بسم الله الرحمن الرحیم

نظریه علوم کامپیوتر

نظریه علوم کامپیوتر - بهار ۱۴۰۰-۱۴۰۱ - جلسه هشتم: خودتولیدکنندگی

Theory of computation - 002 - S08 - self-reproducibility

Self-reproduction Paradox

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Suppose a Factory makes Cars

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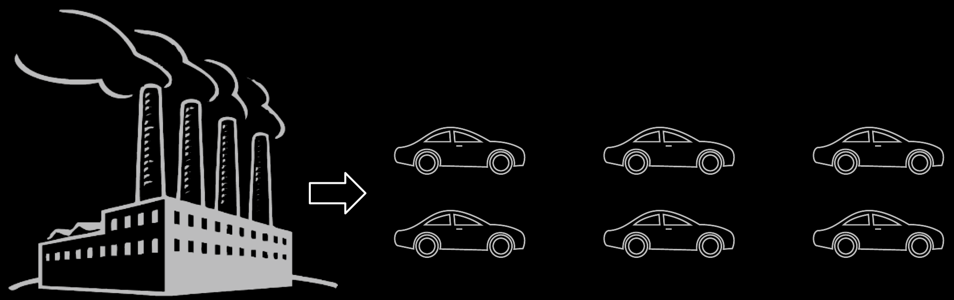

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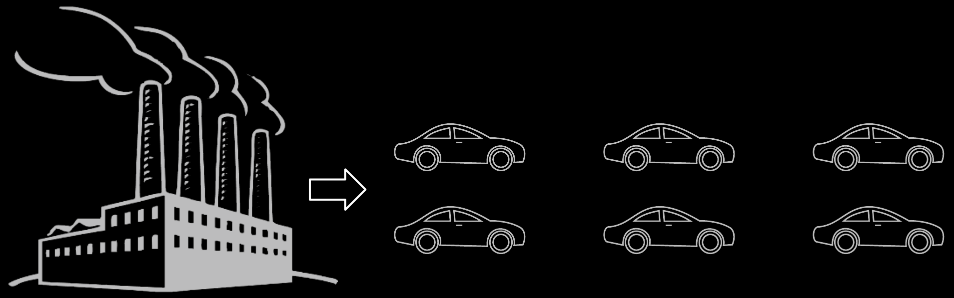

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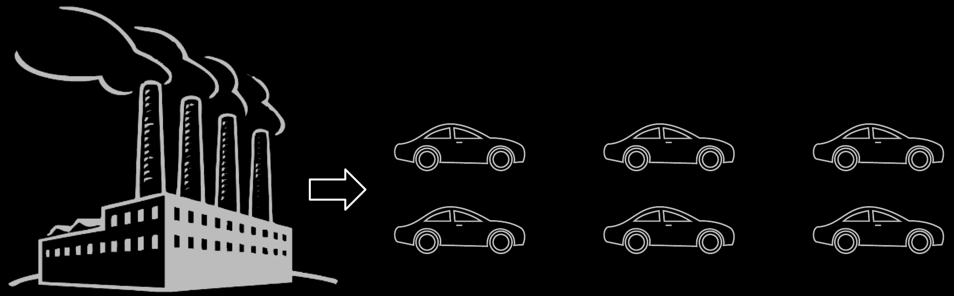

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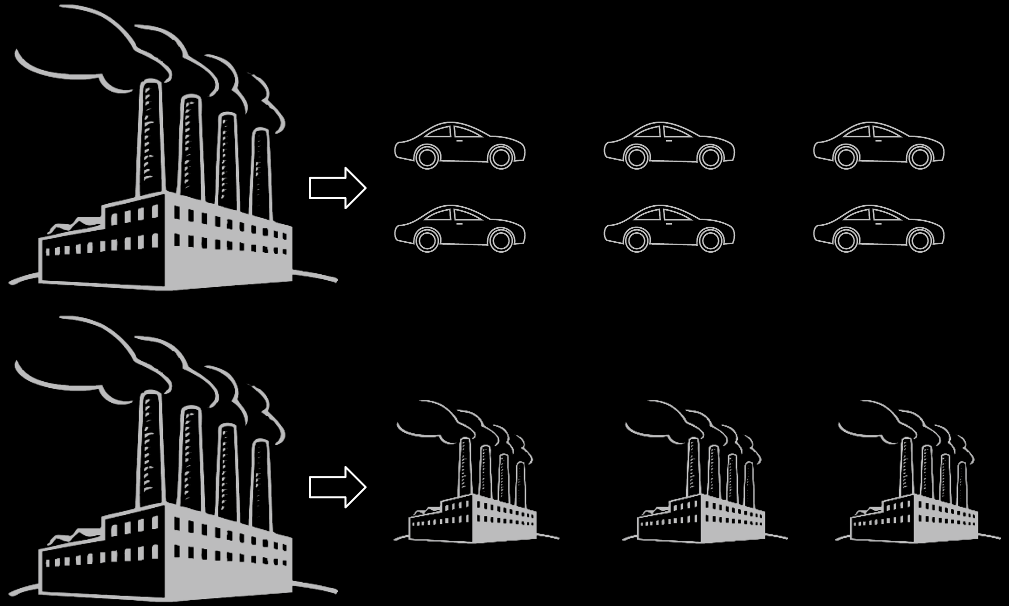

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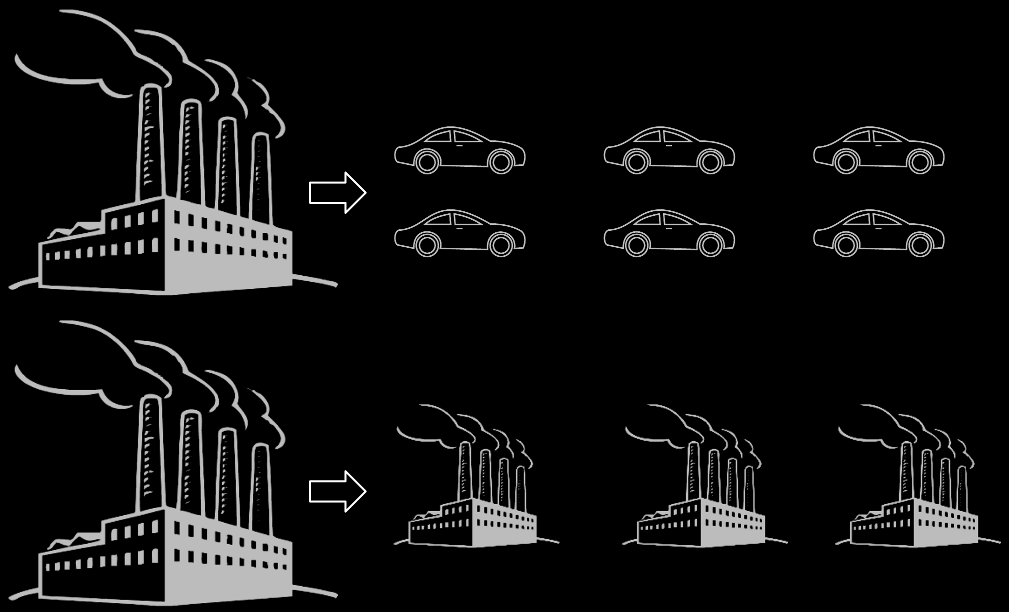

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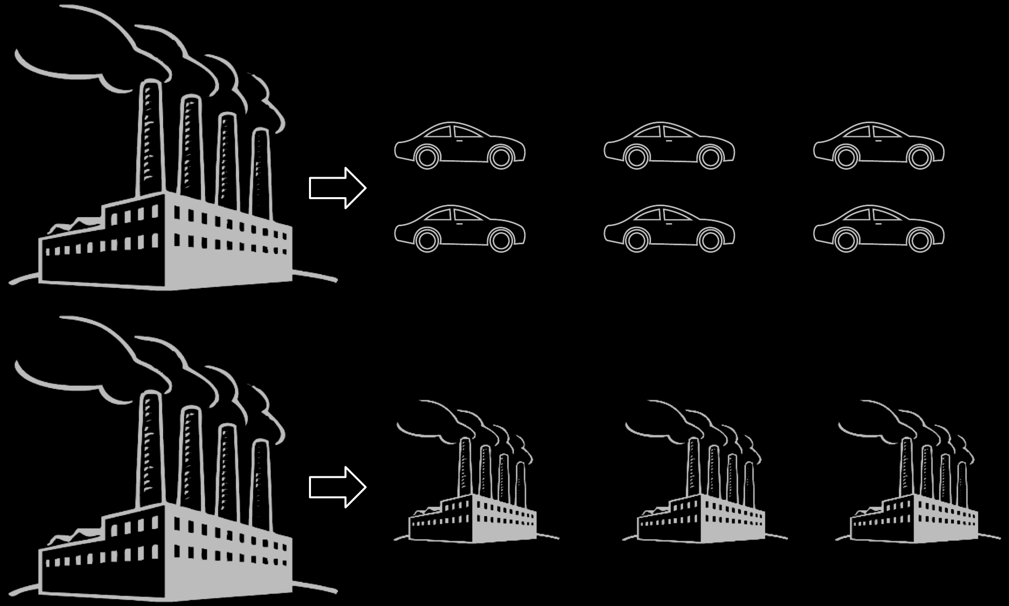

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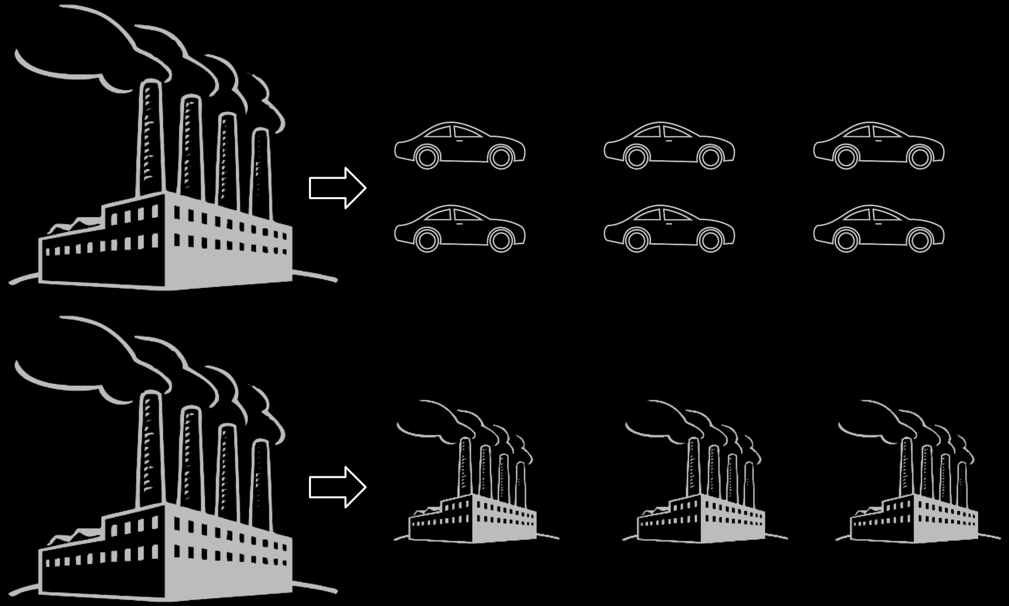

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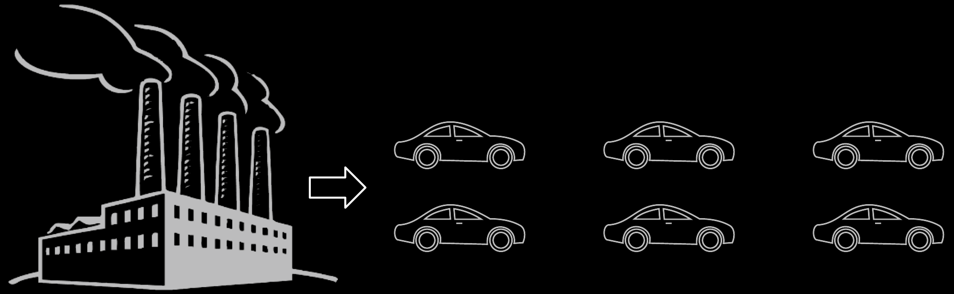

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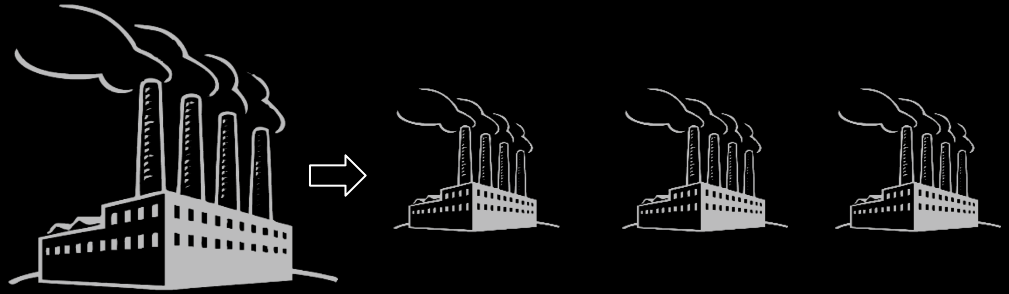

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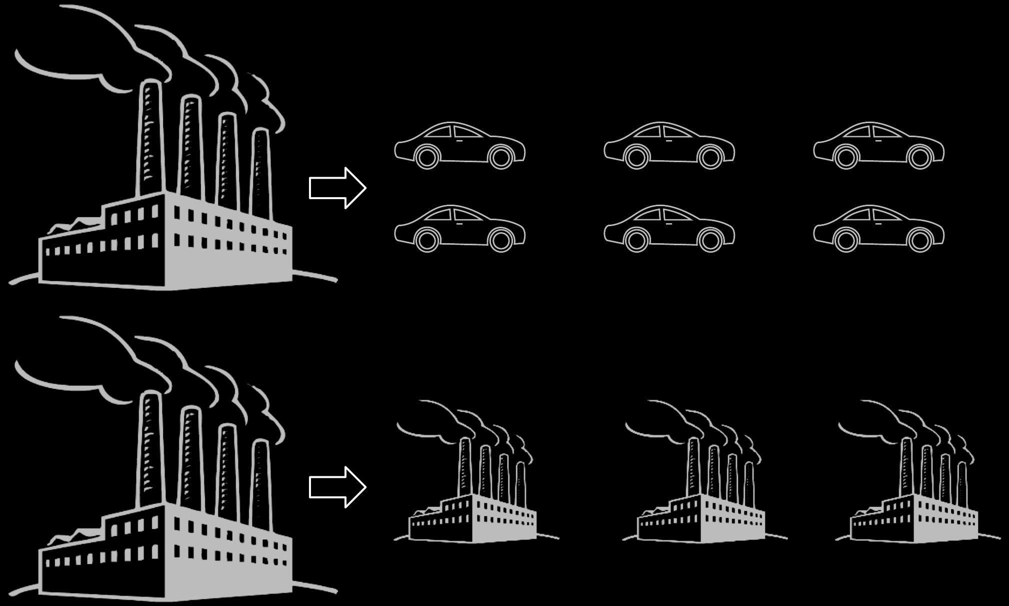

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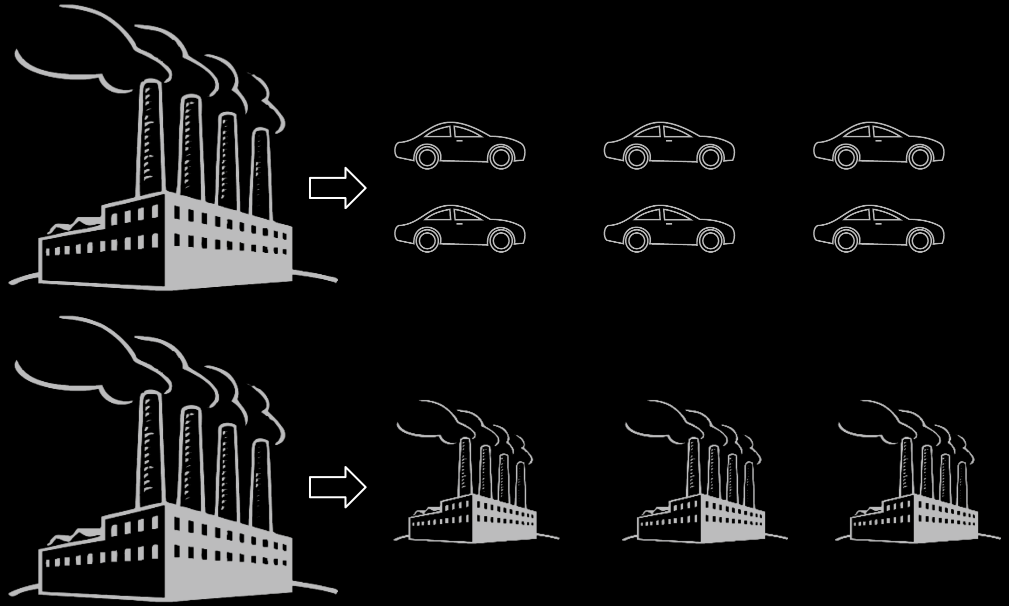

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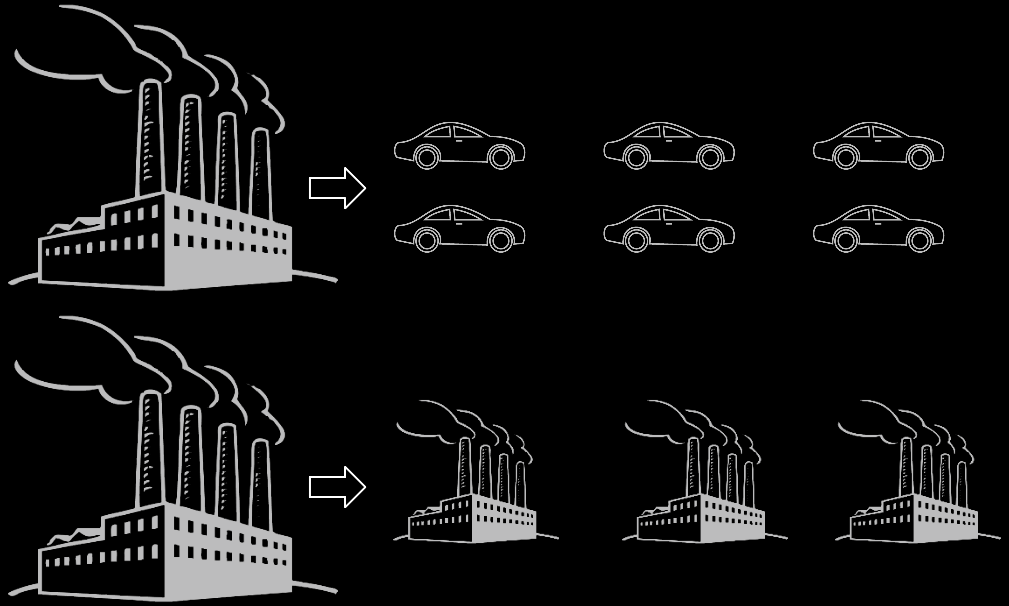

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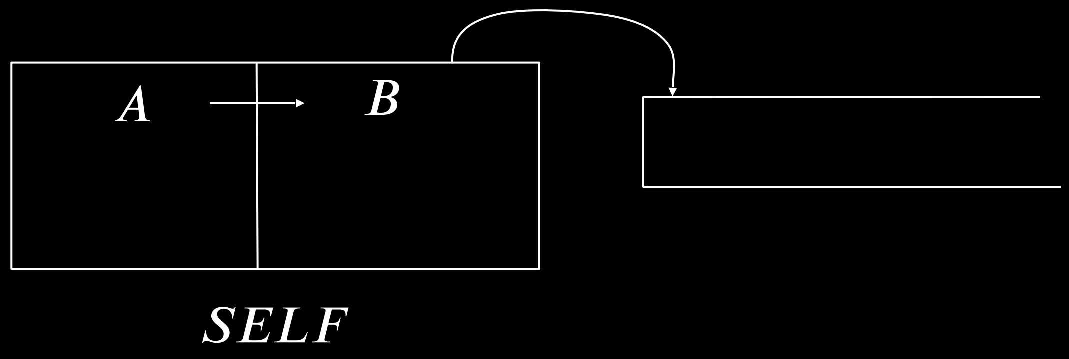

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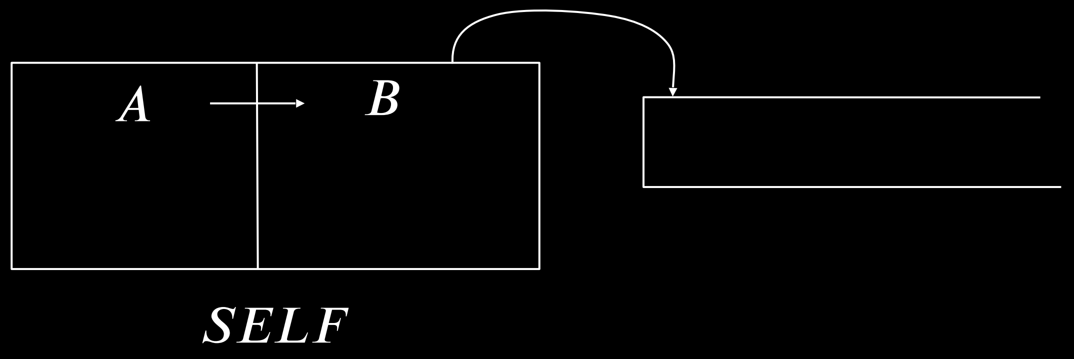

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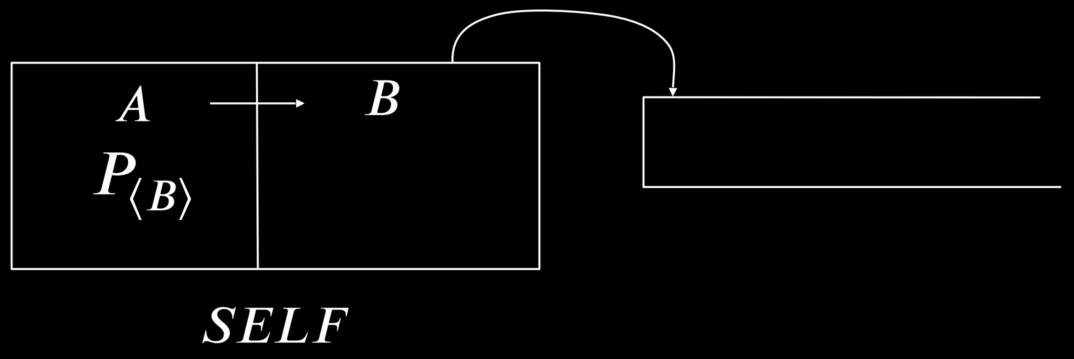

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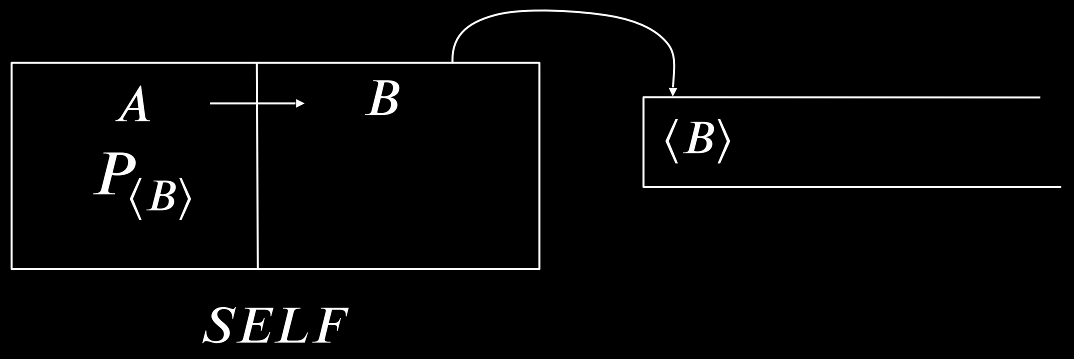

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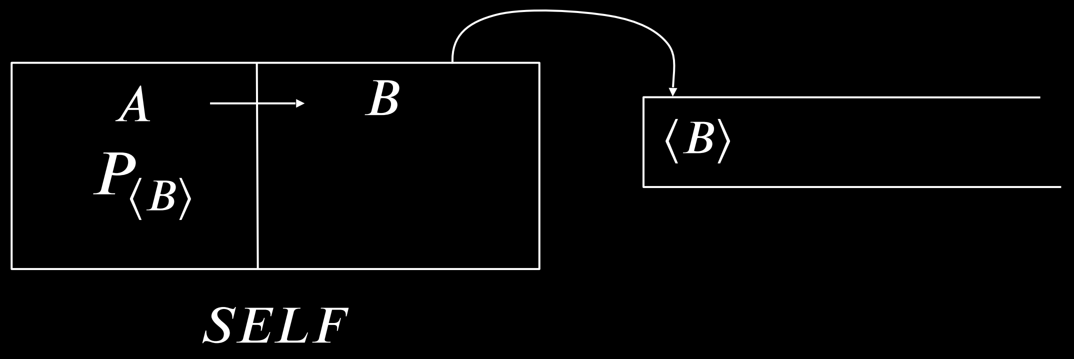

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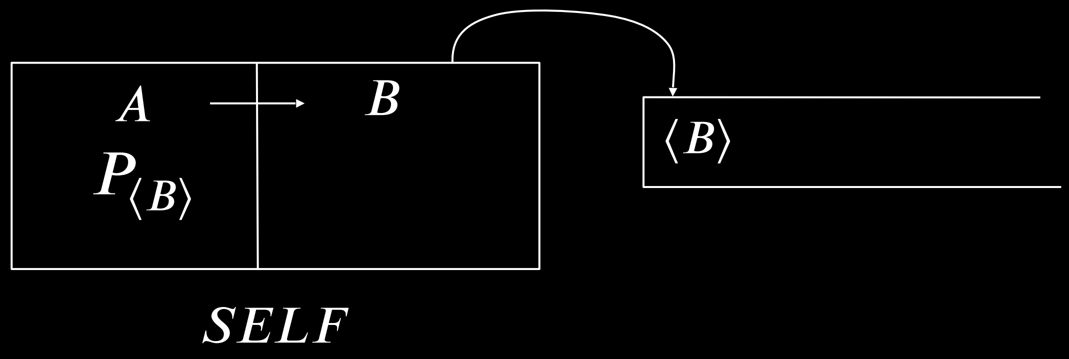

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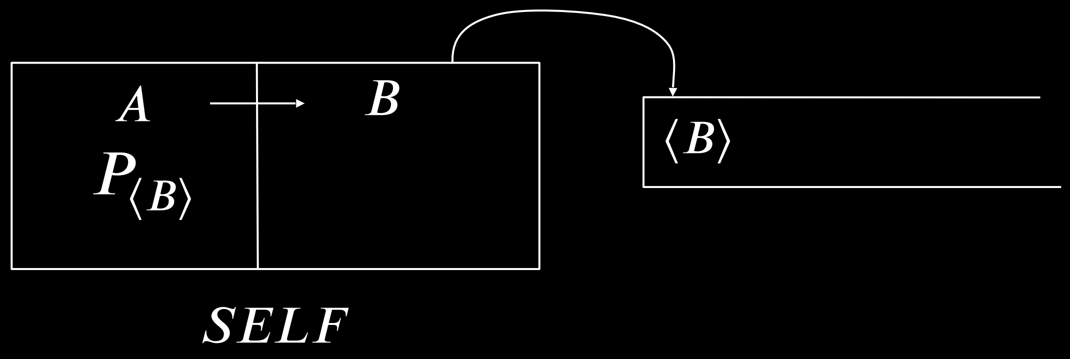

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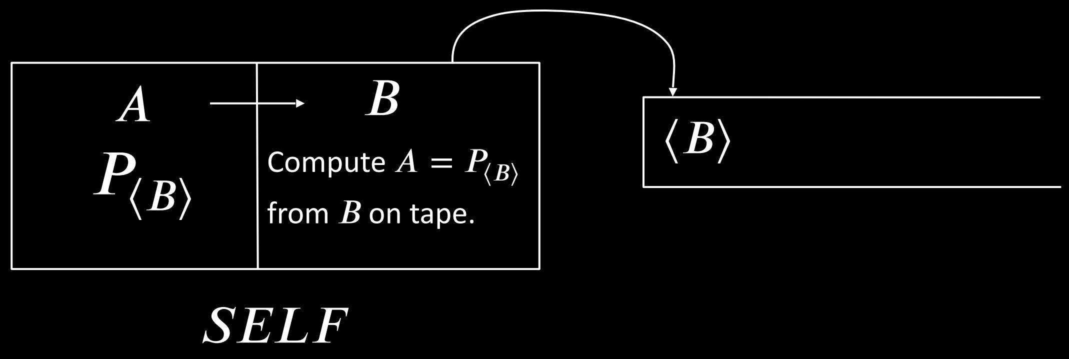

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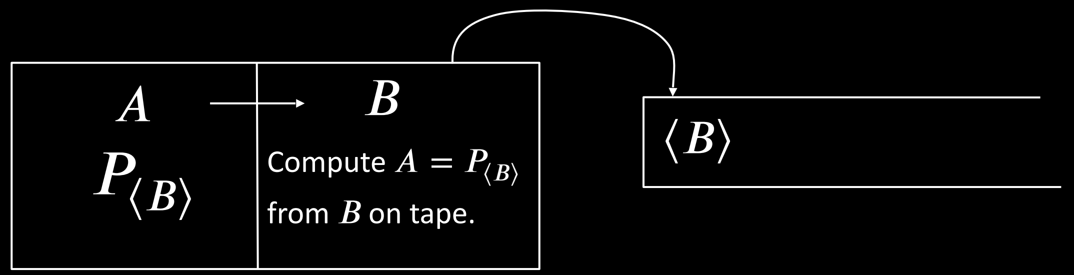

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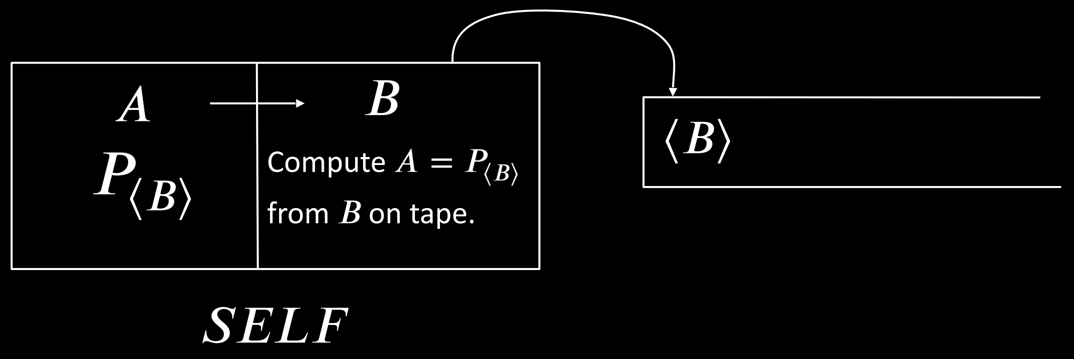

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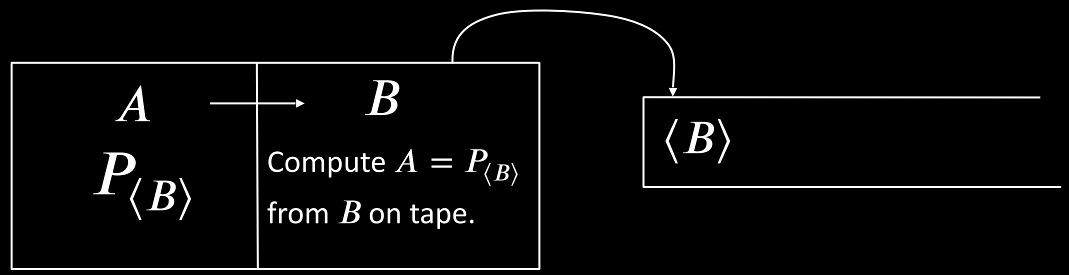

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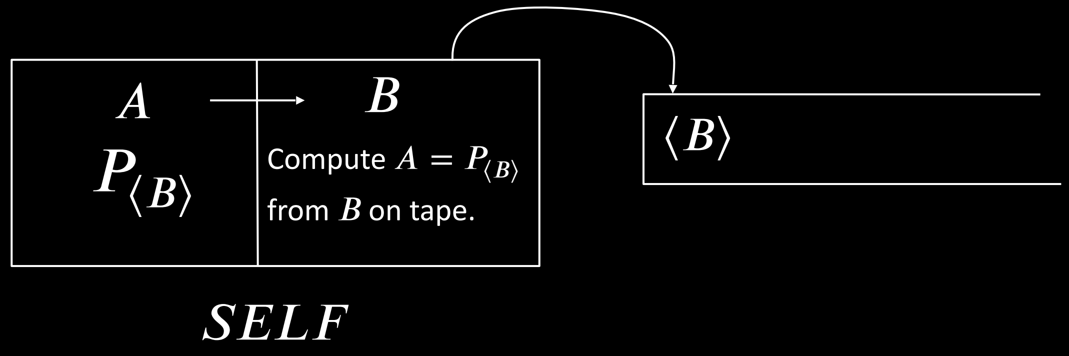

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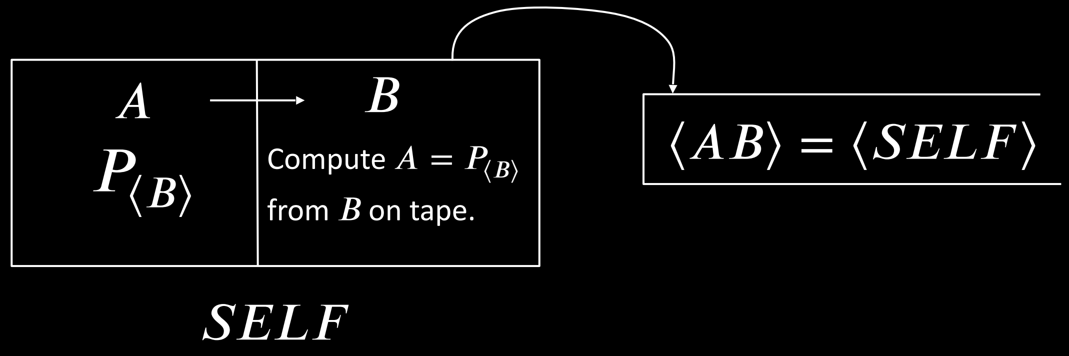

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Given on the tape

A	B
$P_{\langle B \rangle}$	Compute $A = P_{\langle B \rangle}$ from B on tape.

$SELF$

$\langle AB \rangle = \langle SELF \rangle$

Can implement in any programming language.

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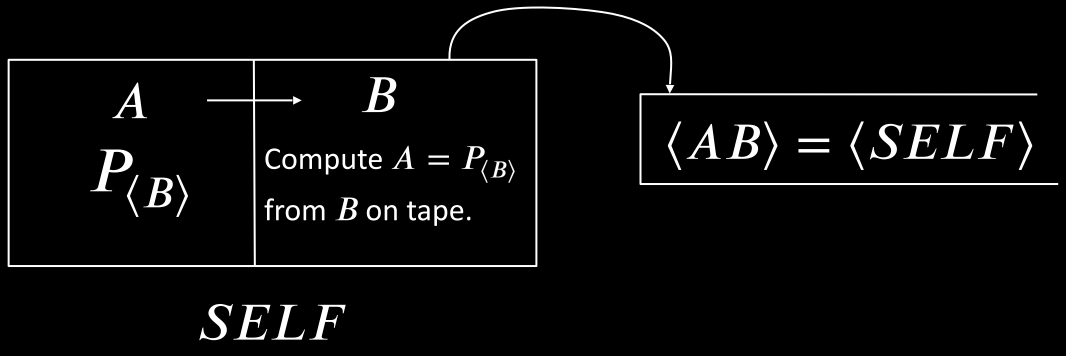

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English Implementation

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Write “Hello World”

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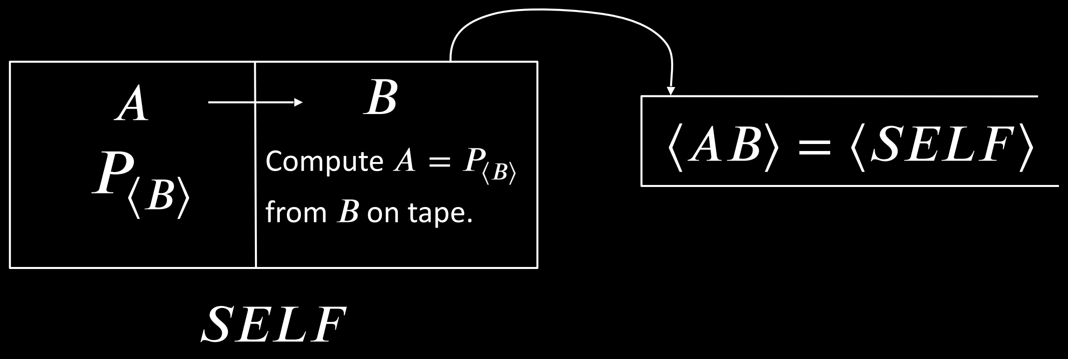

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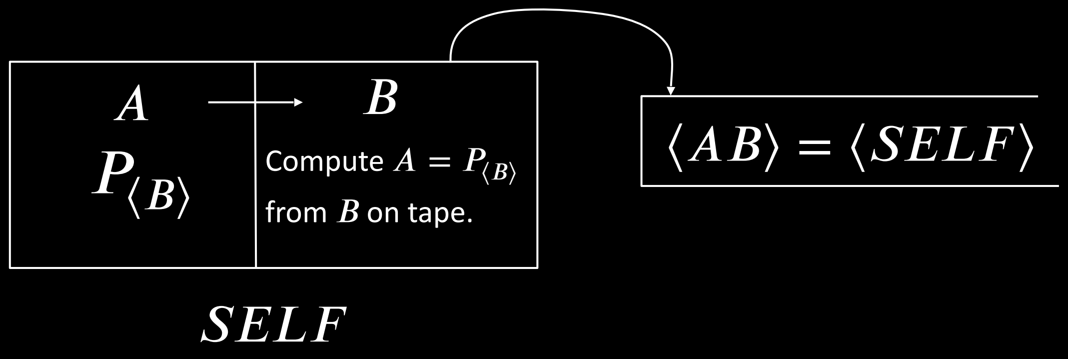

Check-in 11.1

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Implementations of the Recursion Theorem have two parts, a <u>Template</u> and an <u>Action</u>. In the TM and English implementations, which is the <u>Action</u> part?

(a) A and the upper phrase

(b) A and the lower phrase

(c) B and the upper phrase

(d) B and the lower phrase.

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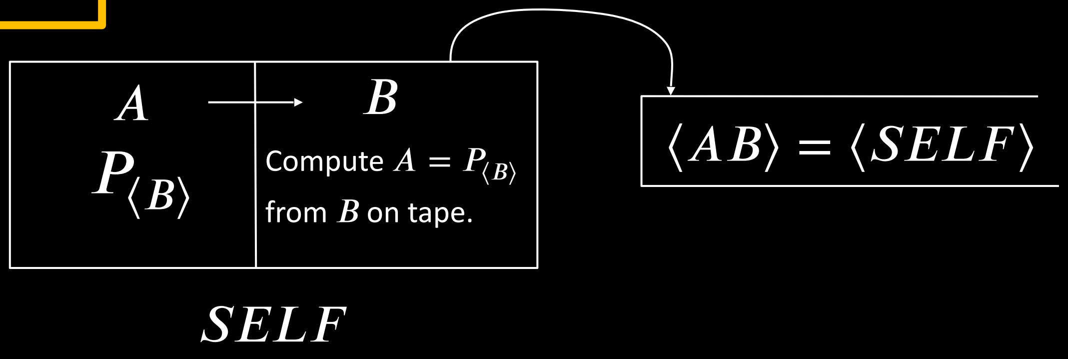

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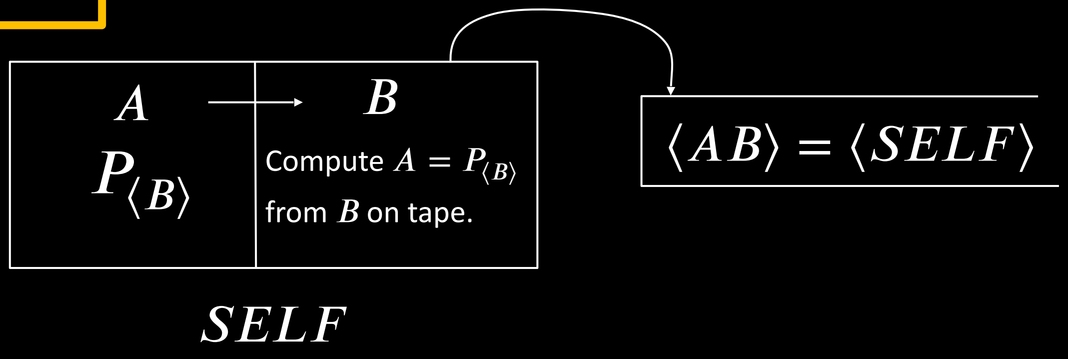

Note on Pset Problem 6: Don't need to worry about quoting.

Check-in 11.1

The Recursion Theorem

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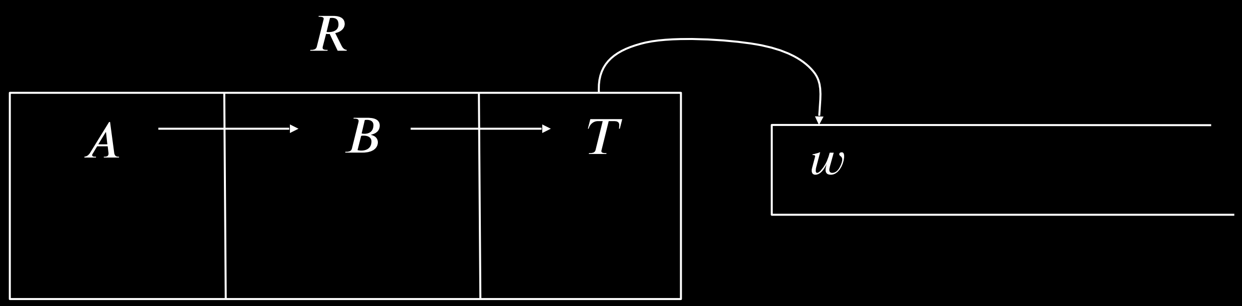

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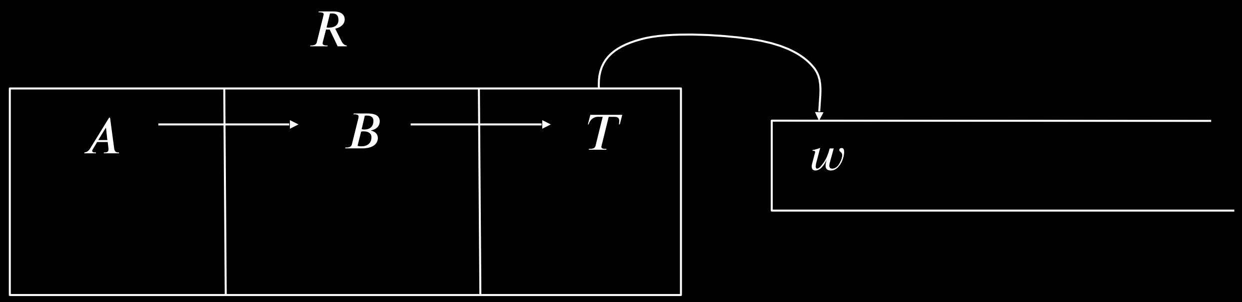

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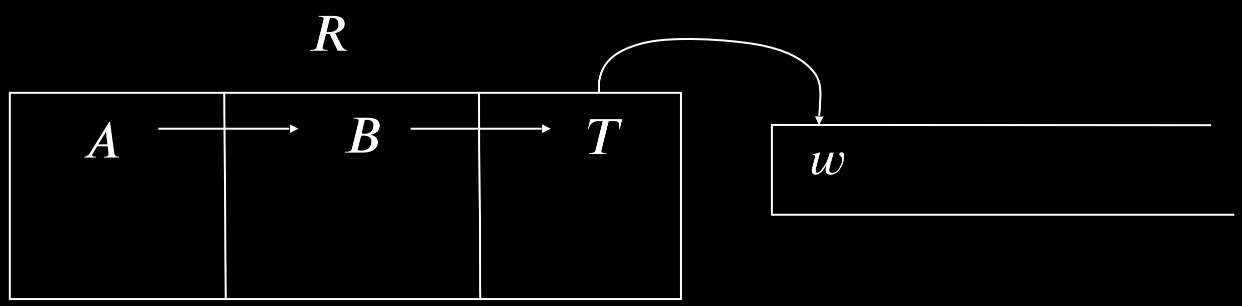

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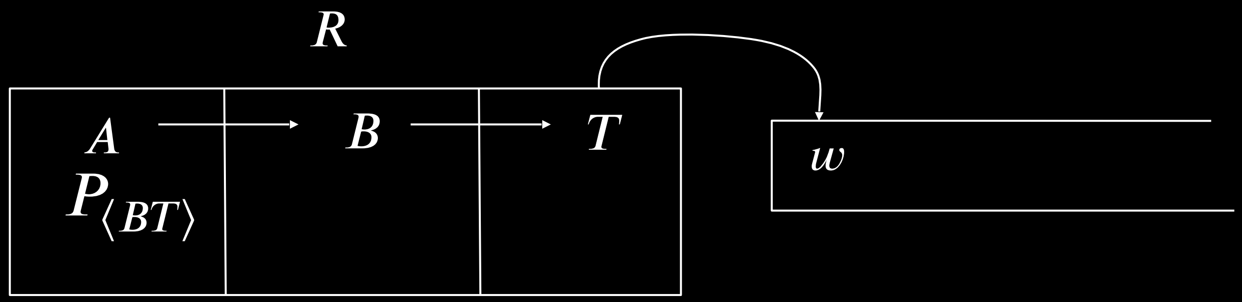

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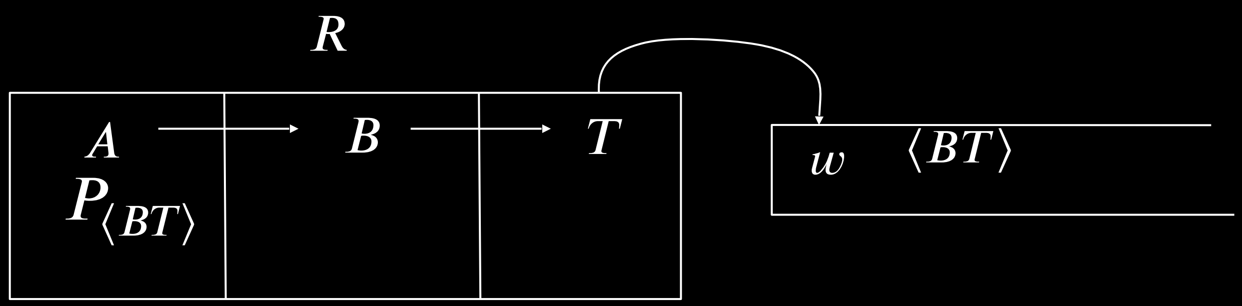

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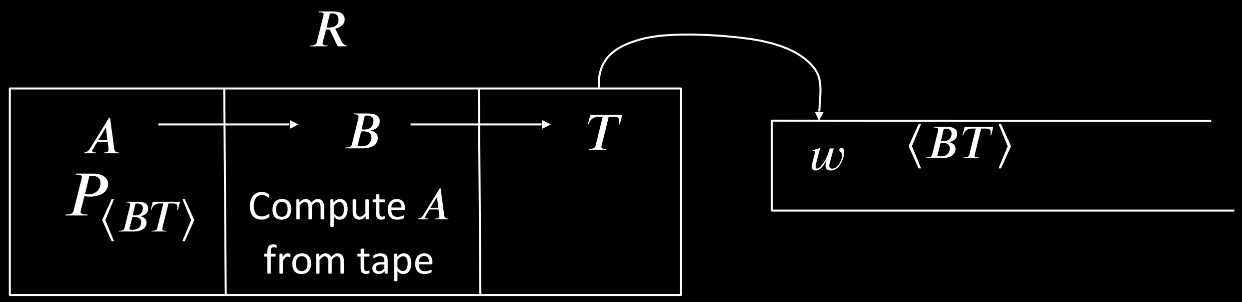

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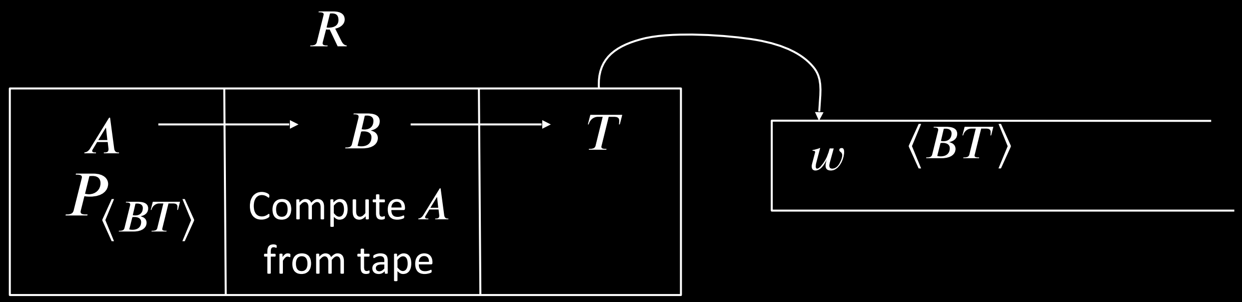

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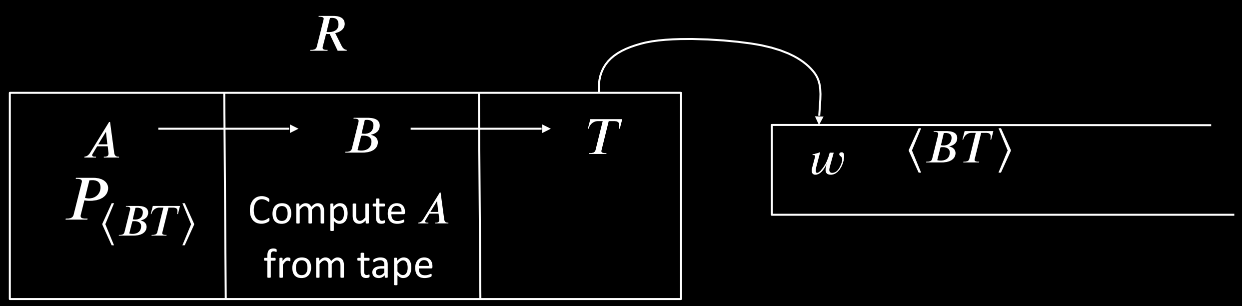

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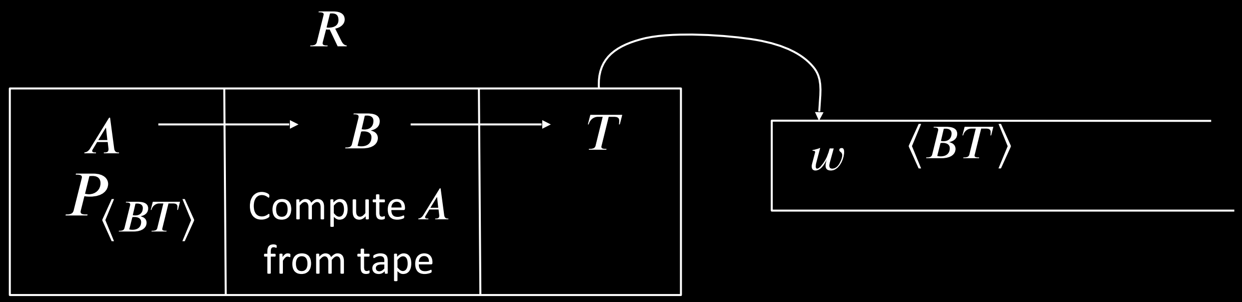

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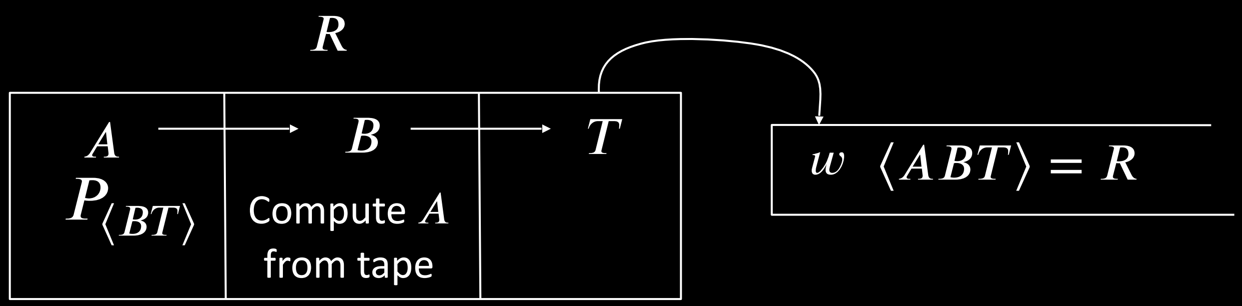

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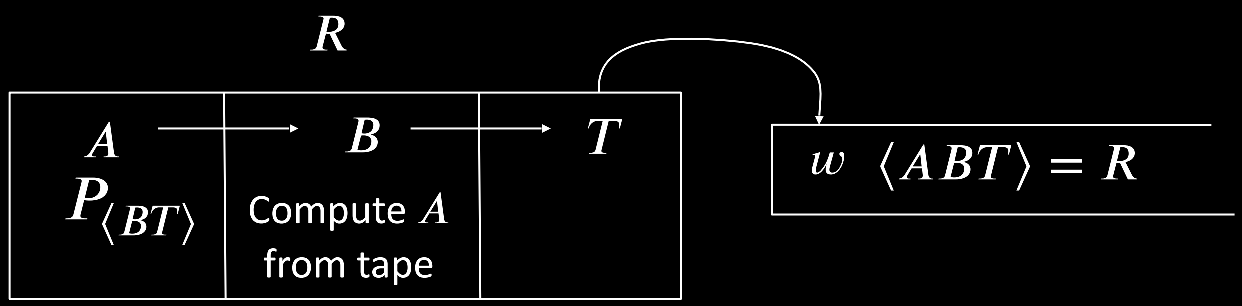

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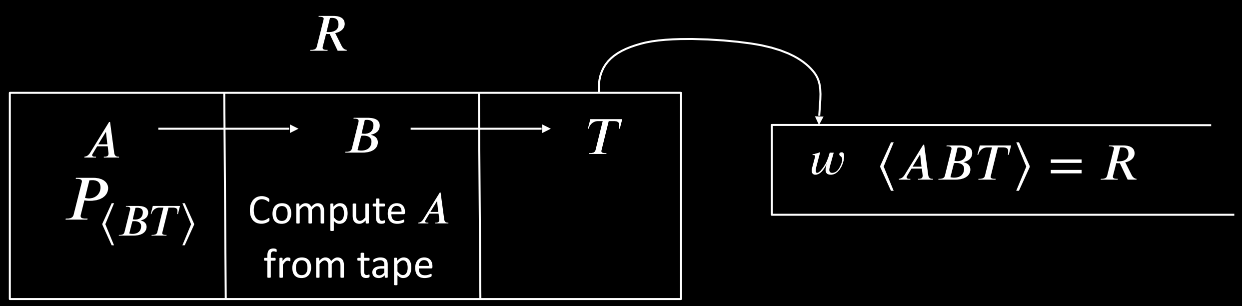

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Check-in 11.2

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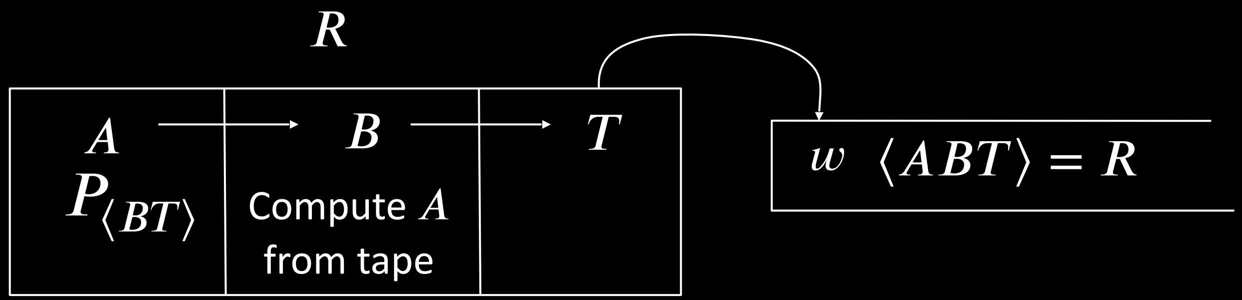

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Check-in 11.2

Can we use the Recursion Theorem to design a TM T where $L(T) = \{\langle T\rangle\}$?

(a) Yes.

(b) No.

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Check-in 11.2

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