

‘Cause I’m Strong Enough: Reasoning about Consistency Choices in Distributed Systems

Presented By:
Aldrin Montana

Example - Causal

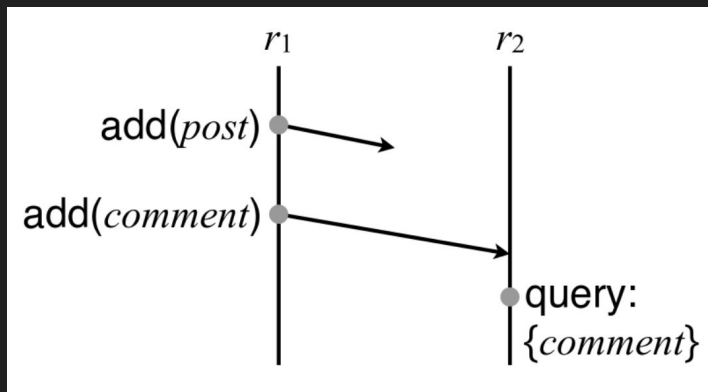


Figure 1A
Illustration of **Add** and **Query**

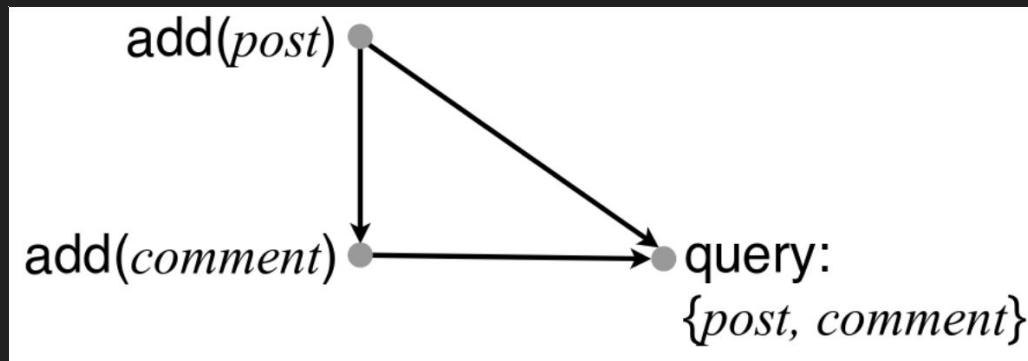


Figure 2A
Example of Definition 1
for **Add** and **Query**

Example - Causal

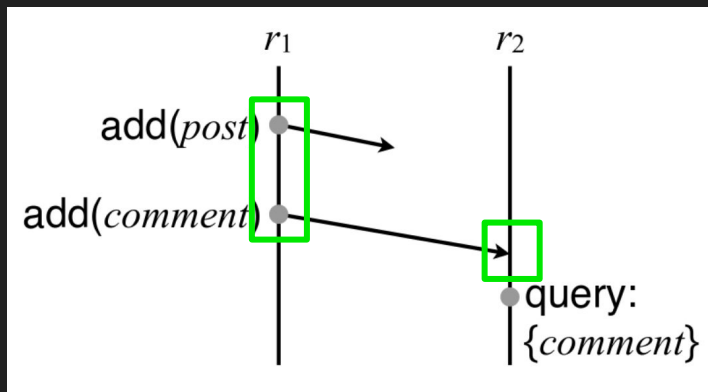


Figure 1A
Illustration of **Add** and **Query**

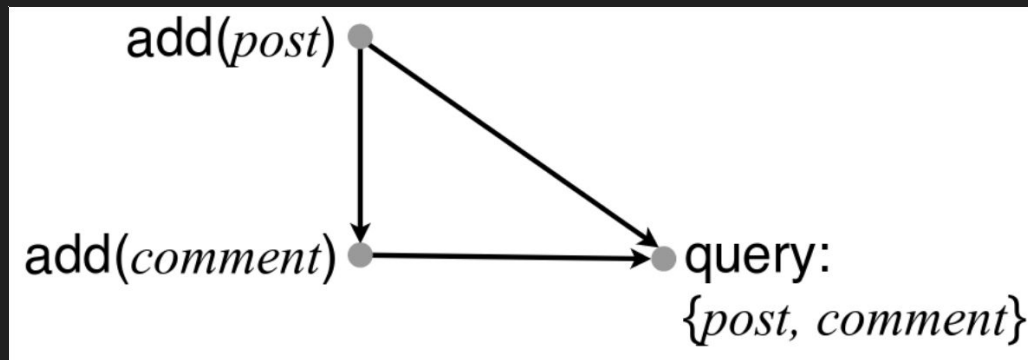


Figure 2A
Example of Definition 1
for **Add** and **Query**

Example

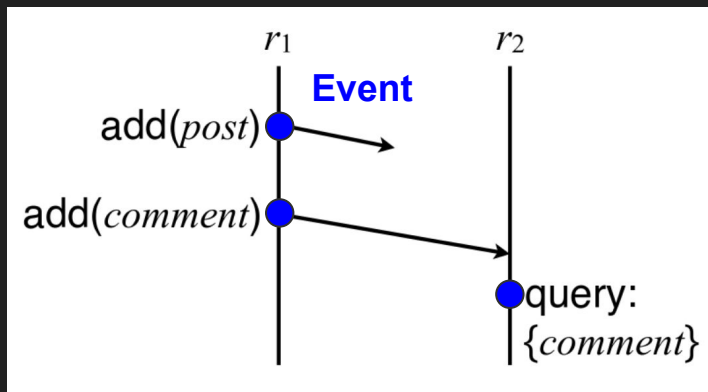


Figure 1A
Illustration of **Add** and **Query**

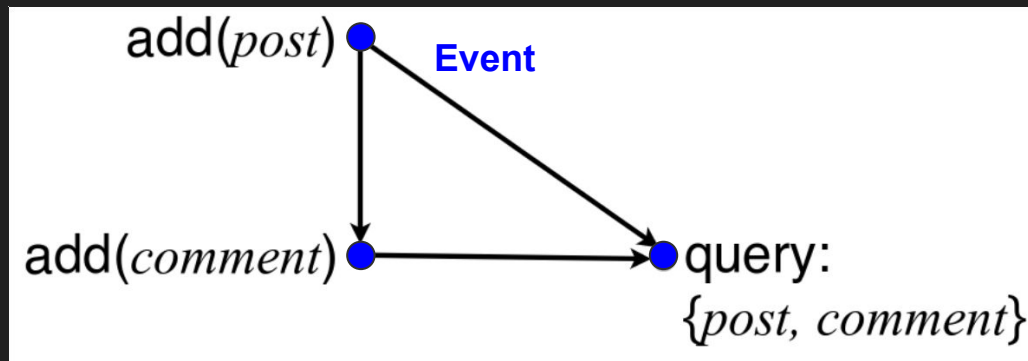


Figure 2A
Example of Definition 1
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Example

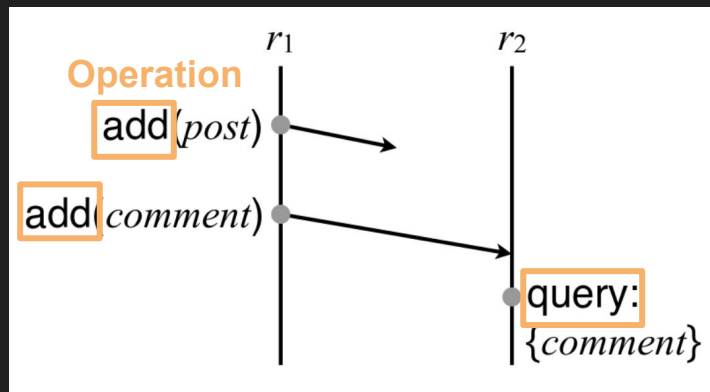


Figure 1A
Illustration of **Add** and **Query**

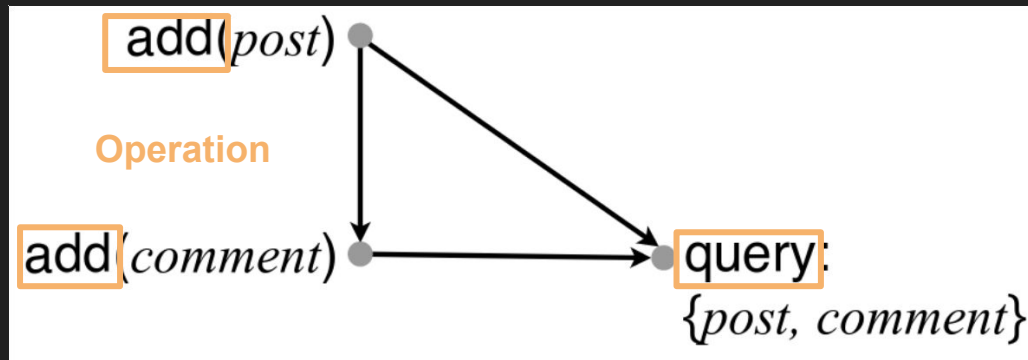


Figure 2A
Example of Definition 1
for **Add** and **Query**

Example

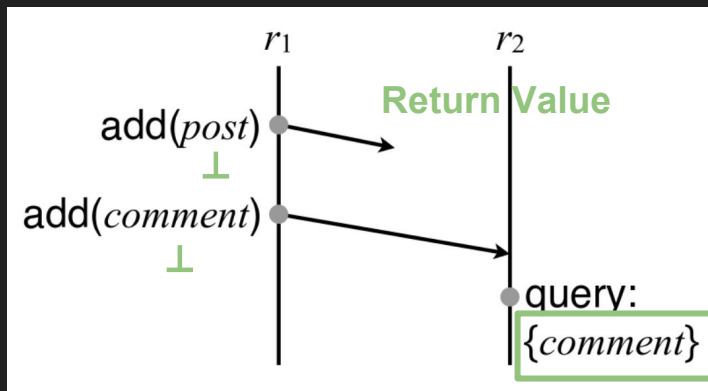


Figure 1A
Illustration of **Add** and **Query**

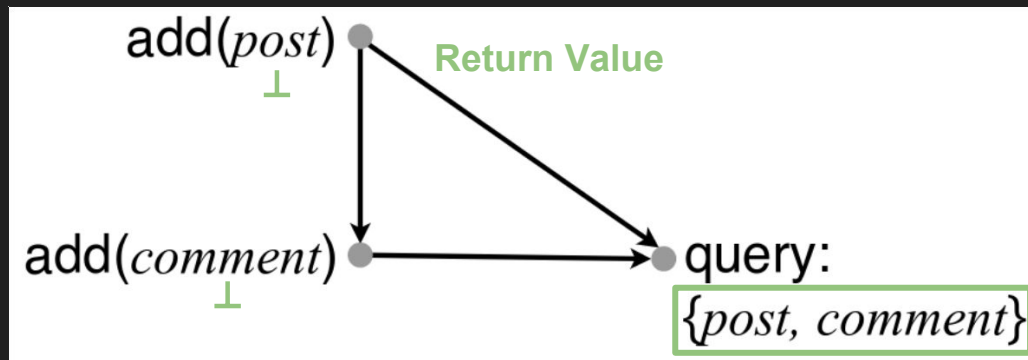


Figure 2A
Example of Definition 1
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Example

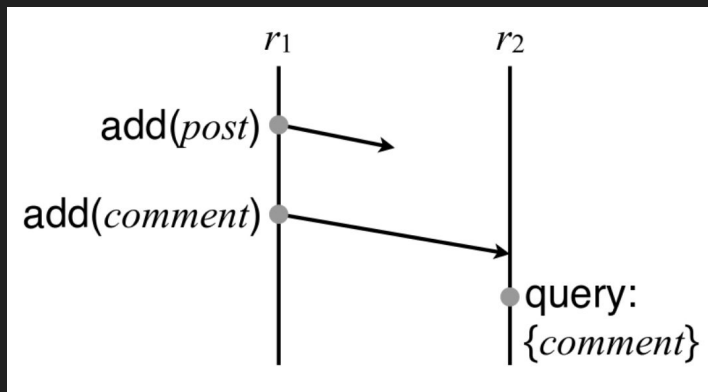


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Illustration of **Add** and **Query**

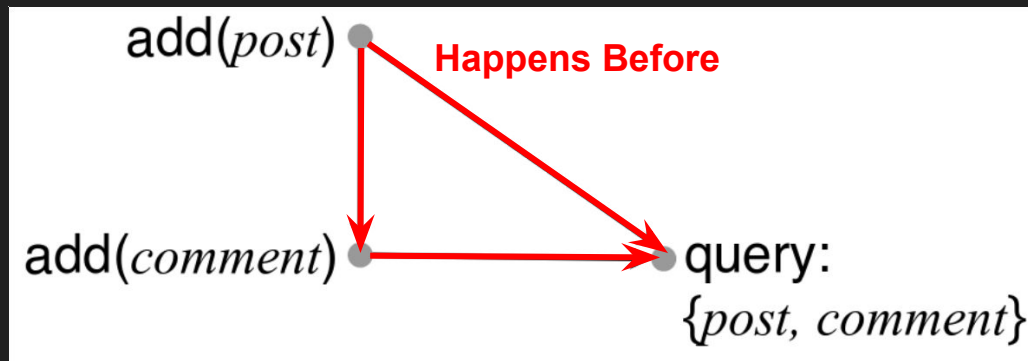


Figure 2A
Example of Definition 1
for **Add** and **Query**

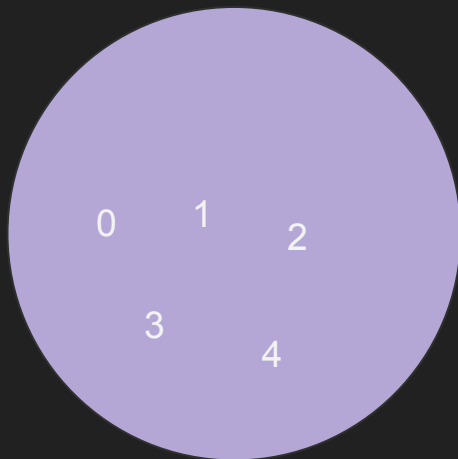
Definitions and Notations

State



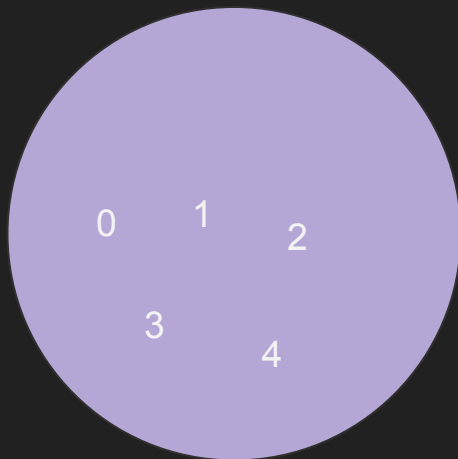
Definitions and Notations

State = \mathbb{Z}

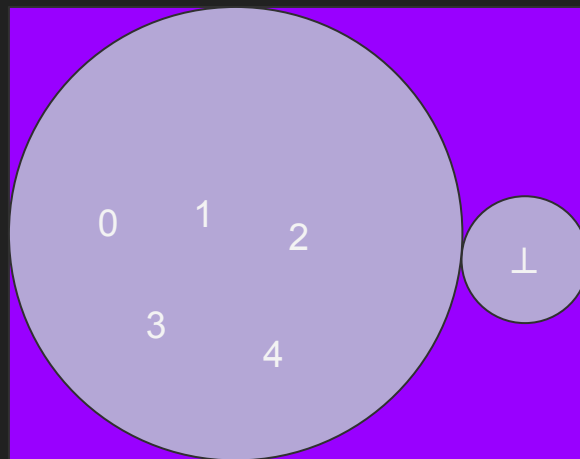


Definitions and Notations

State = \mathbb{Z}

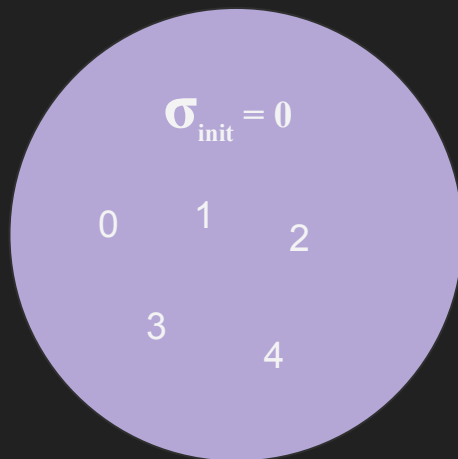


Val = \mathbb{Z}

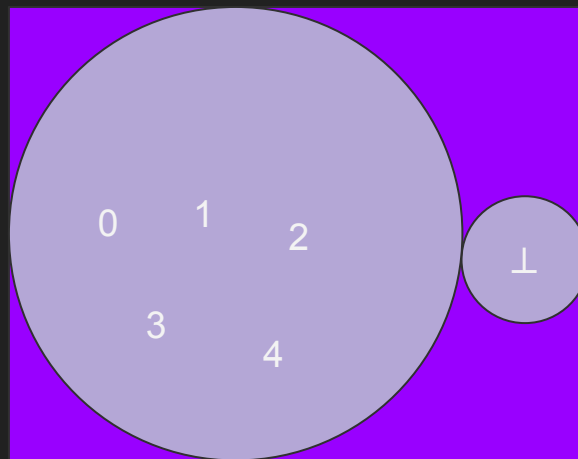


Definitions and Notations

State = \mathbb{Z}



Val = \mathbb{Z}



Definitions and Notations

$$f \in \text{Op} \rightarrow (\text{State} \rightarrow (\text{Val} \times (\text{State} \rightarrow \text{State})))$$

Definitions and Notations

$$F \in \text{Op} \rightarrow (\text{State} \rightarrow (\text{Val} \times (\text{State} \rightarrow \text{State})))$$

$$F_o(\sigma) = (\text{Val}, (\text{State} \rightarrow \text{State}))$$

$$F_o(\sigma) = (F_o^{\text{val}}(\sigma), (F_o^{\text{eff}}(\sigma)))$$

$$F_o^{\text{tok}}$$

Example - Sequential

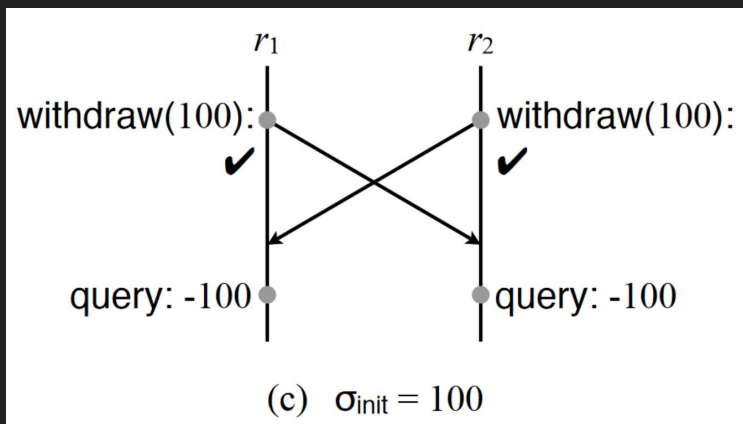


Figure 1C
Illustration of **Withdraw** and **Query**

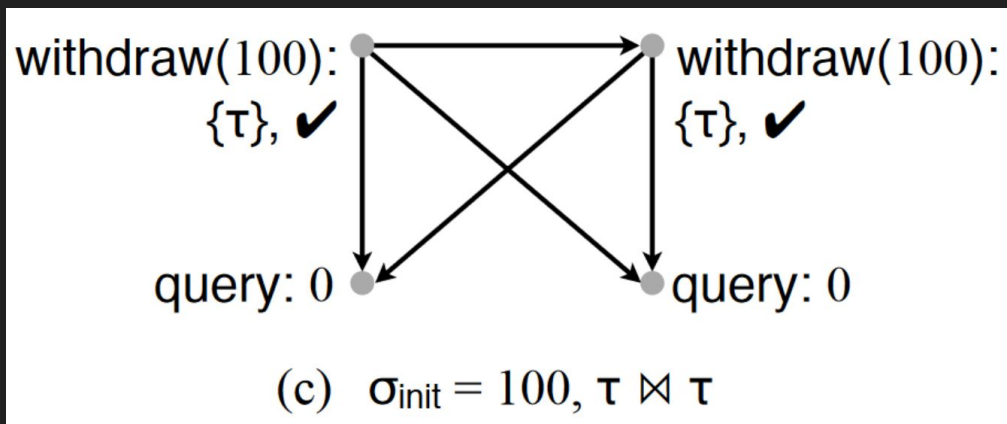


Figure 2C
Example of Definition 1
for **Withdraw** and **Query**

Example - Sequential

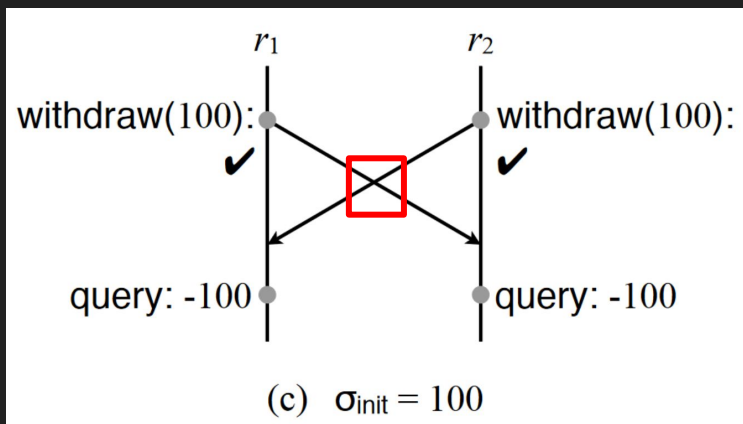


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Illustration of **Withdraw** and **Query**

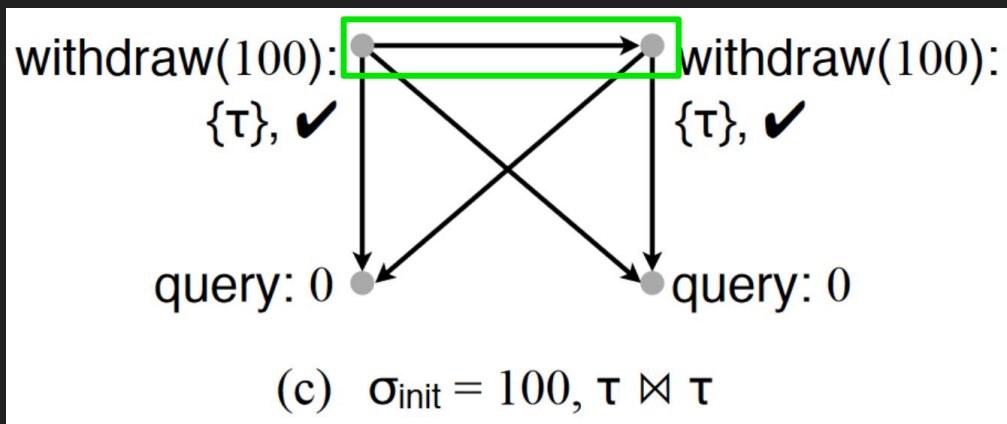


Figure 2C
Example of Definition 1
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Example - Sequential

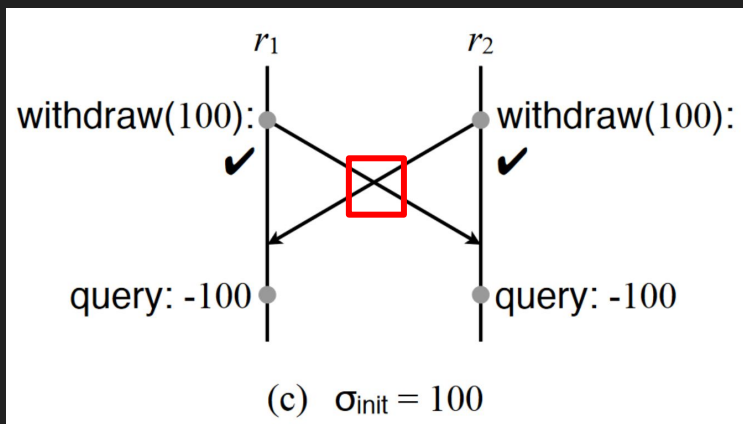


Figure 1C
Illustration of **Withdraw** and **Query**

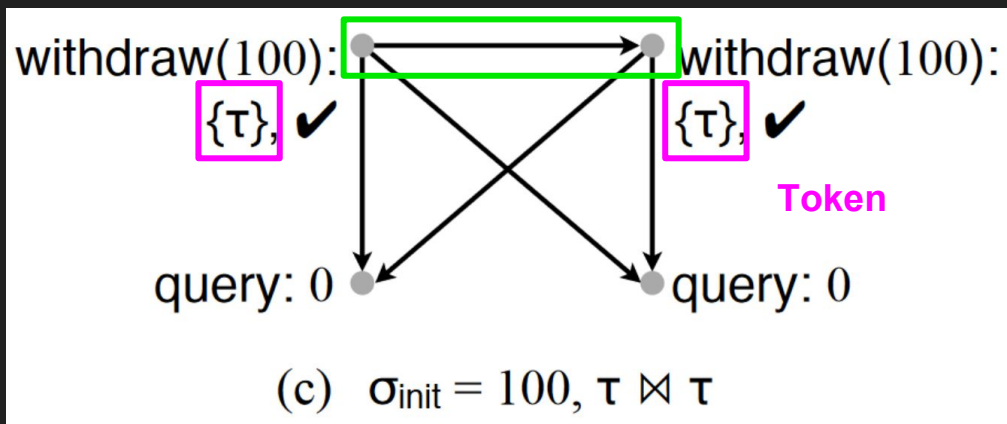


Figure 2C
Example of Definition 1
for **Withdraw** and **Query**

Definitions and Notations - Extensions

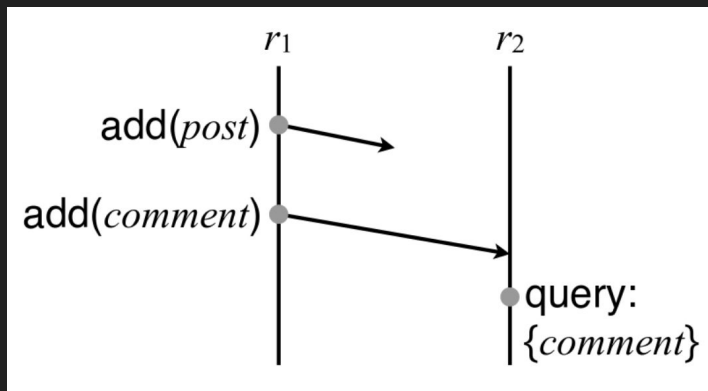


Figure 1A
Illustration of **Add** and **Query**

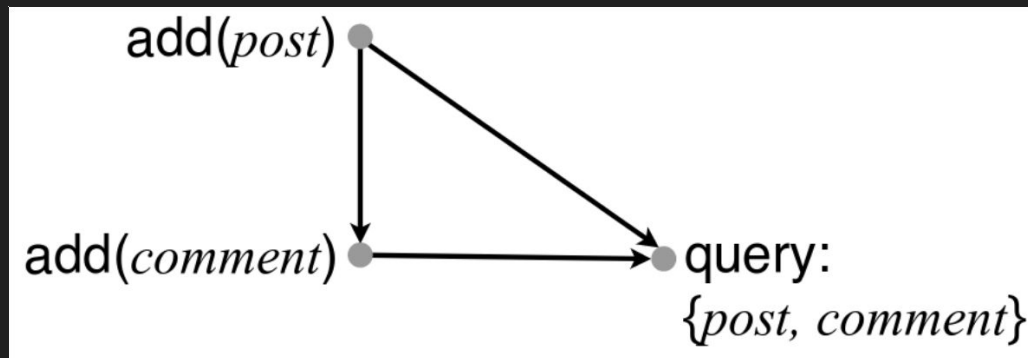


Figure 2A
Example of Definition 1
for **Add** and **Query**

Definitions and Notations

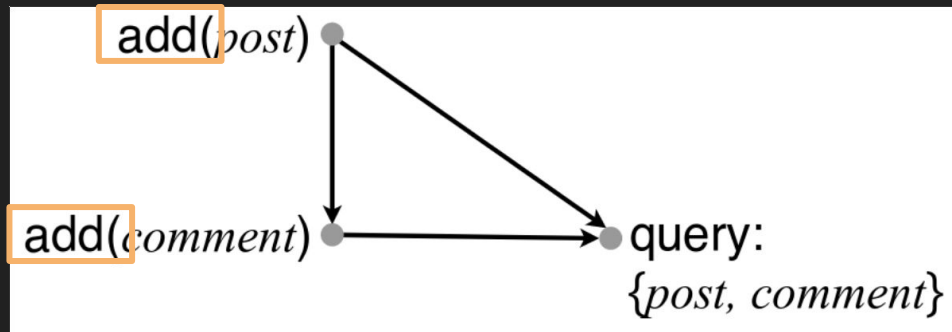
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$$F_o^{\text{tok}}$$

Intuition



If **operations** are **convergent**,
then **tokens** are **not necessary**

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