On Compositional safety verification with Max-SMT

Author: Fabian Böller
Supervision: David Korzeniewski

RWTH Aachen

fabian.boeller@rwth-aachen.de

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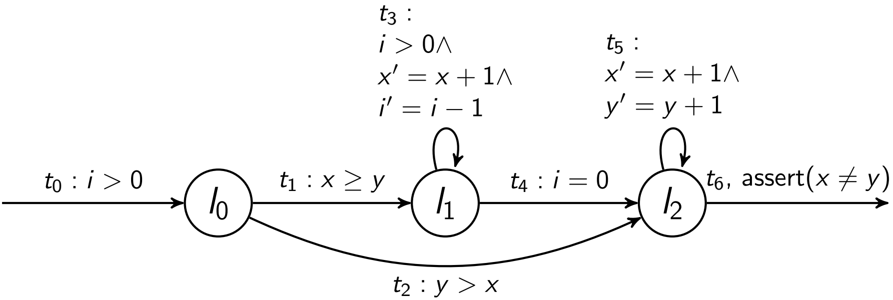
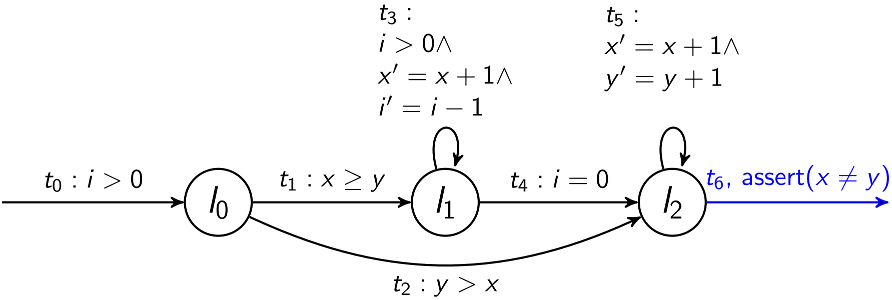
Overview

1. Example execution

Example program



Example execution



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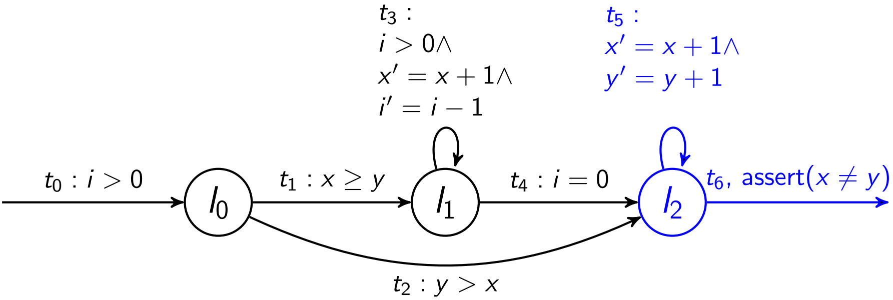

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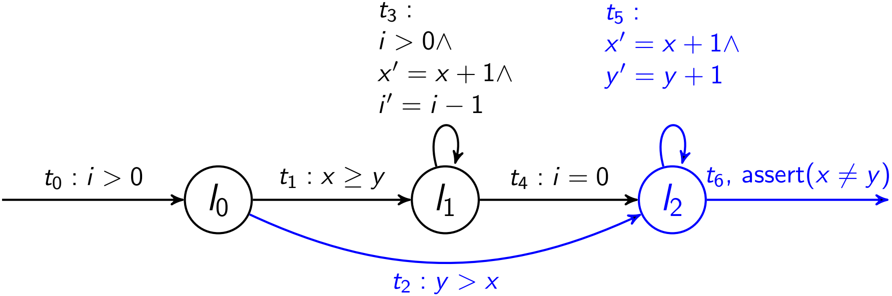

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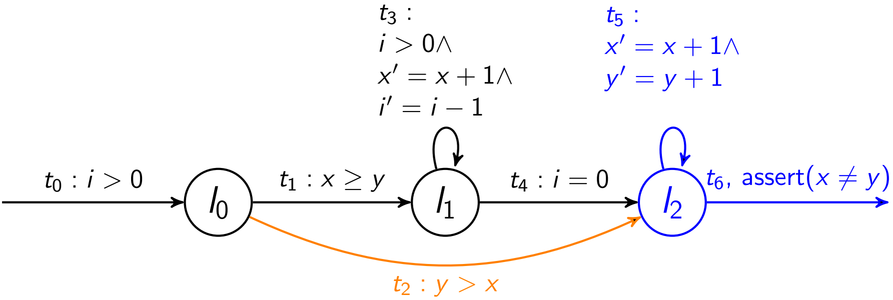

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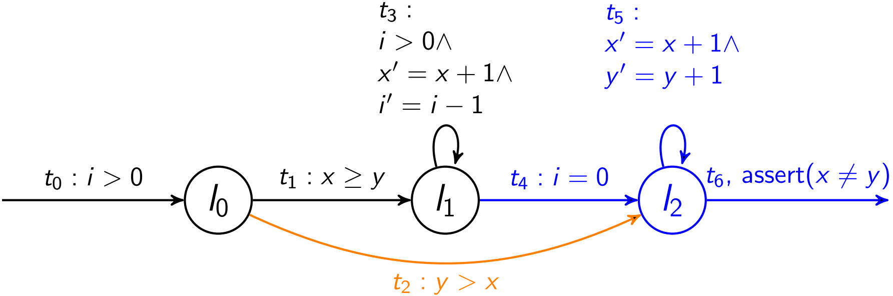

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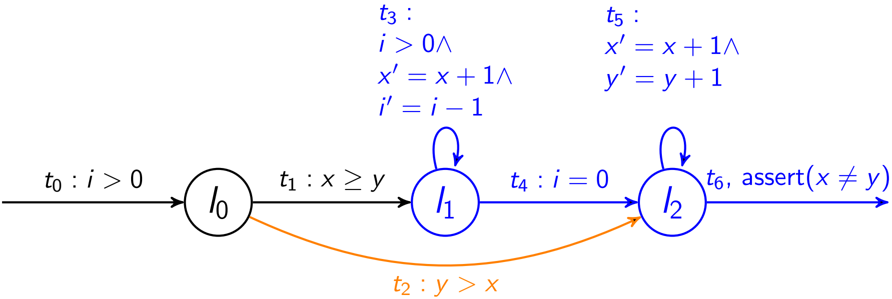

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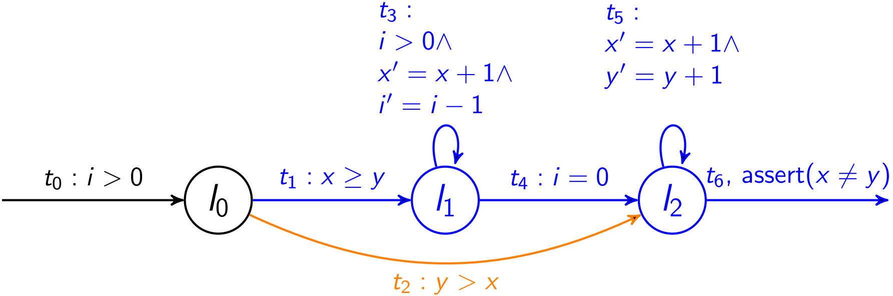

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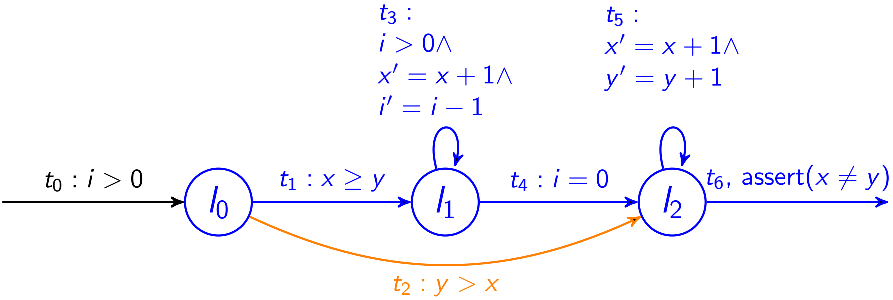

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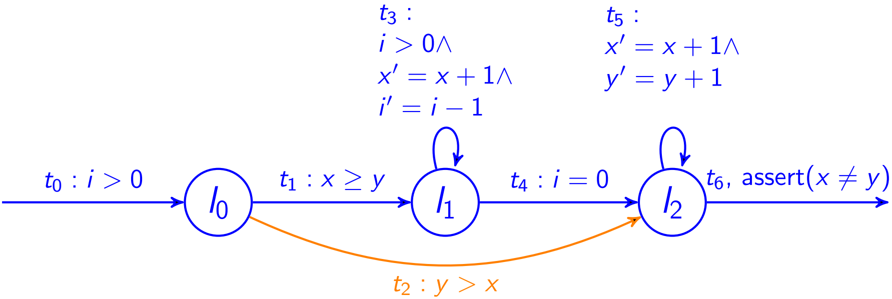

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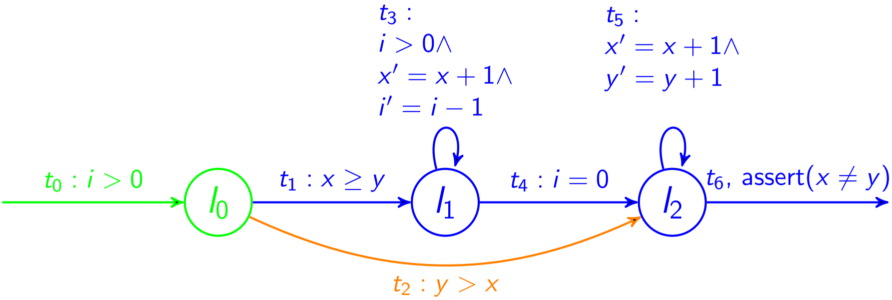

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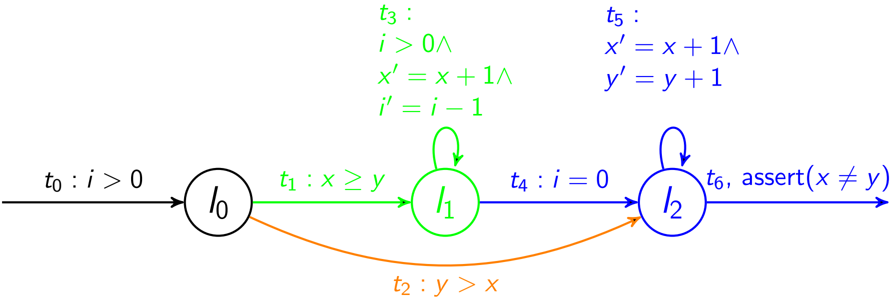

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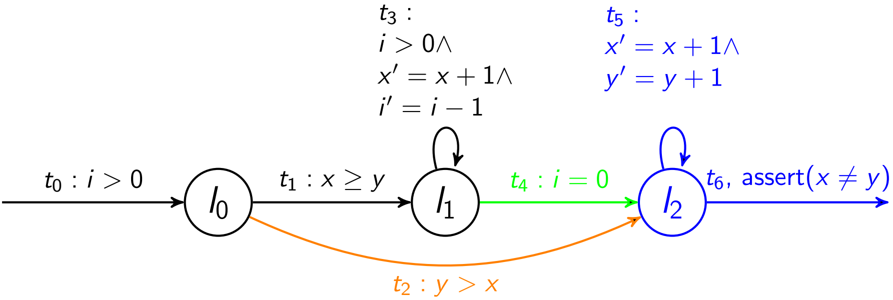

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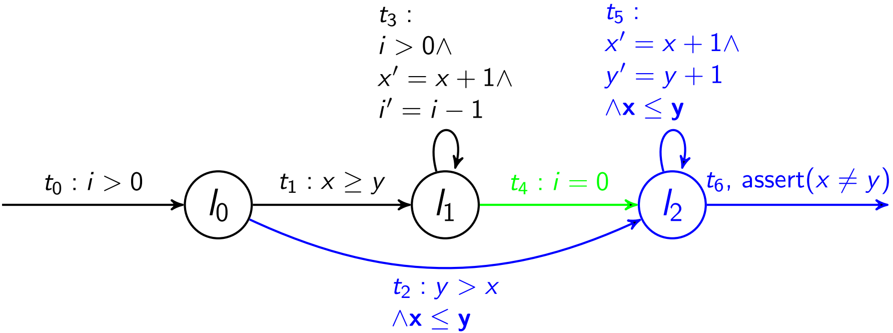

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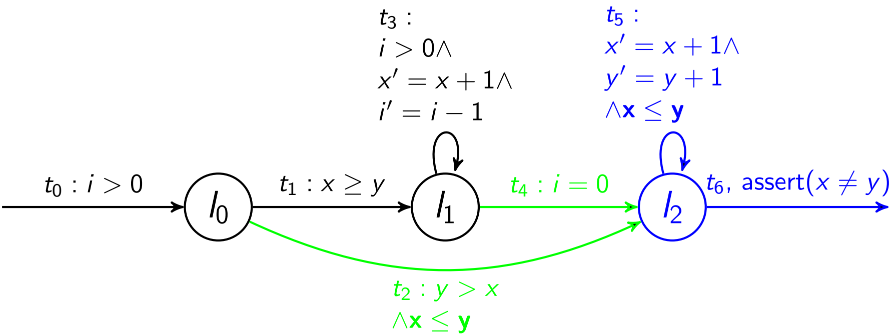

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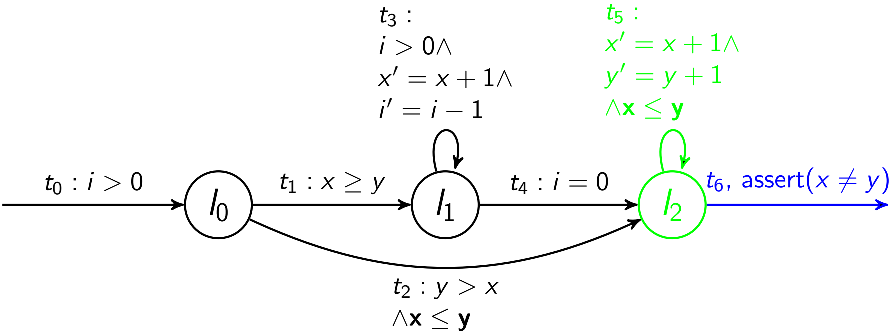

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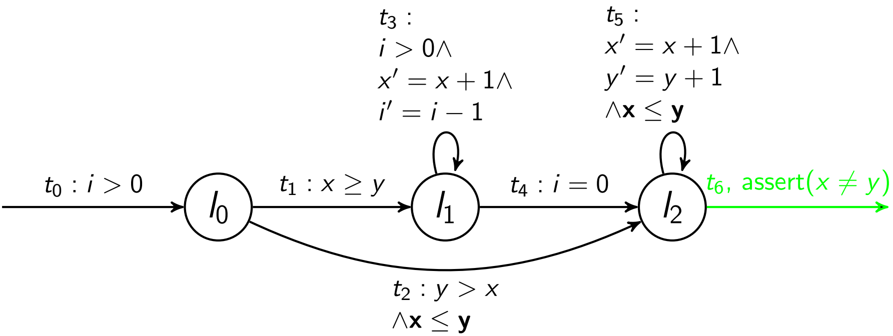
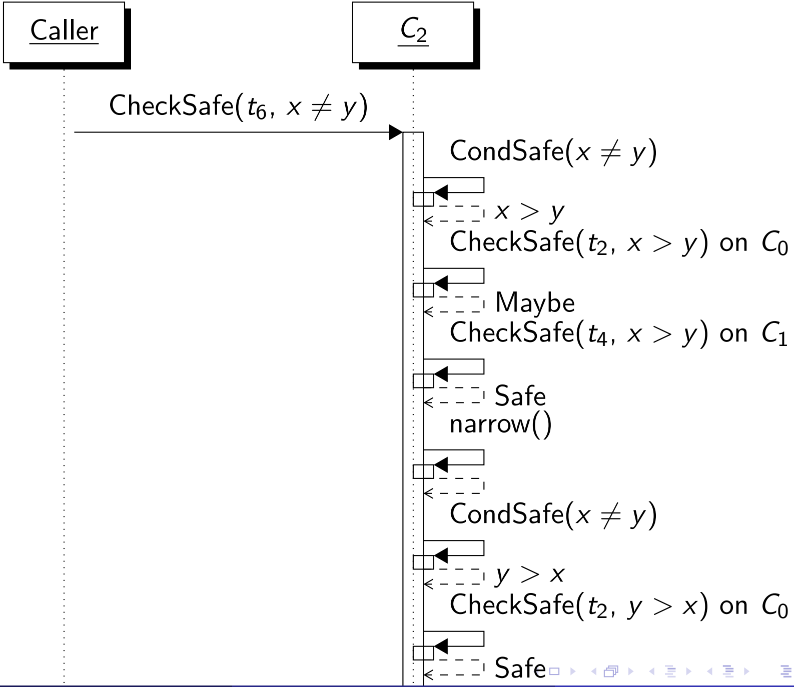




Caller

C_2

CheckSafe(t_6, $x \neq y$)

CondSafe($x \neq y$)

$x > y$

CheckSafe(t_2, $x > y$) on C_0

Maybe

CheckSafe(t_4, $x > y$) on C_1

Safe

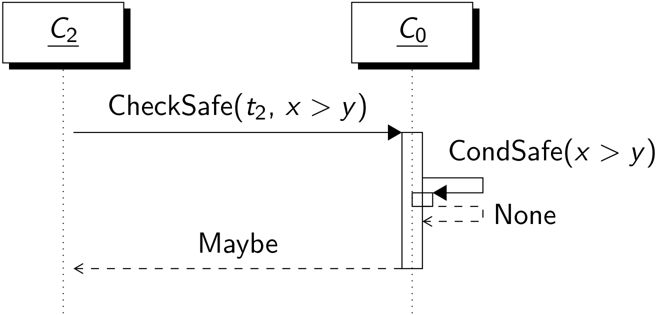
narrow()

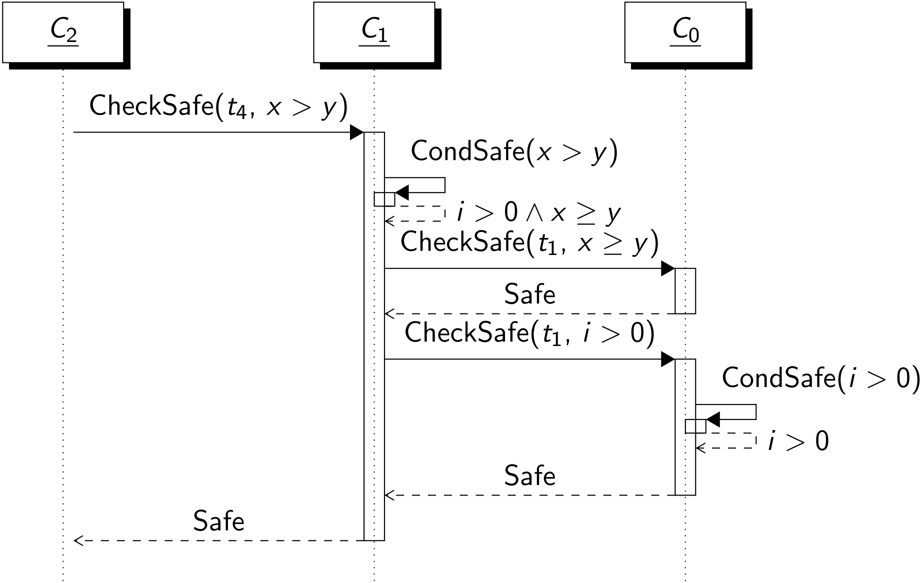
CondSafe($x \neq y$)

$y > x$

CheckSafe(t_2, $y > x$) on C_0

Safe


C_2
C_0
CheckSafe(t_2, $x > y$)
CondSafe($x > y$)
None
Maybe



$\underline{C_2}$

$\underline{C_1}$

$\underline{C_0}$

$\text{CheckSafe}(t_4,\ x > y)$

$\text{CondSafe}(x > y)$

$i > 0 \wedge x \geq y$

$\text{CheckSafe}(t_1,\ x \geq y)$

Safe

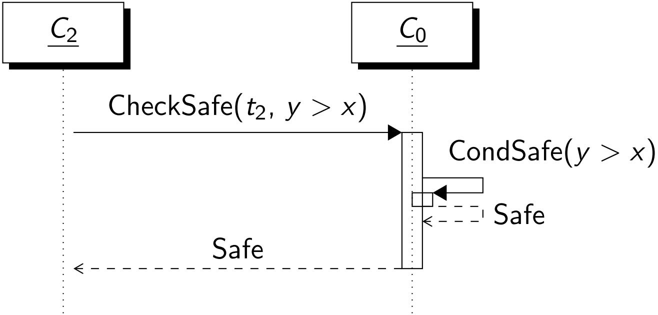
$\text{CheckSafe}(t_1,\ i > 0)$

$\text{CondSafe}(i > 0)$

$i > 0$

Safe

Safe


$\underline{C_2}$
$\underline{C_0}$
CheckSafe(t_2, $y > x$)
CondSafe($y > x$)
Safe
Safe

References

Brockschmidt, Marc and Larraz, Daniel and Oliveras, Albert and Rodriguez-Carbonell, Enric and Rubio, Albert (2015)

Compositional Safety Verification with Max-SMT

Proceedings of FMCAD'15

The End