

Utilizing Graph Rewriting for Narrative Generation

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COMP-522 Final Project

Format

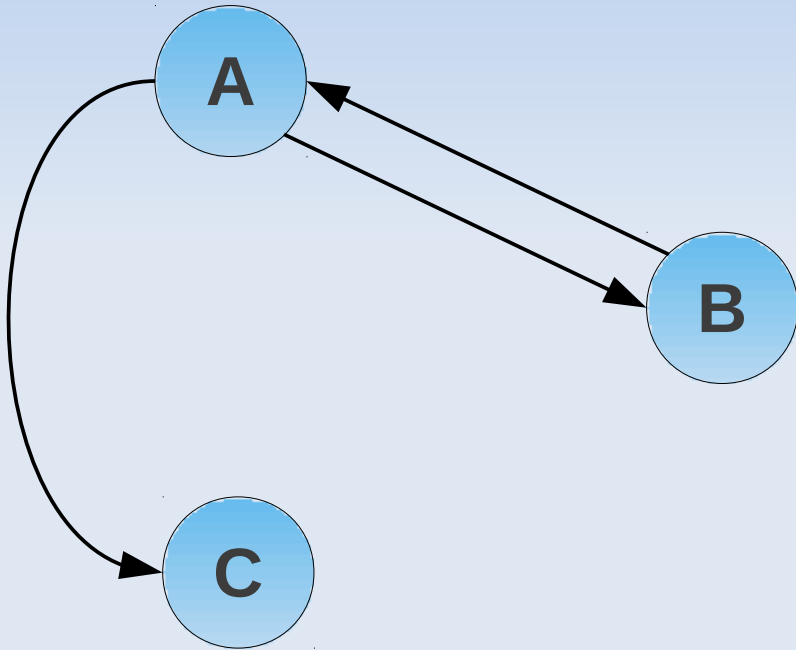
- **Motivation**
- **Graph Rewriting**
- **Definition**
- **Step-by-Step Example**
- **Conclusions**
- **Questions**

Motivation

- **Cheap**
- Extends Gameplay (*infinite?*)

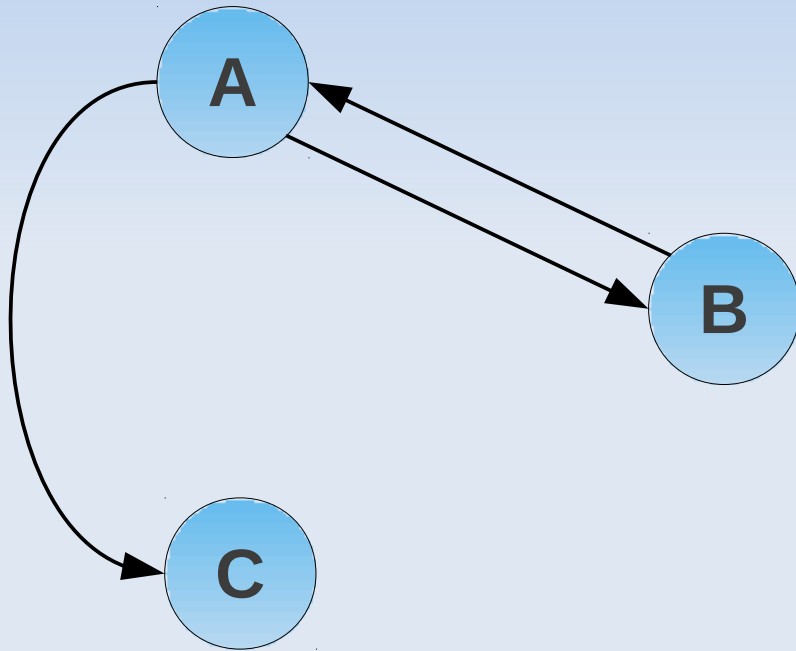
- **Challenging**
- *Repetitive/Dull*

Graph Rewriting

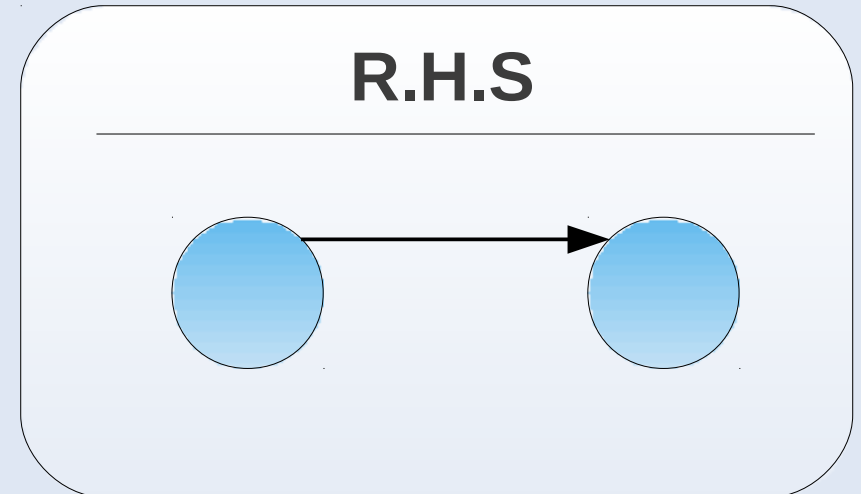
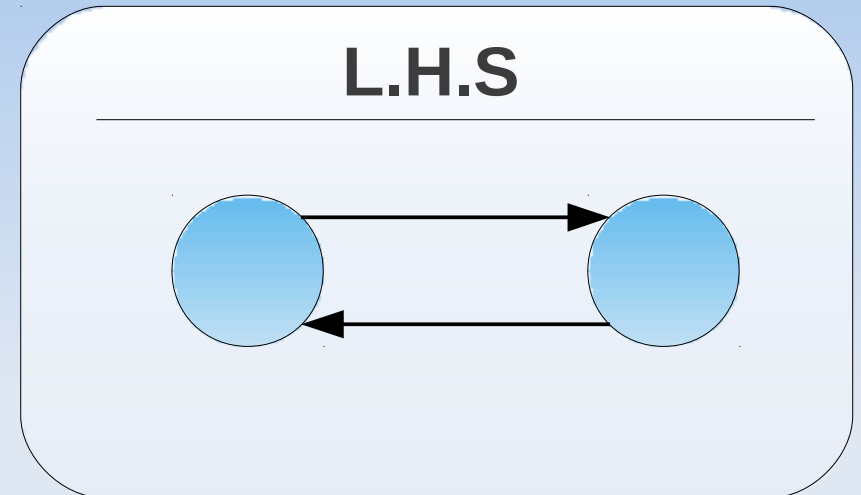


Base Graph

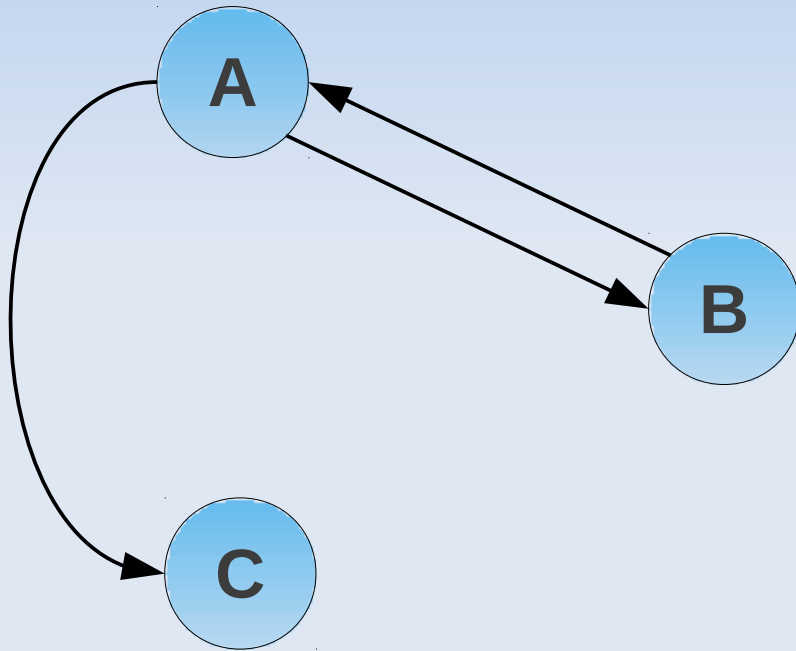
Graph Rewriting



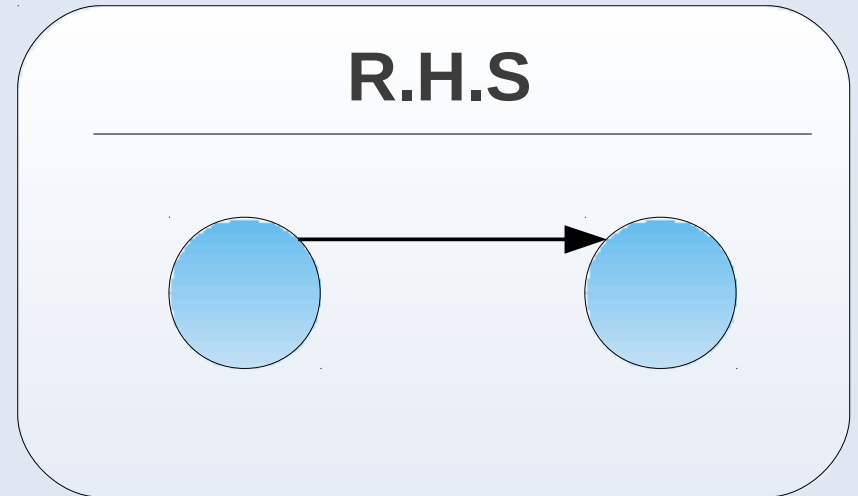
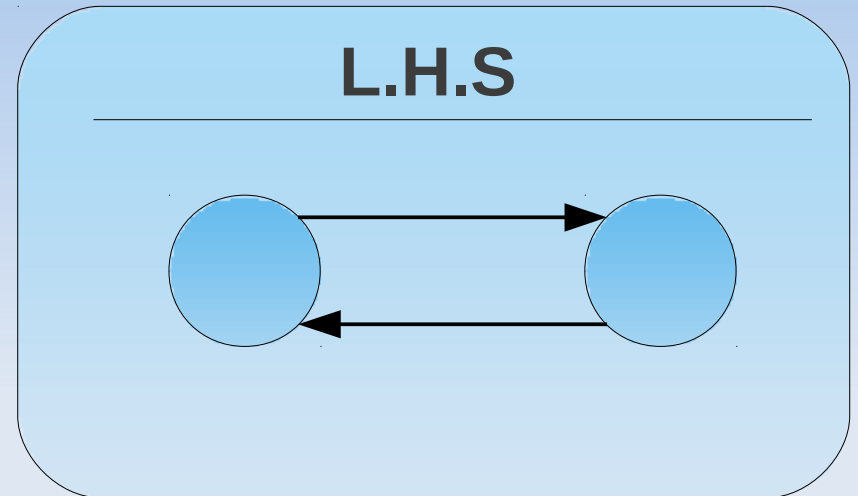
Base Graph



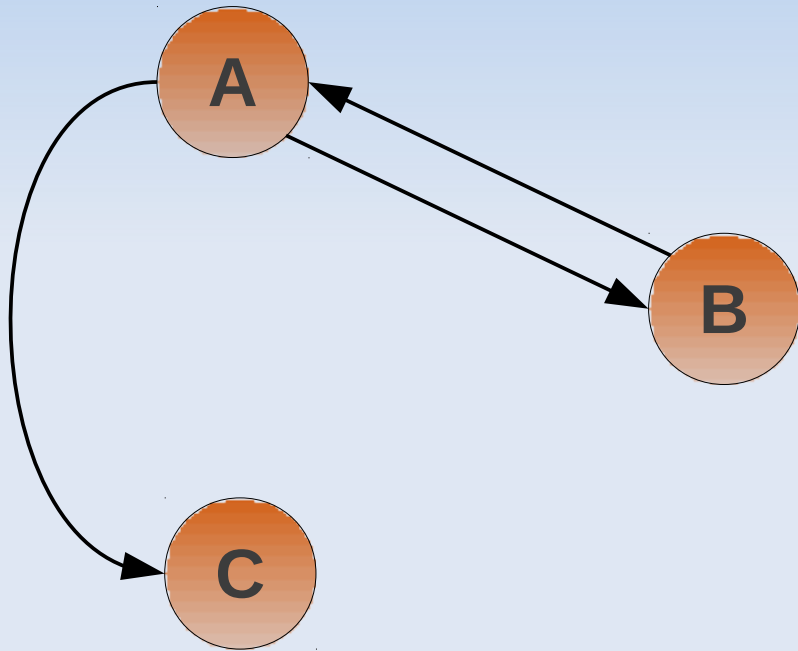
Graph Rewriting



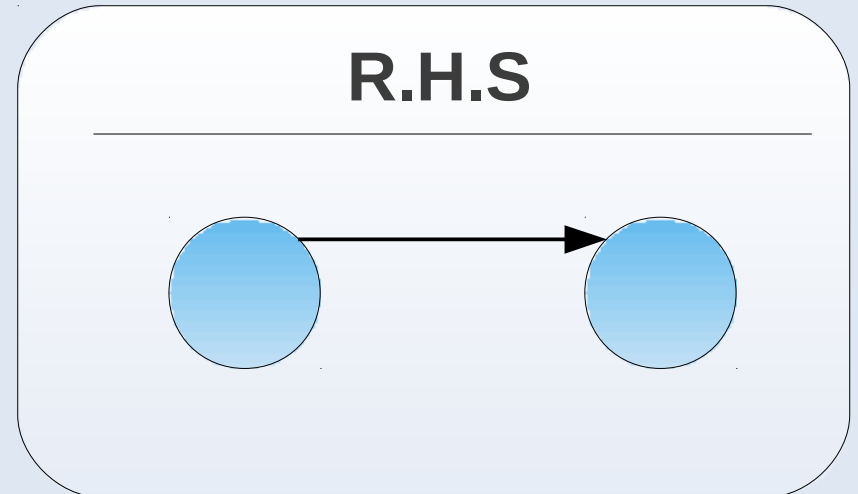
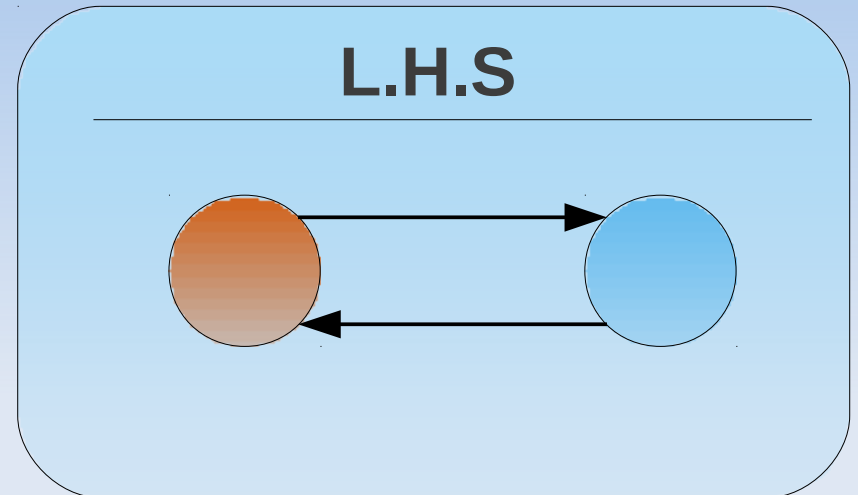
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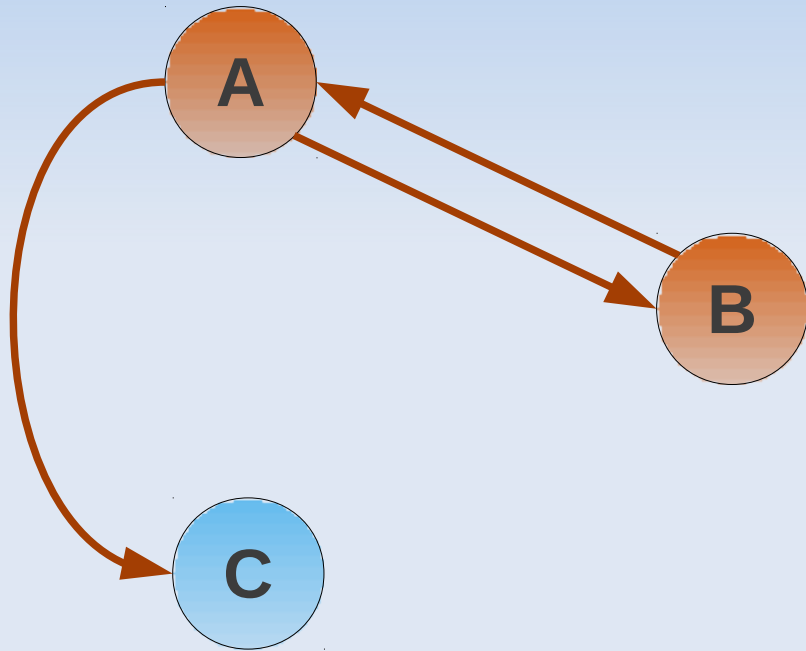
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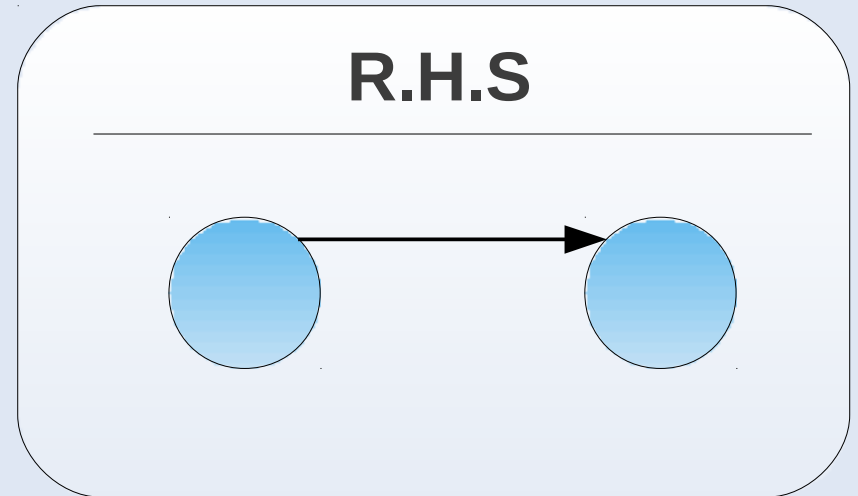
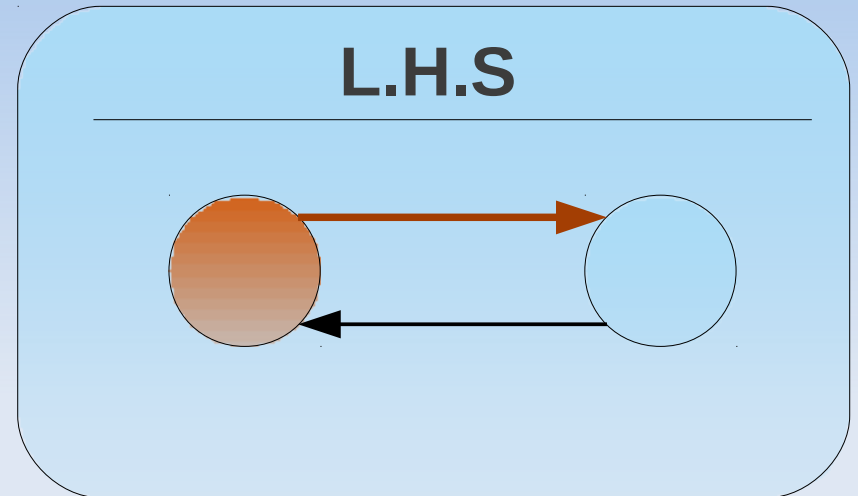
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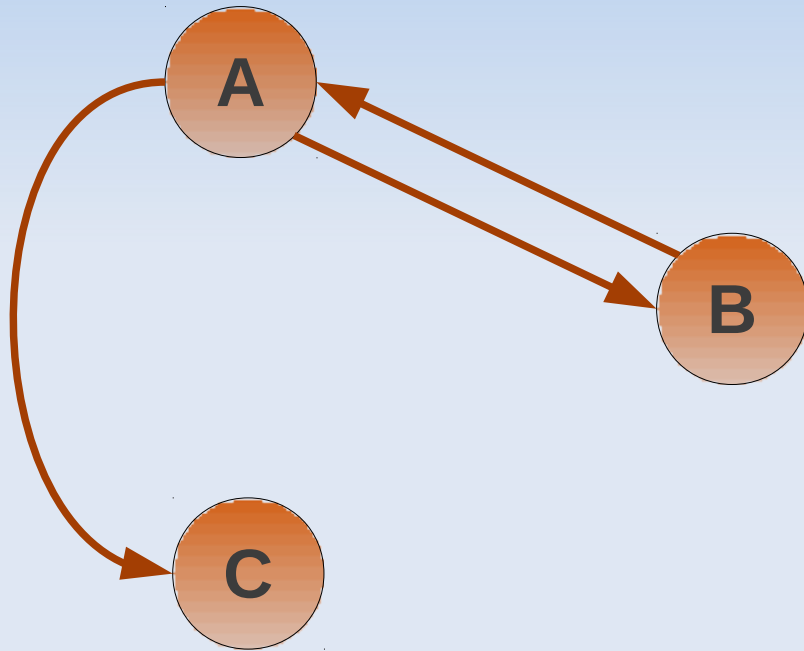
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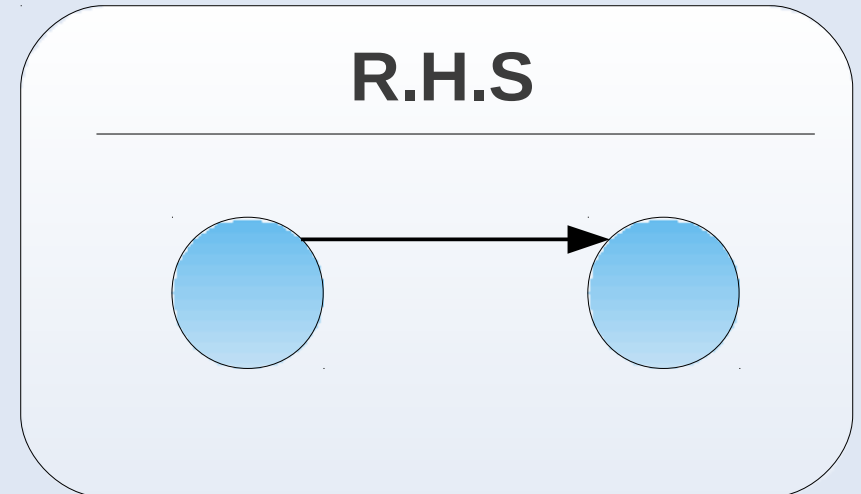
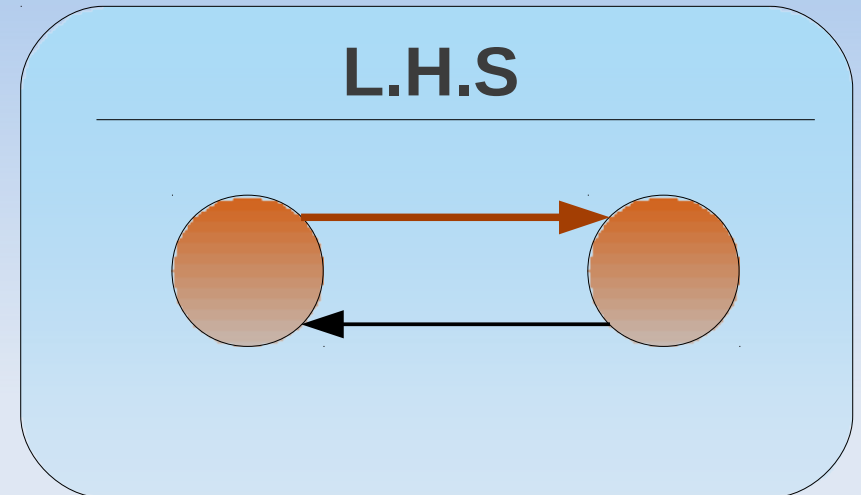
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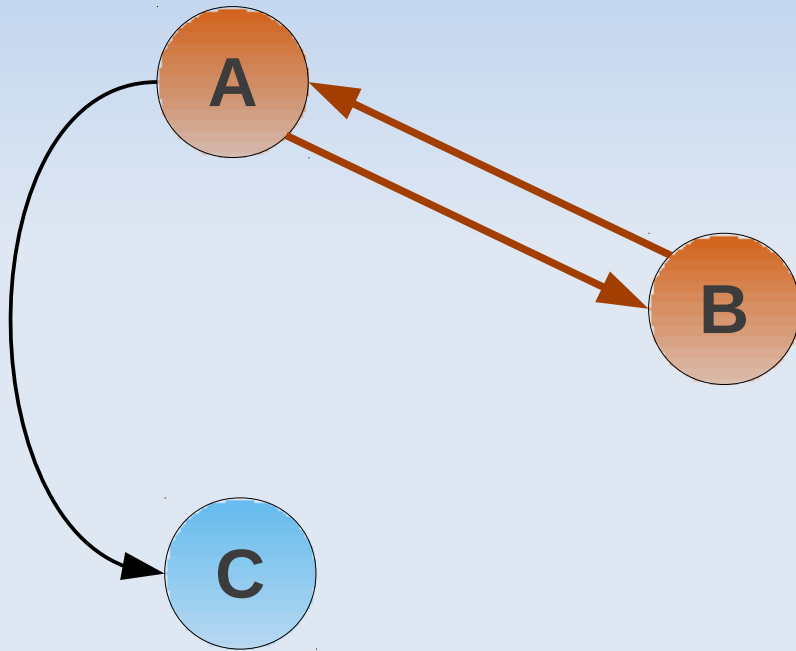
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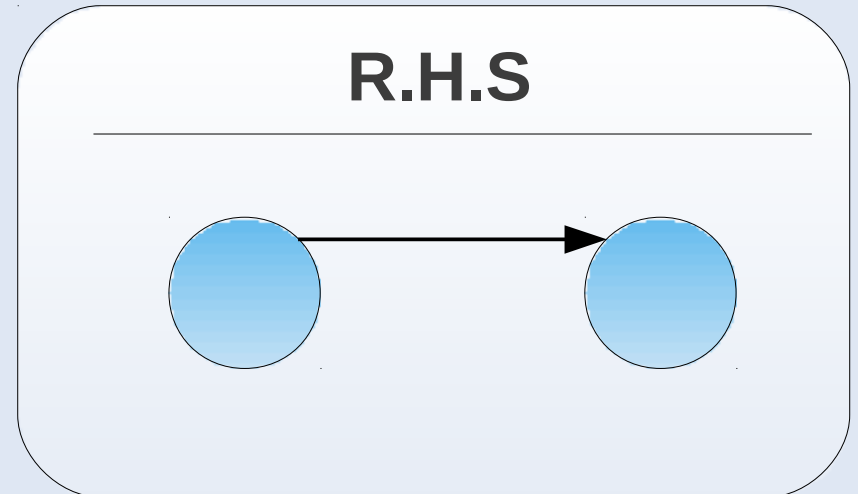
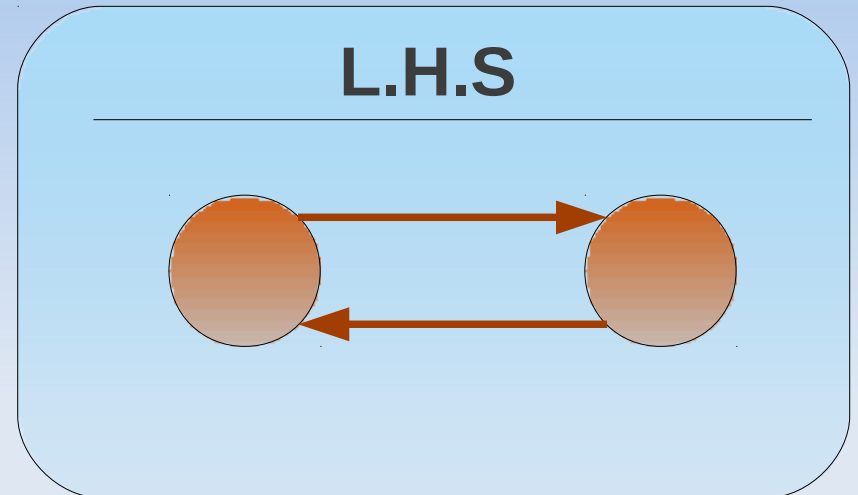
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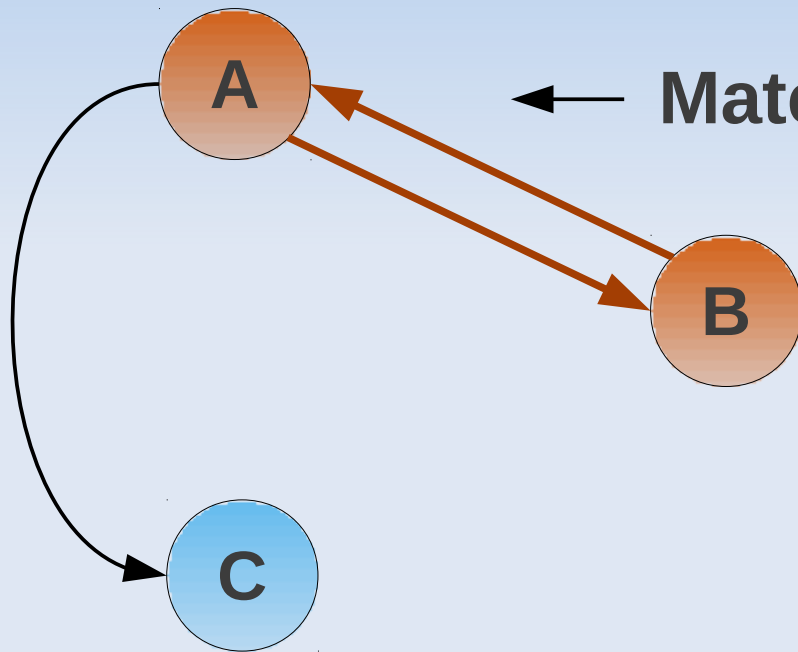
Graph Rewriting



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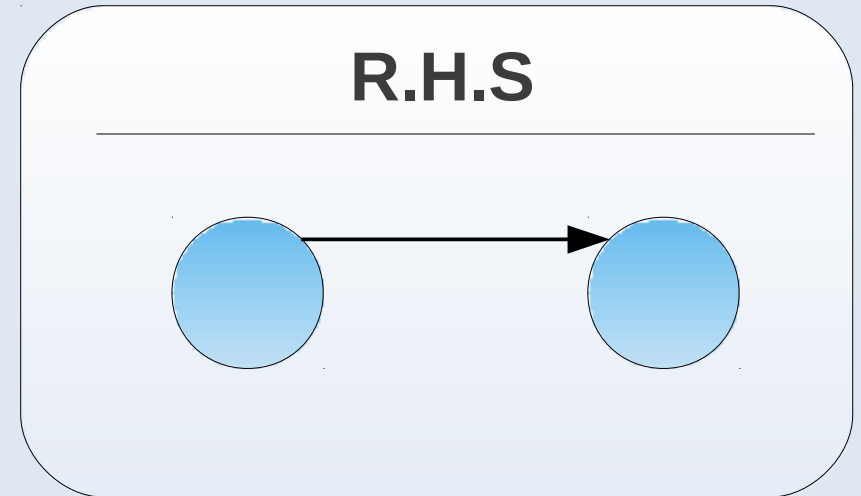
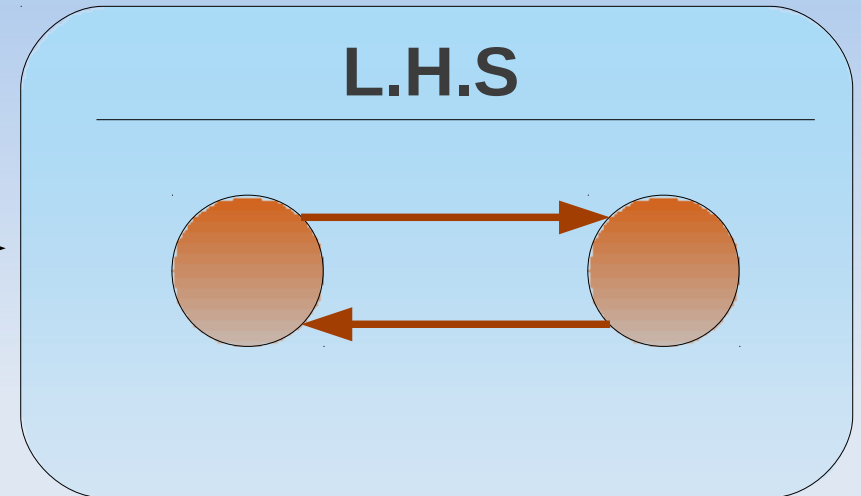


Graph Rewriting

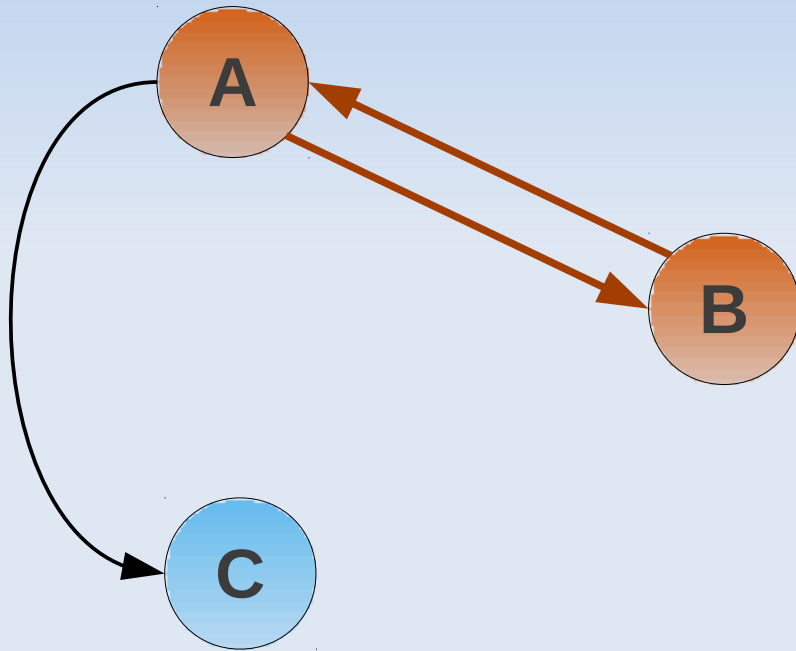


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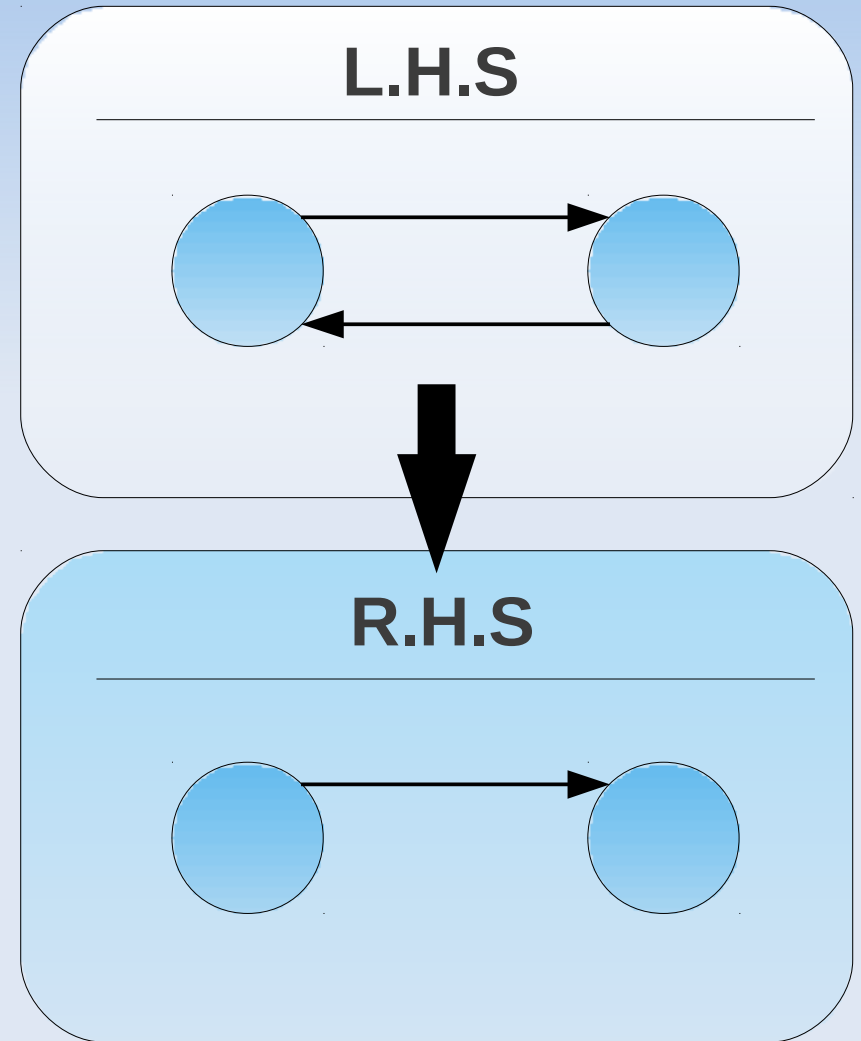
← Match →



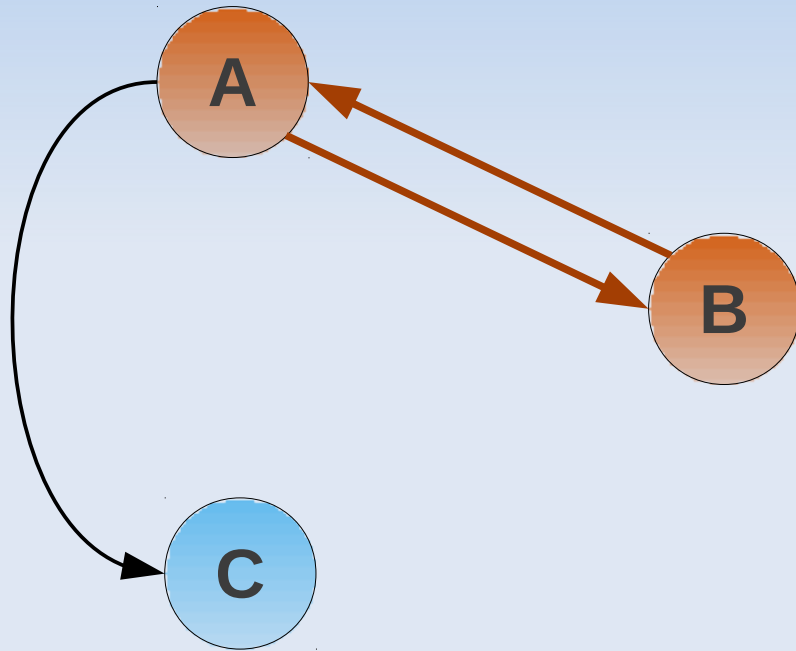
Graph Rewriting



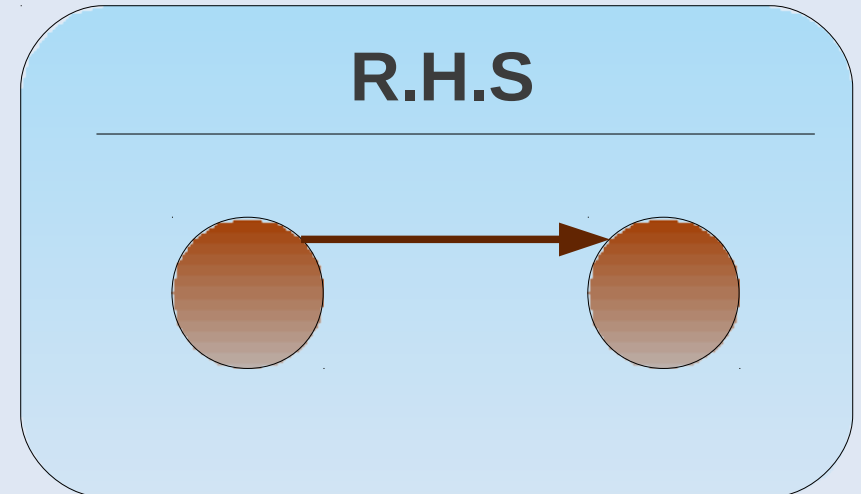
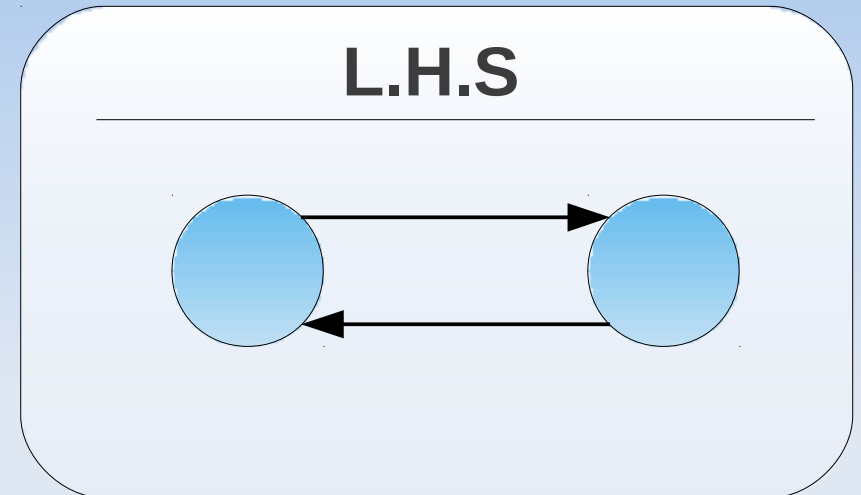
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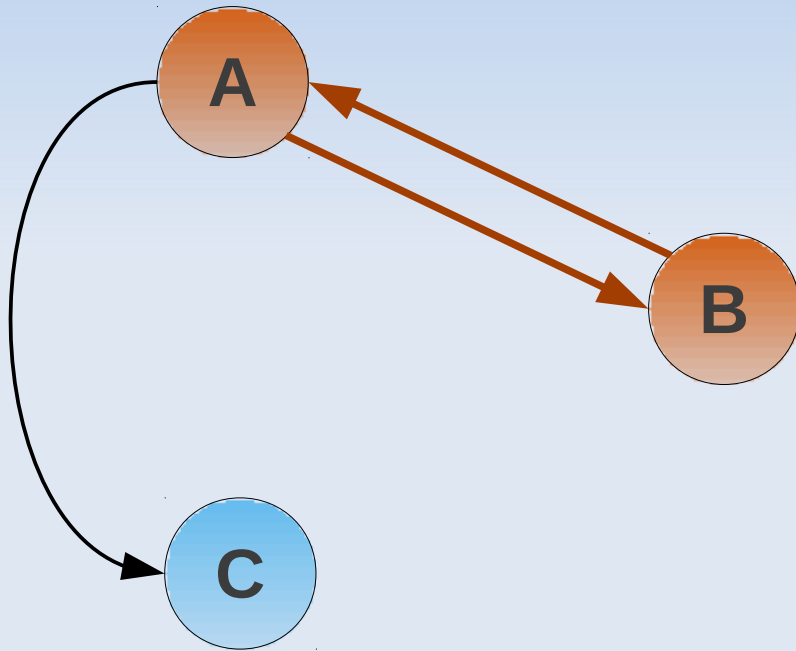
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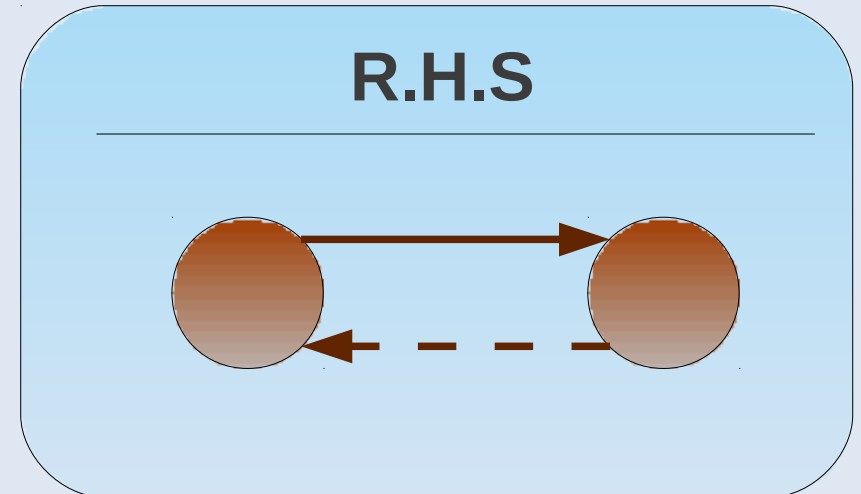
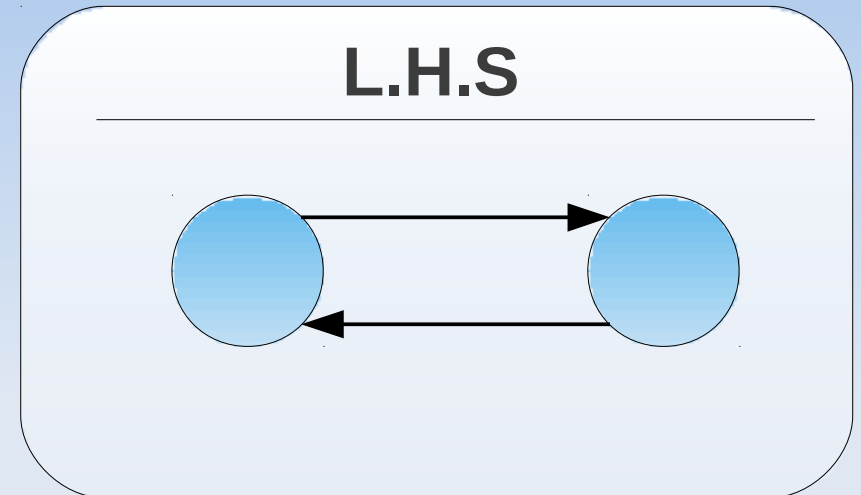
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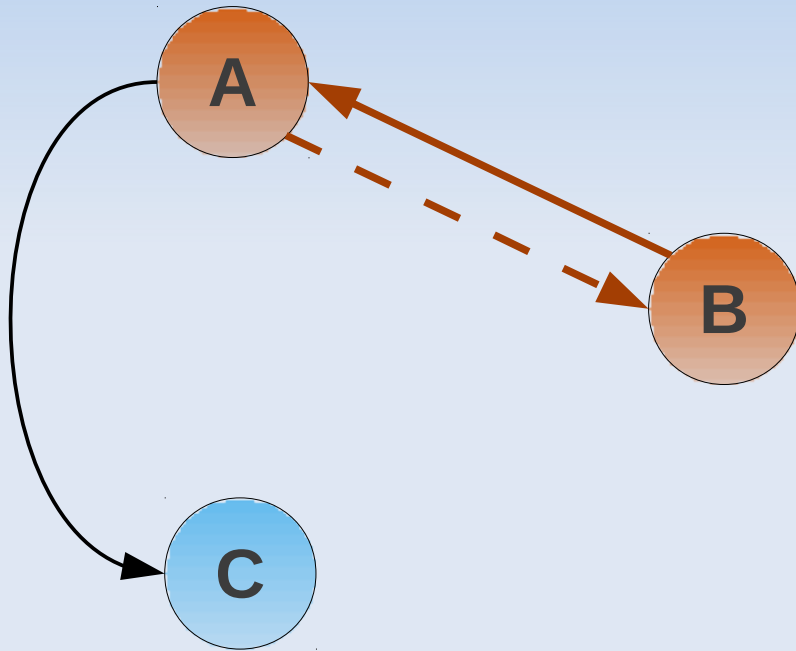
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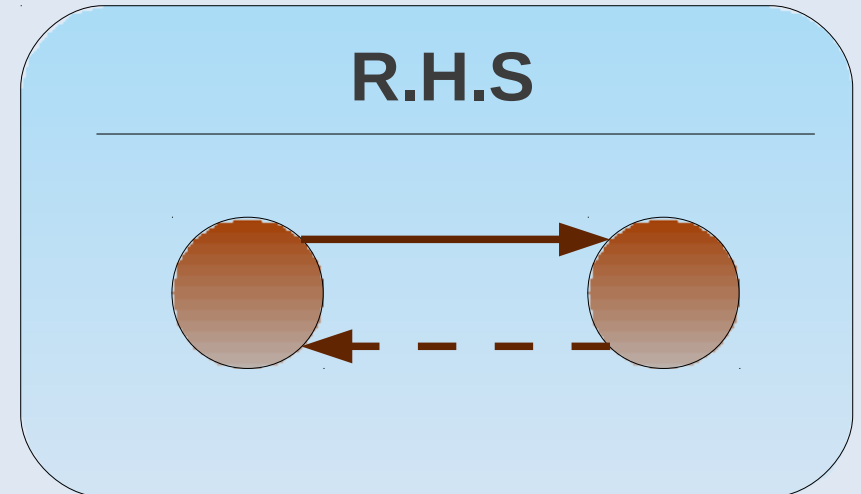
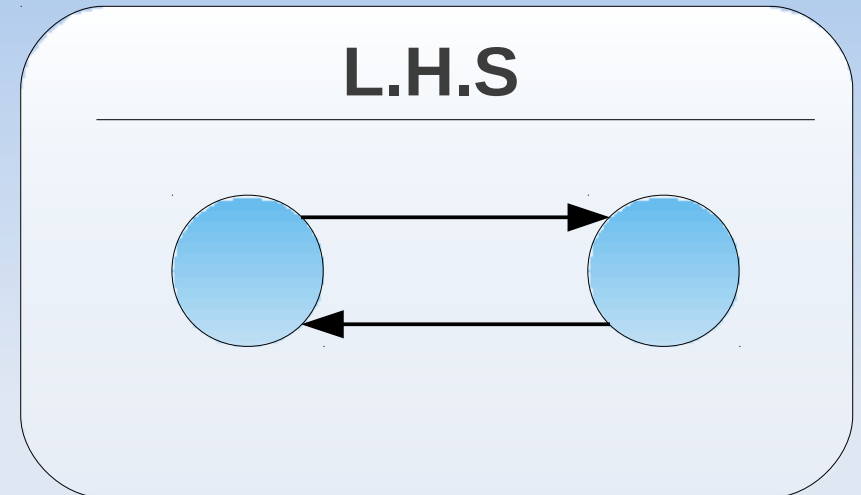
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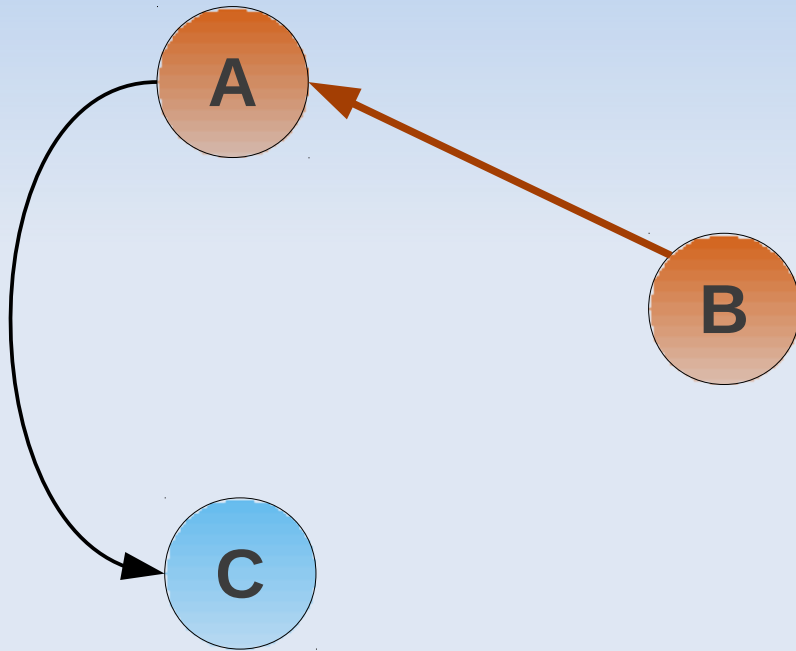
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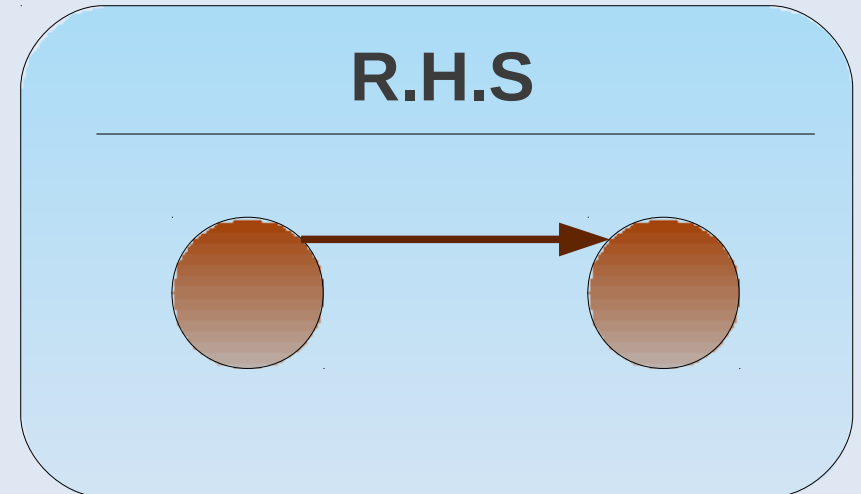
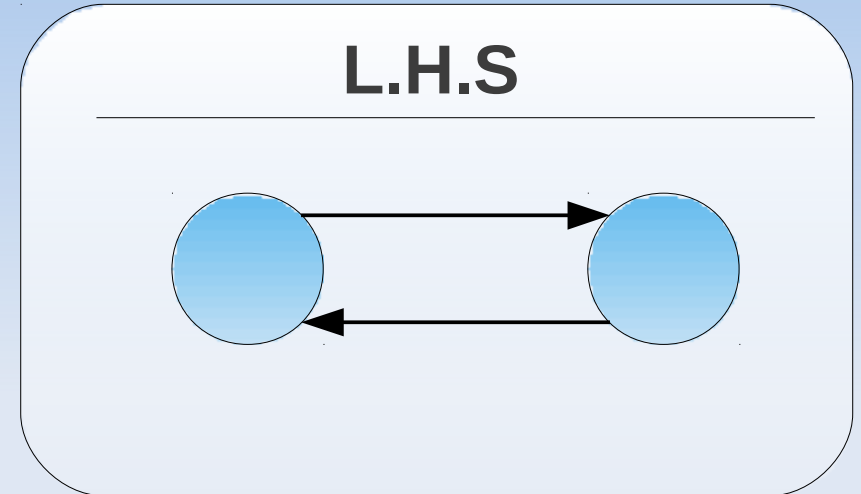
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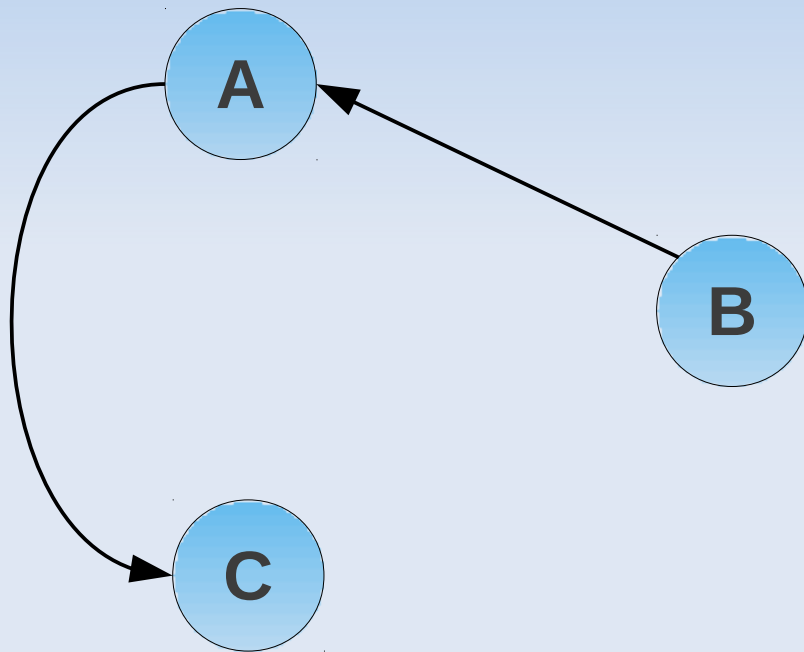
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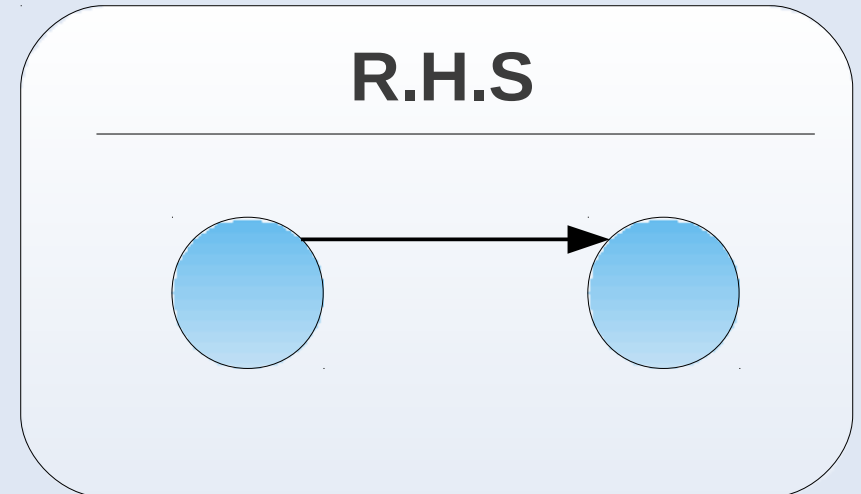
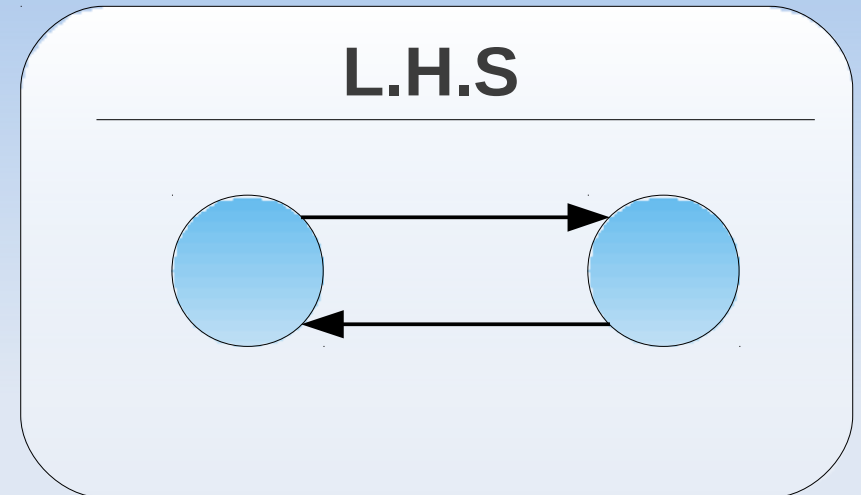
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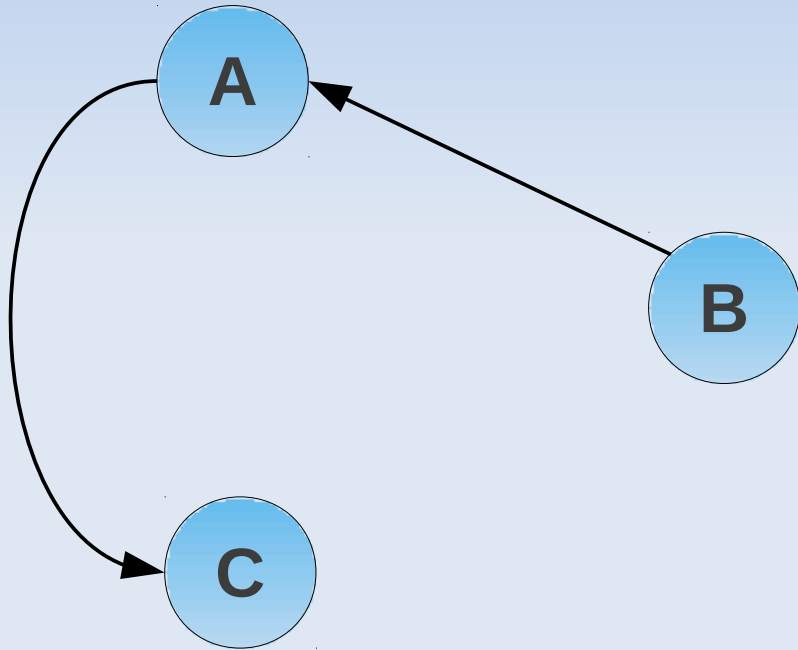
Graph Rewriting



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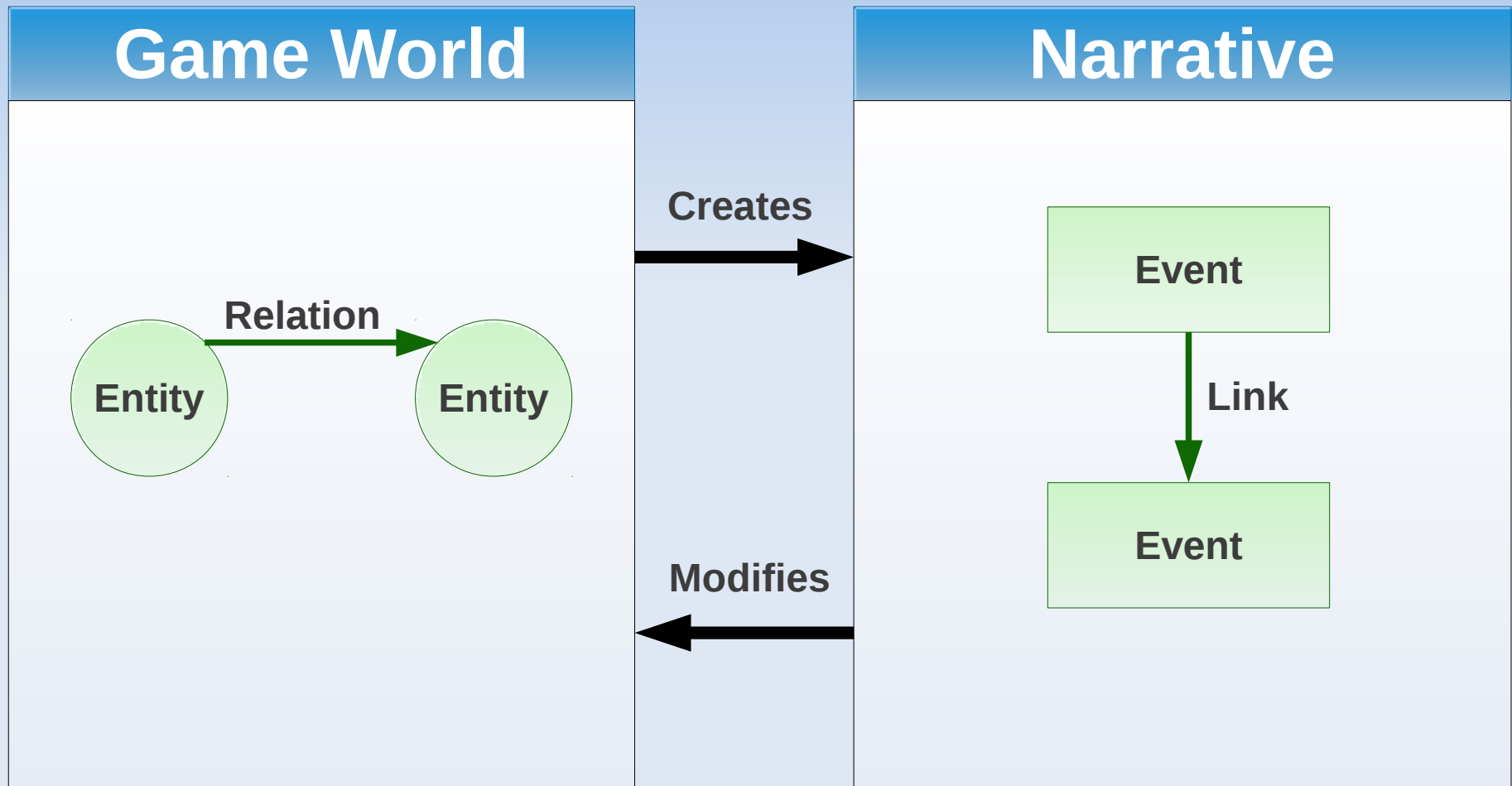


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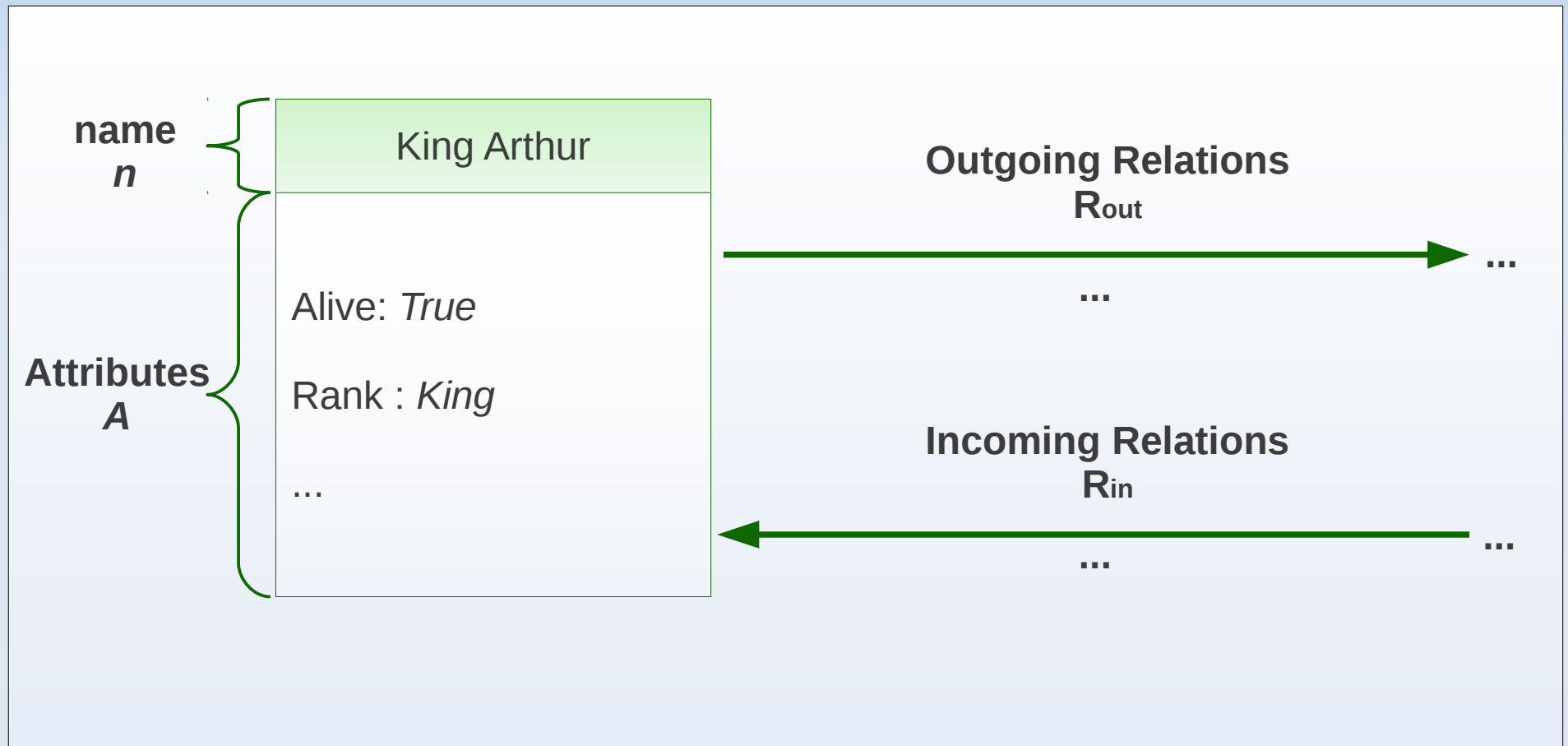
Base Graph

Narrative Generation



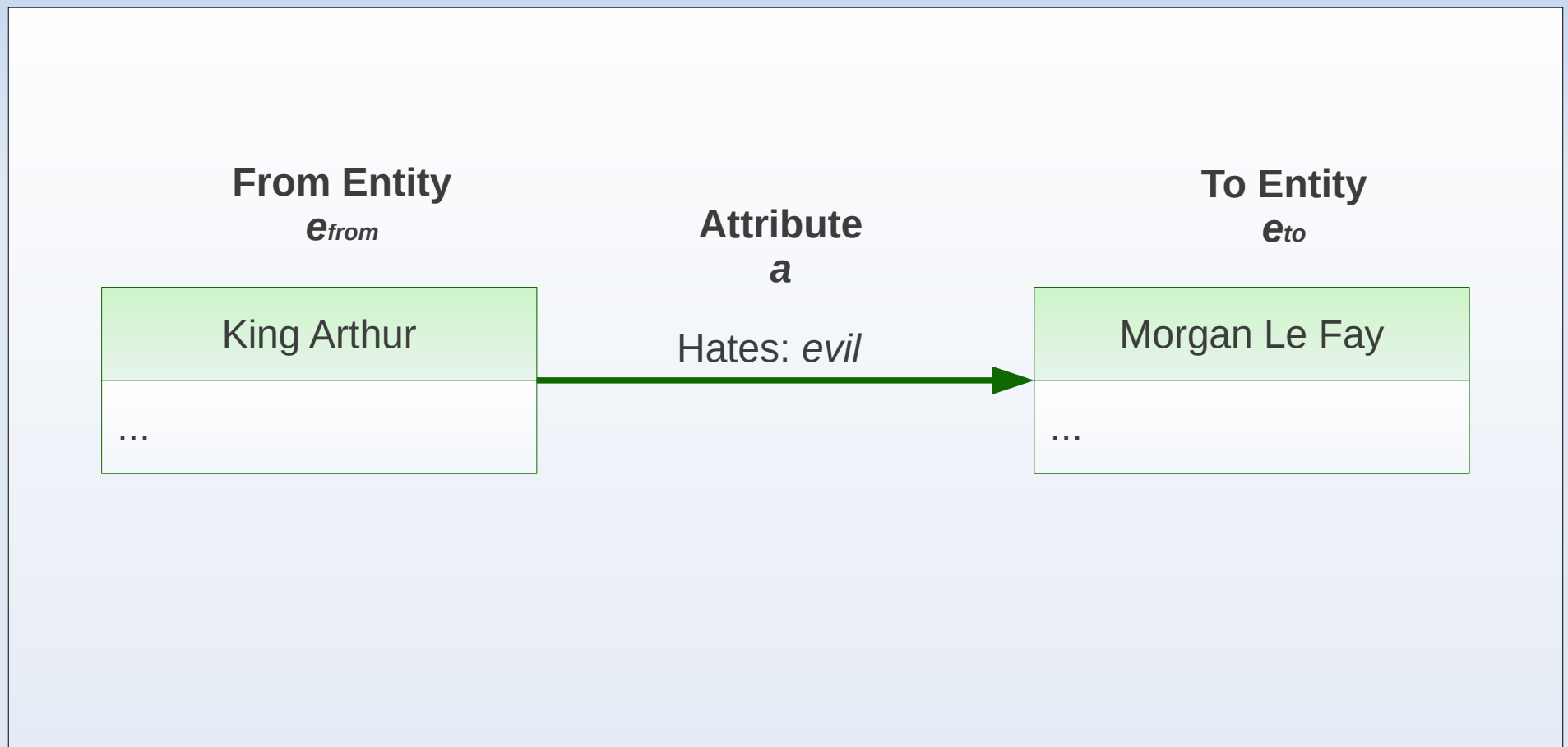
Game World

- Entity: $e = \langle n, A, R_{in}, R_{out} \rangle$



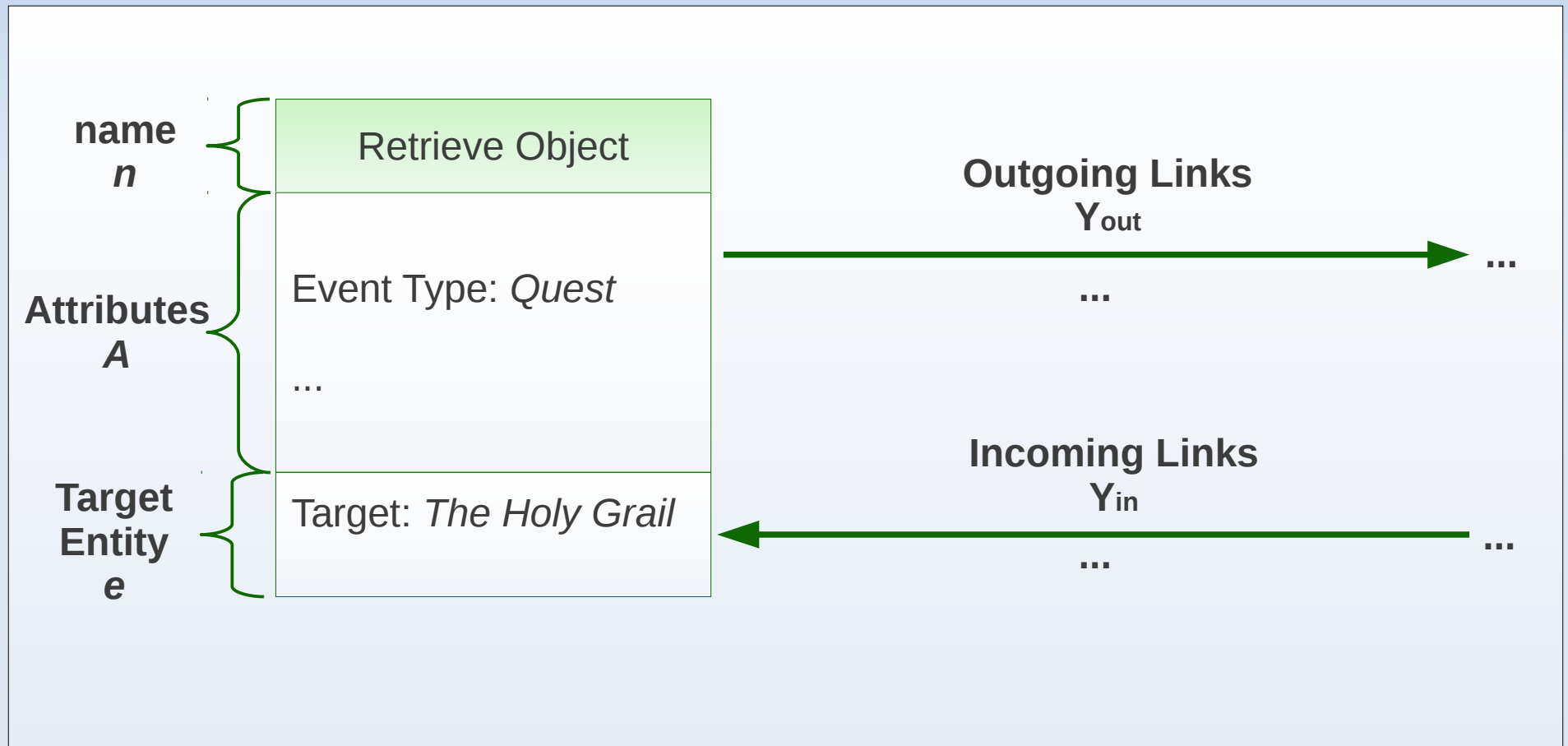
Game World

- Relation: $r = \langle a, e_{from}, e_{to} \rangle$



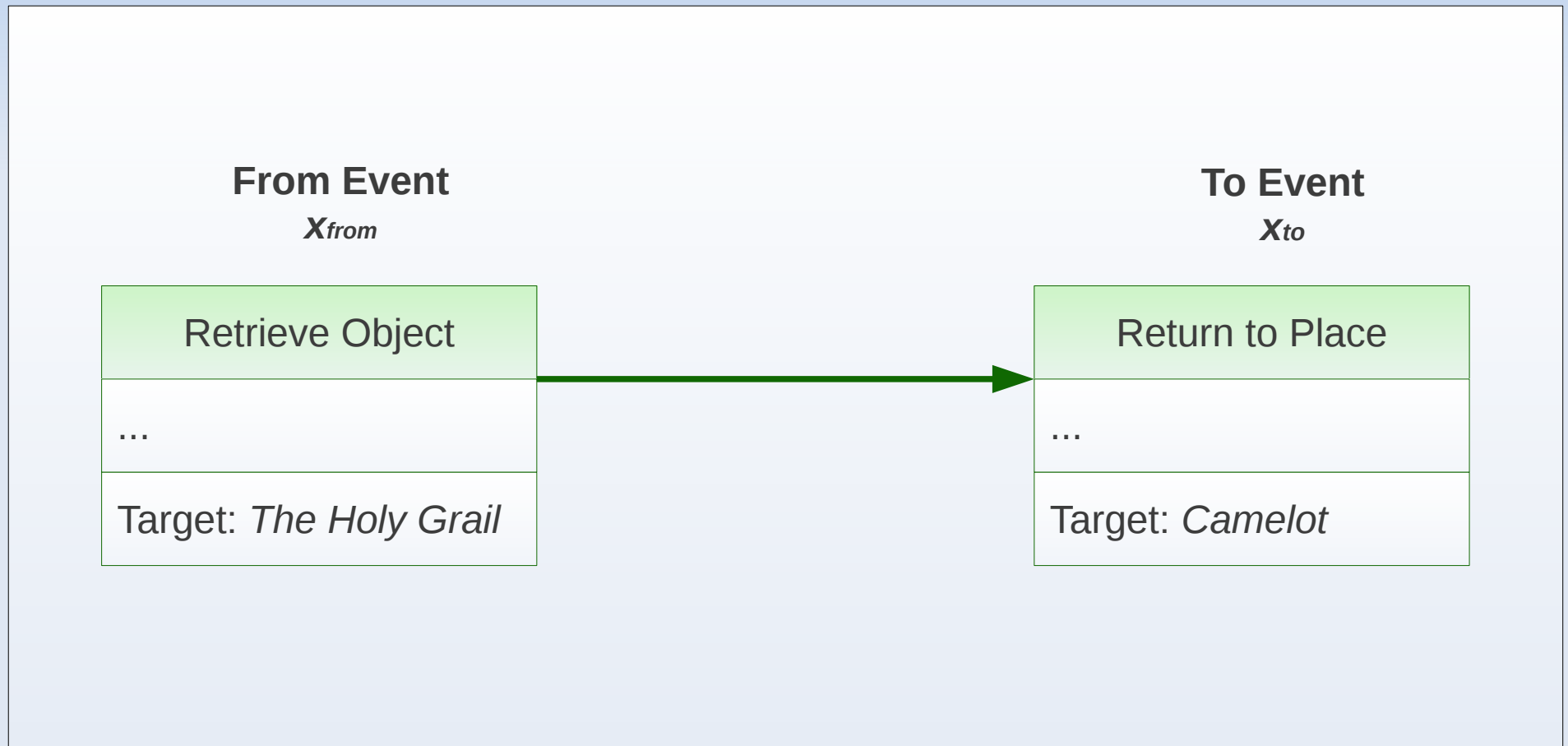
Narrative

- Event: $x = \langle n, A, Y_{in}, Y_{out}, e \rangle$



Narrative

- Link: $y = \langle X_{from}, X_{to} \rangle$



Graph Definitions

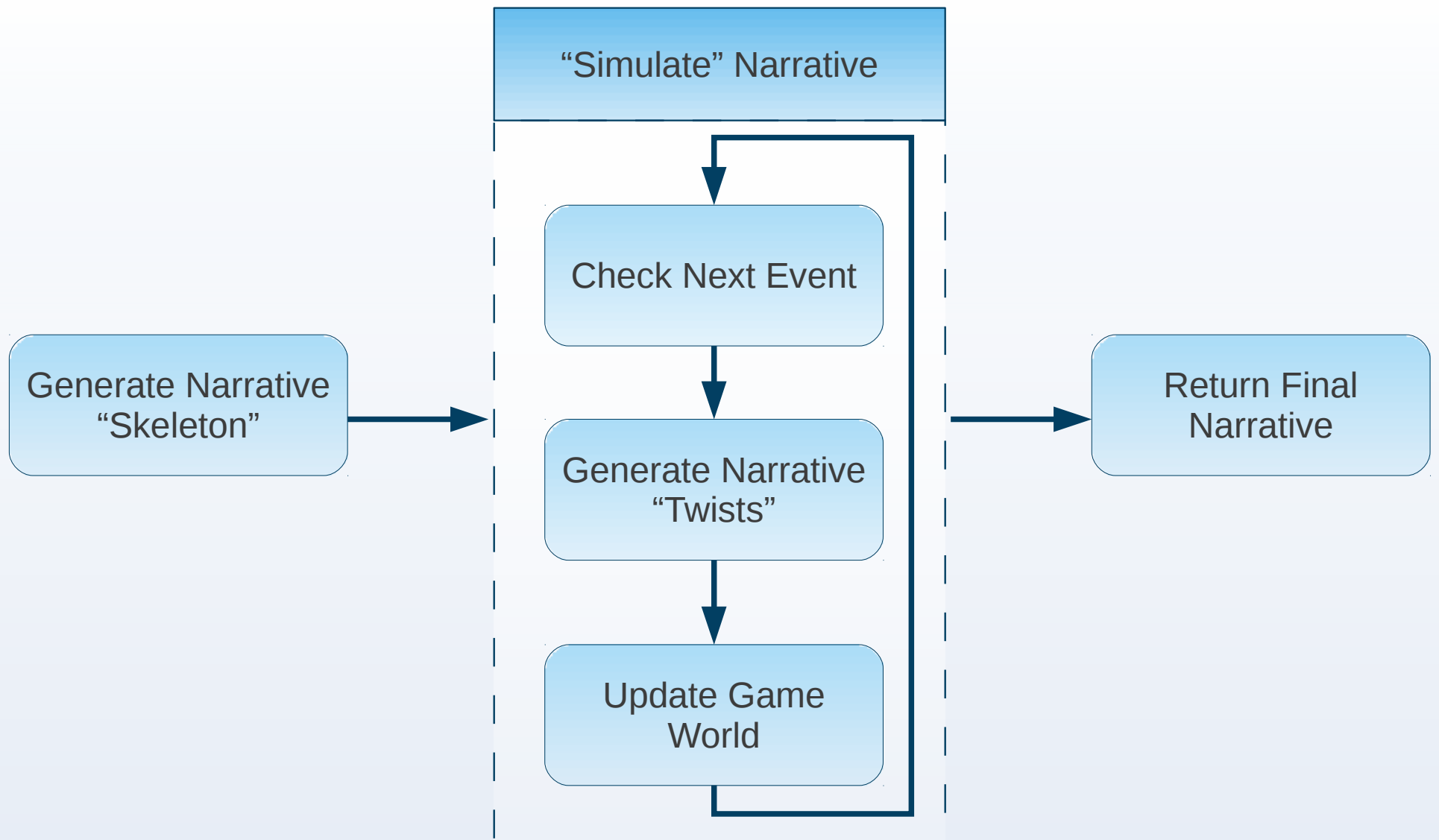
- Game World : $G = \langle E, R \rangle$
 - E , set of *Entities*
 - R , set of *Relations*

- Narrative: $N = \langle X, Y \rangle$
 - X , set of *Events*
 - Y , set of *Links*

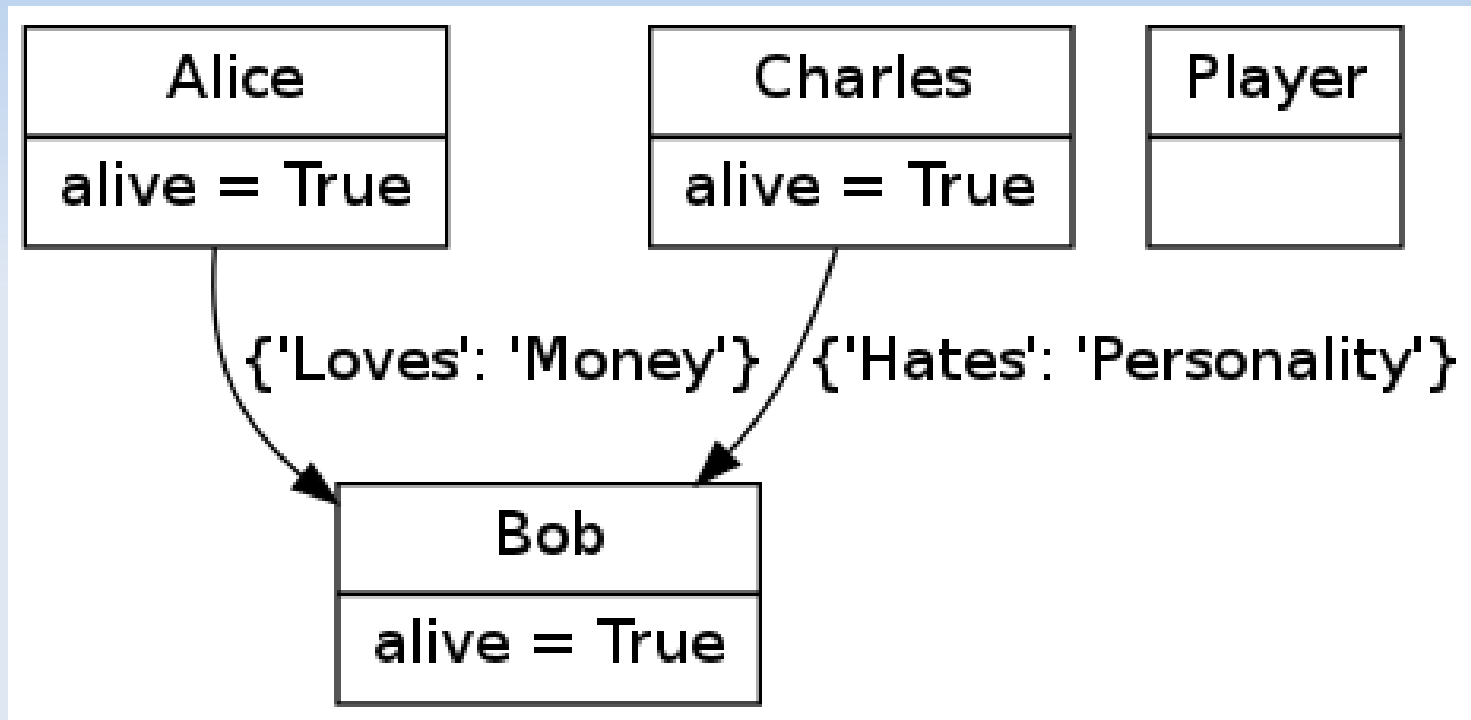
Rewrite Rule



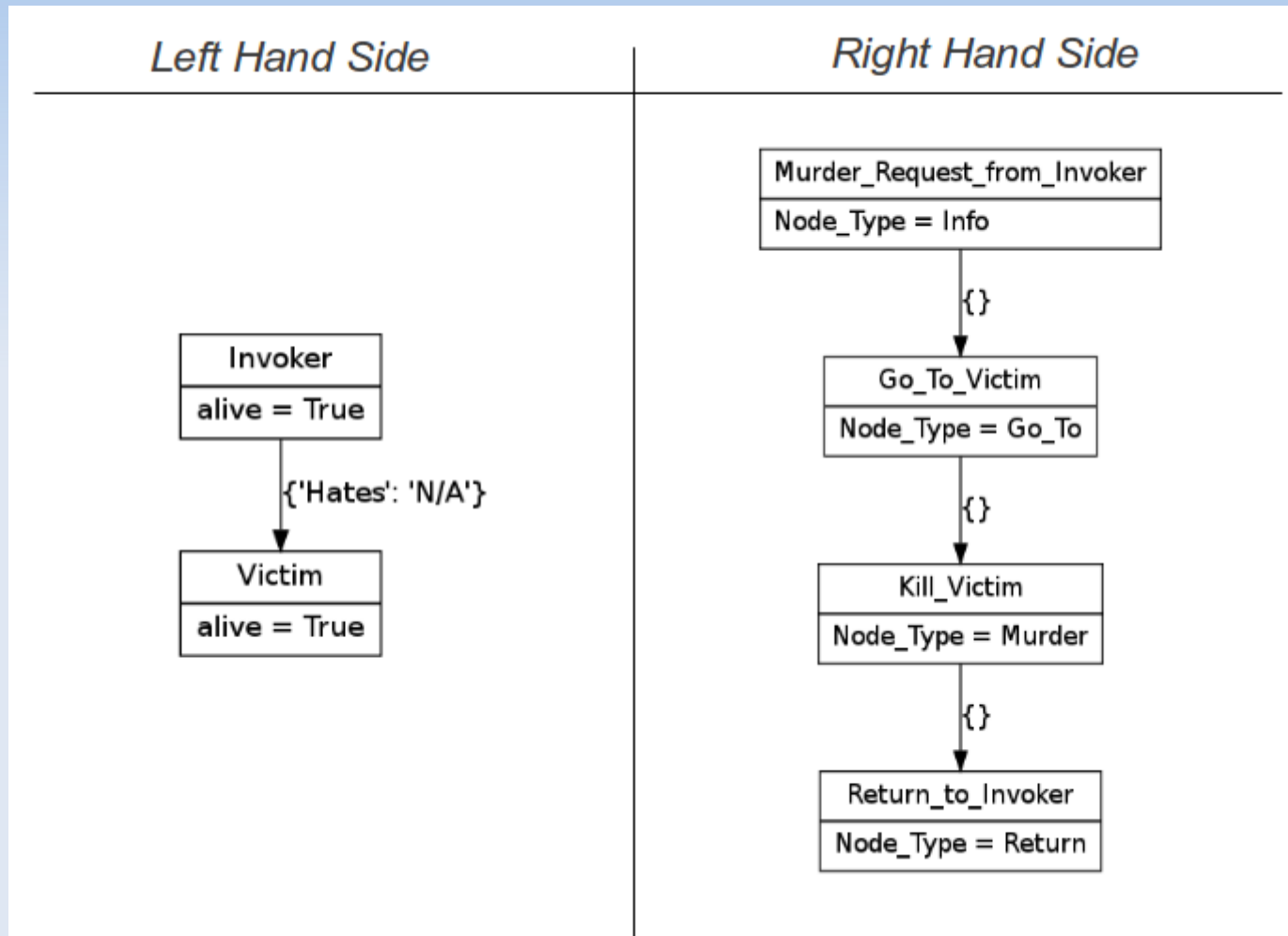
Steps



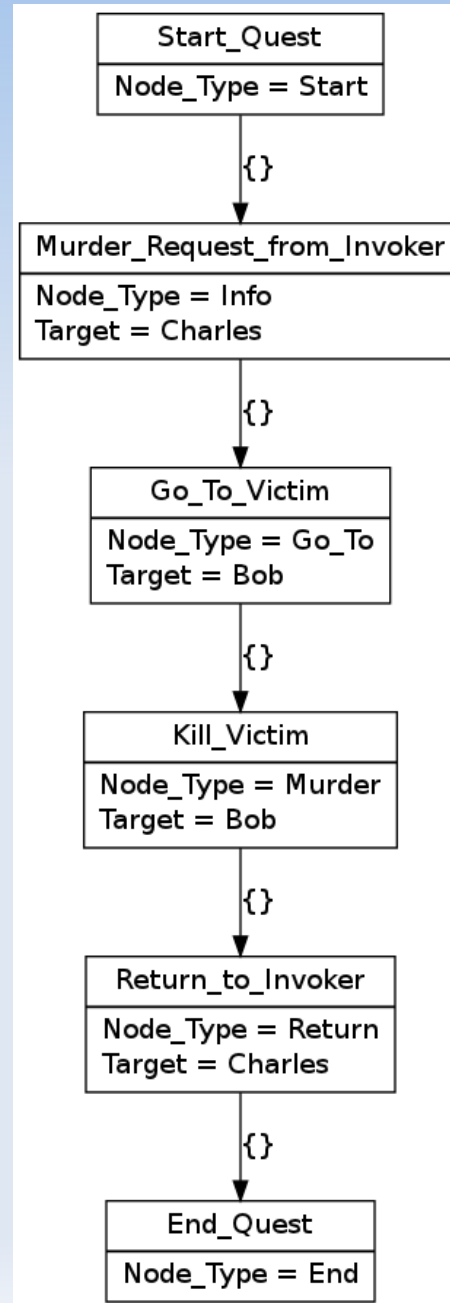
Example



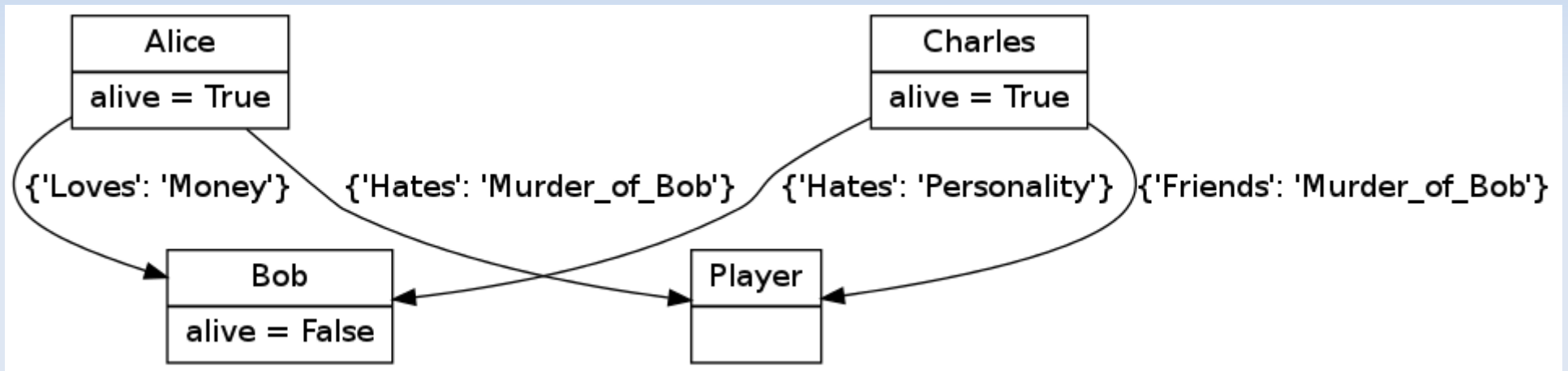
Example



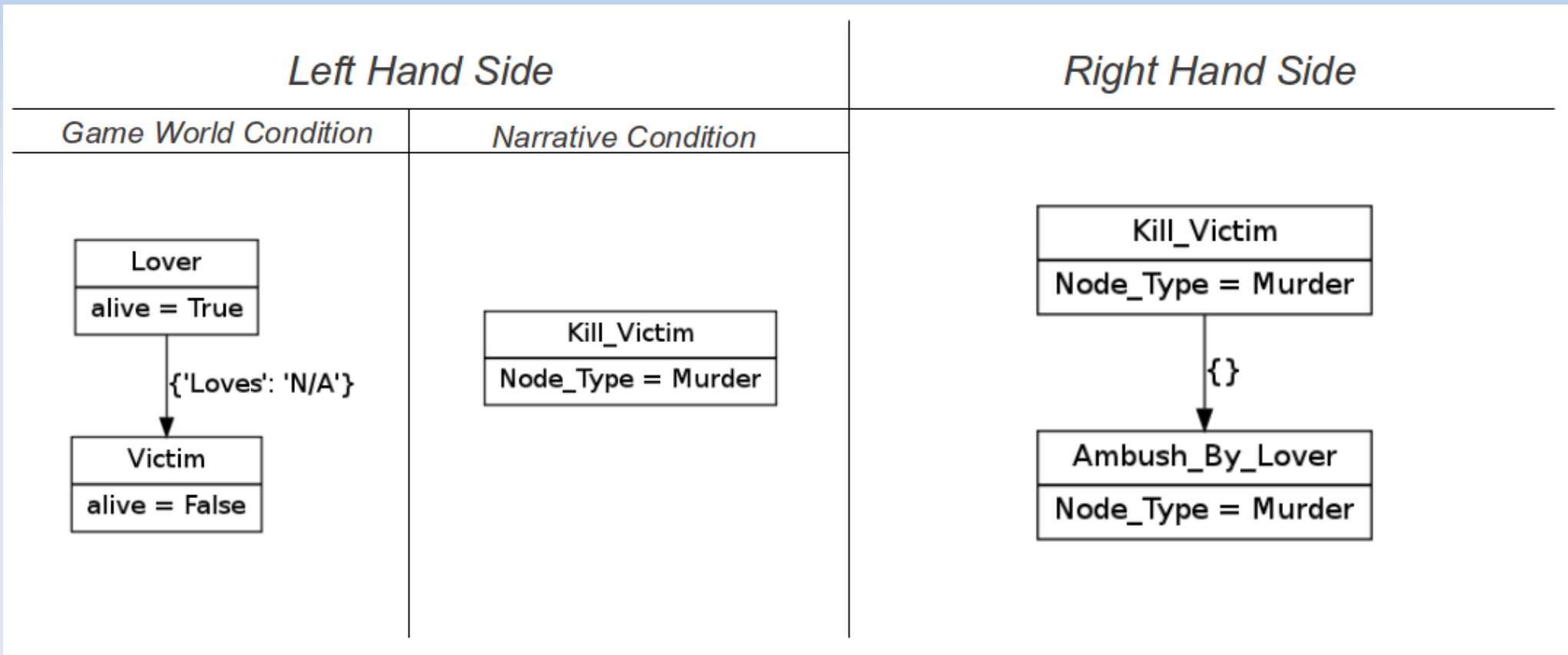
Example



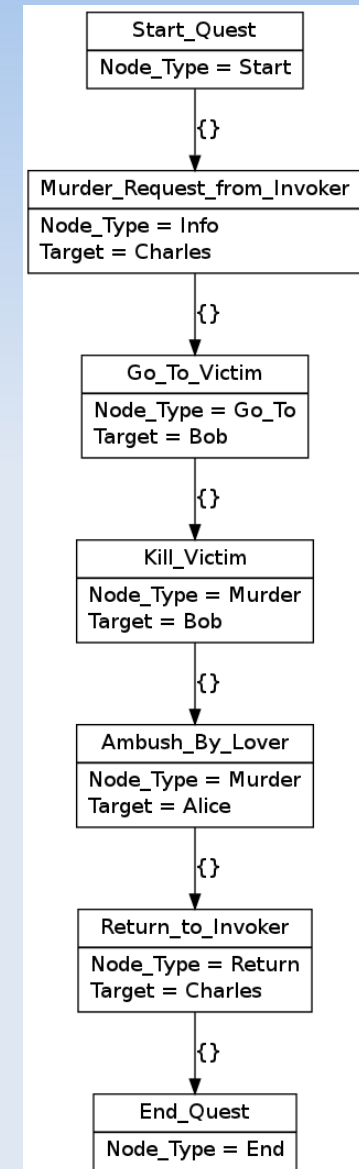
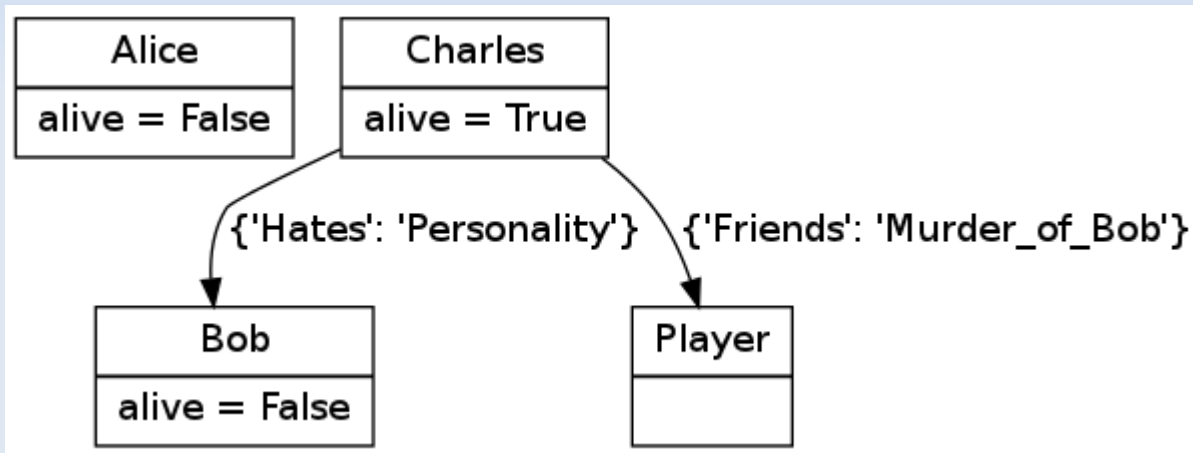
Example



Example



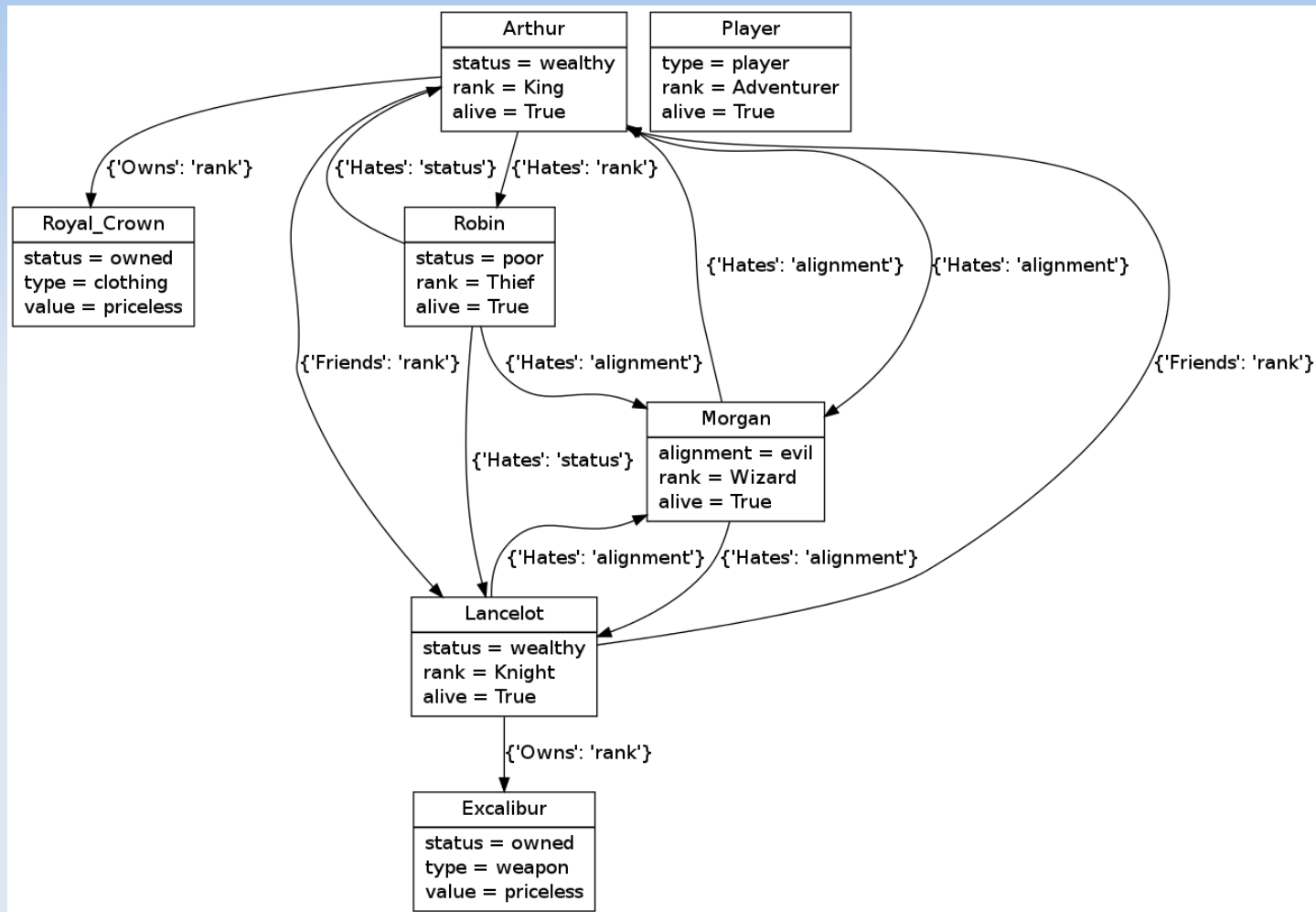
Example



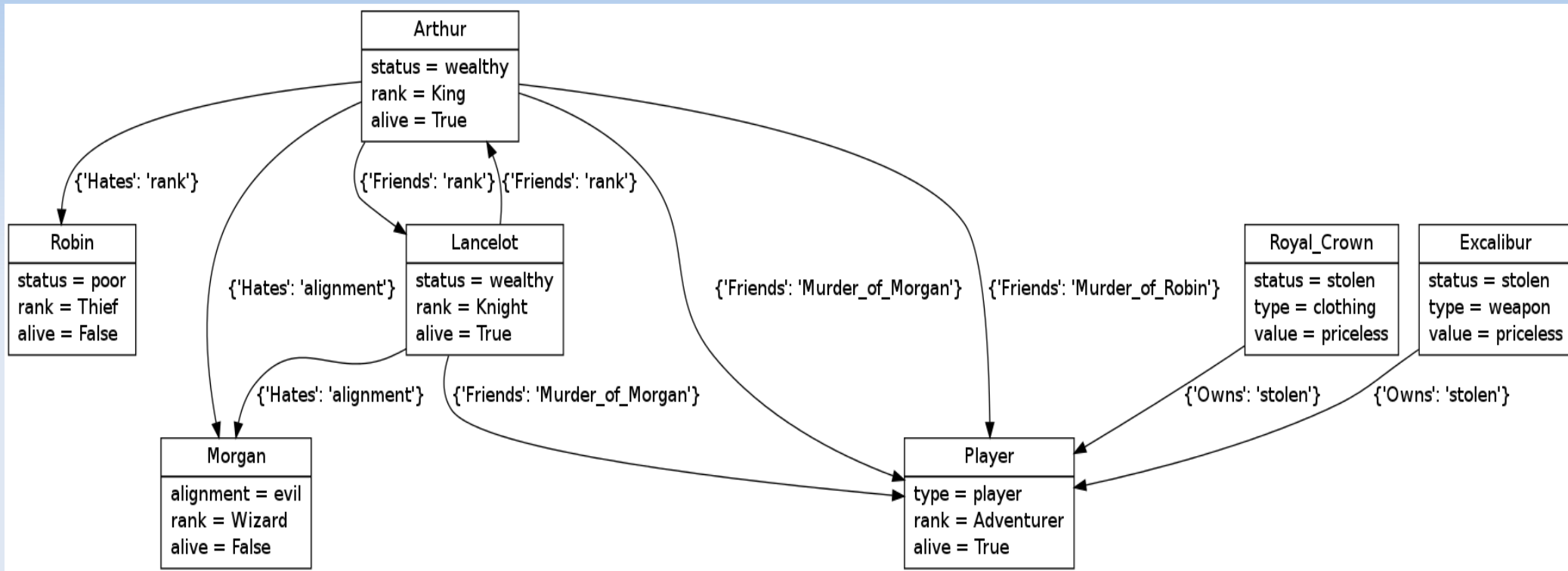
Potential for Analysis

- Average Narrative Length
- Number Narratives Possible

Narrative „Deadlock“



Narrative „Deadlock“



Four Narratives Possible

Conclusions

- System for *Narrative Generation*
- *Graph Rewriting* techniques
- *Game World* and *Narrative* graphs
- *Generation* and *Simulation*

Future Work

- Metric Analysis
- Online Generation
- Branching Narratives

Questions?

References

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References

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