Theta: Abstraction Based Techniques for Verifying Concurrency (Competition Contribution)

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MŰEGYETEM 1782

BME FACULTY OF ELECTRICAL ENGINEERING AND INFORMATICS

ftsrg Critical Systems Research Group

New algorithms

- Abstraction-based partial order reduction:
  - Variables untracked in the abstraction does not cause dependency
  - Static POR based on source sets

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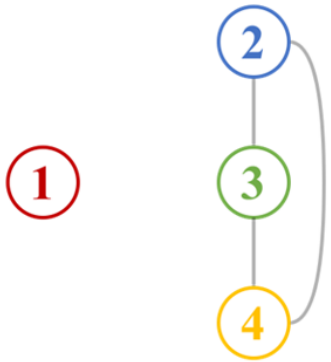

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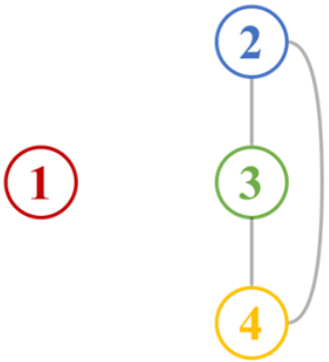

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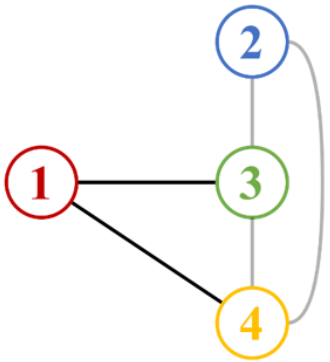

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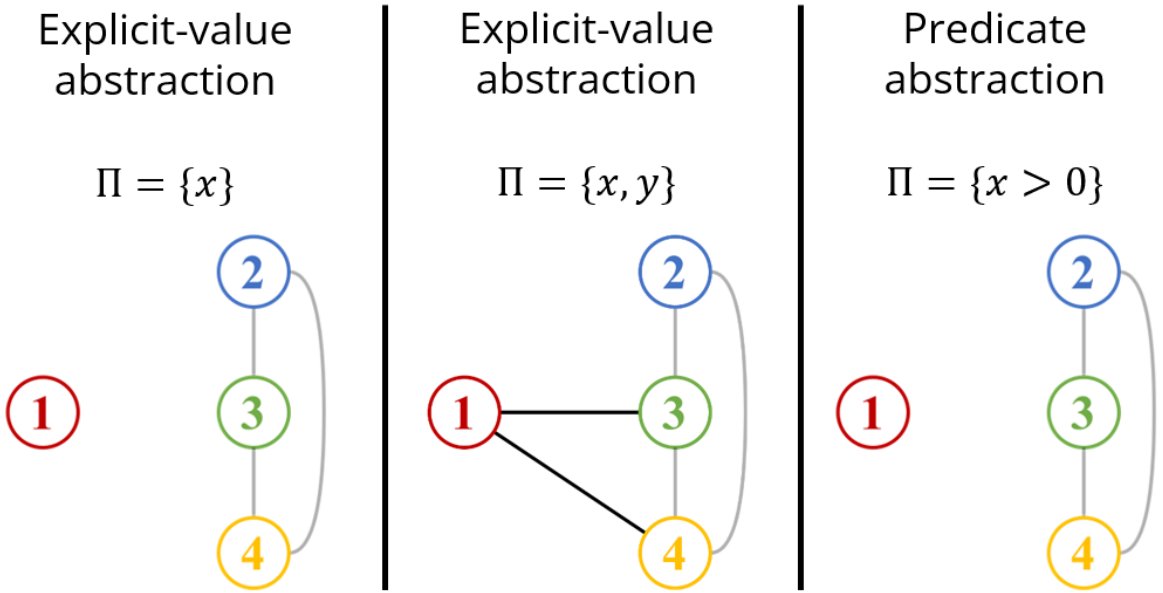

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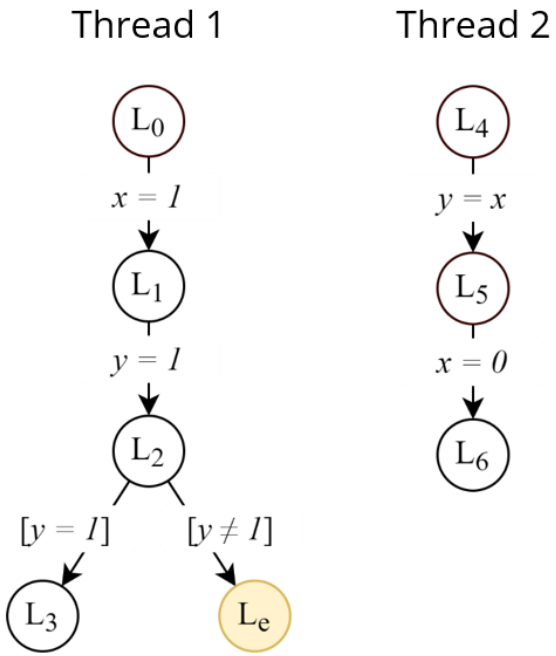

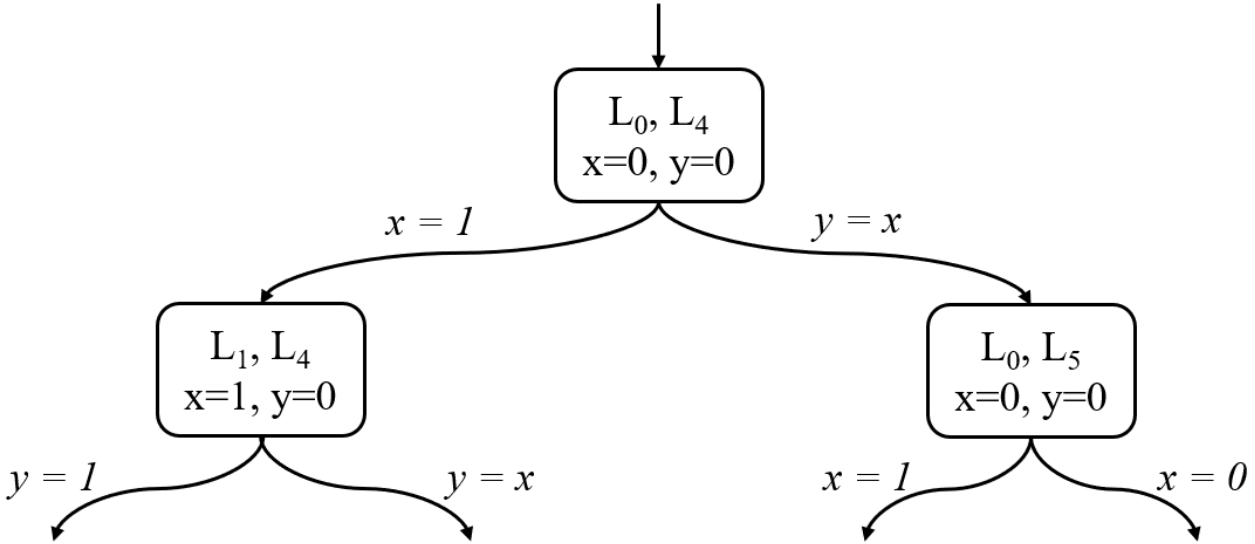

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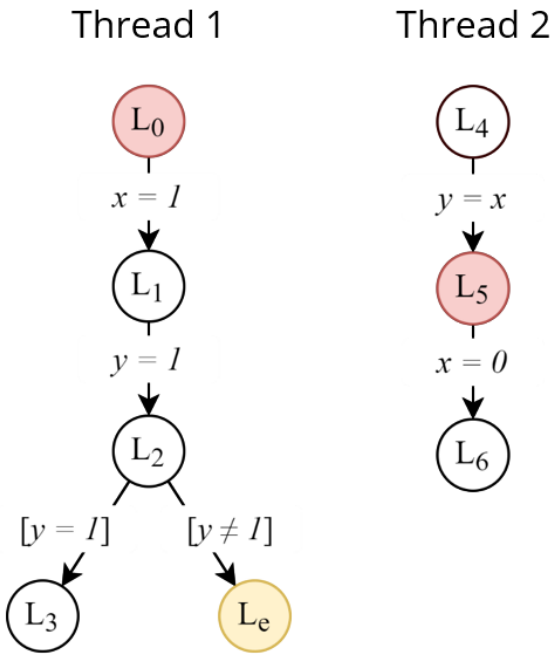

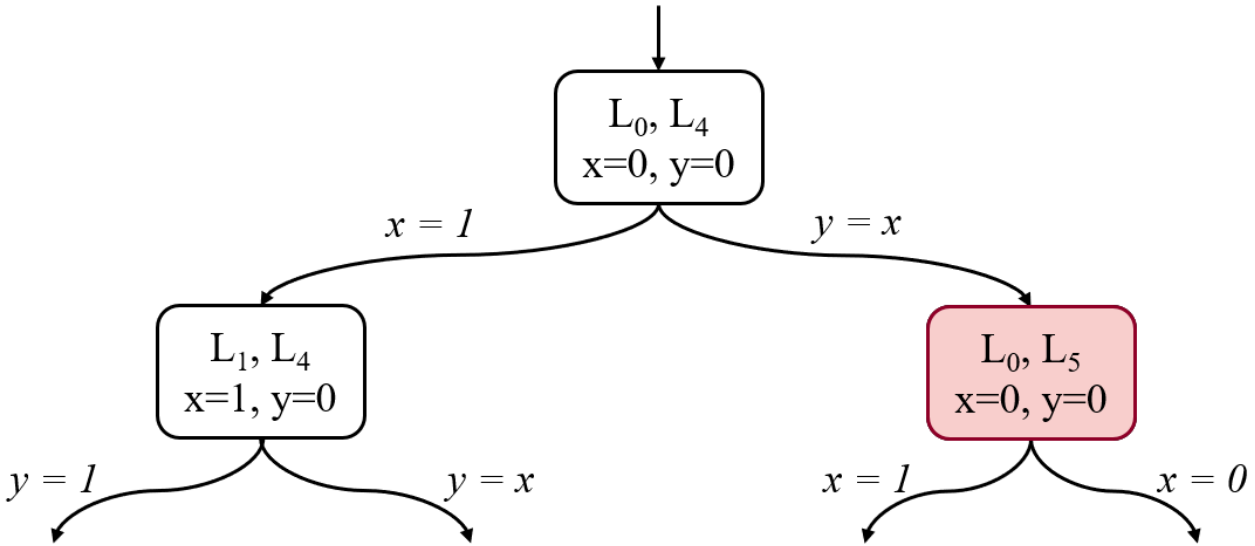

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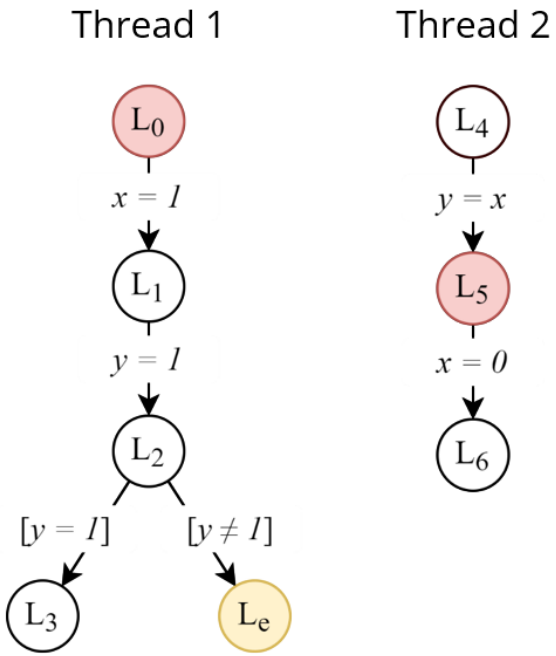

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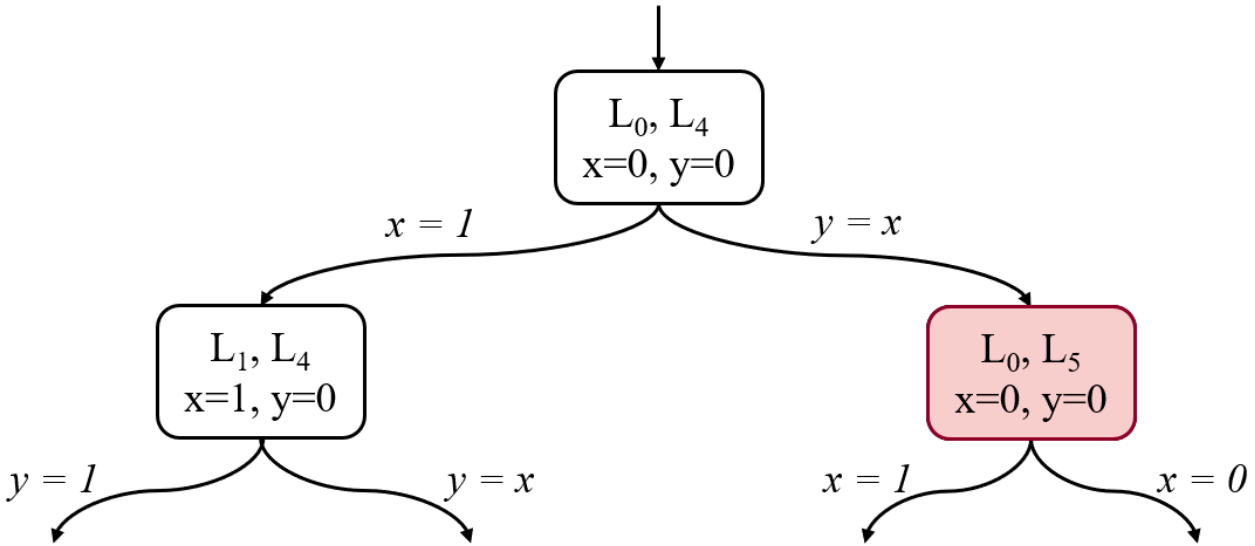

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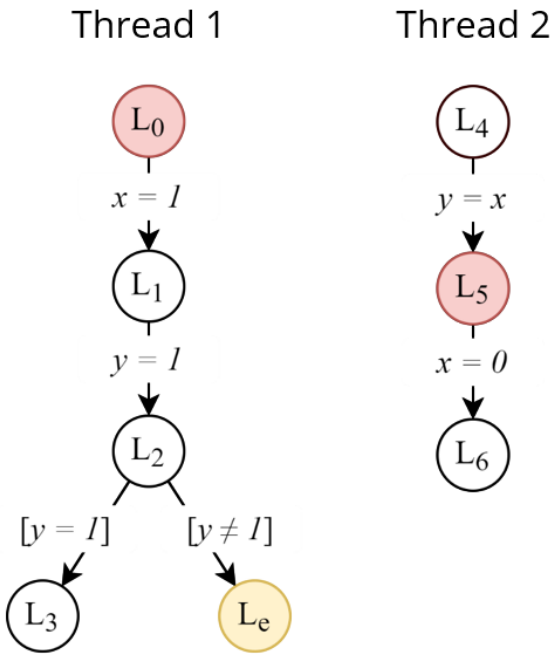

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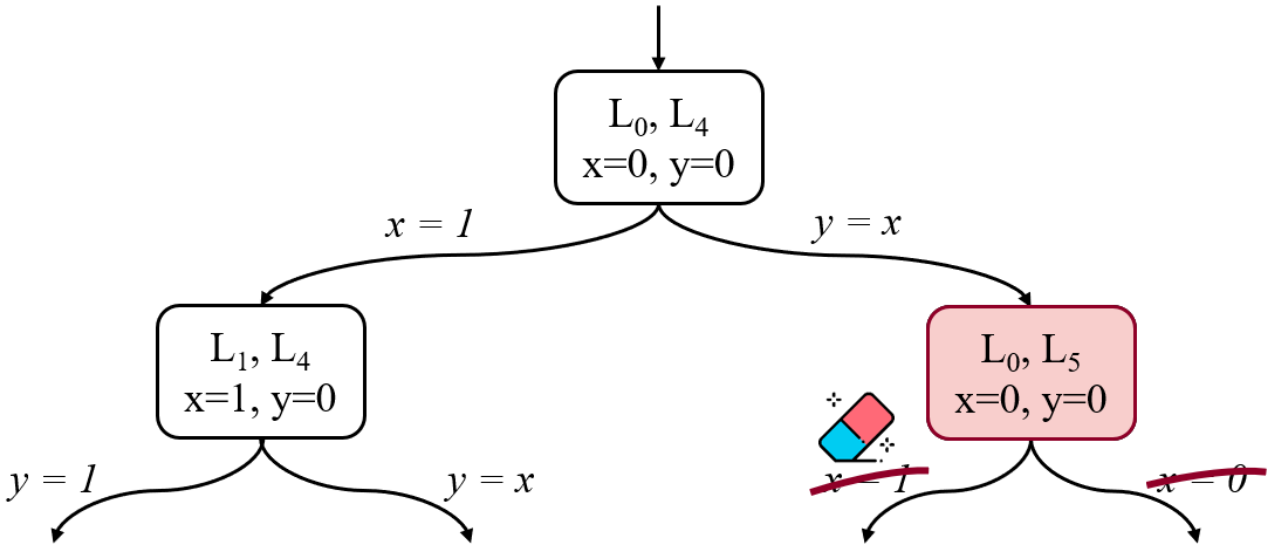

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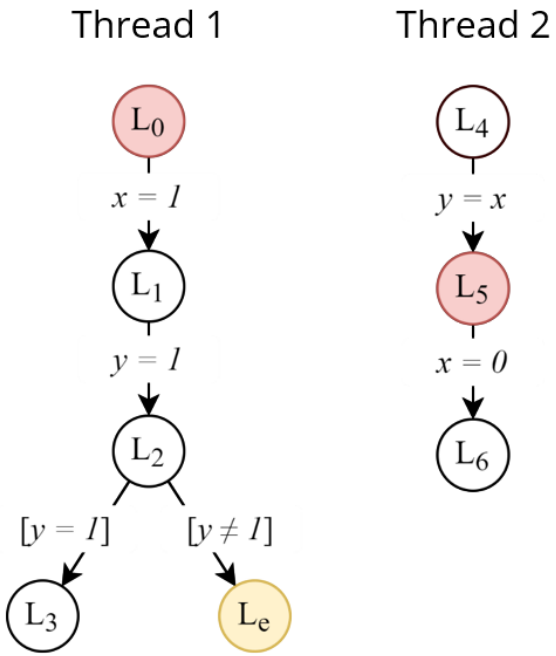

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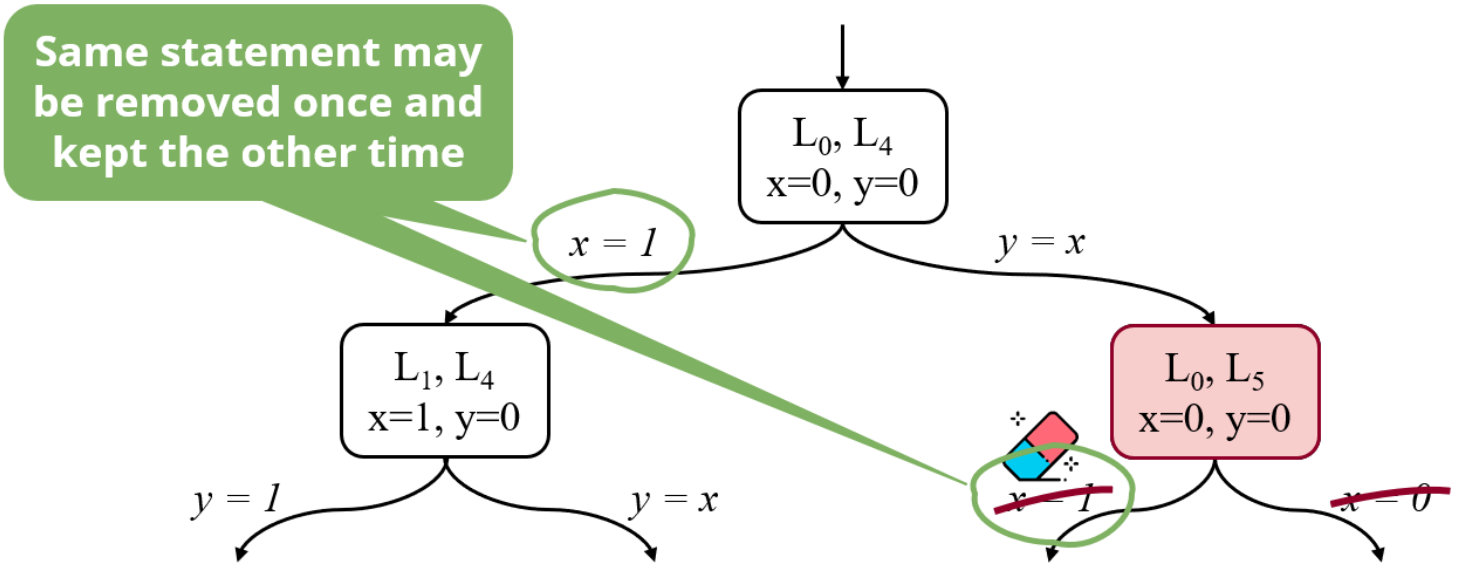

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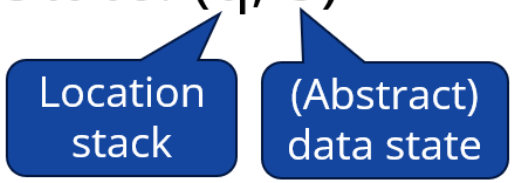

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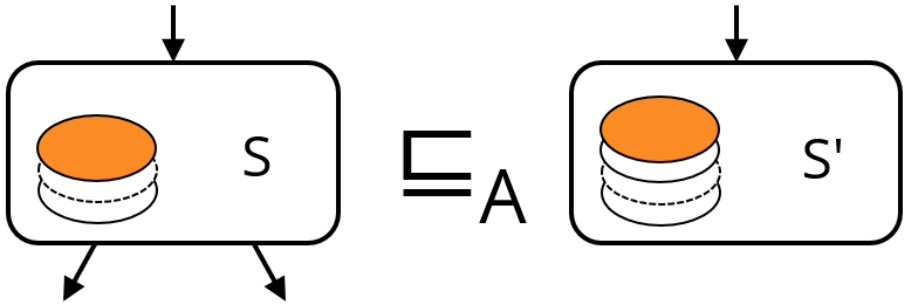

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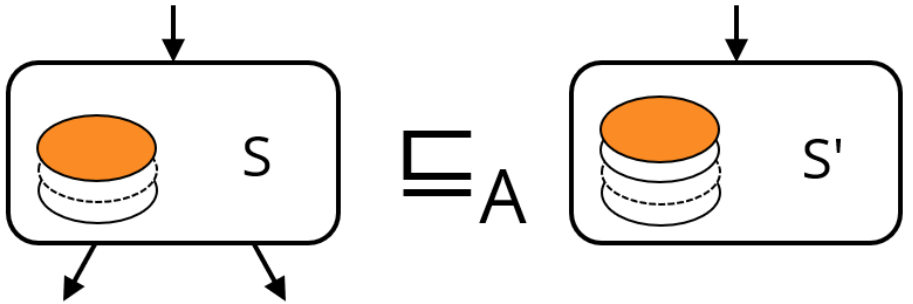

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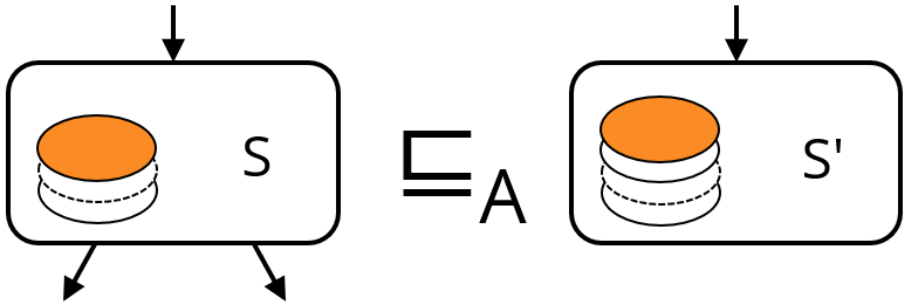

Advantages:

- **Reduced abstract state-space**
- **Can solve infinitely recursive tasks**

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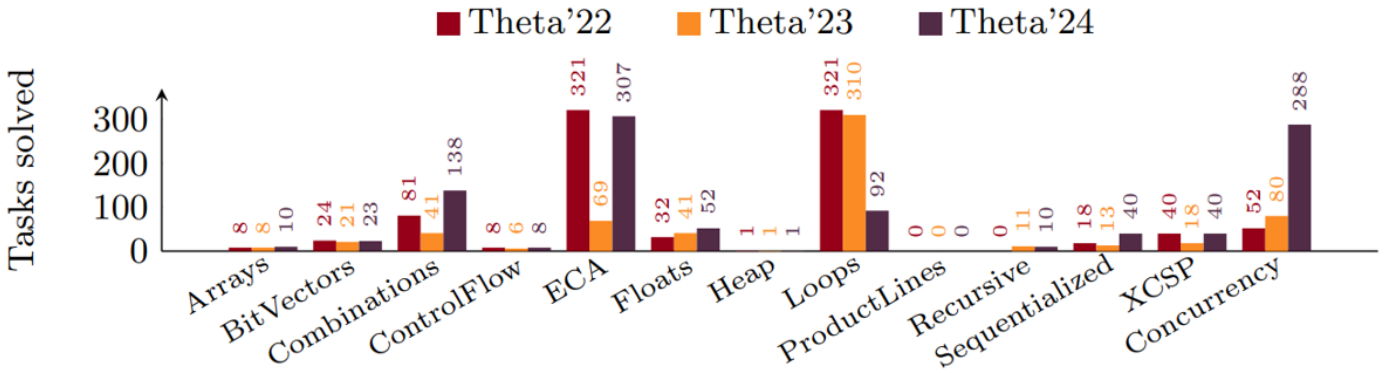
  - Striving for correctness: 0 incorrect tasks for reachability properties (only 2 other tools managed this)



Successful reachability tasks of THETA per year

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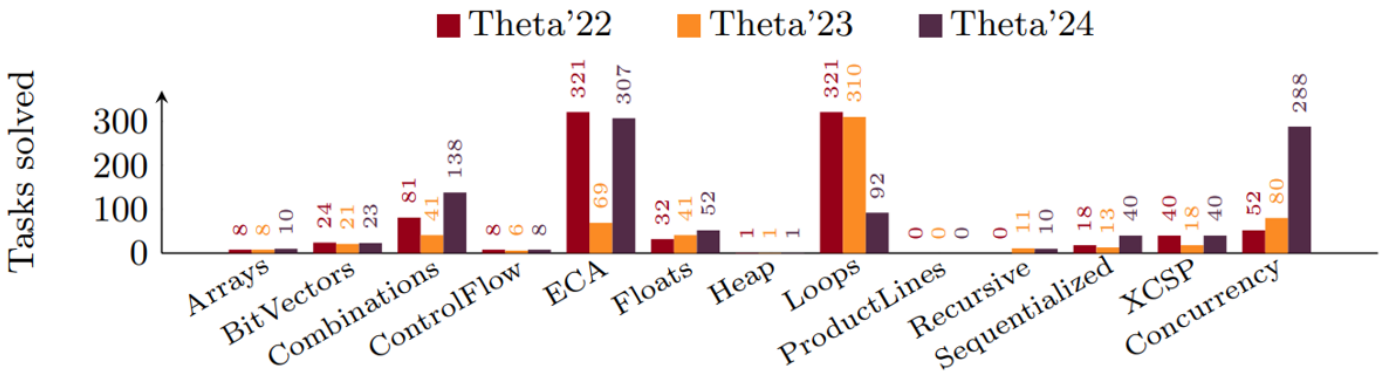

Successful reachability tasks of THETA per year

- Next steps:
  - frontend development: support for more C language constructs
  - analysis of worse-than-expected results