Nutzen der Automatentheorie zur Verbesserung der Sicherheit durch Verifikation in IT-Systemen von KRITIS-Betreibern

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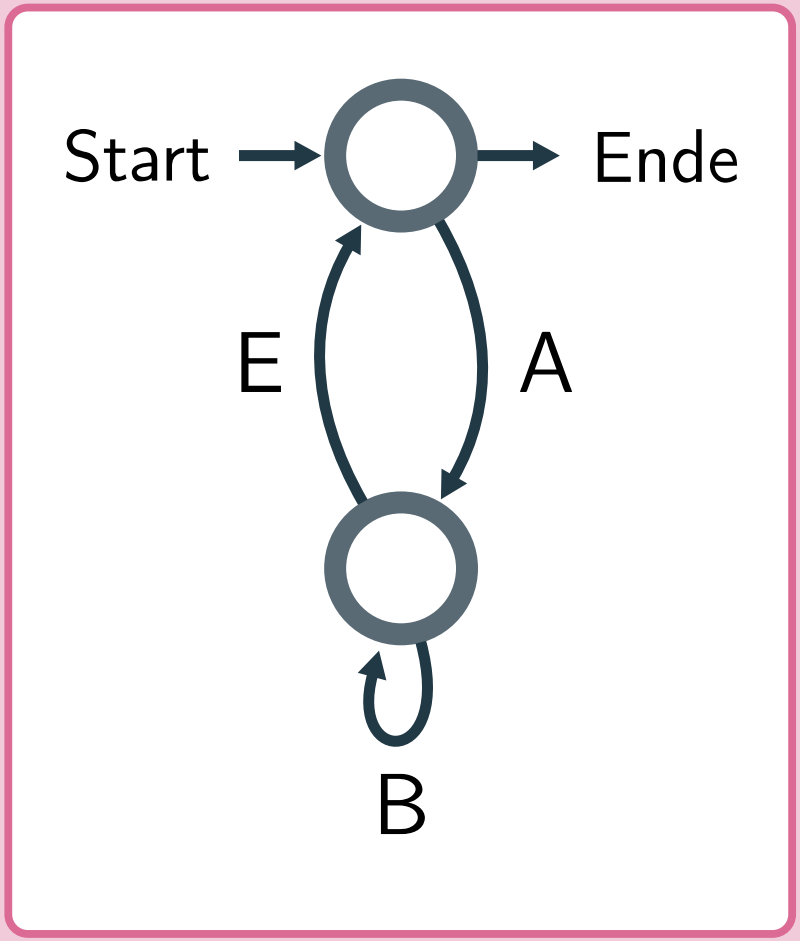
Halle
August 4, 2025

Theoretische Grundlagen

Praktische Einsicht

KRITIS Einsatz

Was sind diese Automaten?



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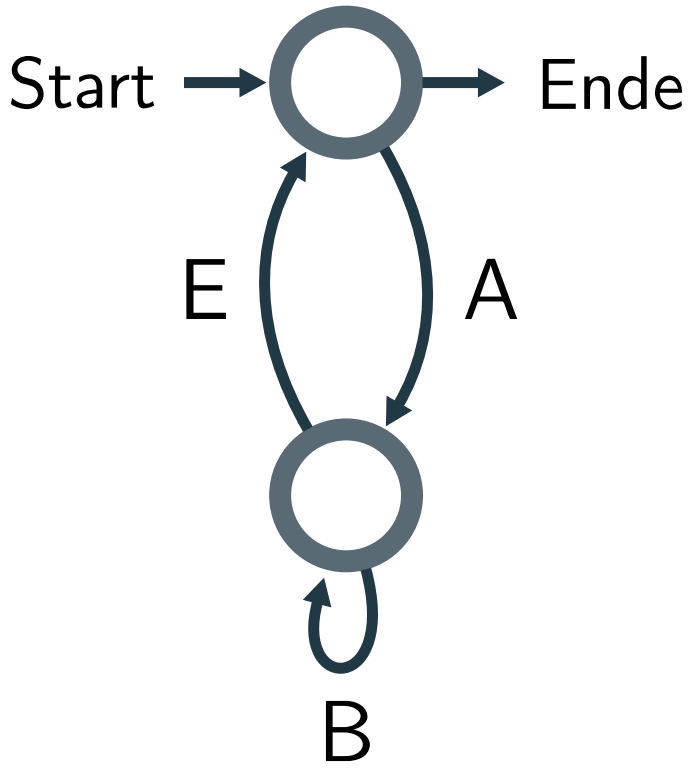

ABE

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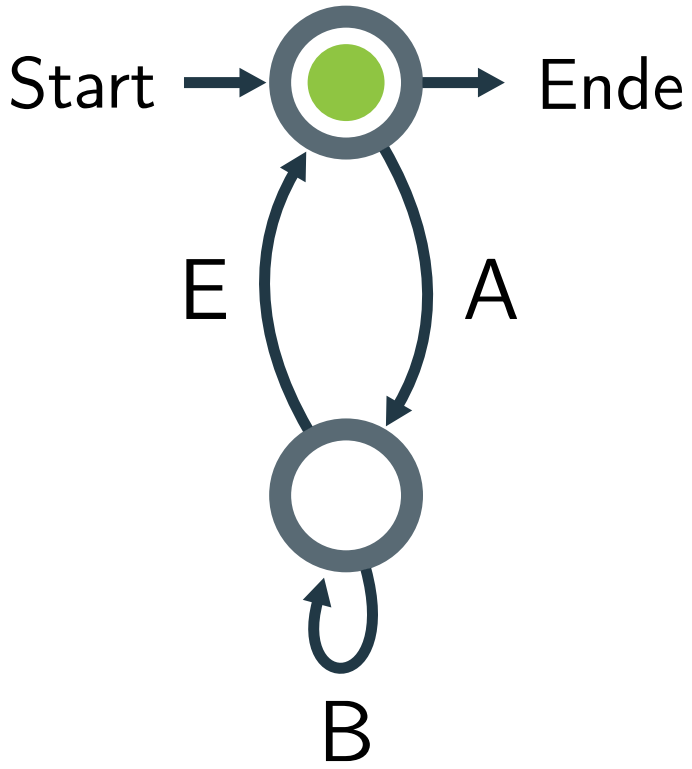

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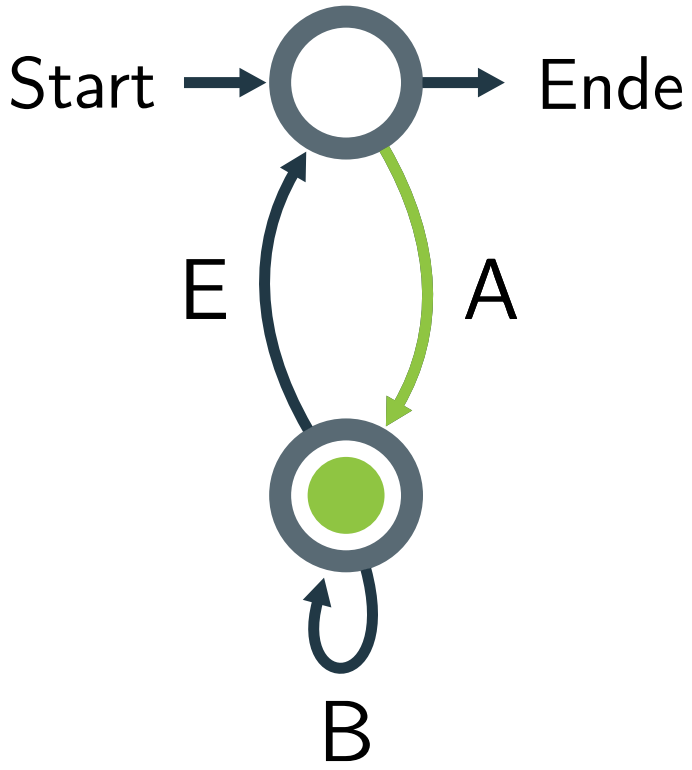

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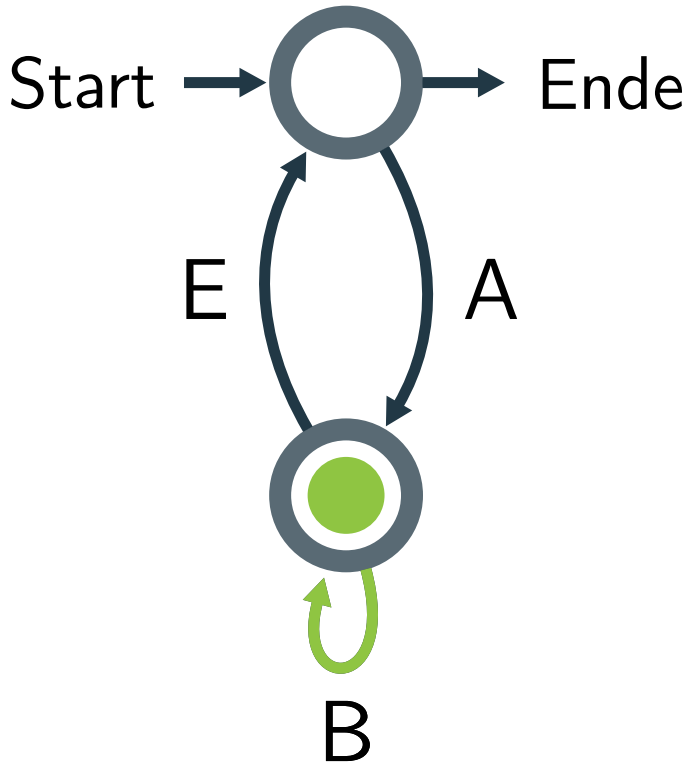

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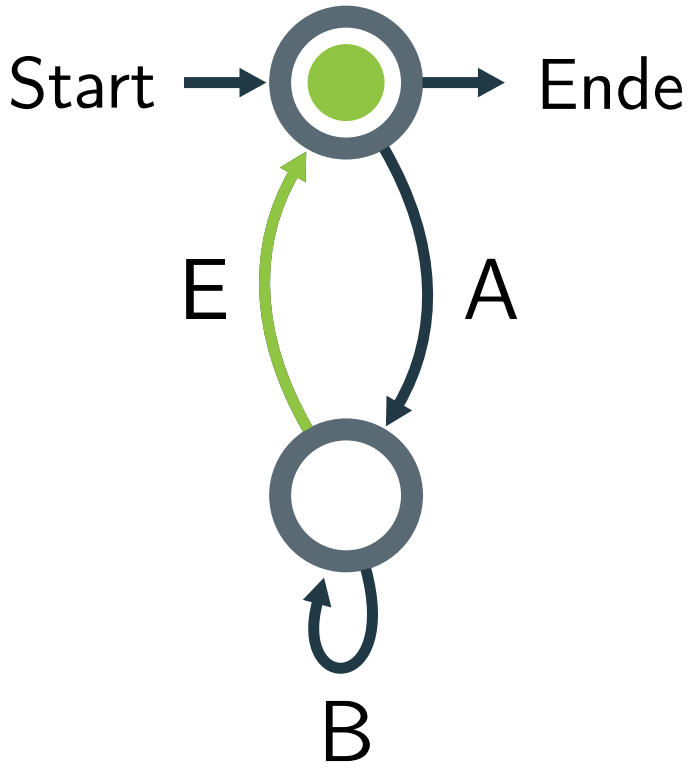

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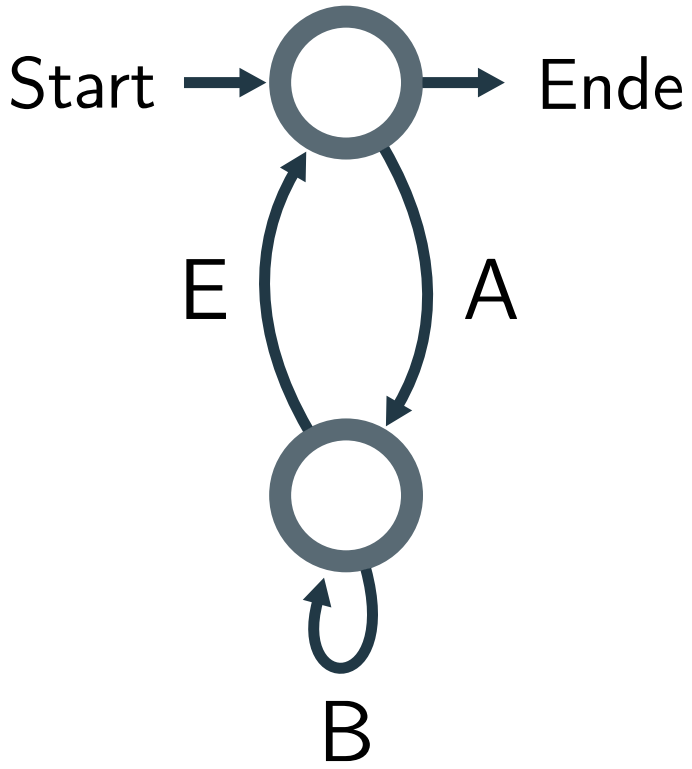

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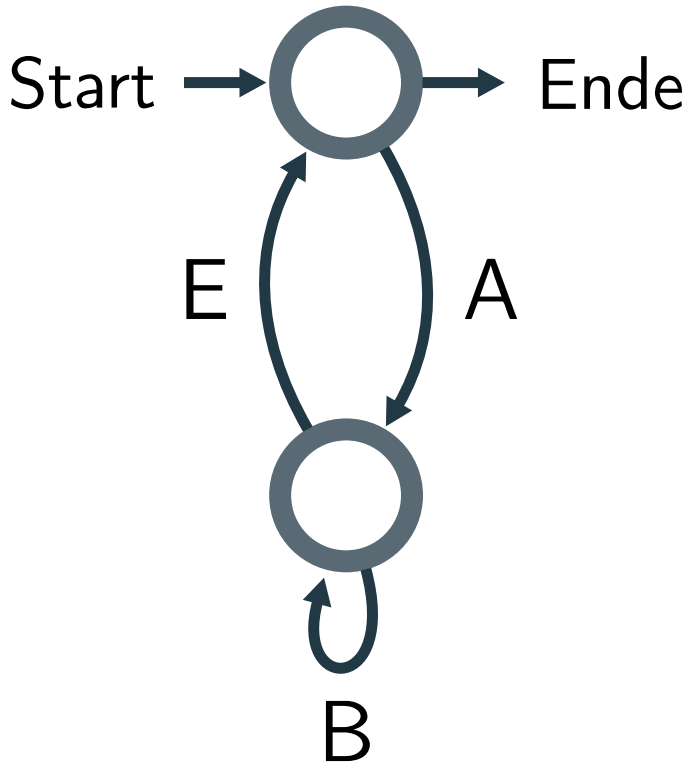

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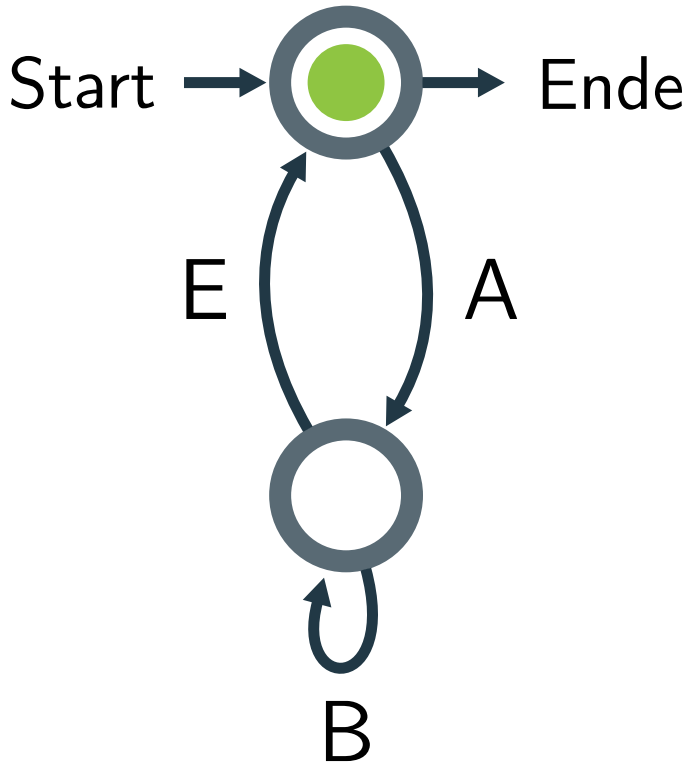

ABE
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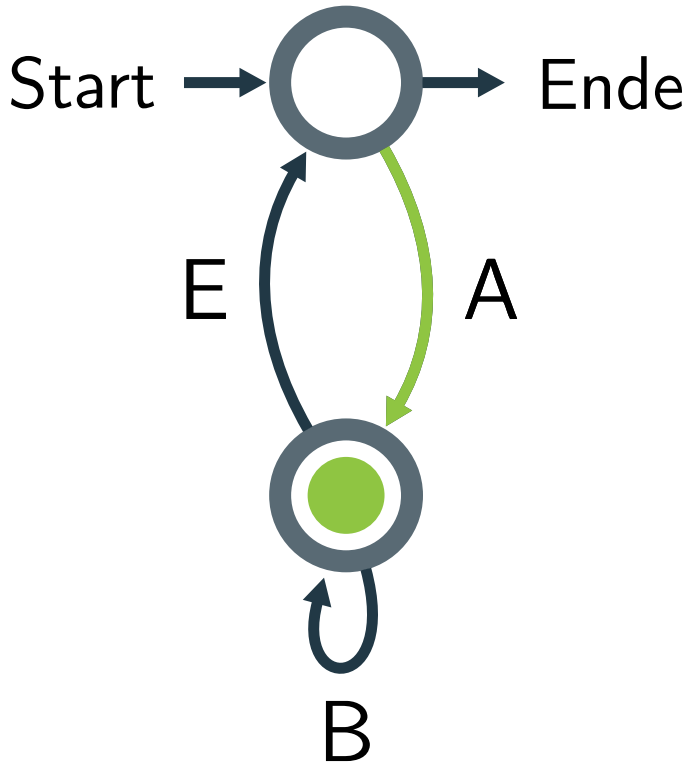

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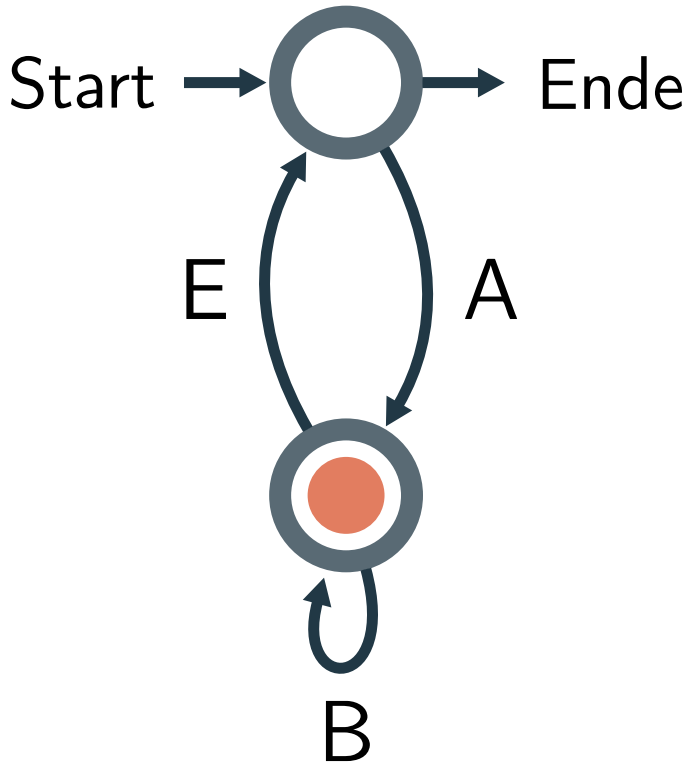

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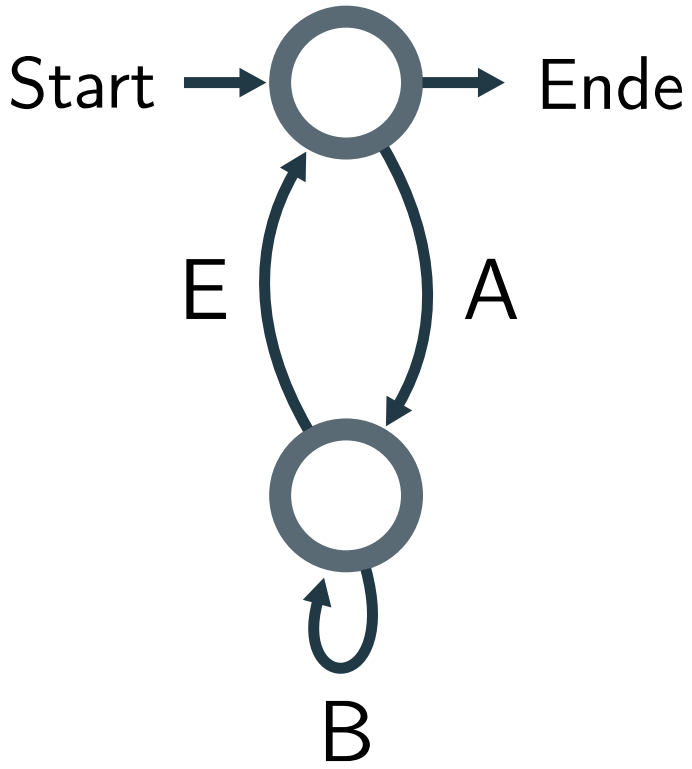

ABE ⭘

AAE ✖

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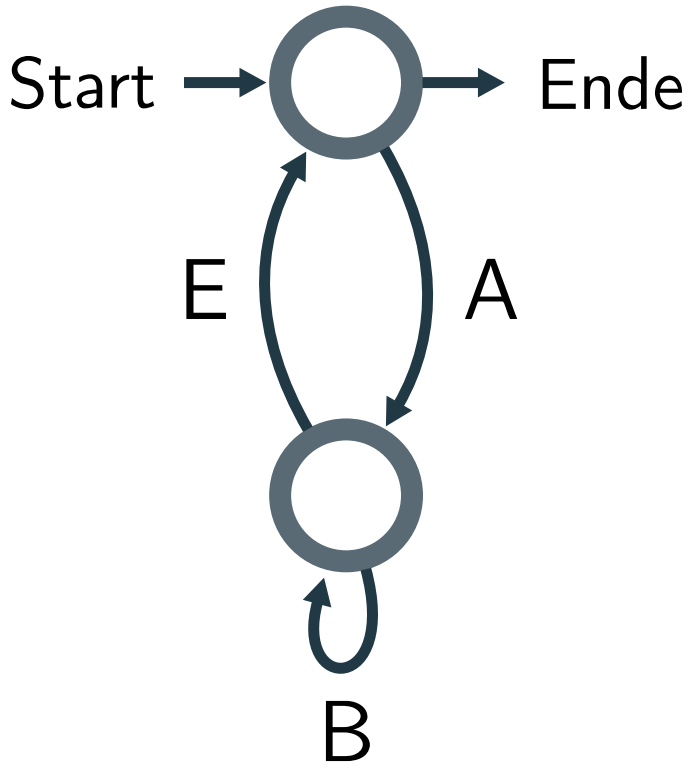

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ABEAE

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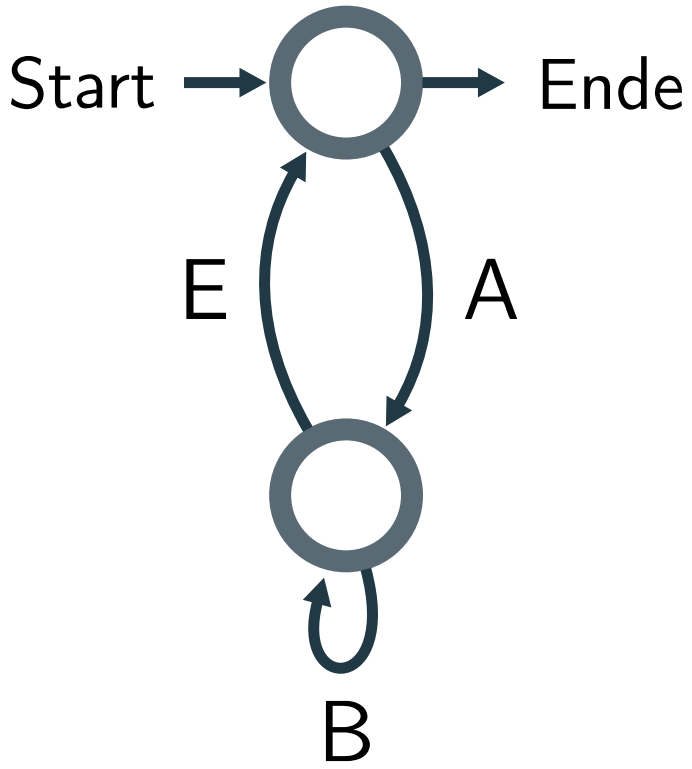


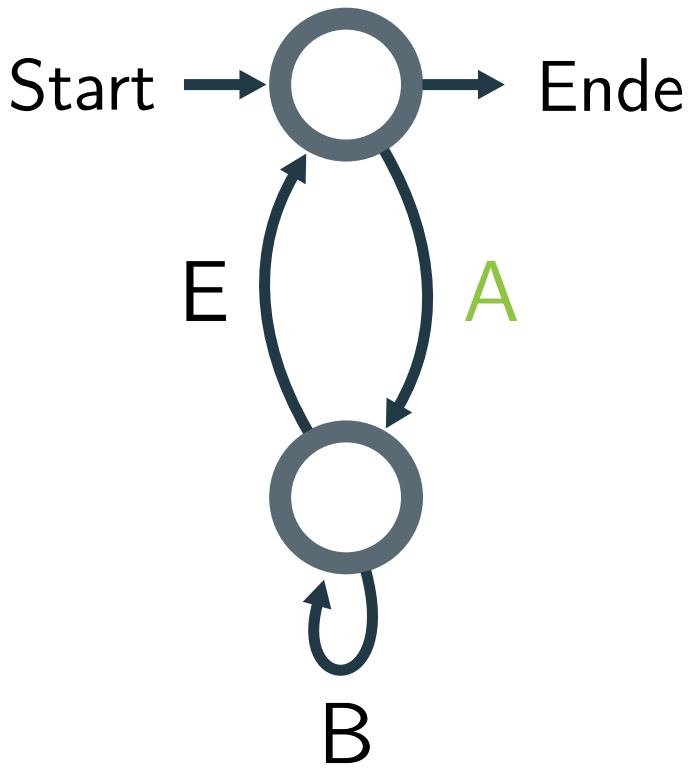
ABE ⭘

AAE ✖

ABEAE ⭘

Was sind diese Automaten?

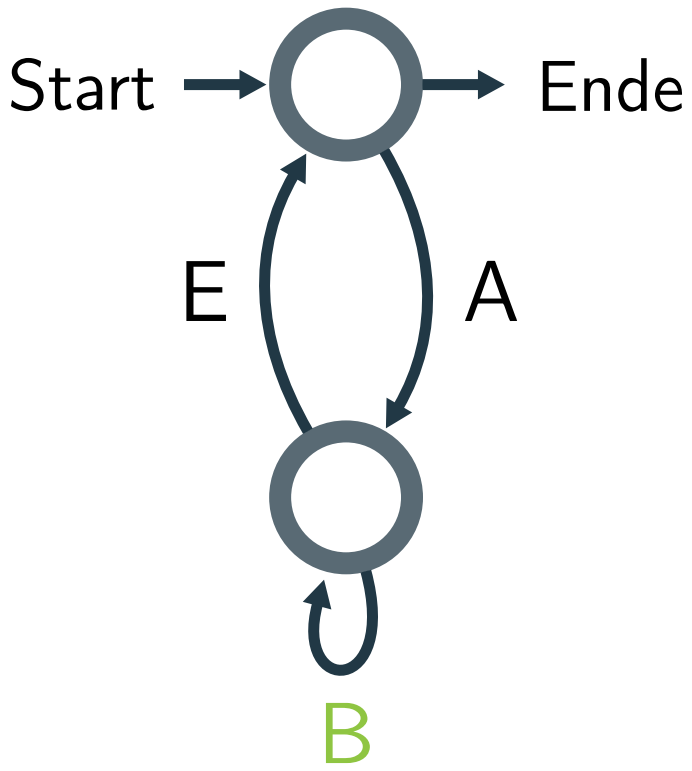
A $\hat{=}$ Aufnahme



ABE ⊙
AAE ✖
ABEAE ⊙

Was sind diese Automaten?

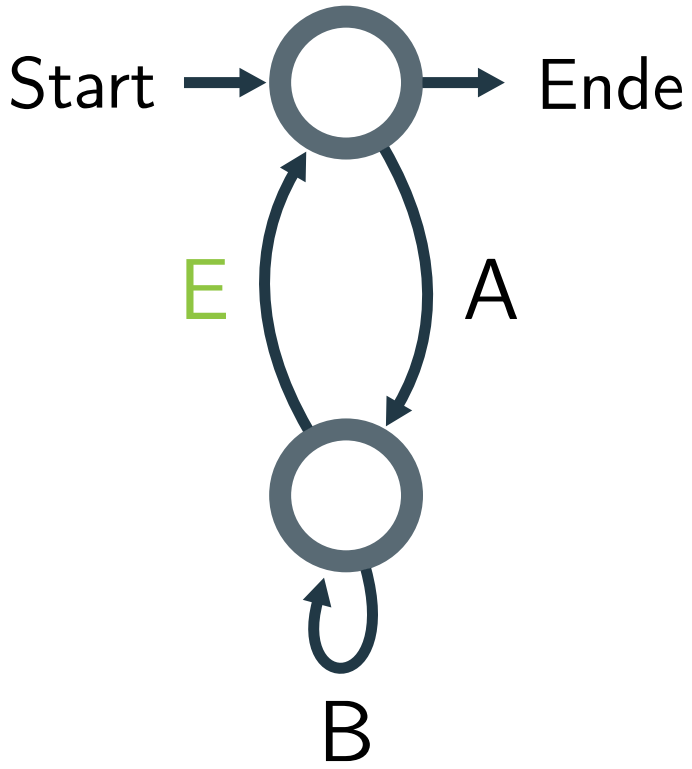
A $\hat{=}$ Aufnahme B $\hat{=}$ Bearbeitung



ABE	⊙
AAE	✖
ABEAE	⊙

Was sind diese Automaten?

A ≙ Aufnahme B ≙ Bearbeitung E ≙ Einreichung



ABE ⊙
AAE ✖
ABEAE ⊙

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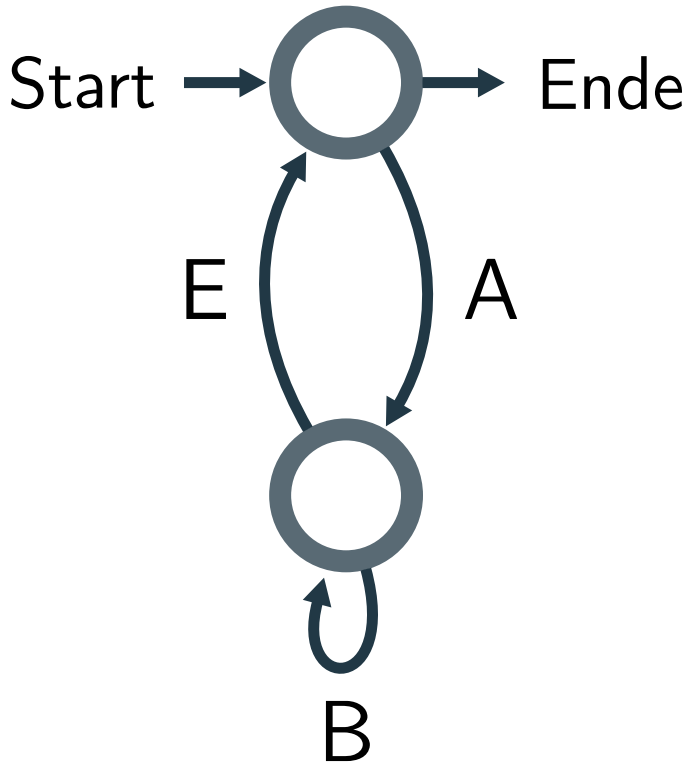

ABE	⊙
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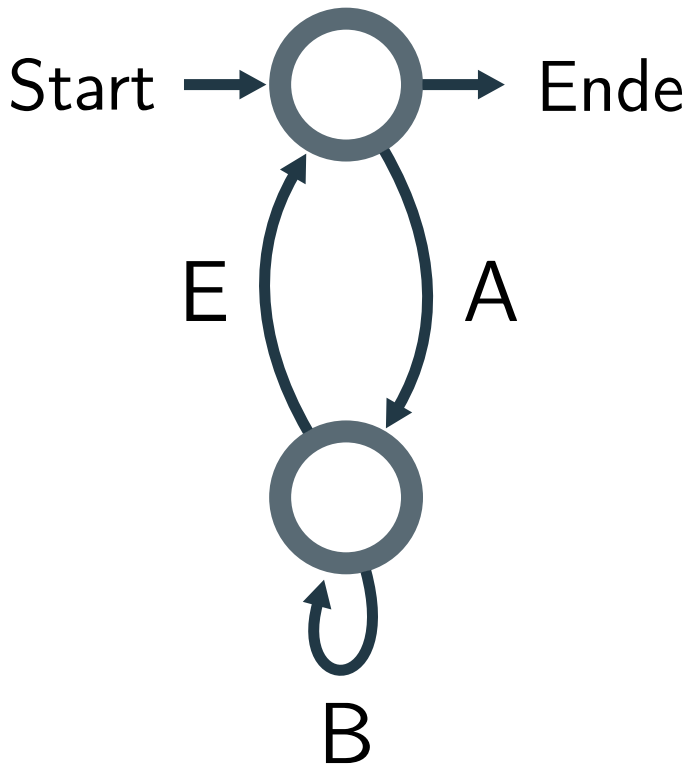
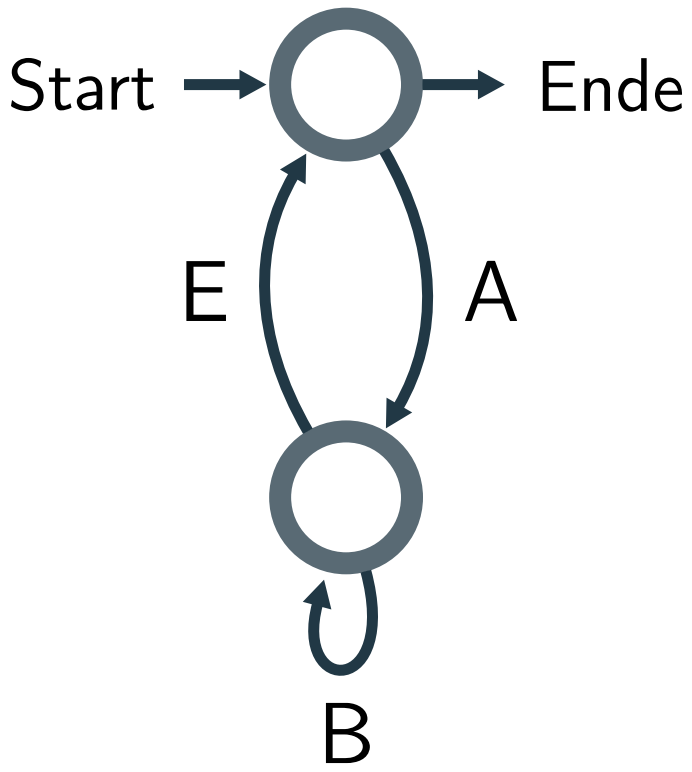


ABE ⊙
AAE ✖
ABEAE ⊙

Jede Aufnahme benötigt eine Einreichung, bevor eine neue Aufnahme erfolgt.

Was sind diese Automaten?

A $\hat{=}$ Aufnahme B $\hat{=}$ Bearbeitung E $\hat{=}$ Einreichung



ABE ⊙
AAE ✖
ABEAE ⊙

Jede Aufnahme benötigt eine Einreichung, bevor eine neue Aufnahme erfolgt.

$|u|_A = |u|_E$ oder $|u|_A = |u|_E + 1$

Verifikation mit Modelchecking

Spezifikation

Verifikation mit Modelchecking

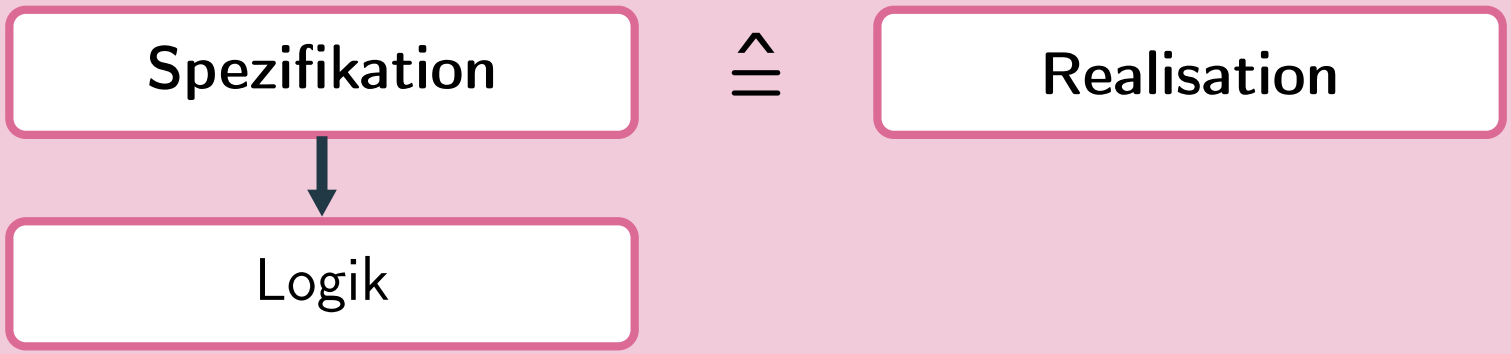
Spezifikation

Realisation

Verifikation mit Modelchecking

Spezifikation $\hat{=}$ **Realisation**

Verifikation mit Modelchecking



Verifikation mit Modelchecking

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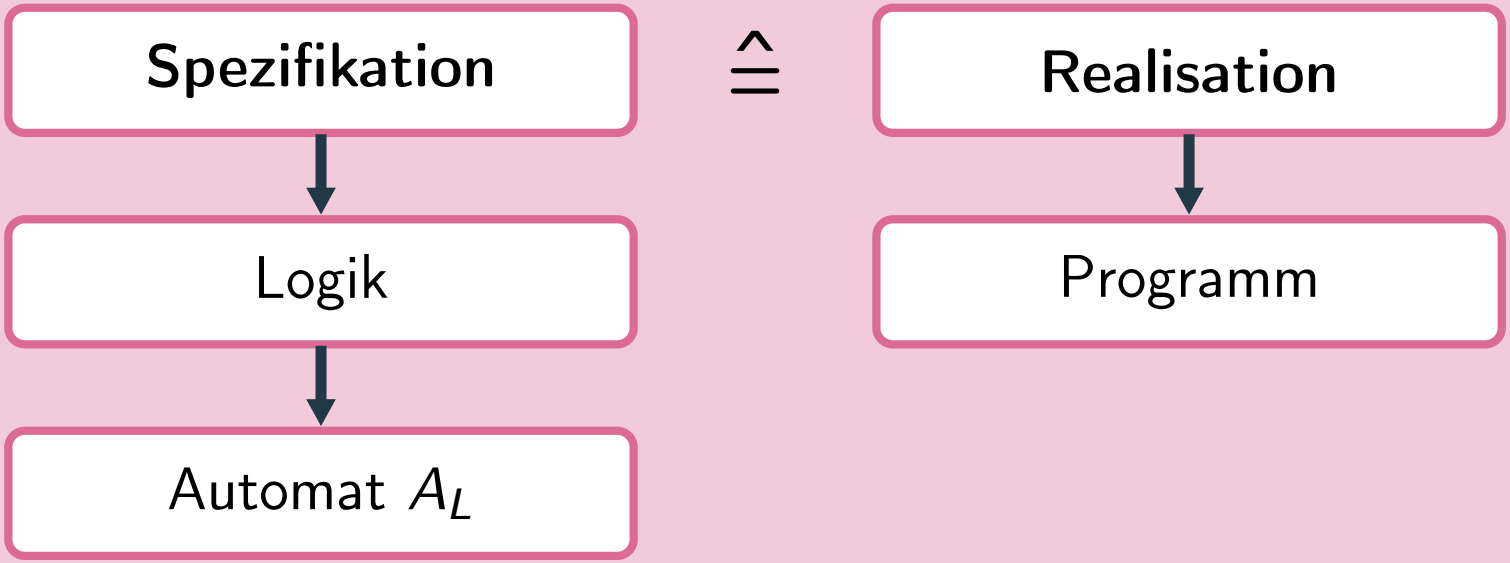

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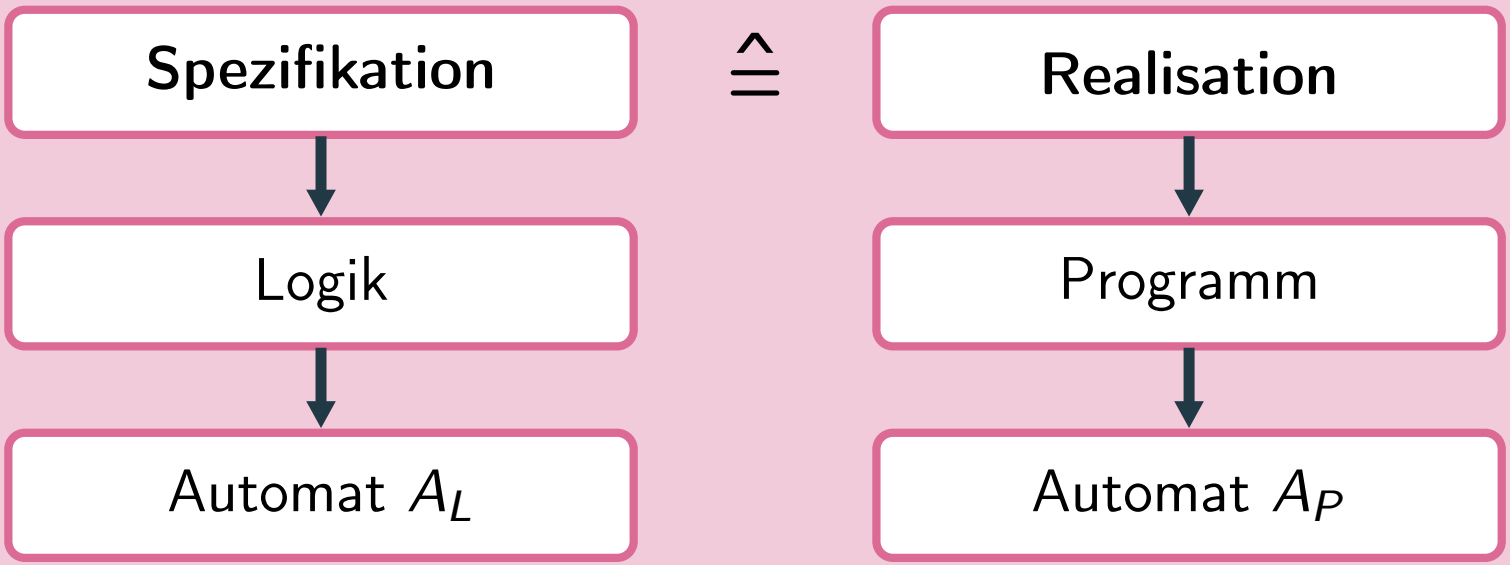

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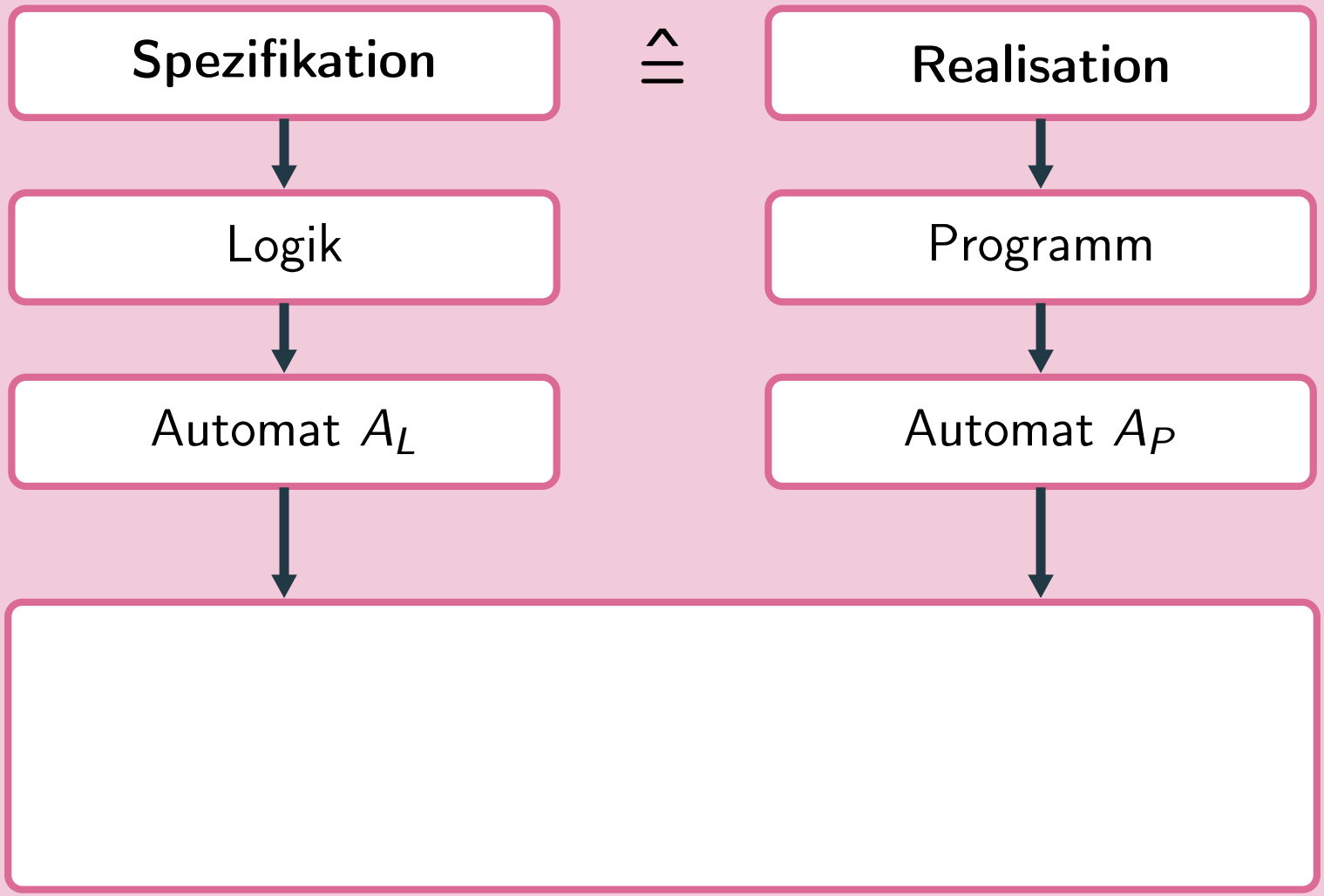

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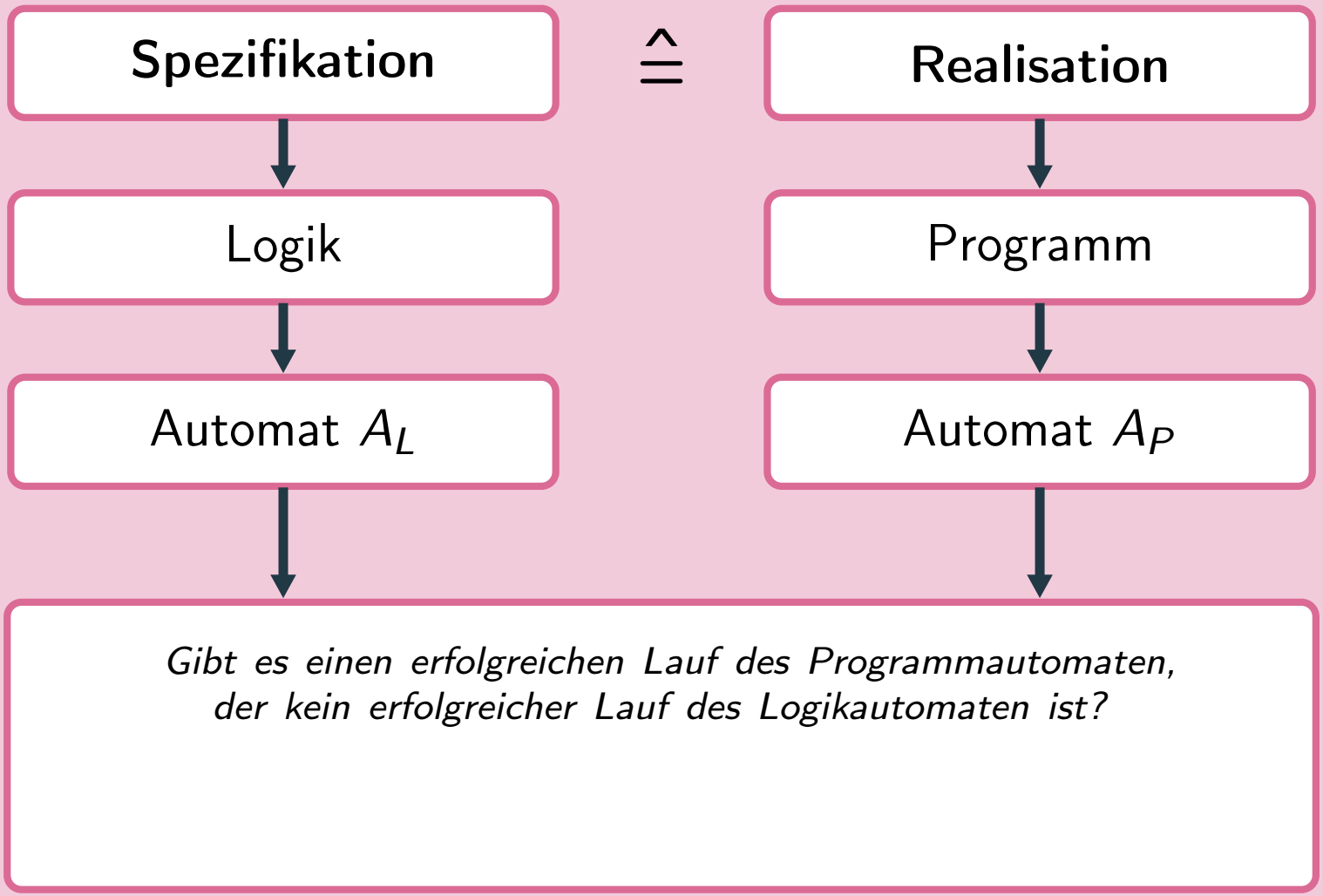

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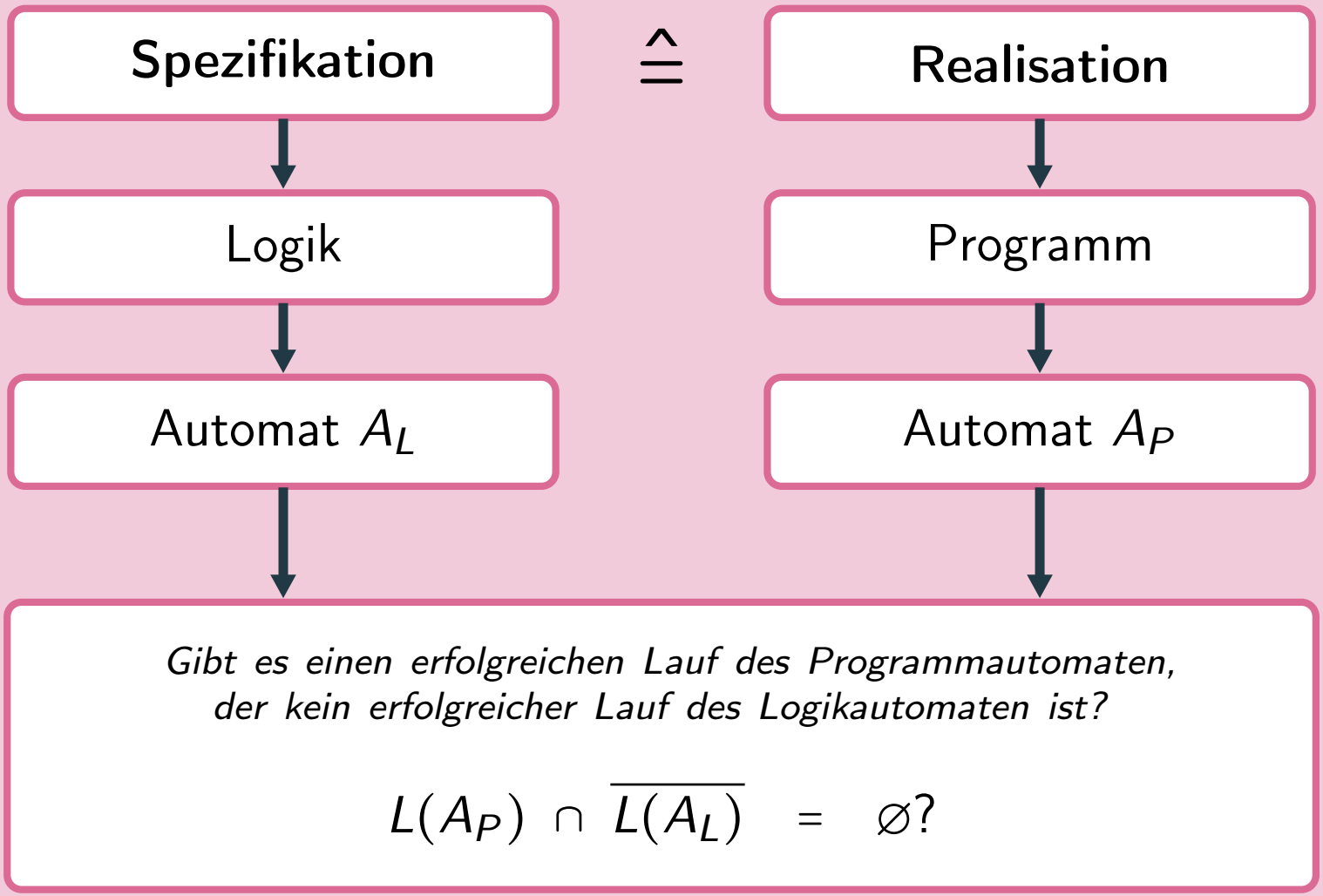

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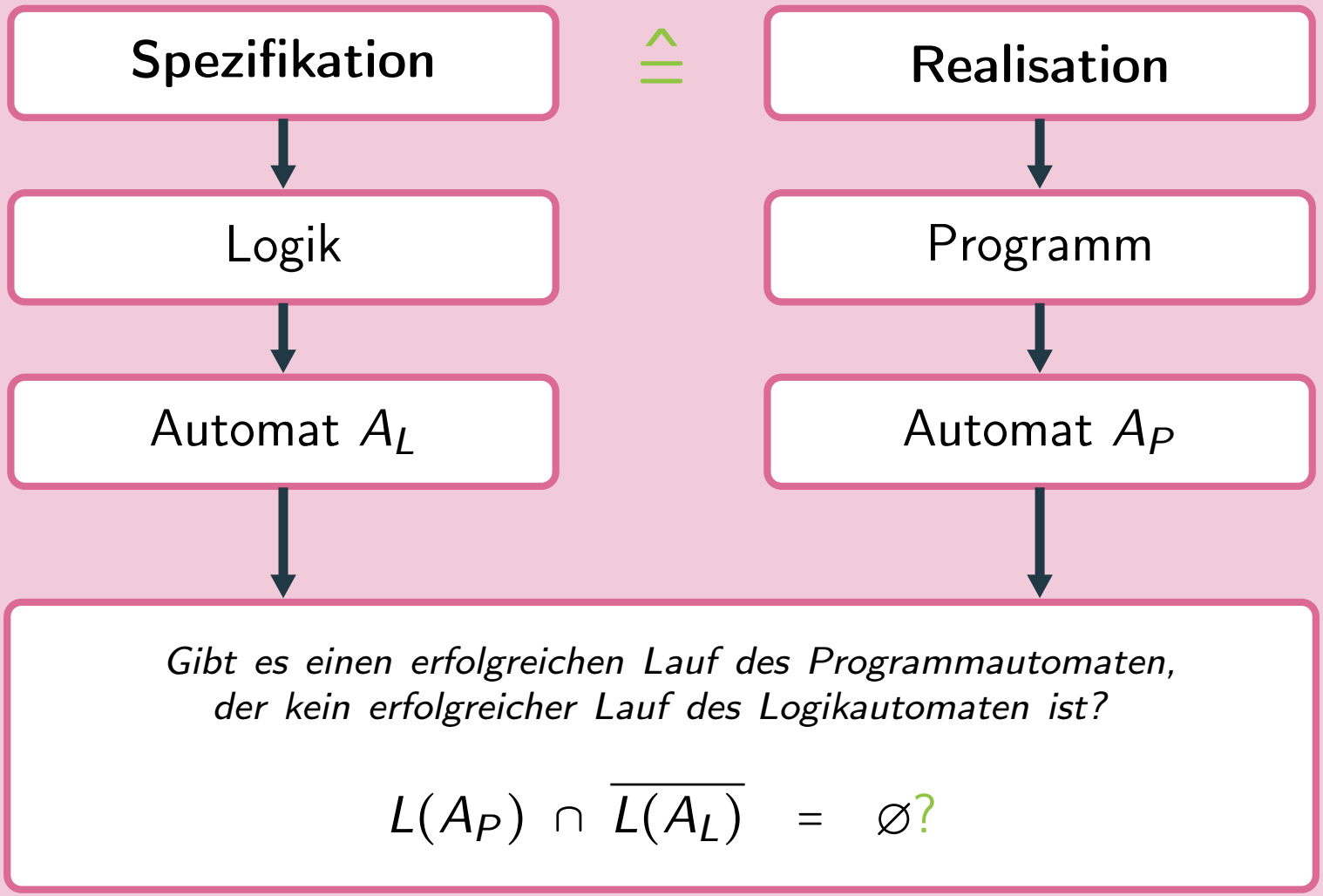

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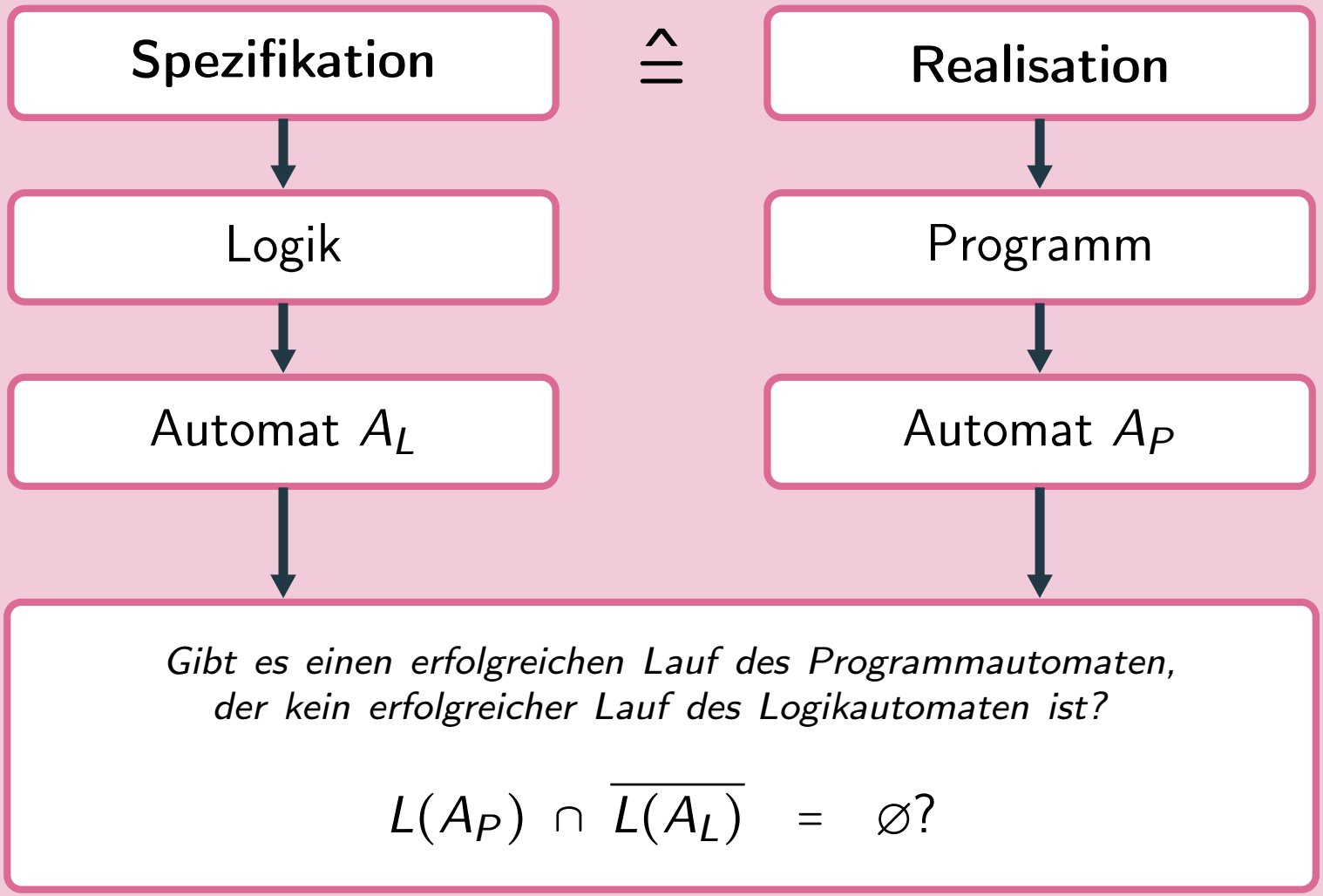


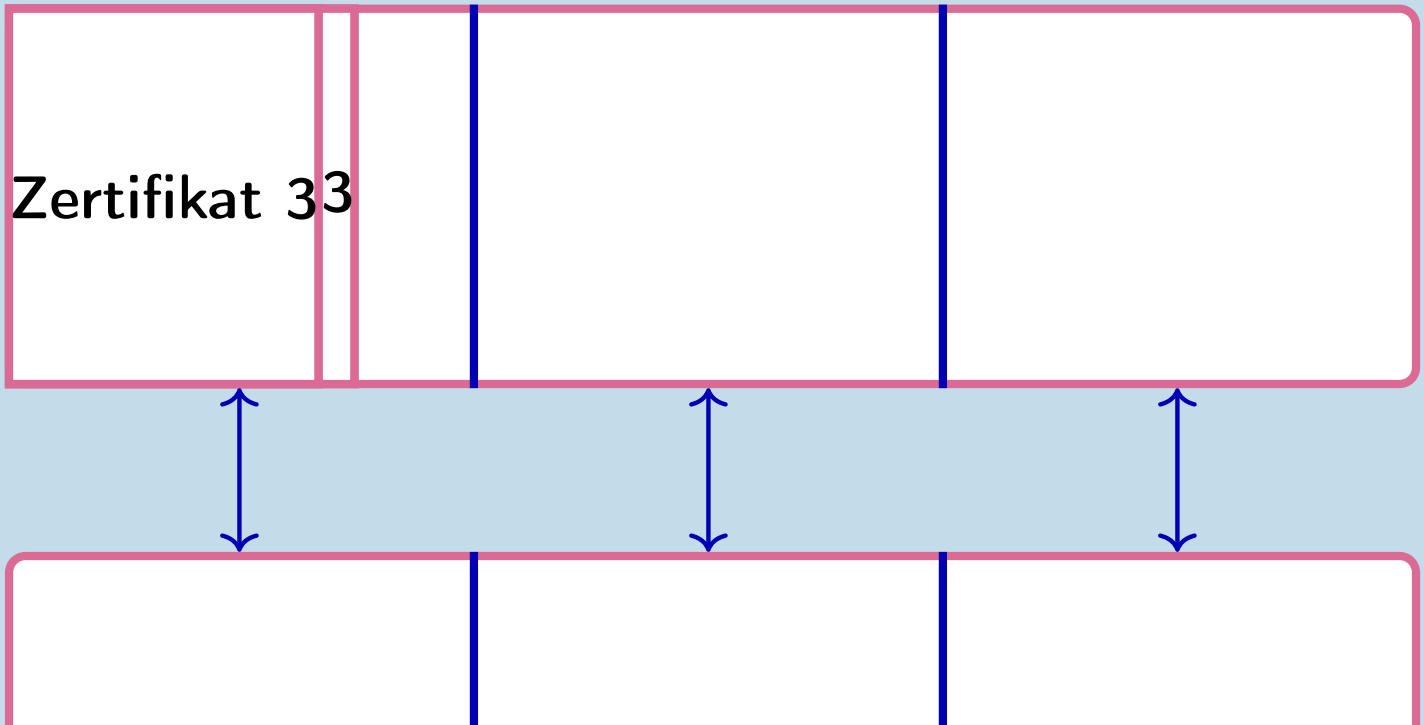
Modelchecking in Aktion

Modelchecking im Finanzwesen

Modelchecking in Bahnsteuerungssystemen

Kosten der Softwareverifikation

Software



Der Preis der Sicherheit

Who will check the checkmen?