C Code Conversion to One Counter Automata for Reachability Analysis

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Overview

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5. C code converter tool
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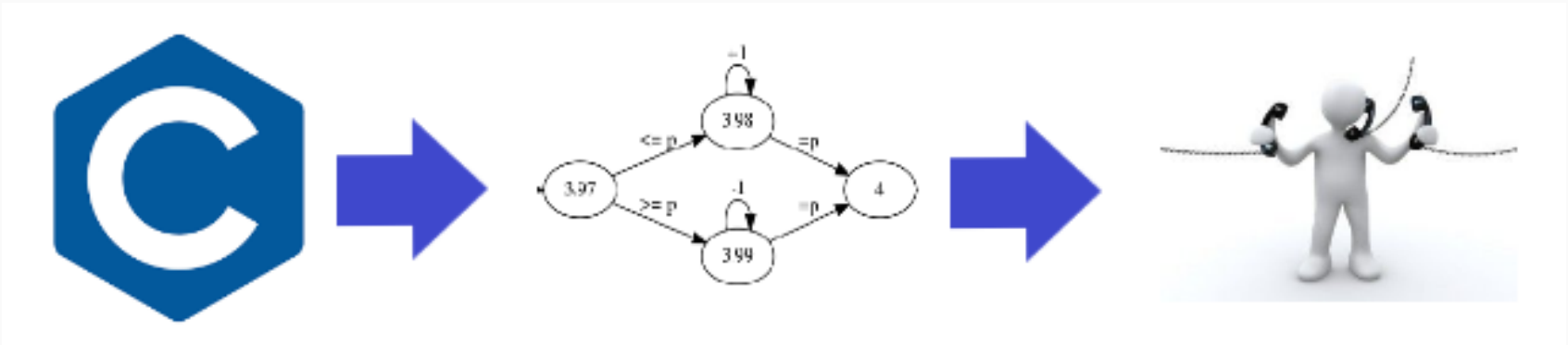
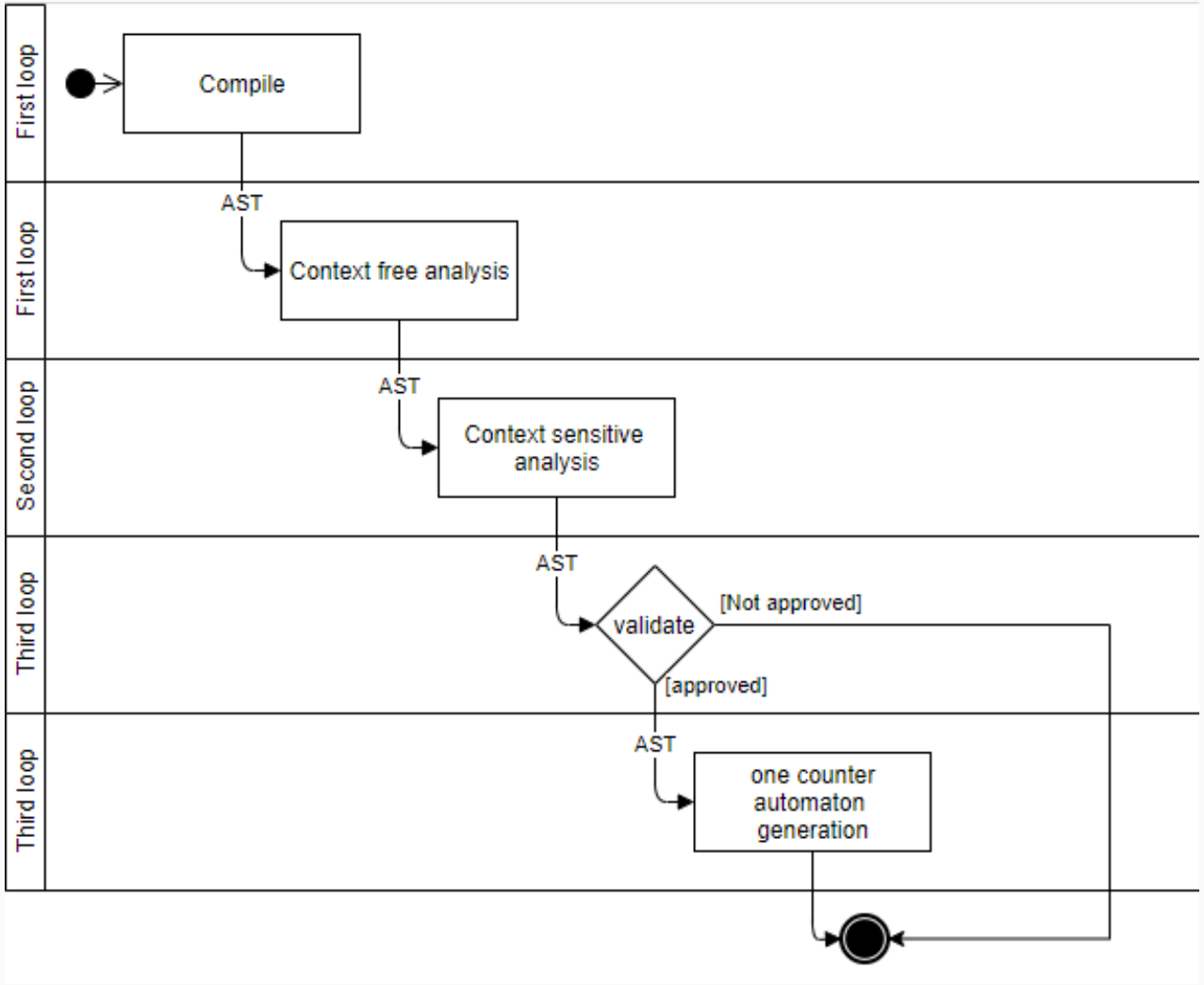
Problem Overview

C code conversion

- Analyse code reachability
- Convert C code to counter automaton
- Code restrictions



Tool overview



Related Work

Related work I

On parametric timed automata and one-counter machines
Daniel Bundala, Joel Ouaknine, 2017
Information and Computation

Flat Counter Automata Almost Everywhere!
Jérôme Leroux, Grégoie Sutre, 2005
Automated Technology for Verification and Analysis

Programs with Lists Are Counter Automata
Ahmed Bouajjani, Marius Bozga, Peter Habermehl, Radu Iosif, Pierre Moro, Tomáš Vojnar, 2006
Computer Aided Verification

Related work II

Quantum Finite One-Counter Automata

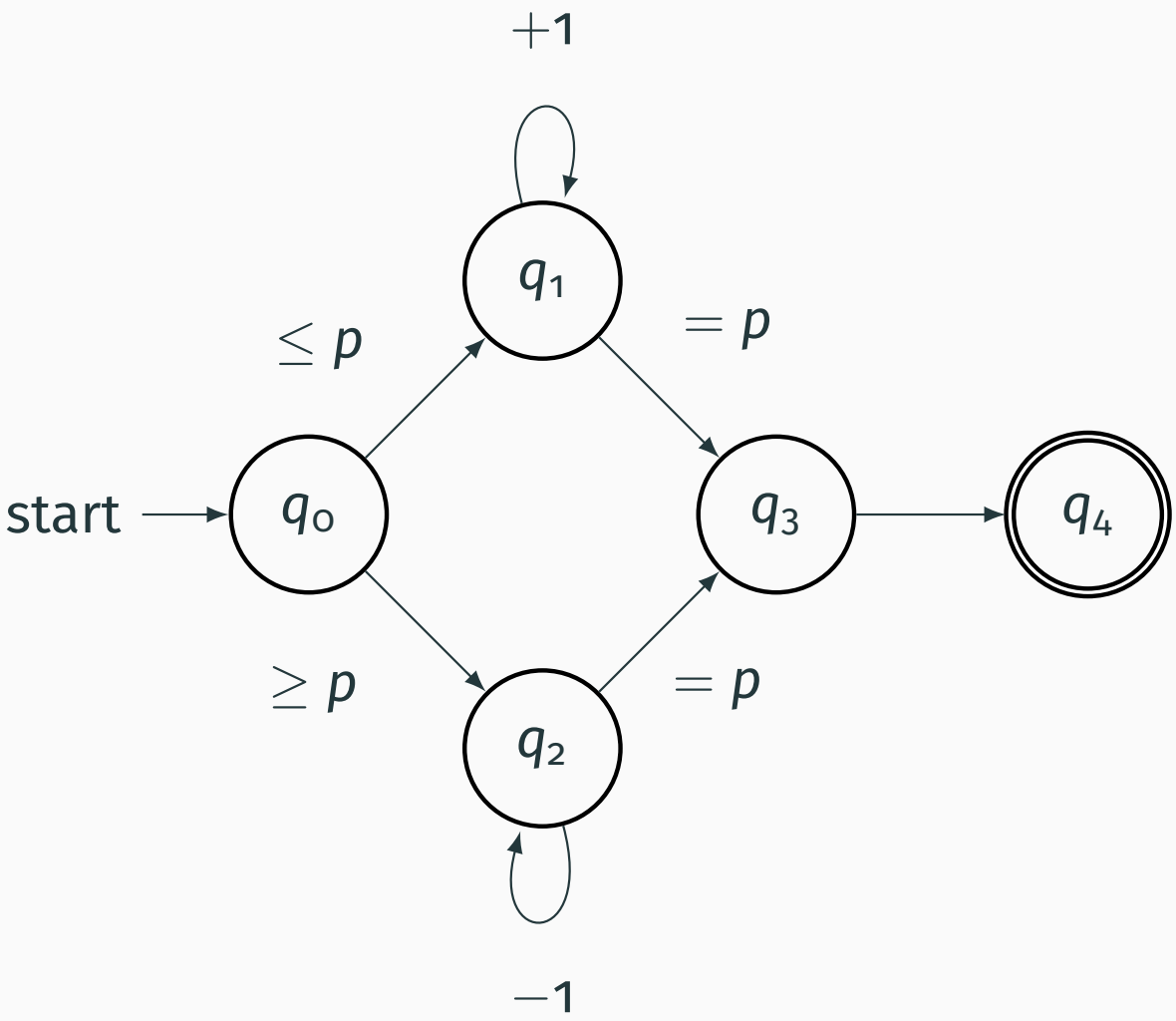
Kravtsev, Makism, 1999

SOFSEM'99: Theory and Practice of Informatics

Motivation

One Counter Automata

Counter automata I

- Non-Deterministic Finite Automata with counter(s)
- limited set of operations
  - increment the counter with parameter/constant
  - compare the counter to parameter/constant
- transition relation $\sigma \subseteq Q \times op \times Q$

Counter automata II