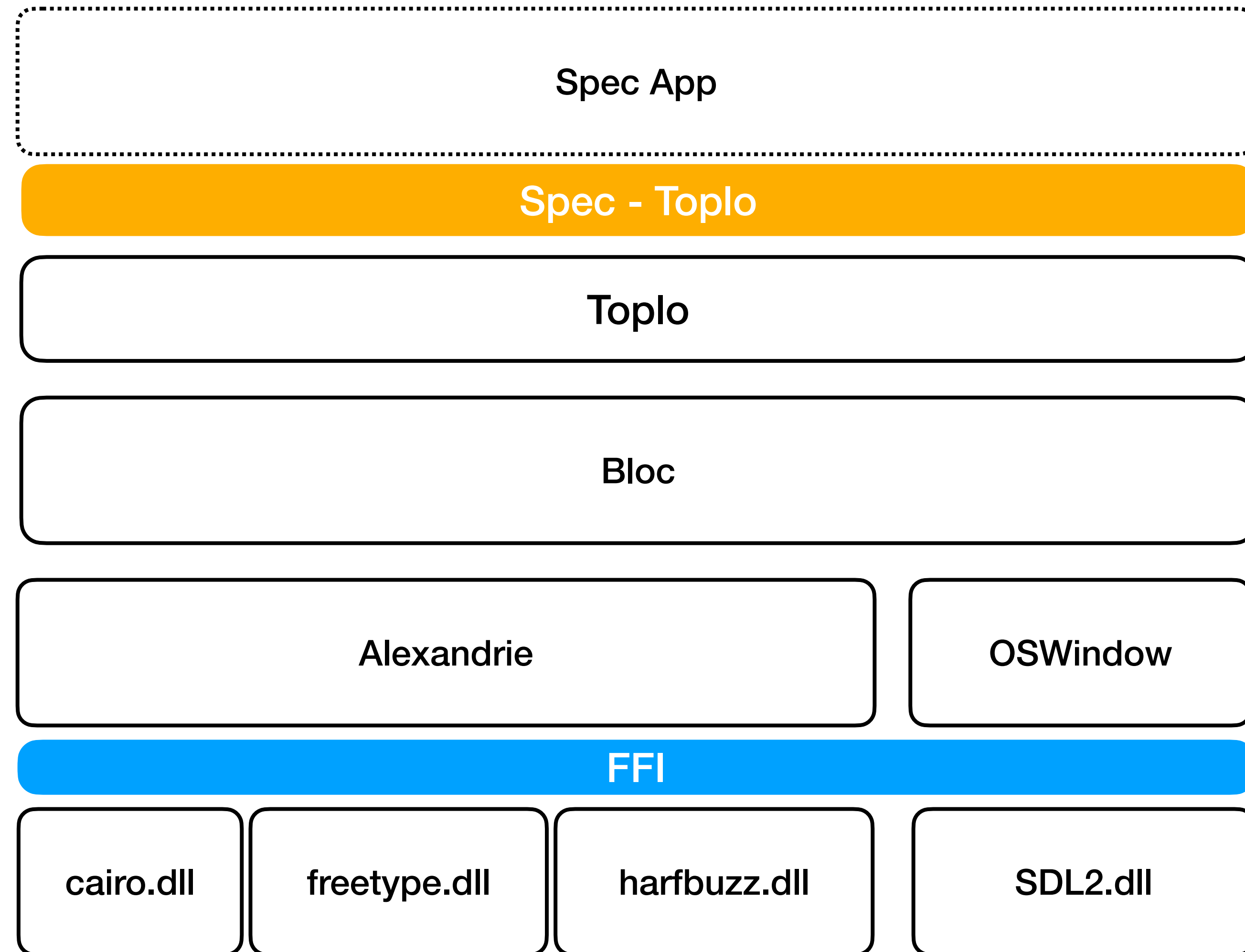
The power of Toplo, the ease of Spec

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**Still in
Development**

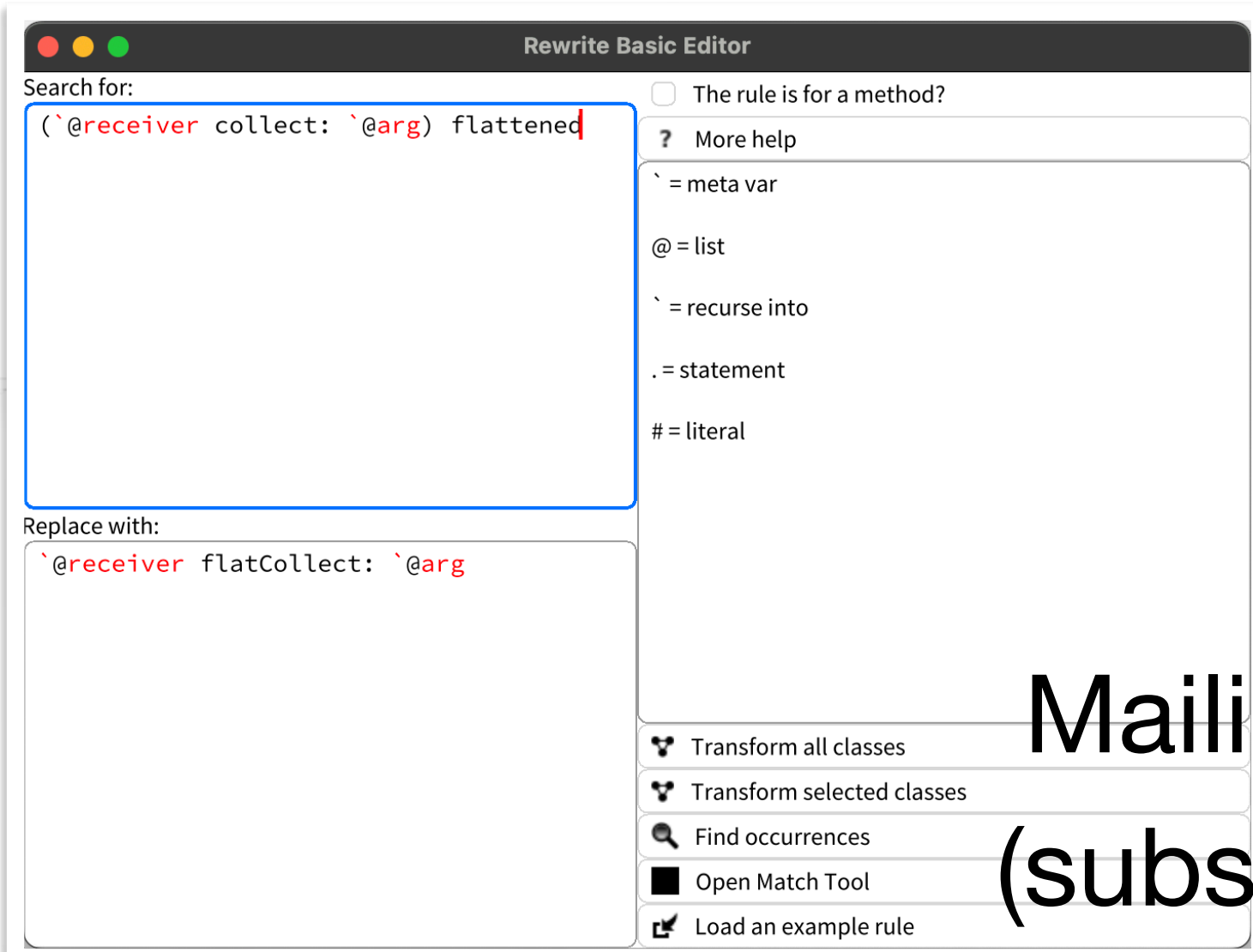
Our Application Stack



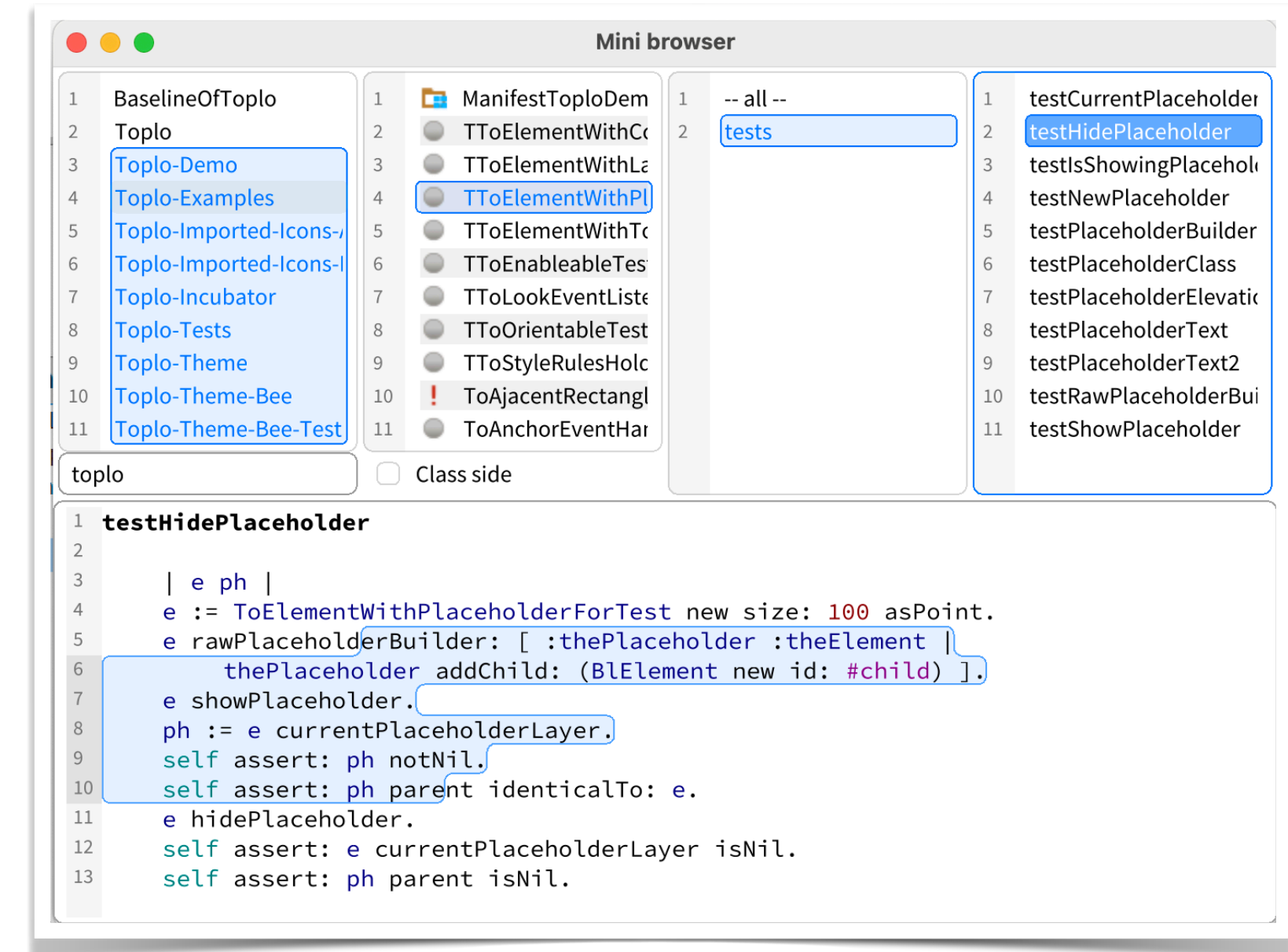


Future

- Faster & More Stable Bloc
- More Widgets in Toplo (Tables / Trees)
- Full Implementation of Spec-Toplo
- Tests & Documentation
- Roassal in Bloc



**STAY
TUNED!**



Mailing-list: lse-openbloc@inria.fr
(subscribe at: <http://sympa.inria.fr>)

Discord: Pharo server / #bloc channel

Bloc: <https://github.com/pharo-graphics/Bloc>

Toplo: <https://github.com/pharo-graphics/Toplo>

Spec-Toplo: <https://github.com/pharo-graphics/Spec-Toplo>

