

Unit-2: Model-checker NuSMV

B. Srivathsan

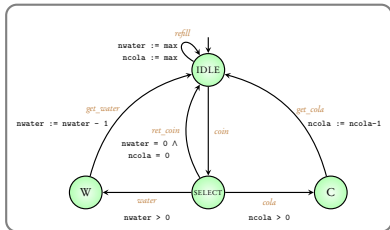
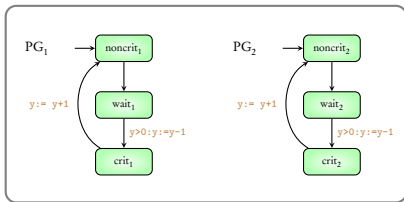
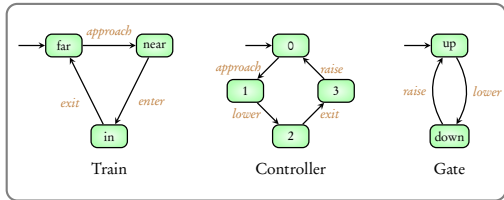
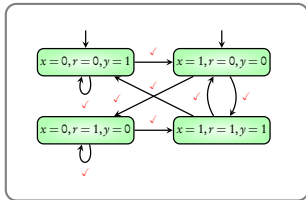
Chennai Mathematical Institute

NPTEL-course

July - November 2015

Module 1:
Model-checking tools

Models of code



How **reliable** is the code?

Does

Code

satisfy

Requirements ?

Does

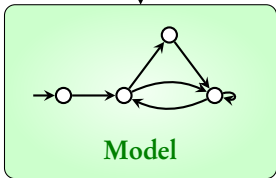


satisfy

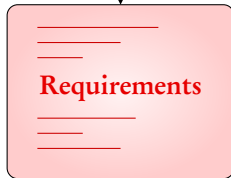


?

Does



satisfy



?

Does

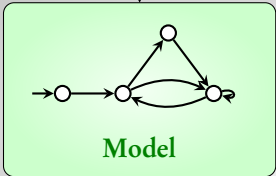


satisfy

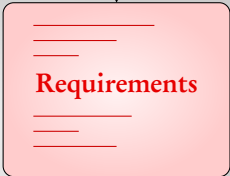


?

Does



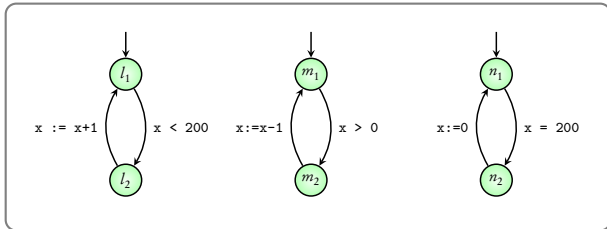
satisfy



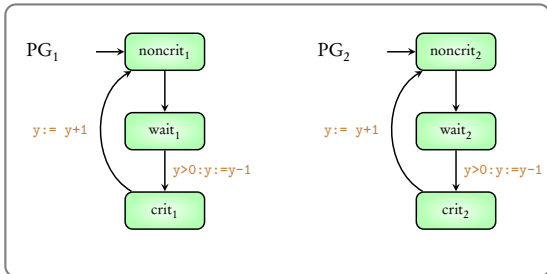
?

Model Checking

Examples of requirements

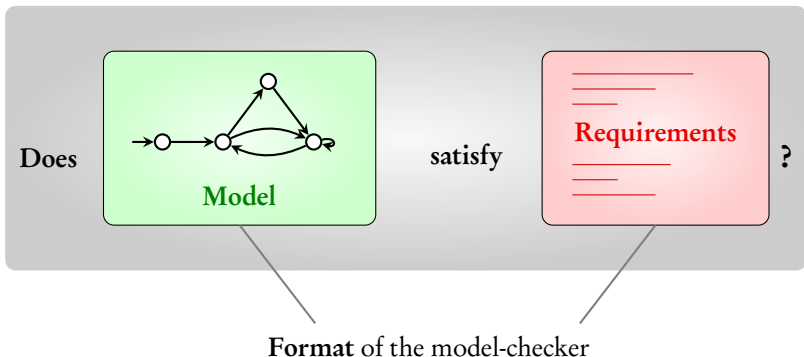


$x \geq 0$ always

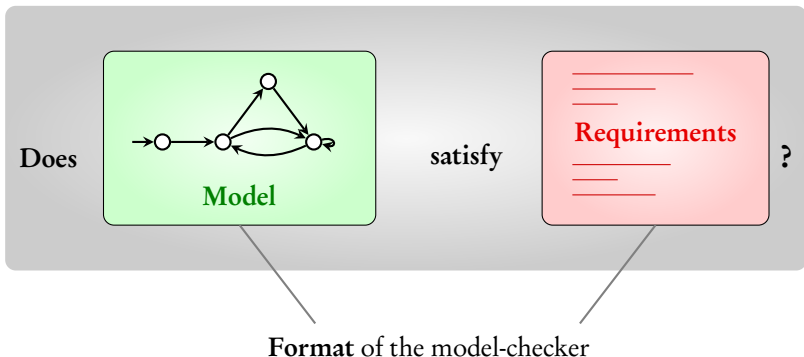


Mutual exclusion property

Model checkers



Model checkers



Model-checkers **automatically** solve the above question

Some open source model-checkers

- ▶ **SPIN**

- ▶ Well-suited for **concurrent** systems

- ▶ **NuSMV**

- ▶ Well-suited for **hardware** circuits
 - ▶ More requirements can be checked compared to SPIN

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In this course: NuSMV

Installing NuSMV

Summary

Model-checkers

Verifying requirements on models

NuSMV

Summary

Model-checkers

Verifying requirements on models

NuSMV

This week: Learn to use NuSMV through examples