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An extensible production-level debugger

Adrien Vanègue

Steven Costiou

Problem: building and evaluating new debuggers

Debuggers are difficult to build.

- Huge development costs
- Difficult to reuse: prototypes are often one-shot
- Costly and difficult to maintain
- Difficult to test

How to make debuggers extensible to facilitate the construction and maintenance of new prototypes?

Debuggers are difficult to evaluate.

- Prototypes are often unstable
- Difficult to evaluate on real-world scenarios: practitioners need to adopt and use the new debugger

How to make debuggers solid to make them usable in practice and evaluate them?

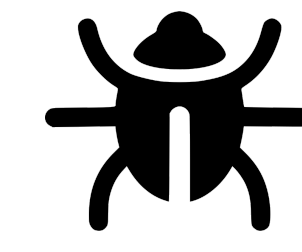
Requirements for extensible production-level debugger

Modular and easy to reuse, test and maintain

extensible and easy to build on top

production-level and regularly maintained

Testing

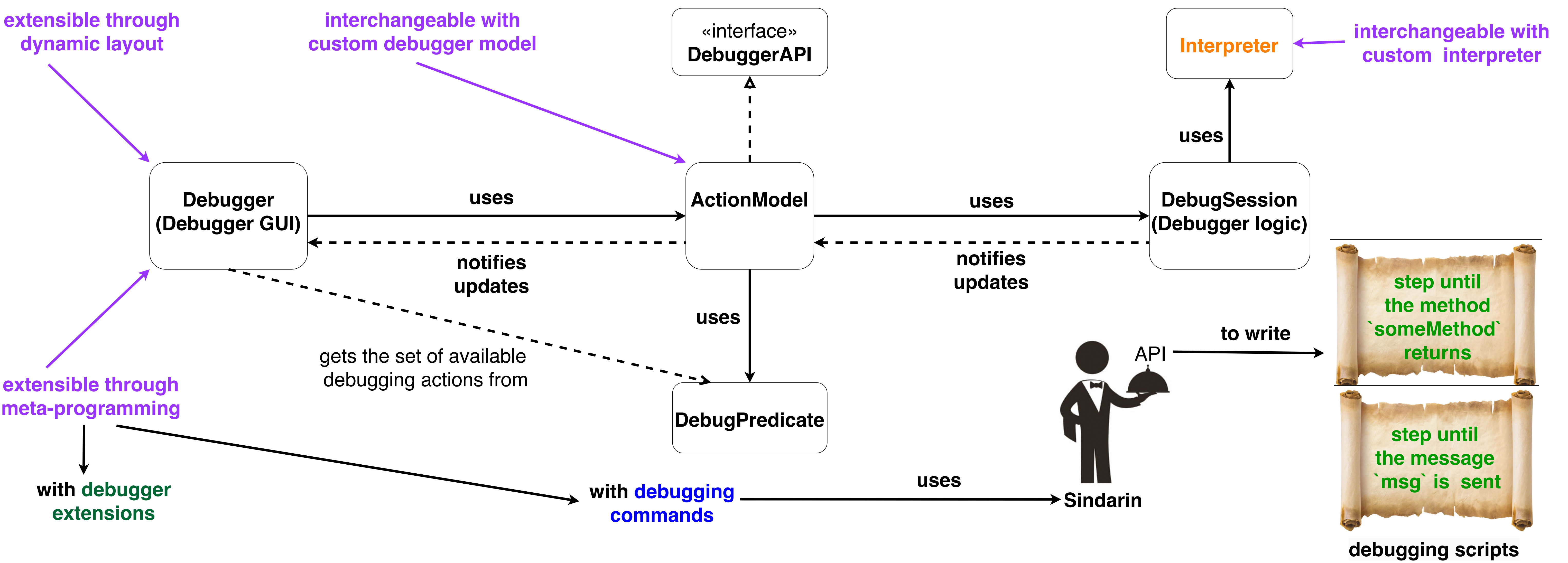


Tools resulting from prototypes are stable, through testing and bug fixes



Easy to adopt: practitioners use the debugger they know along with the new tool

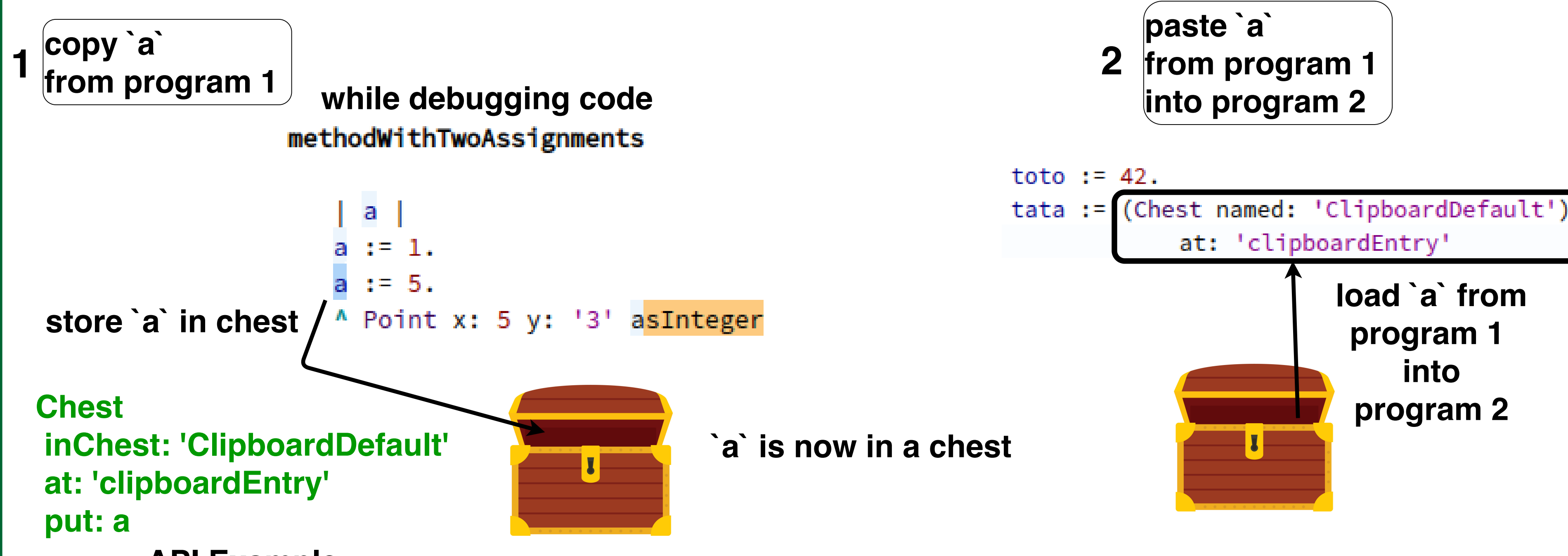
The Pharo debugger design



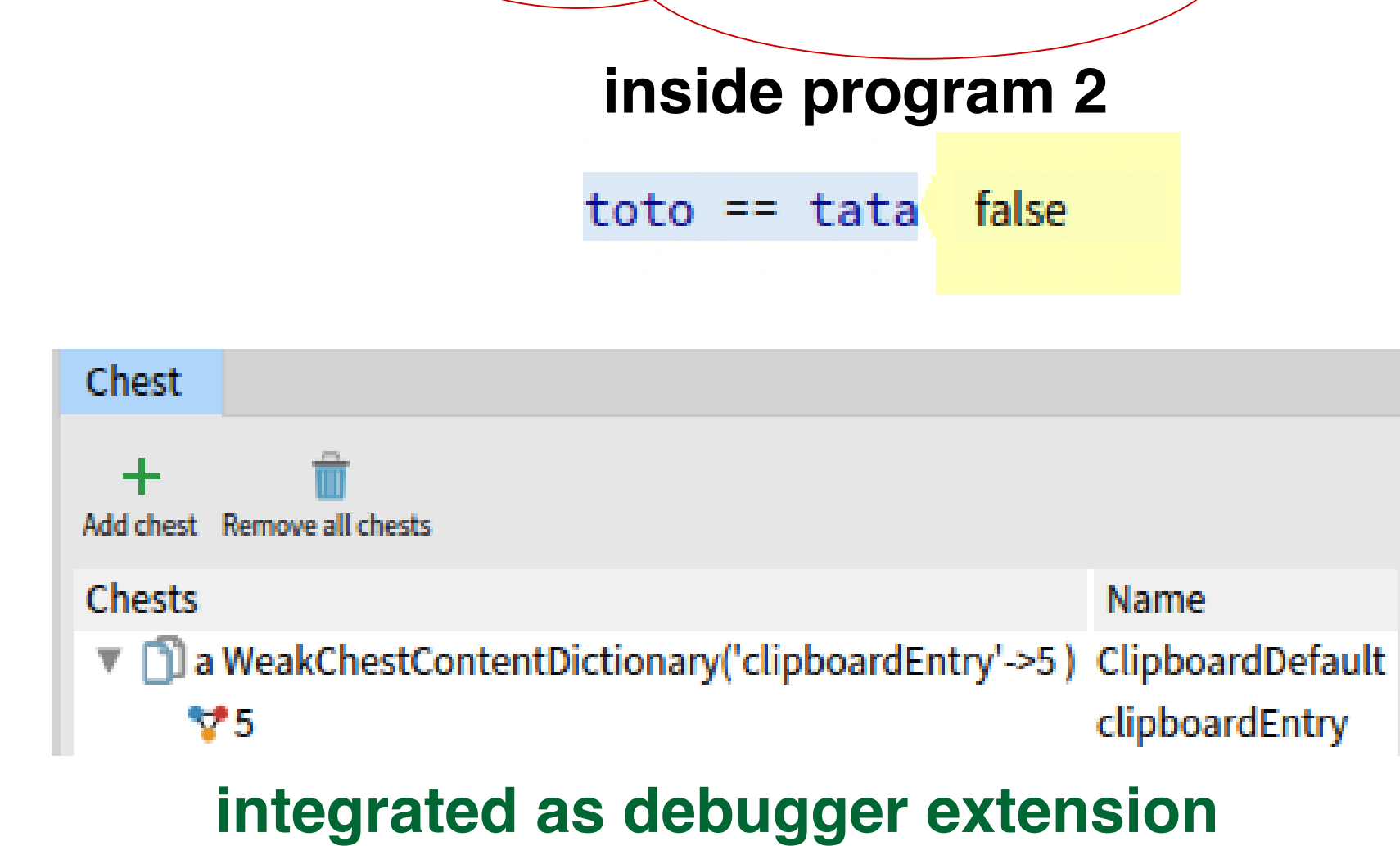
Building new debugging tools: Examples

CHEST:

a global collection with an API to access objects from everywhere

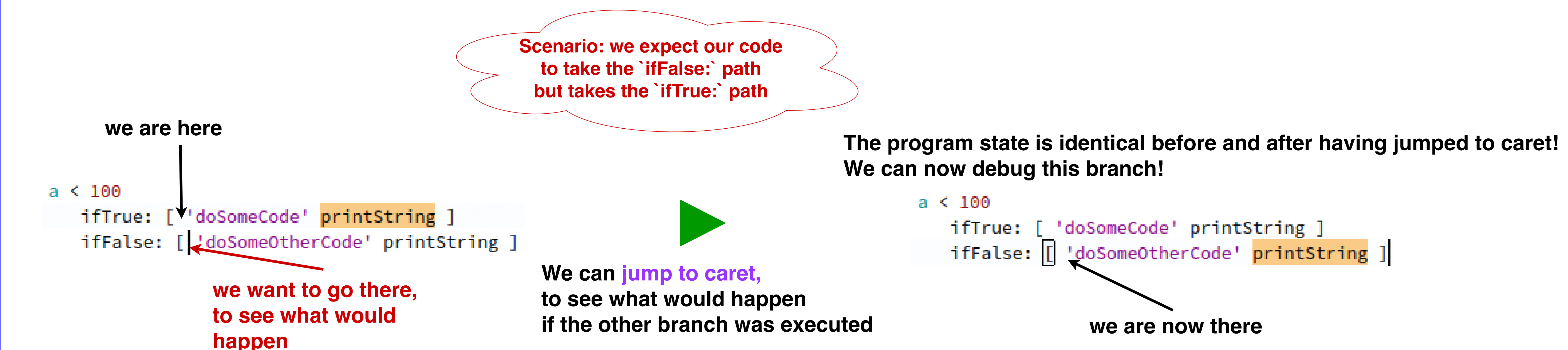


How to compare my objects between program 1 and 2?

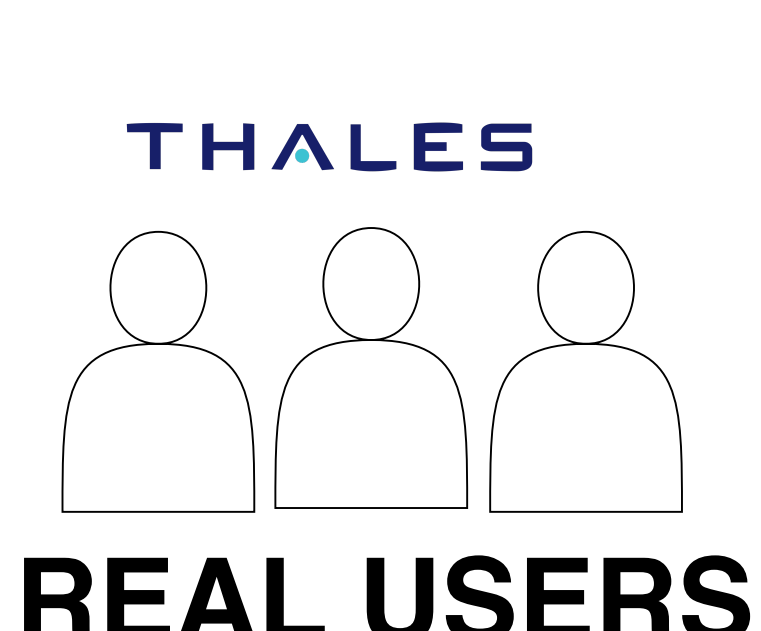


JUMP TO CARET:

a Goto command to debug



A production debugger integrated into the Pharo language



- moldable debugger, possible to add:
 - specific debugging operations
 - specific debugging tools
- new debugging tools can be used as extensions of the existing debugger
- Concerns are separated as each component is independent: the interpreter, the model, the API, the UI, the debugging commands, and the debugger extensions
- 3 main contributors, 958 commits
- Listening to feedback from users
- The debugger is used for empirical evaluation of research prototypes
- Lots of contributions merged into the Pharo baseline
- 559 tests