Towards Finding Relational Redescriptions

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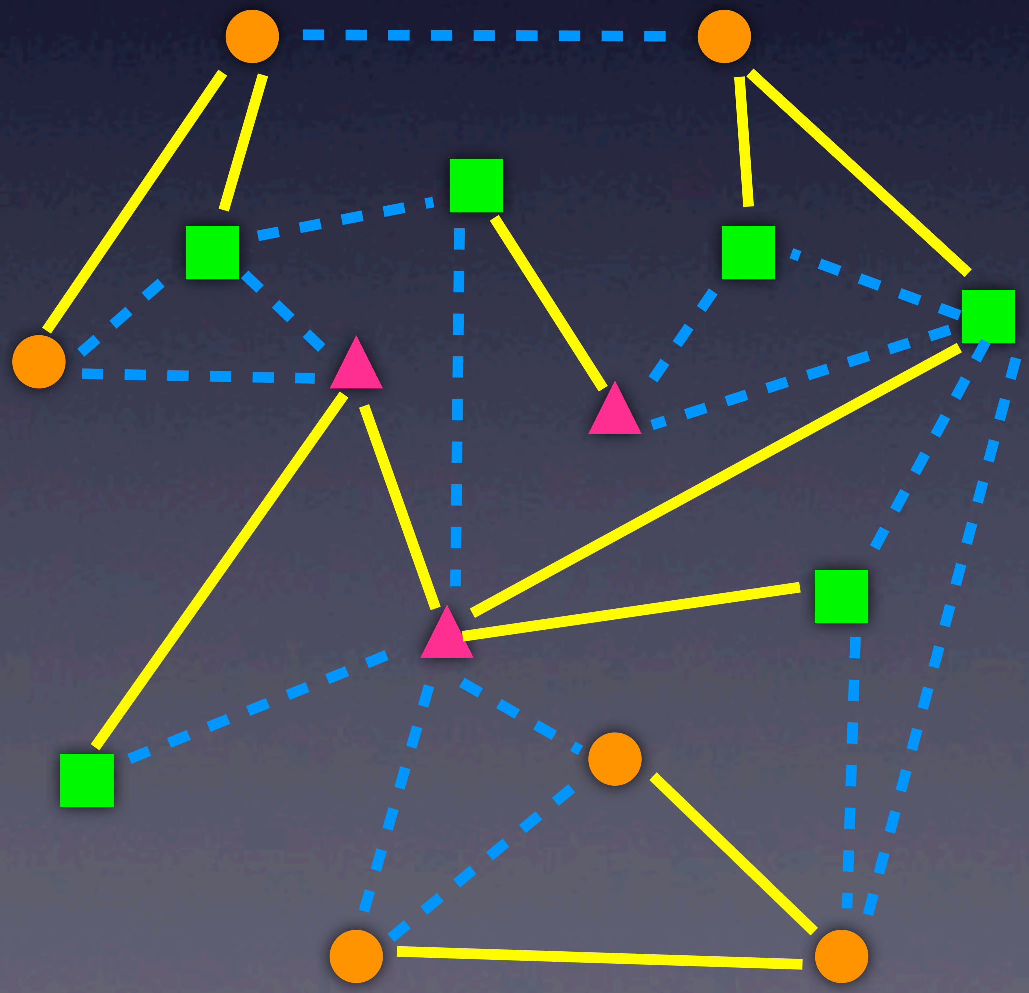
Relational Redescription Mining (RRM)

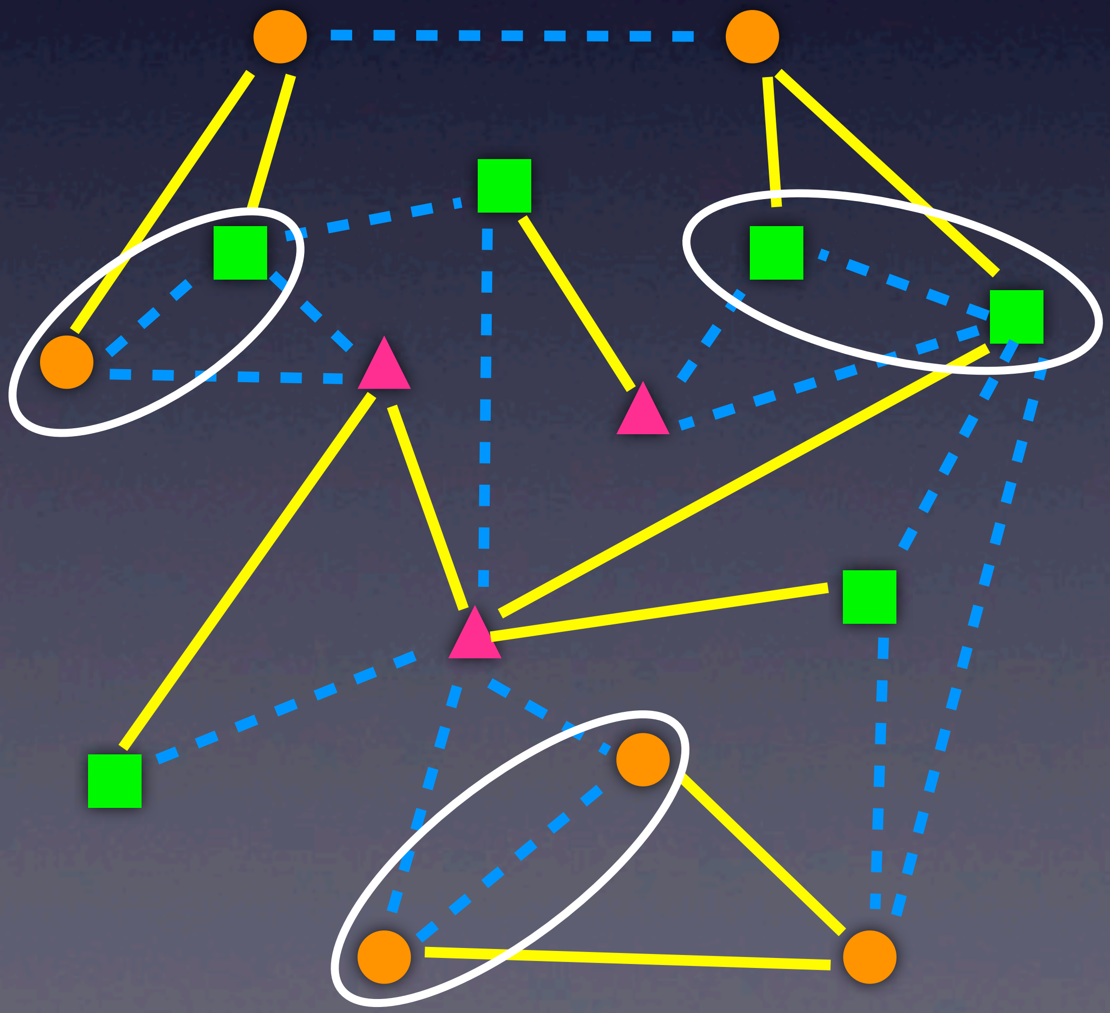
Given: data network

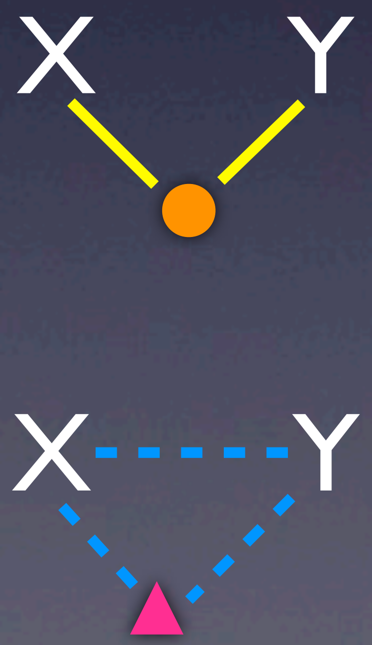


Relational Redescription Mining (RRM)

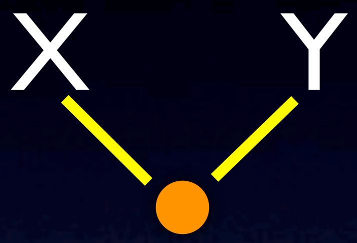
Given: data network

Find: structurally different patterns covering (nearly) same set of node tuples



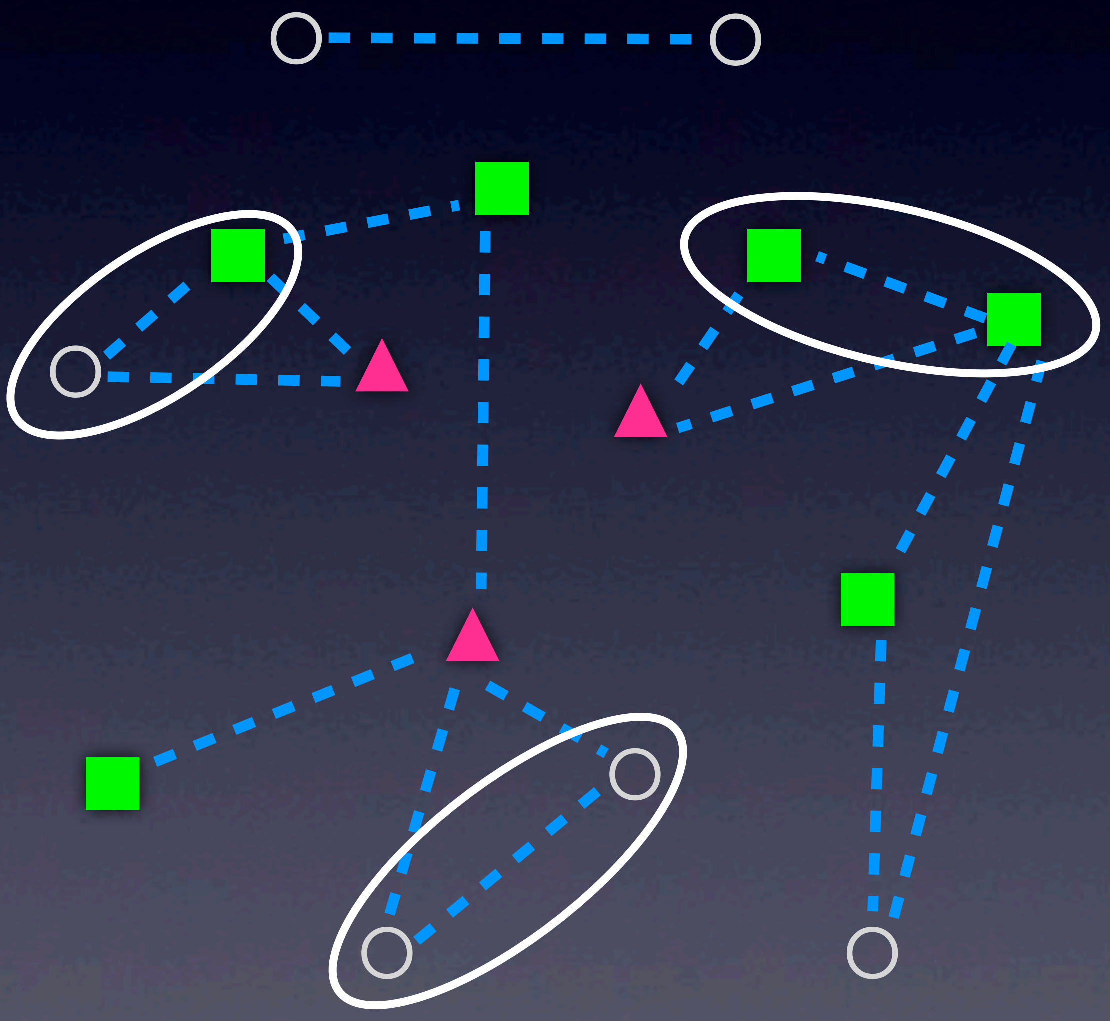


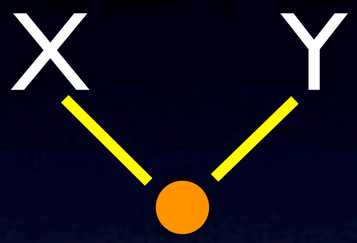
RRM Alternating Scheme



1. Fix first pattern to create examples

RRM Alternating Scheme





1. Fix first pattern to create examples
2. Consider predicates not used by first pattern

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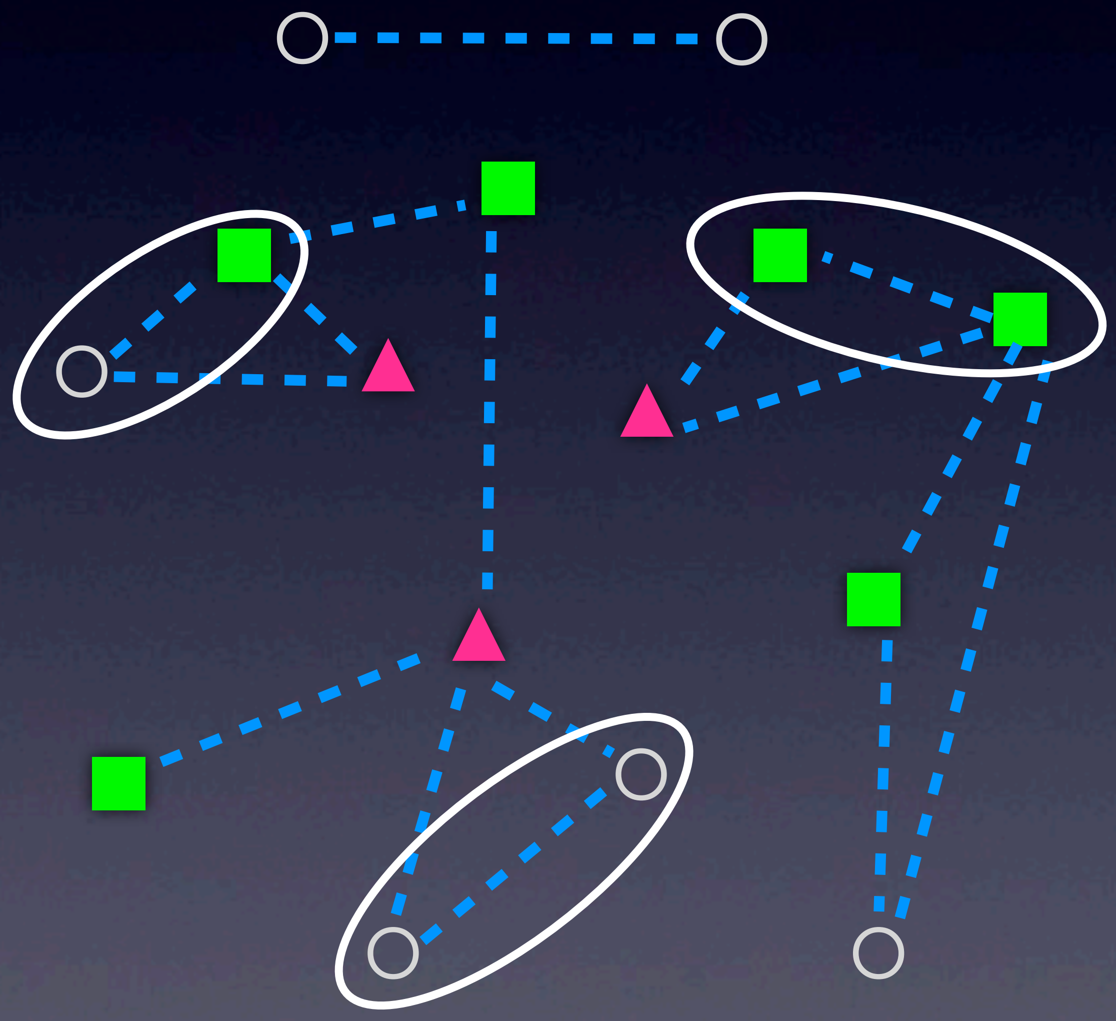
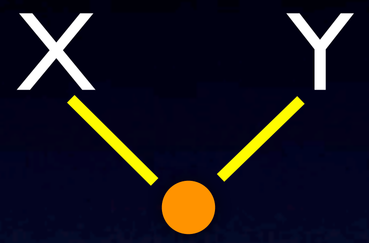
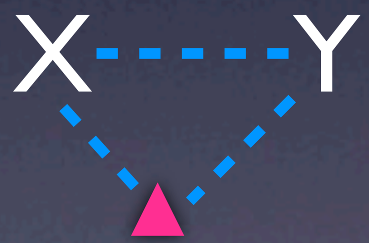




1. Fix first pattern to create examples
2. Consider predicates not used by first pattern
3. Find second pattern



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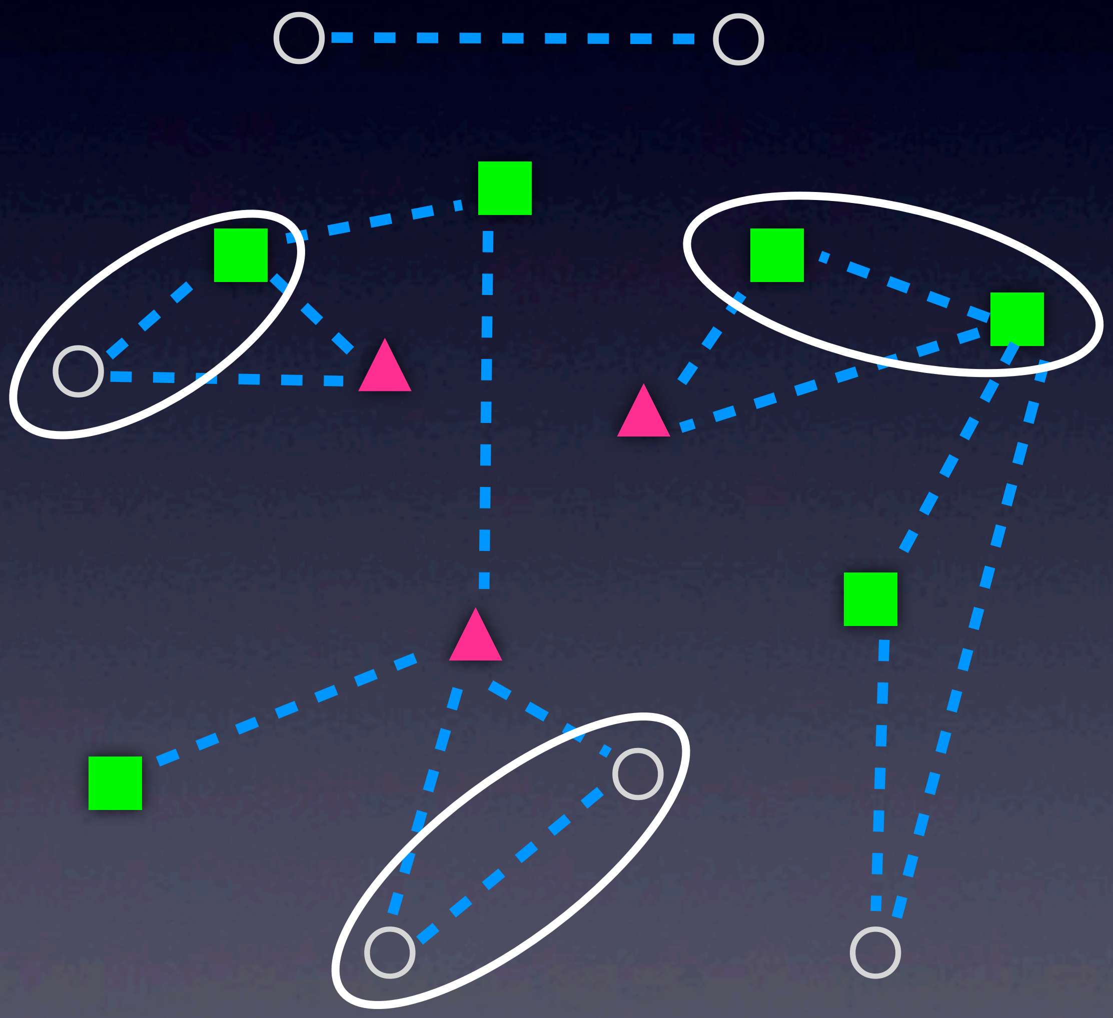

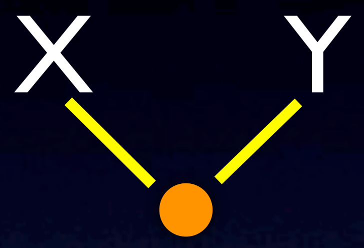

1. Fix first pattern to create examples
2. Consider predicates not used by first pattern
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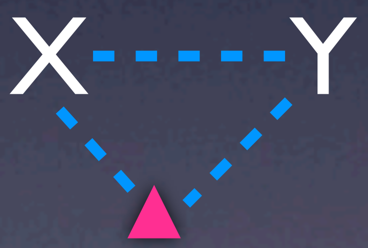
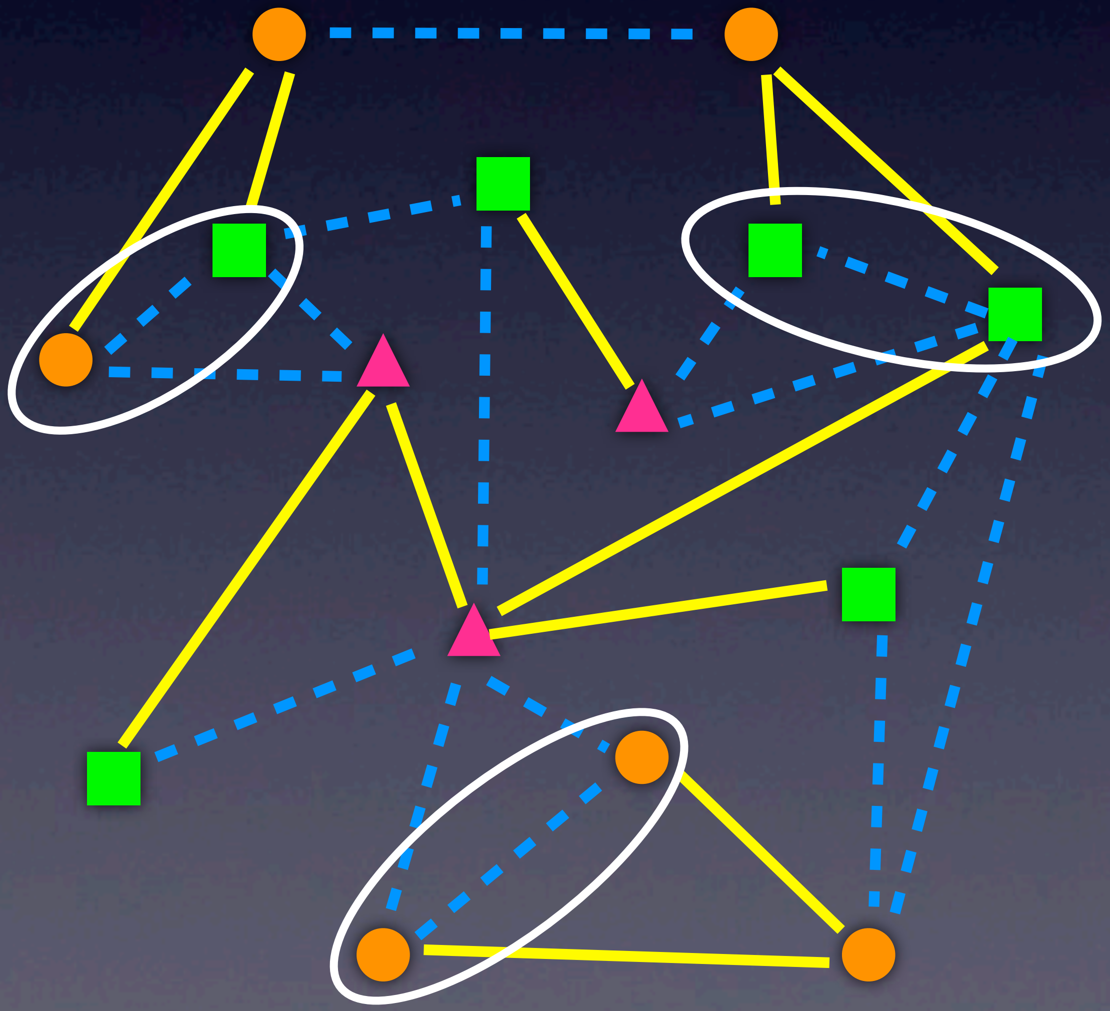
4. Swap roles and iterate



First Step Towards RRM

Given: data network &
set of node pairs



First Step Towards RRM

Given: data network &
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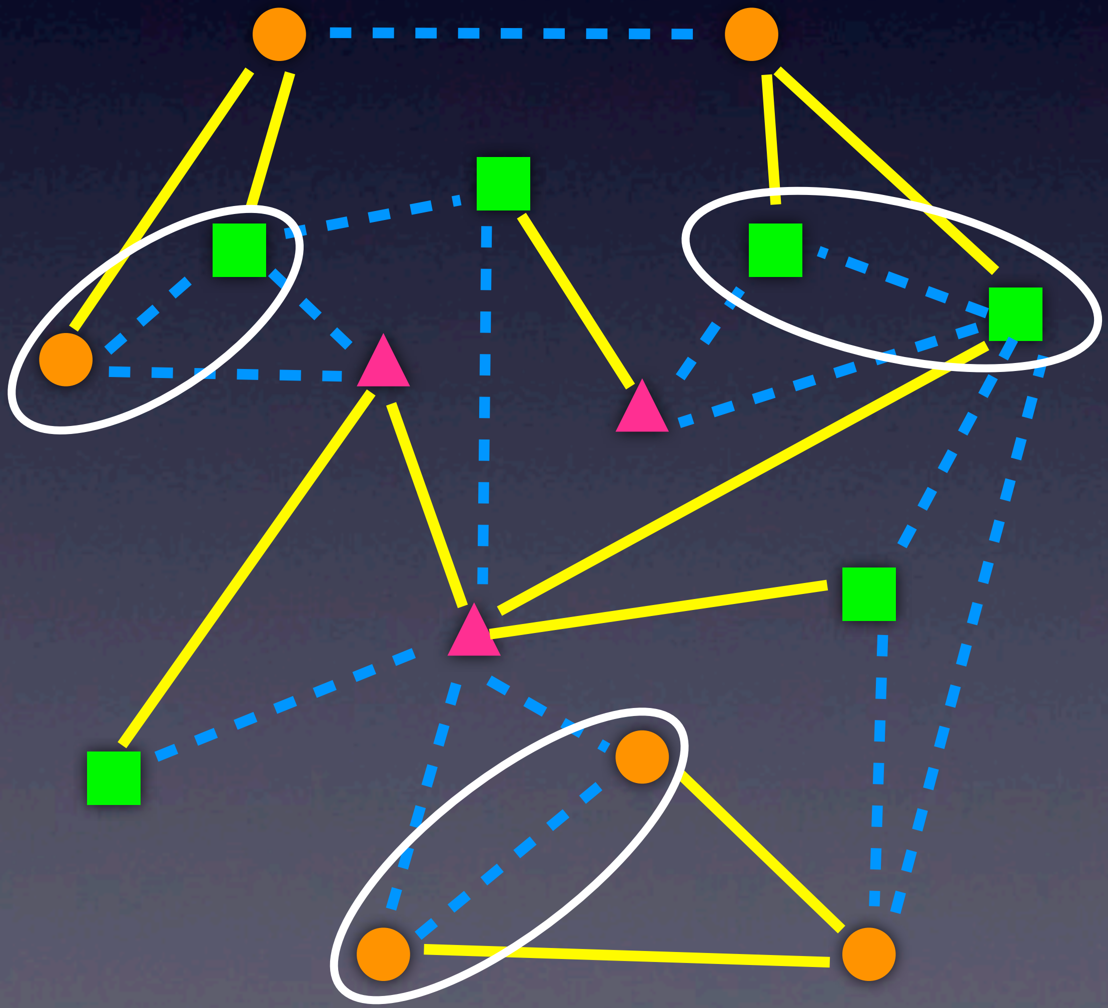
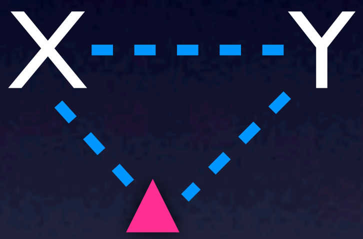
Find: set of patterns
connecting examples





First Step Towards RRM

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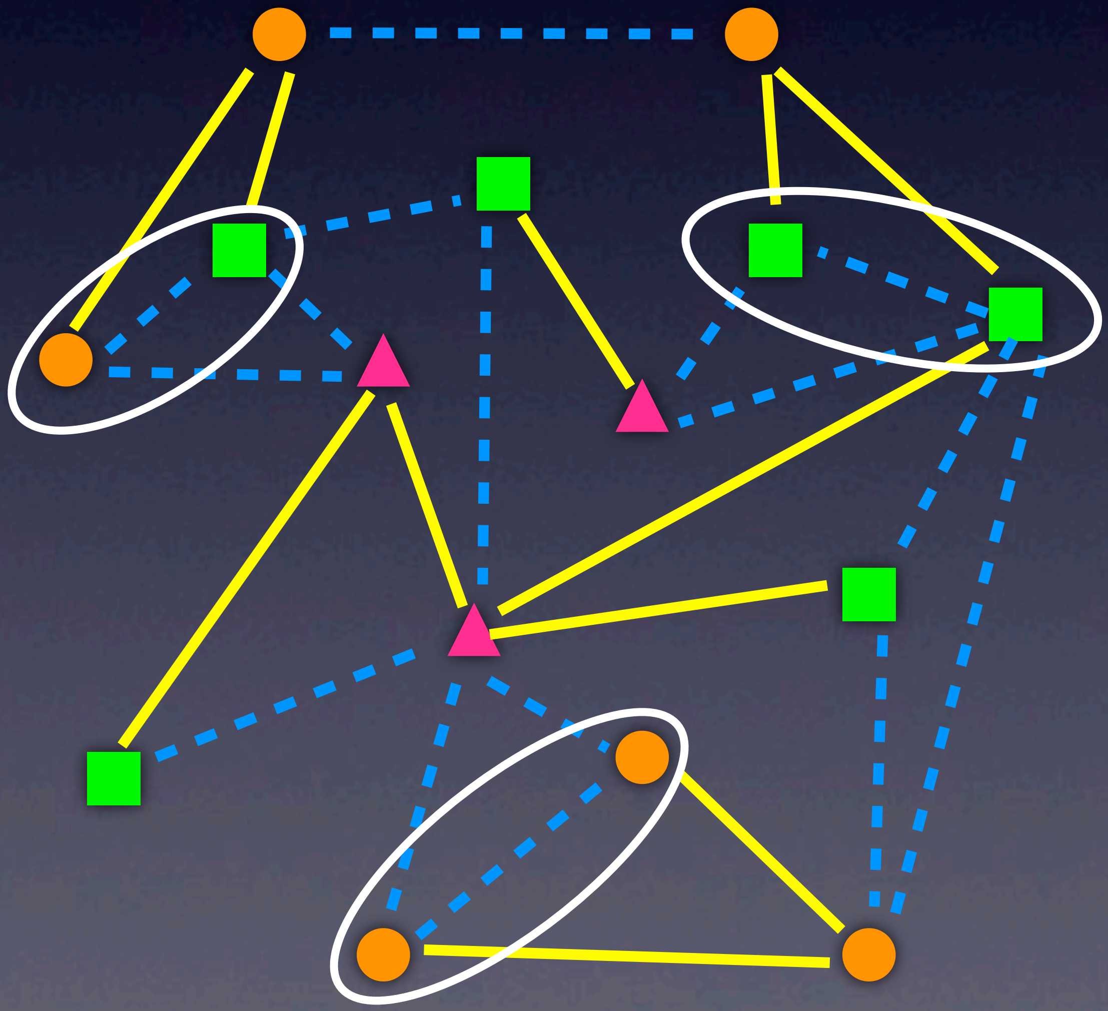

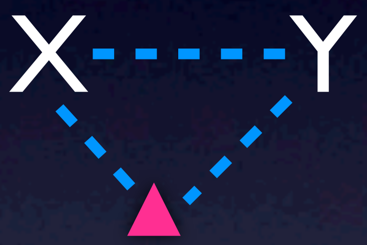

Challenges:

- connected patterns
- complex patterns
- fast mining

Our Approach

1. Extract path descriptions
2. Mine frequent path patterns
3. Build graph patterns from path patterns
4. Select set of graph patterns

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constraint-based pattern mining with FIM_CP

Our Approach

1. Extract path descriptions

constraint-based pattern mining with FIM_CP

2. Mine frequent path patterns
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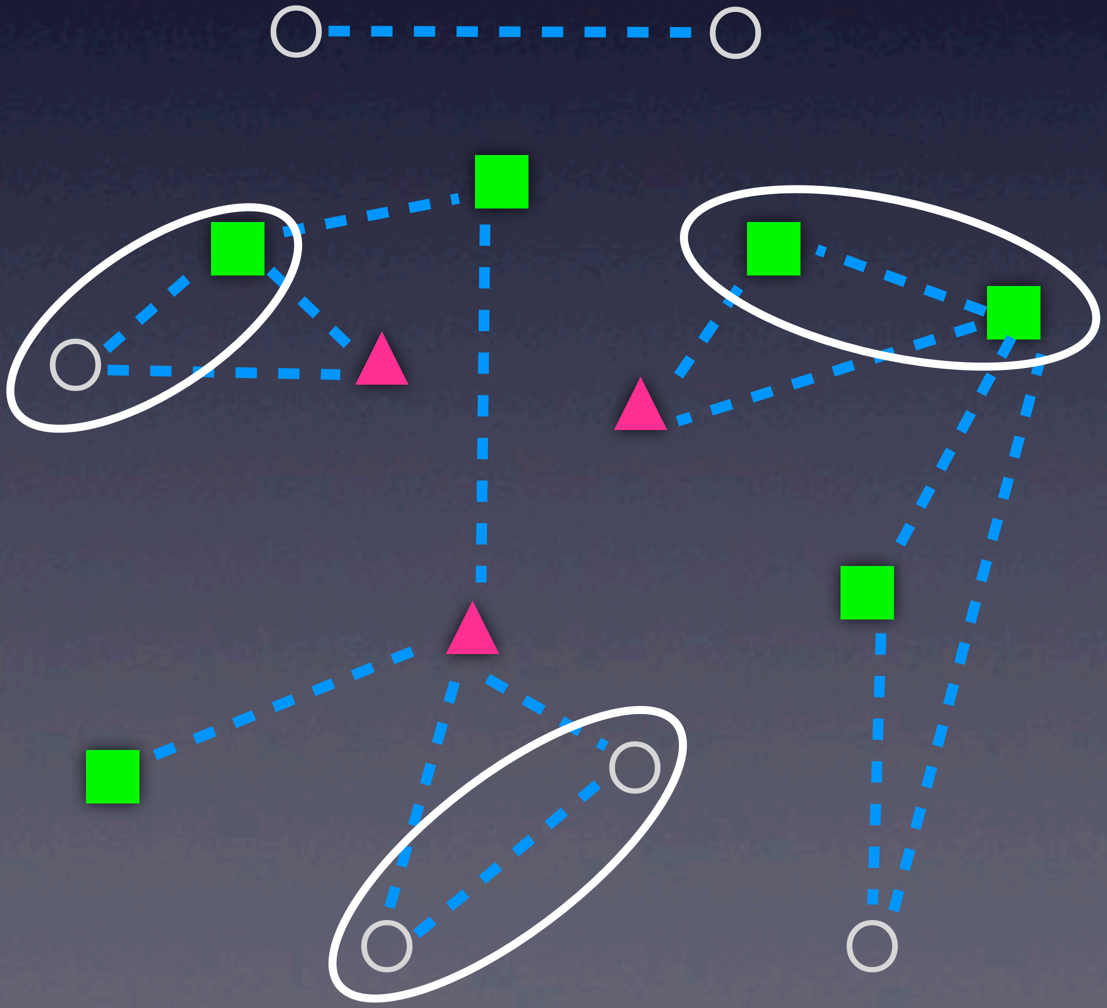
interleaved

1. Extract path descriptions

- edge types
- node attributes
- node attribute comparisons



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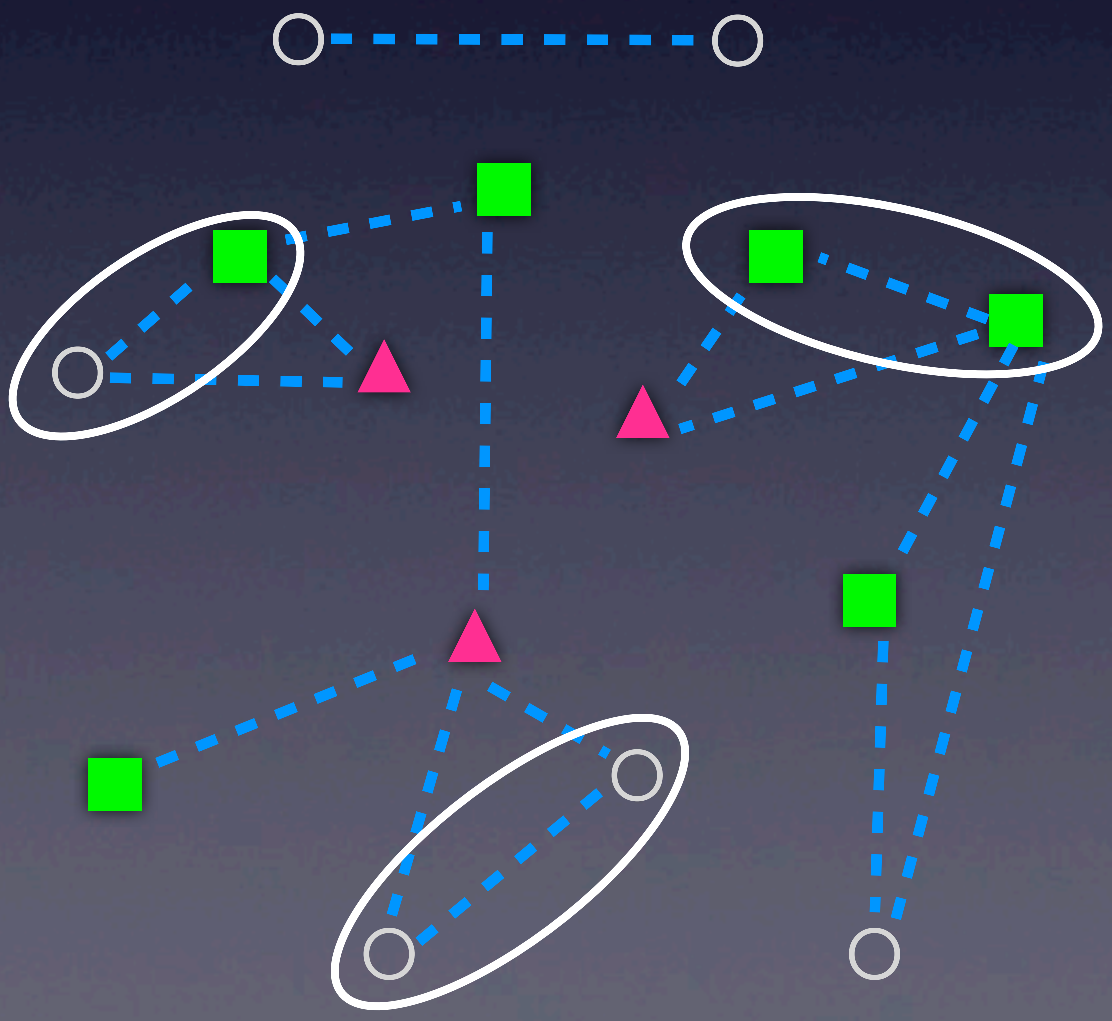
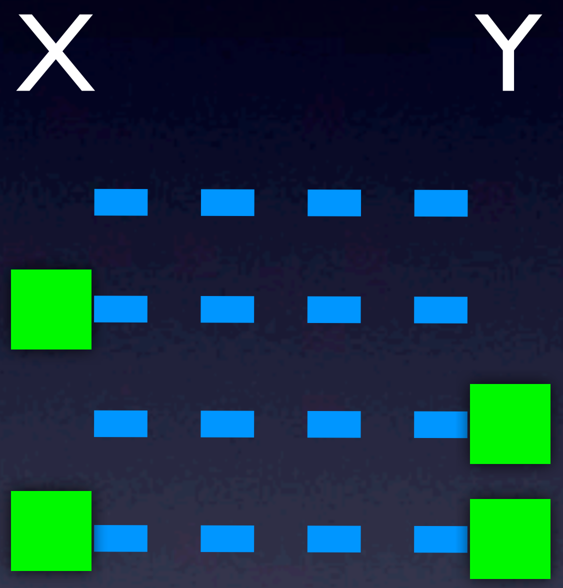
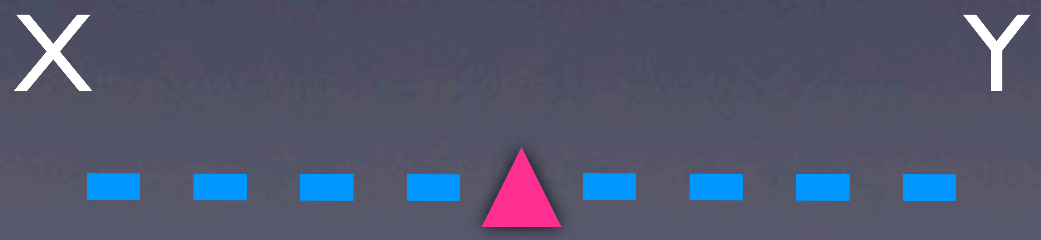
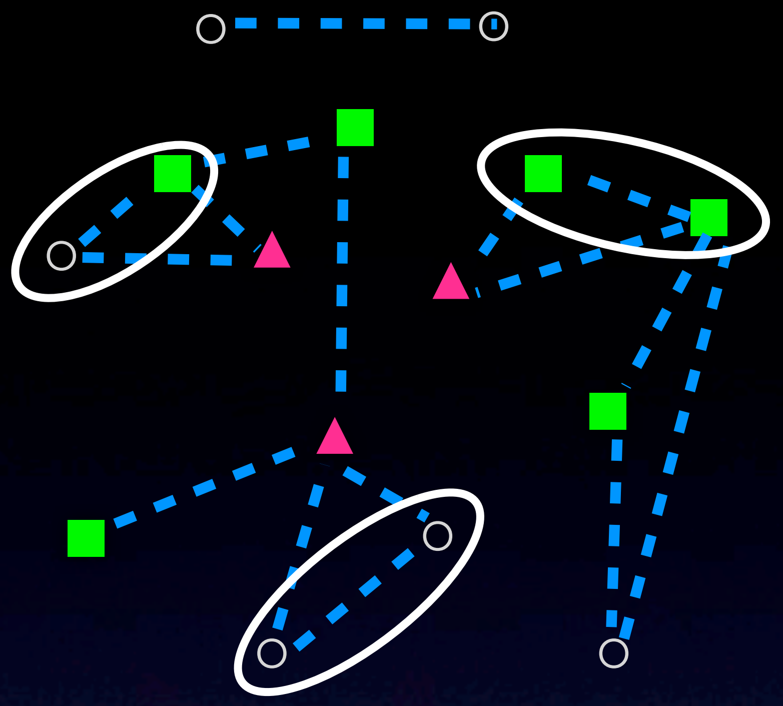
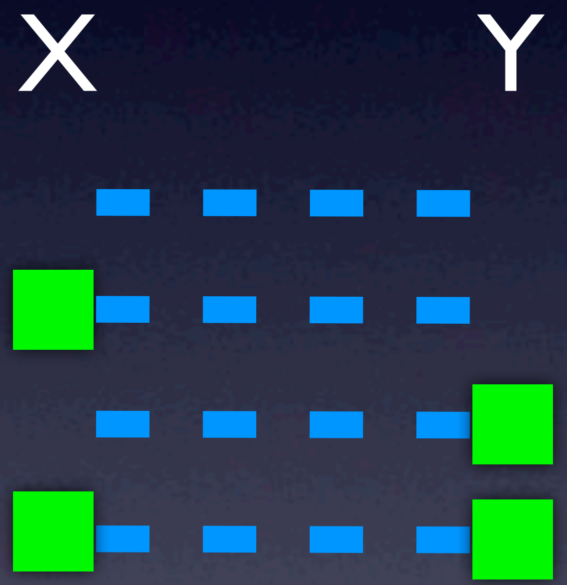


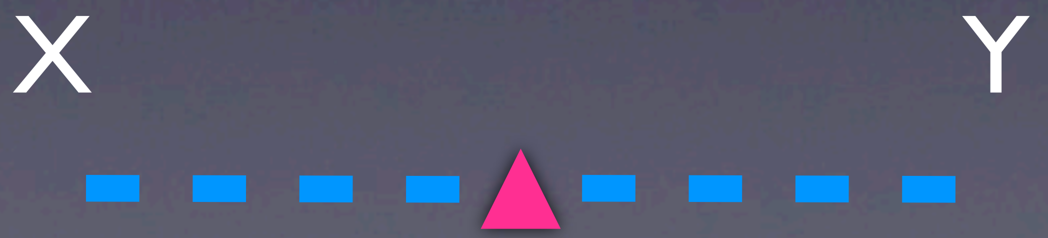




2. Mine frequent paths







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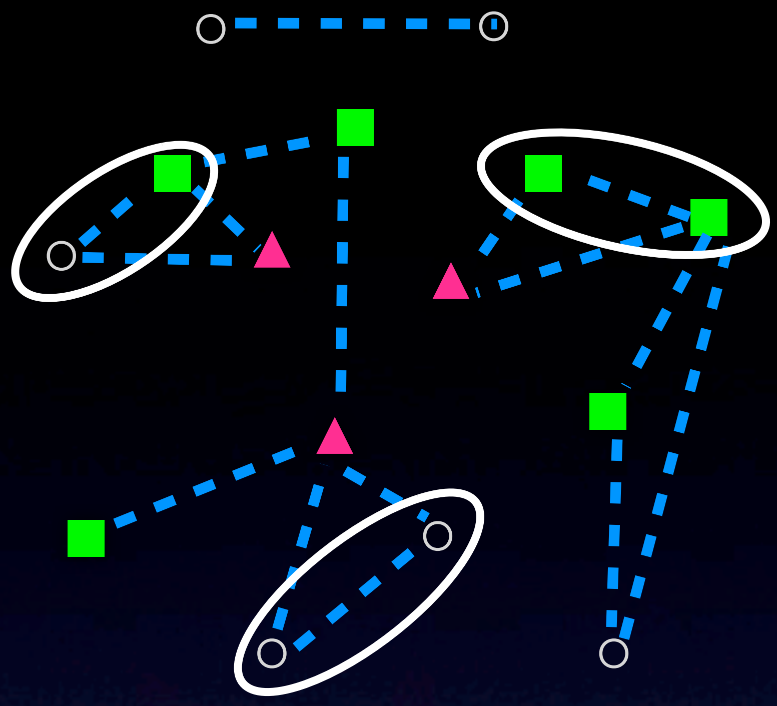

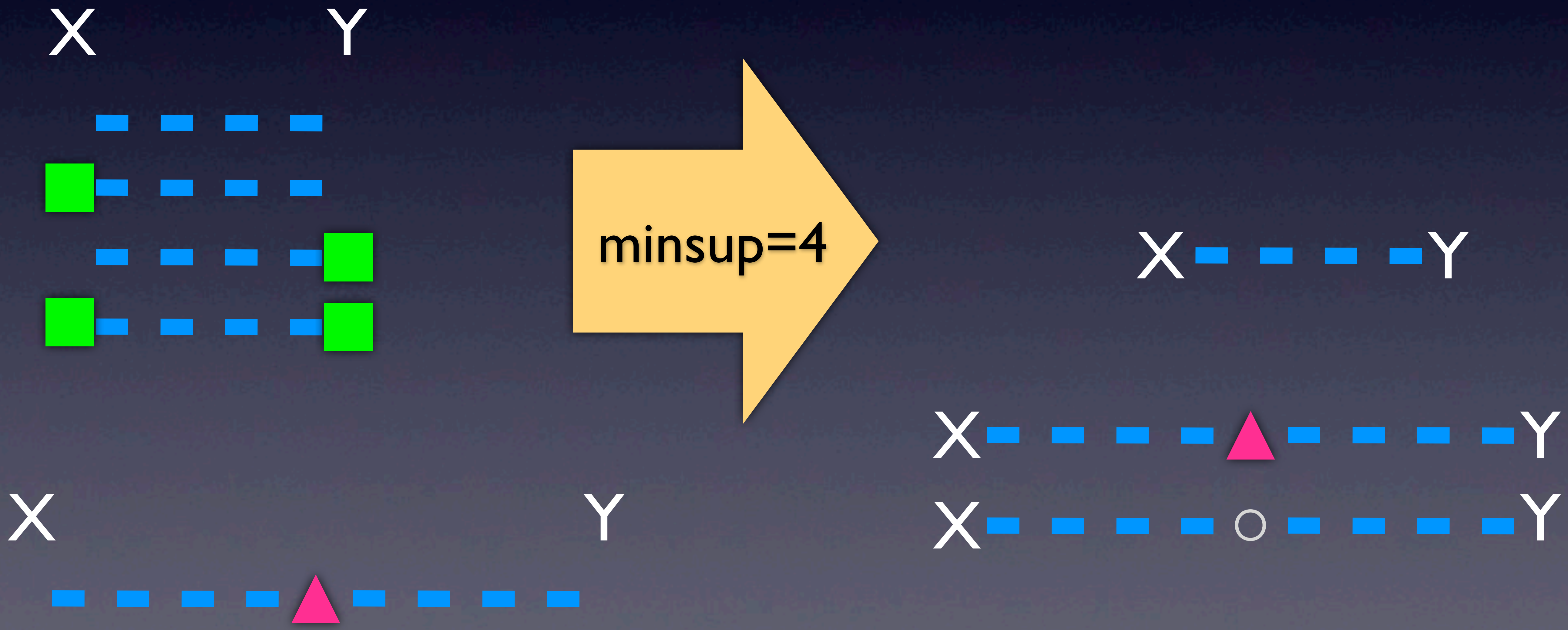

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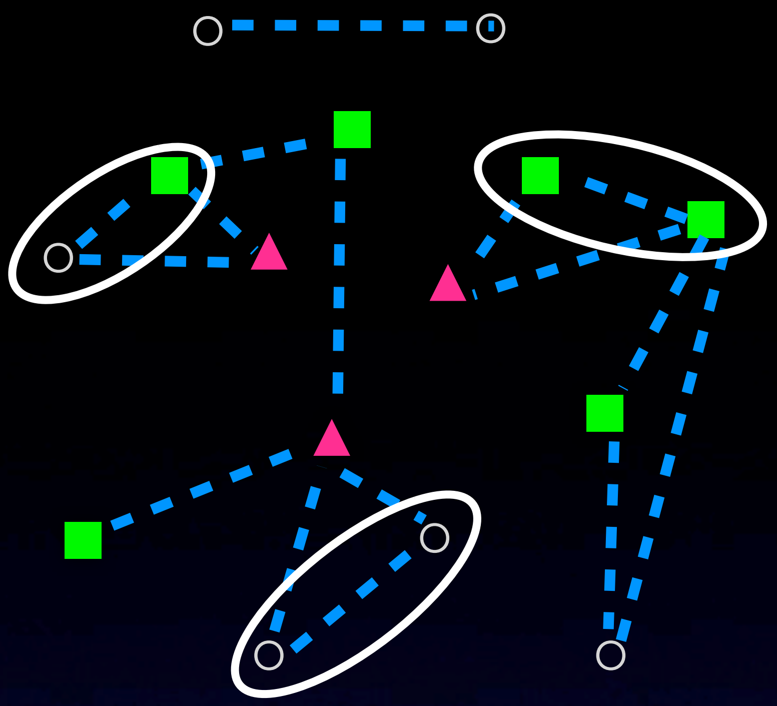
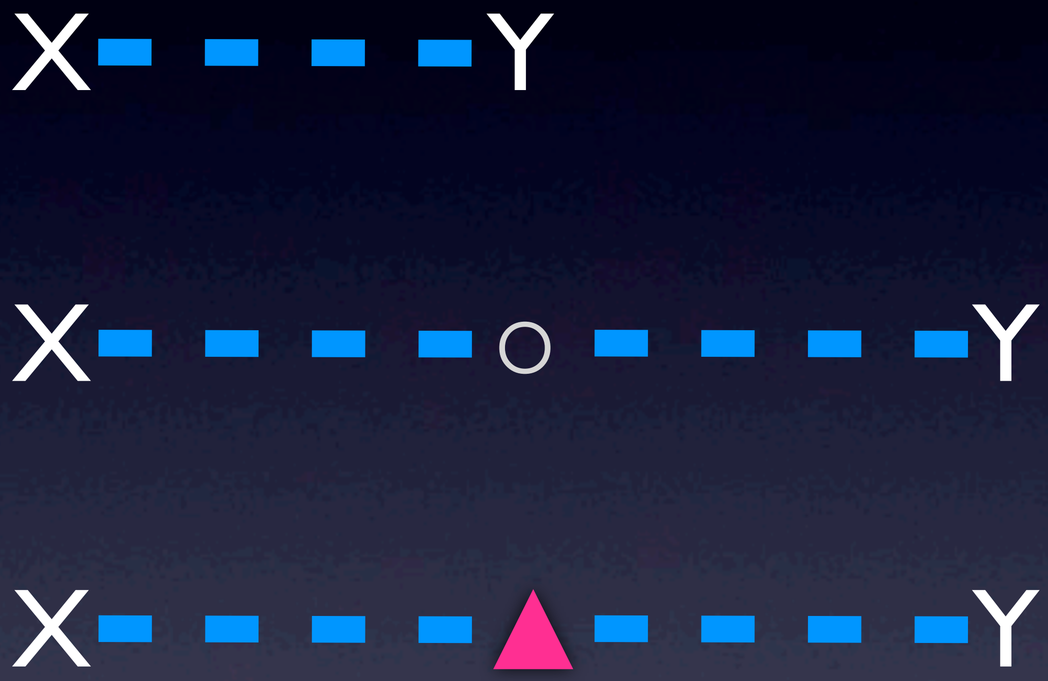
3. Build graphs





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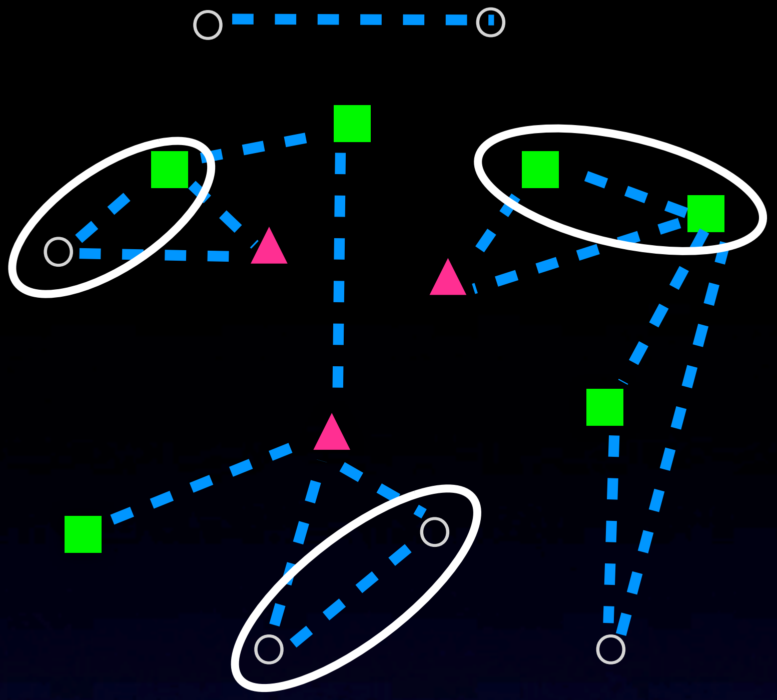
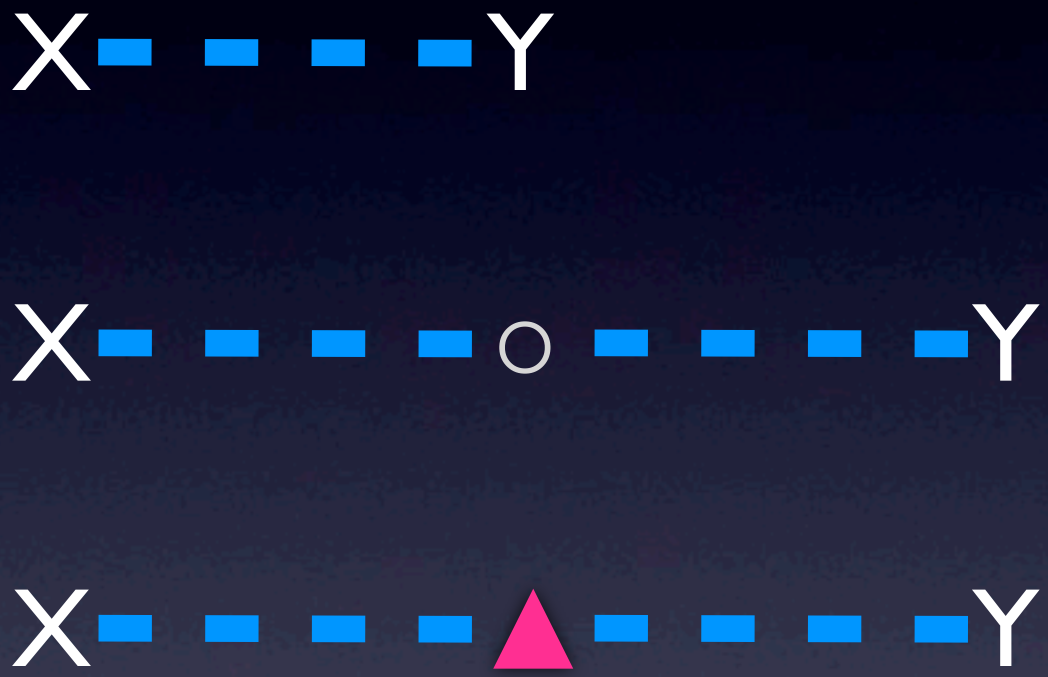
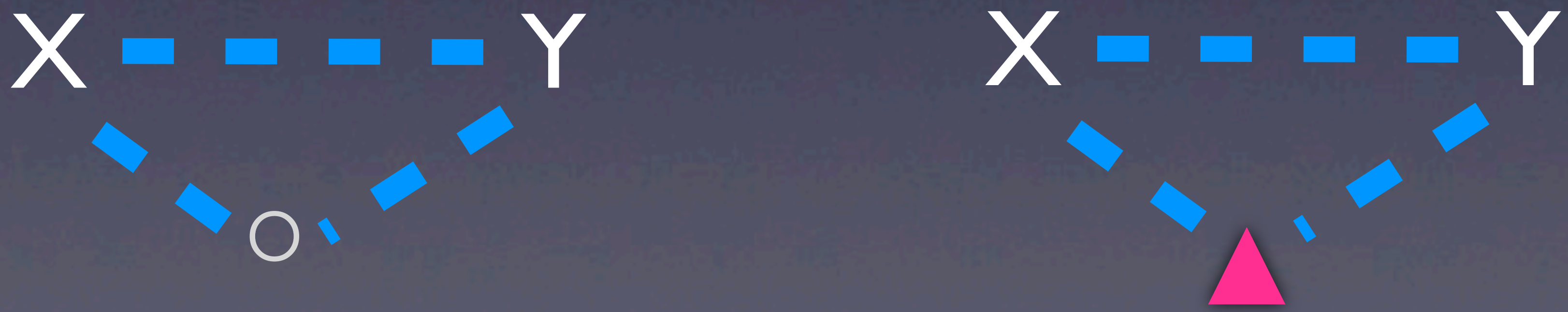
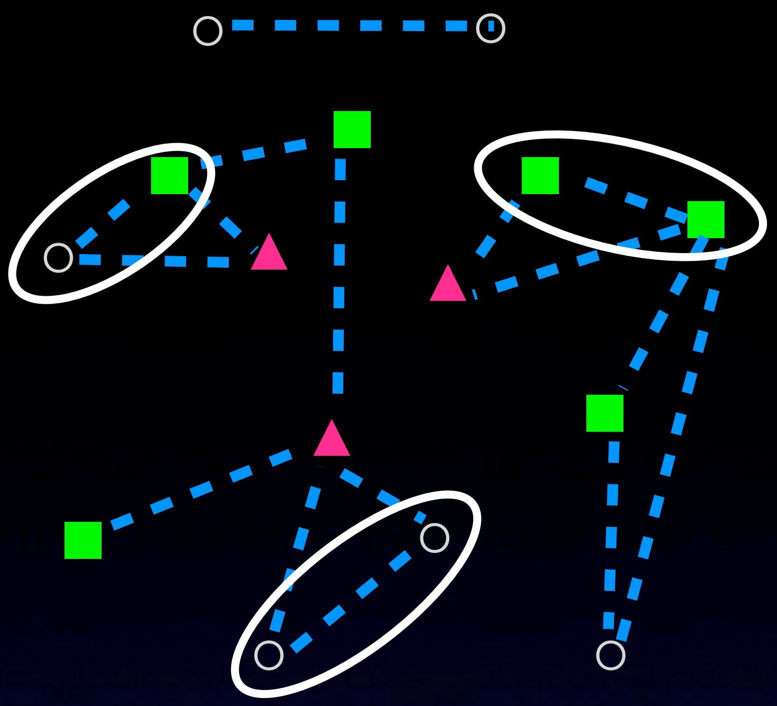
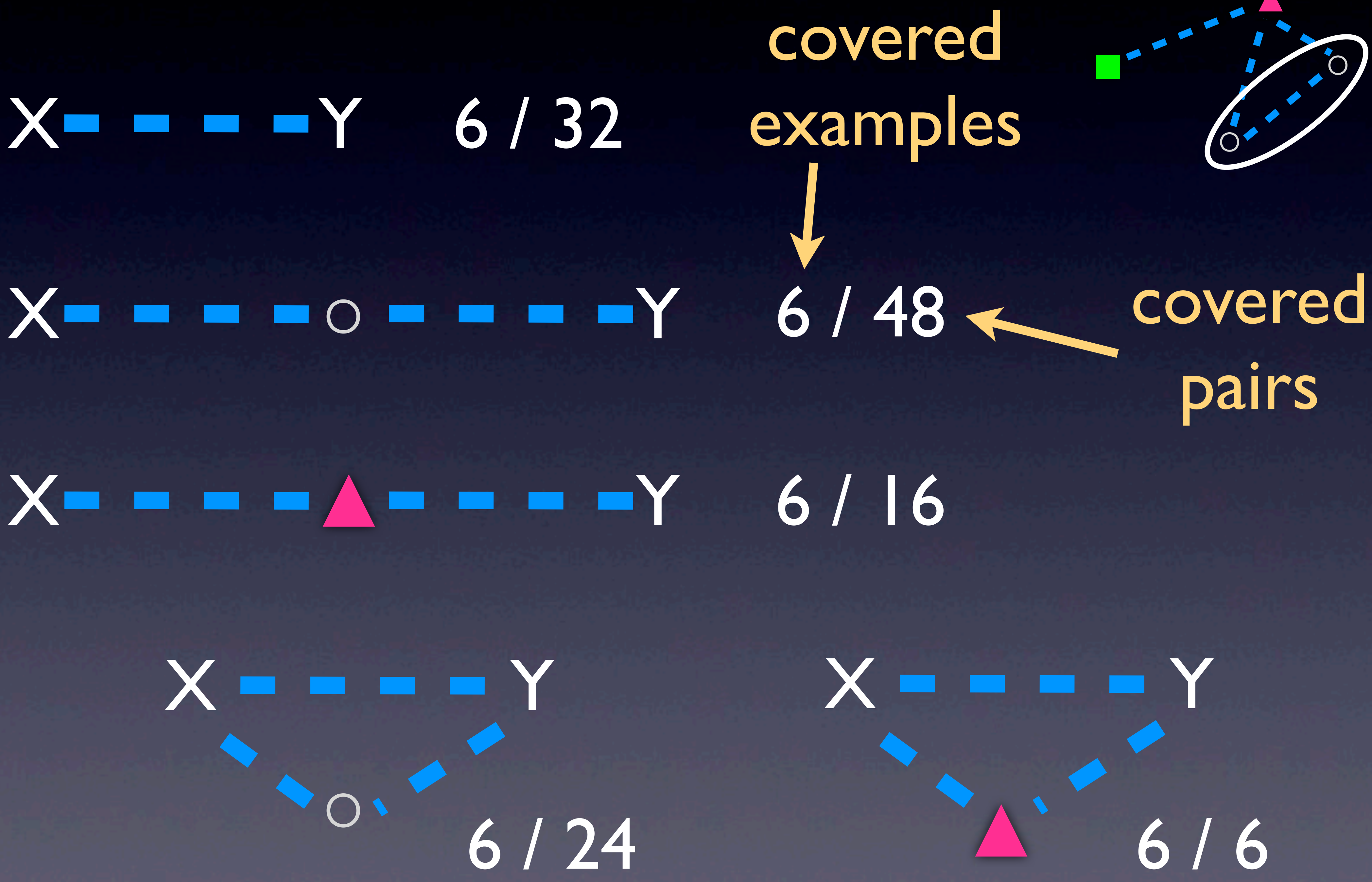






4. Select graphs





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covered examples

6 / 48

covered pairs

6 / 16

6 / 24

6 / 6

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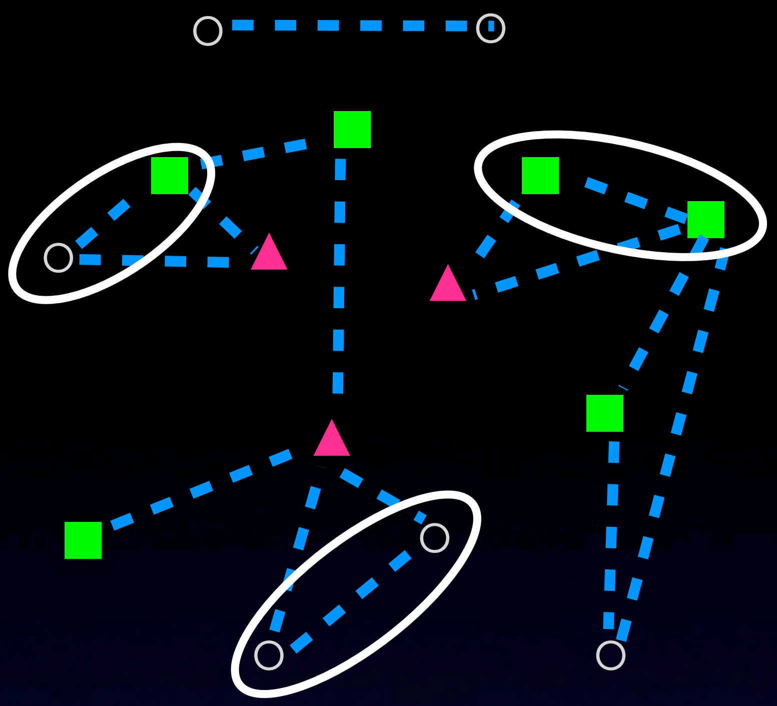

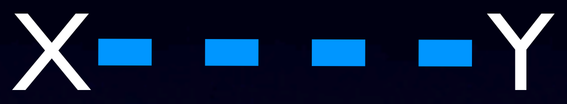

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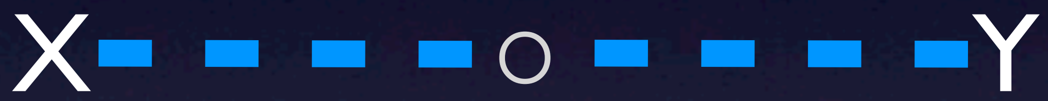

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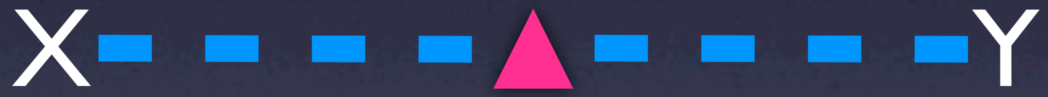

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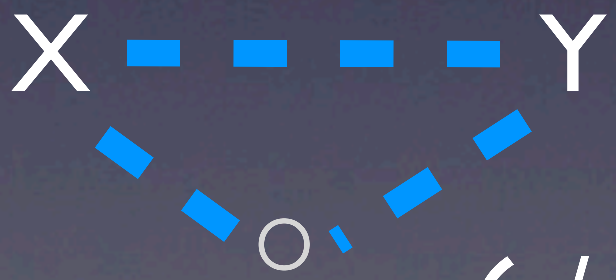

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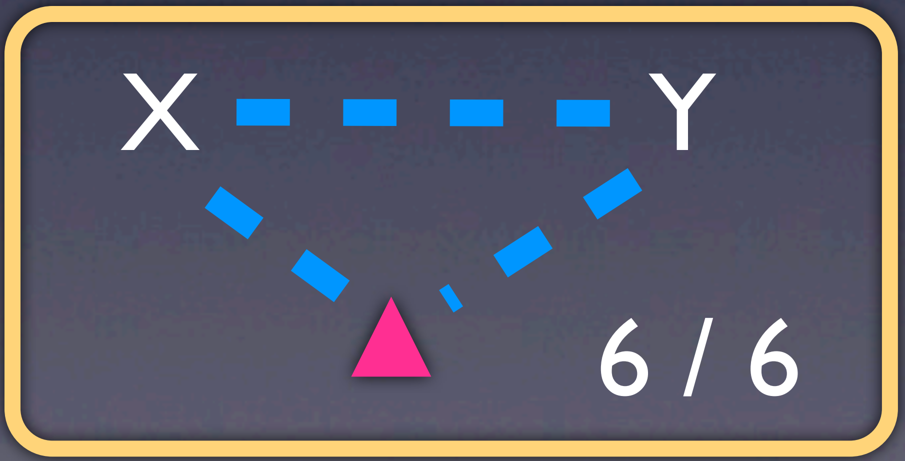

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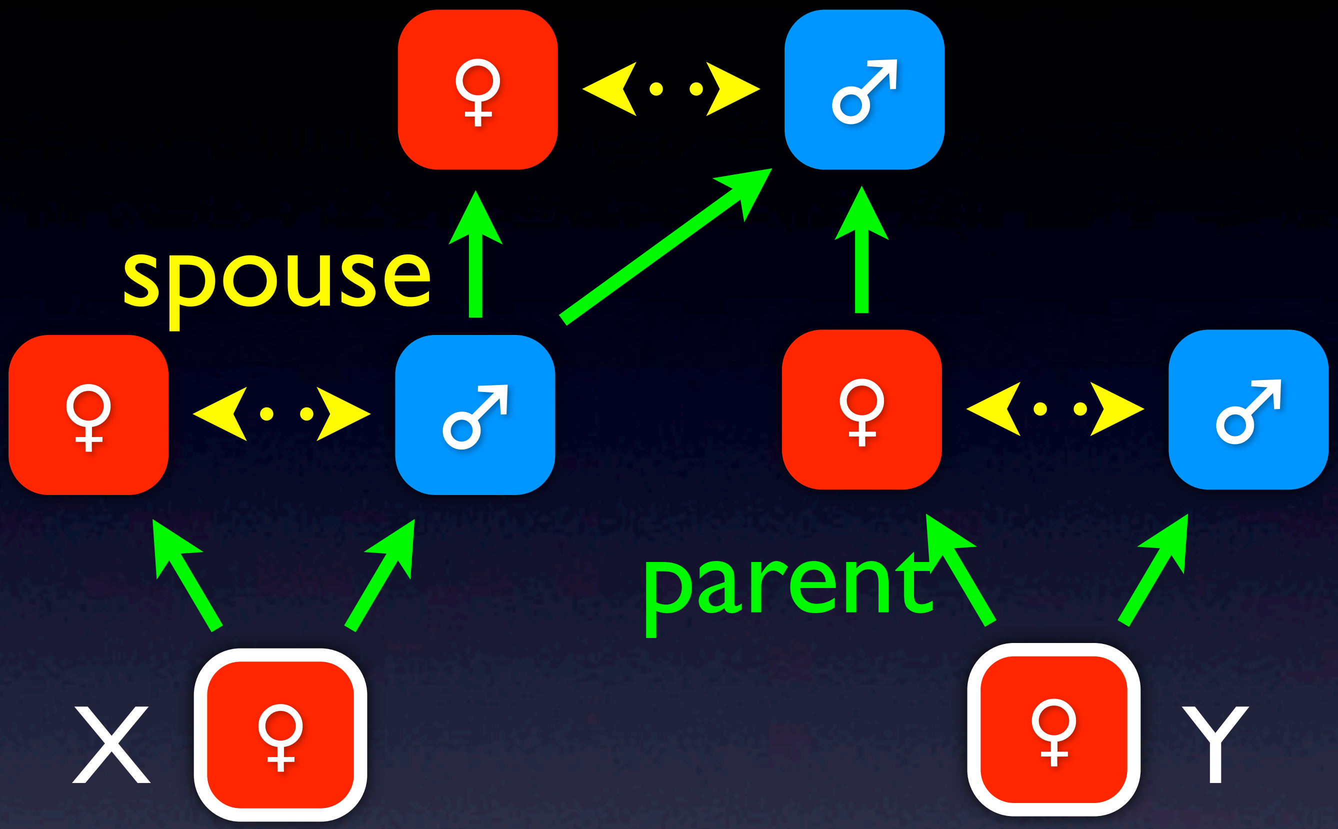
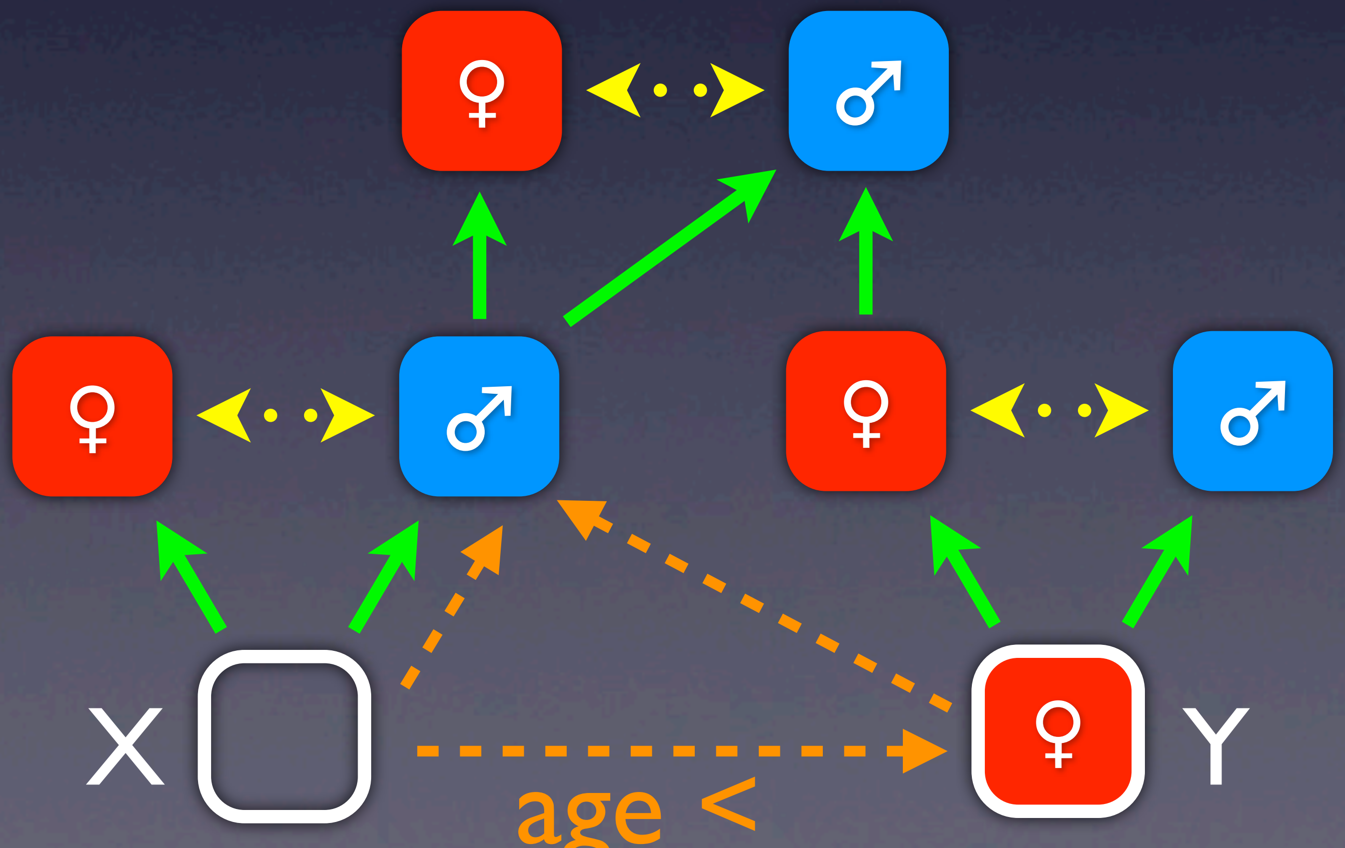
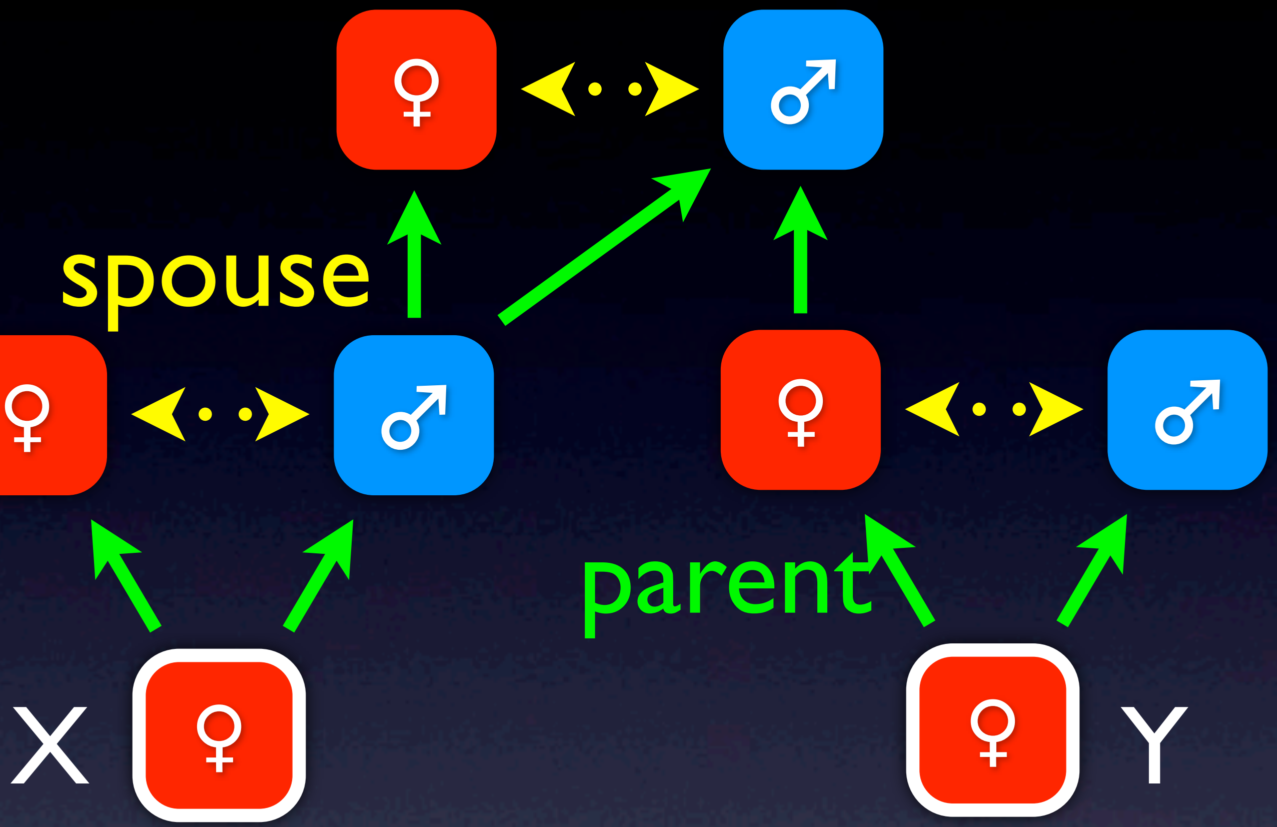
Experiment: Kinship Terms

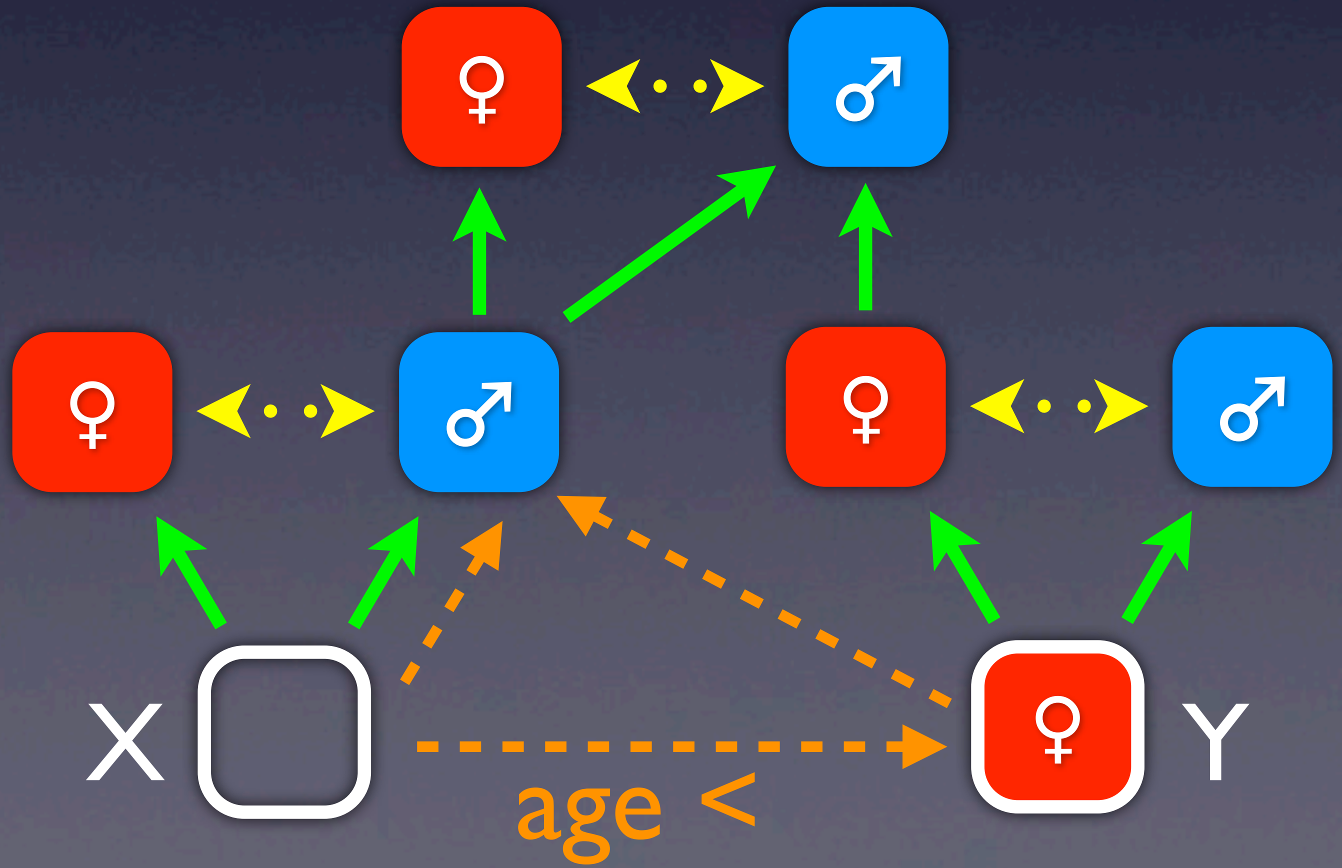




Experiment: Kinship Terms

Algyeliya = “my father’s sister’s daughter” or “my mother’s brother’s daughter”





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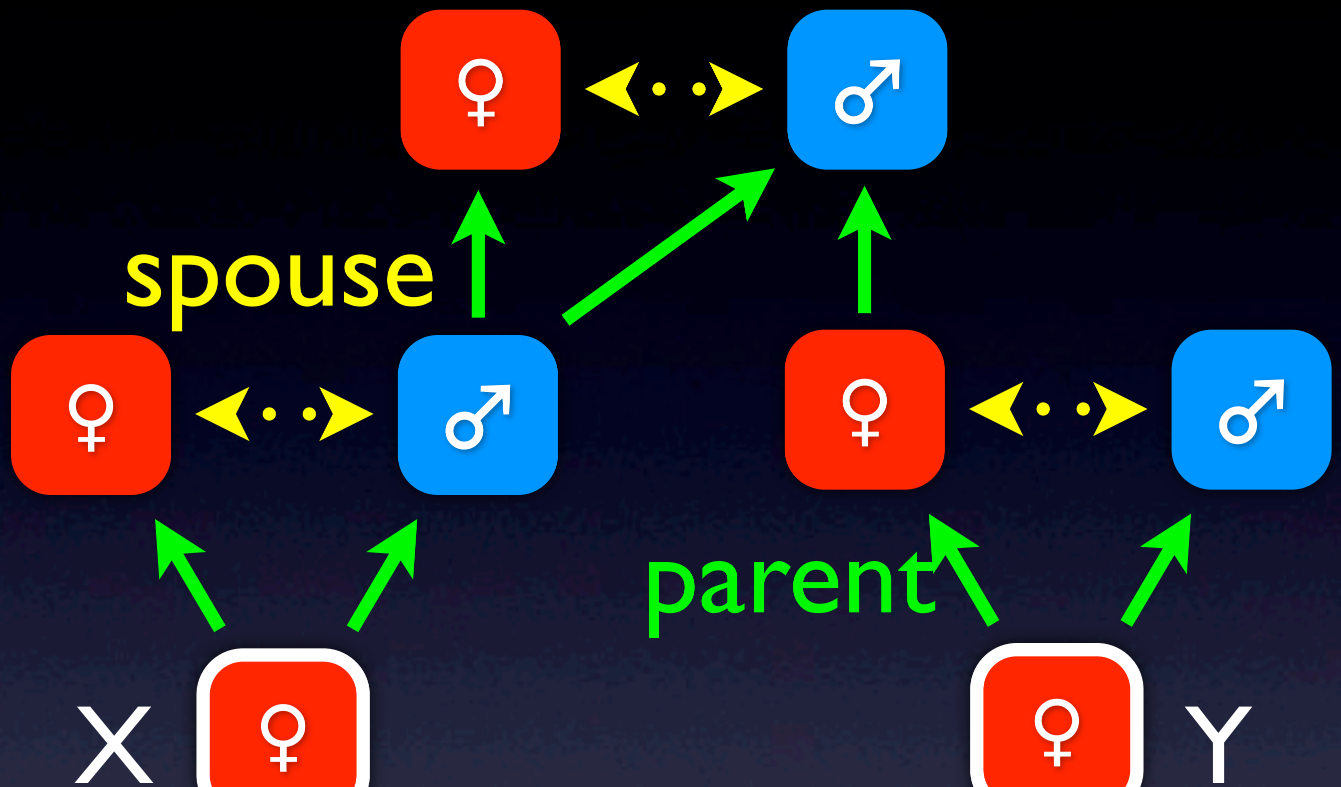

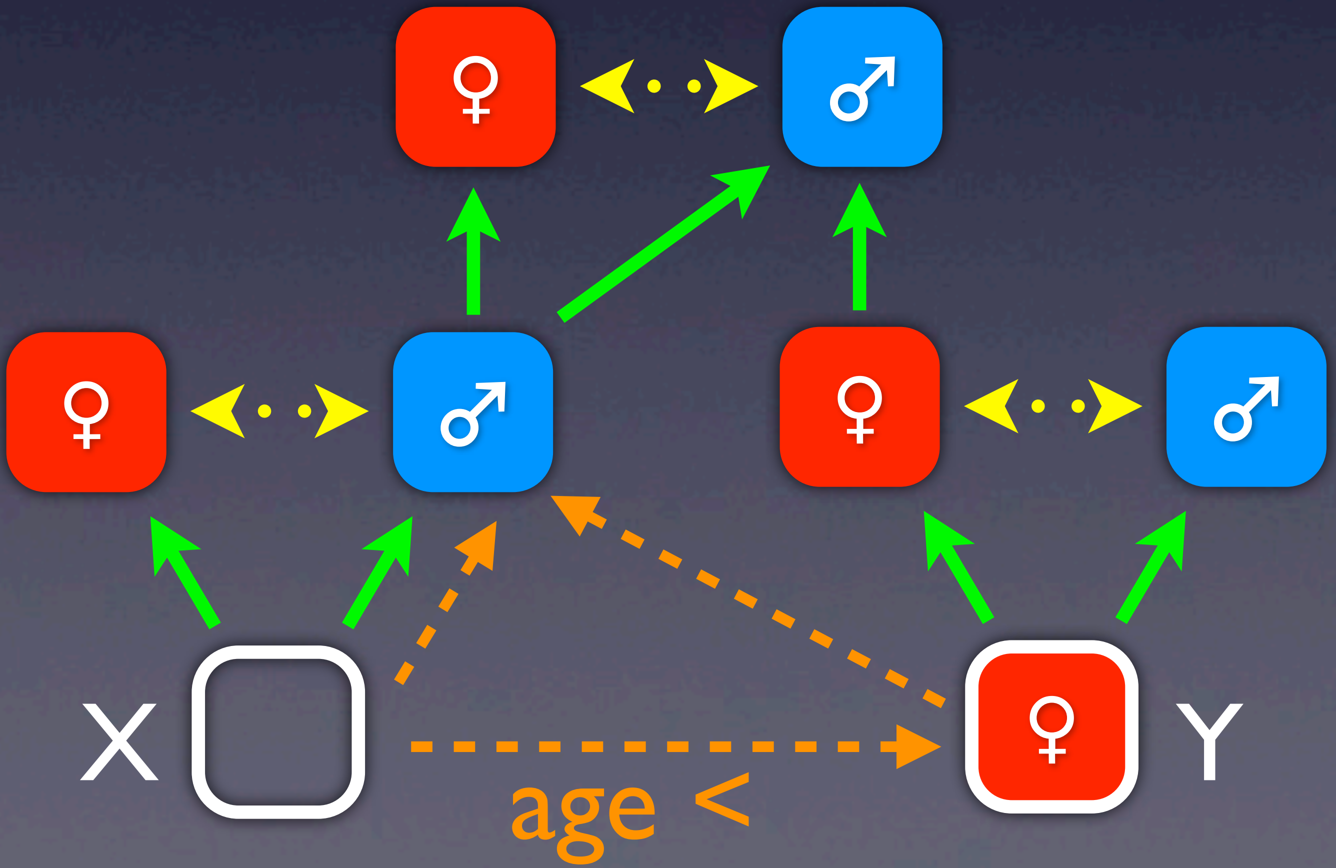

Challenges:

- connected patterns
- complex patterns
- fast mining

Conclusions

- **Relational redescriptions**: structurally different relational patterns covering same tuples
- **First step**: find disjunctive patterns covering given example pairs
- **Our approach**: constructing patterns from frequent paths
- **Experiments**: approach finds more complex patterns faster than direct relational approach

Thank you!