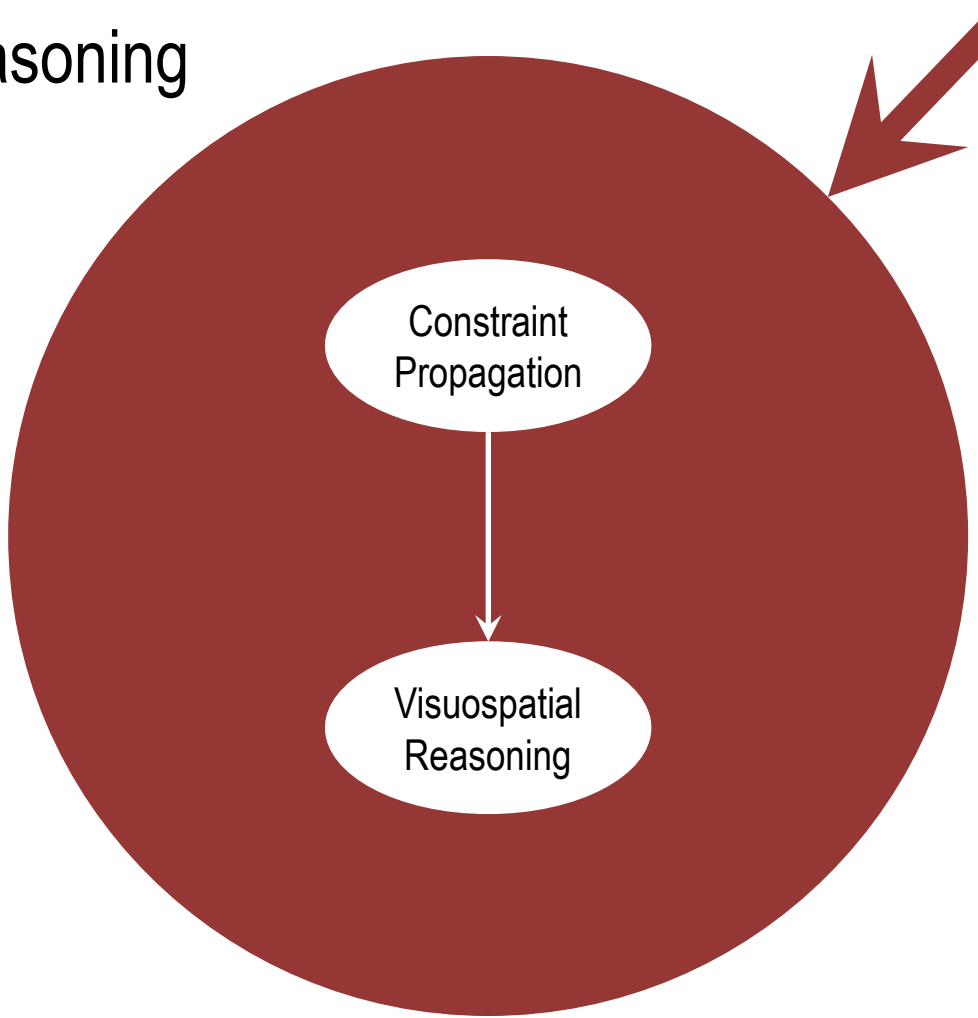
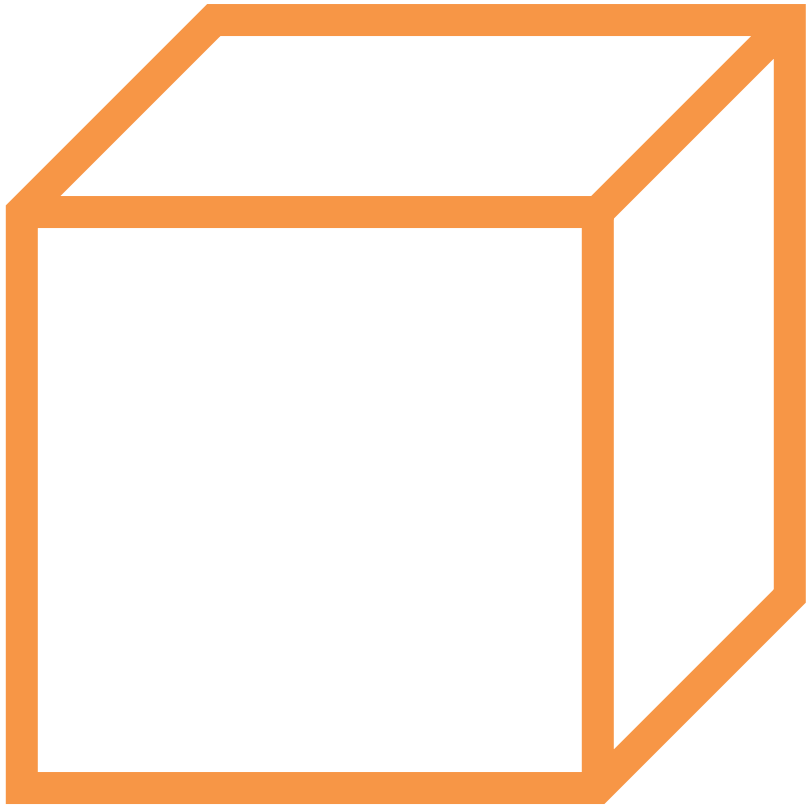

Constraint
Propagation

Visuospatial Reasoning

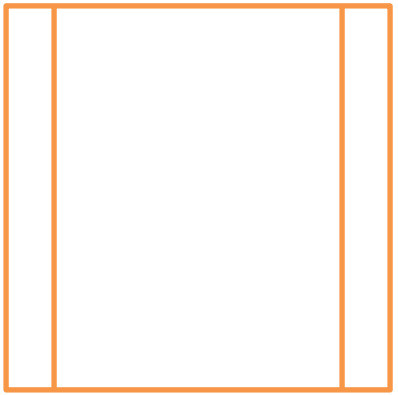


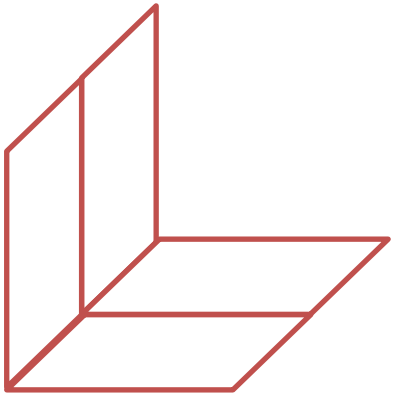
Lesson Preview

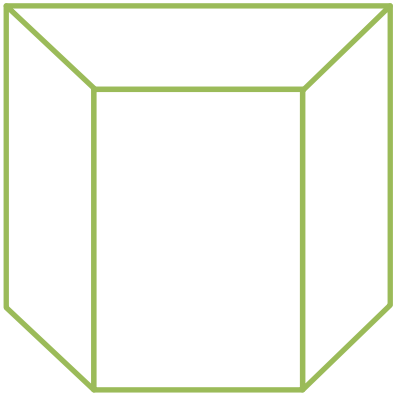
- Definition
- Image processing
- Natural language understanding
- Advanced problems

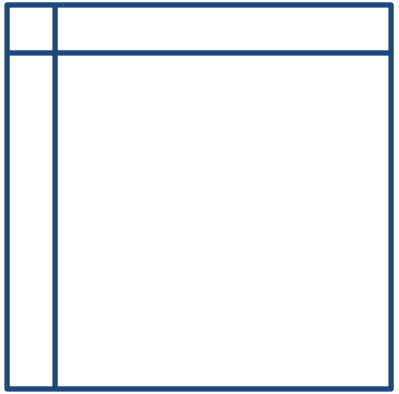


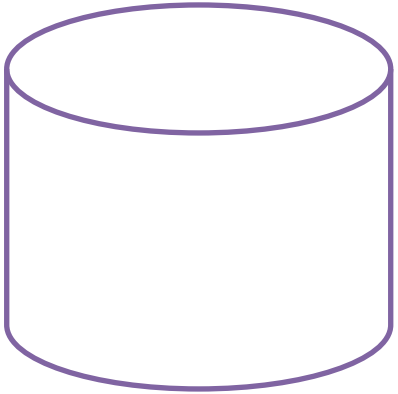
Which of these wireframes depicts a 3D figure that could exist in the real world?

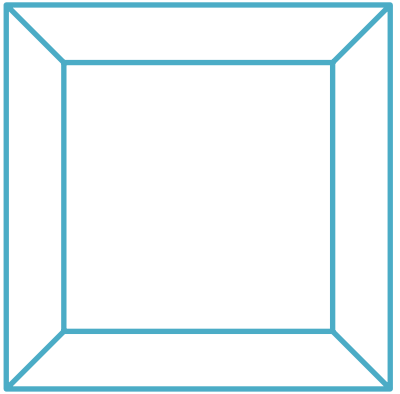








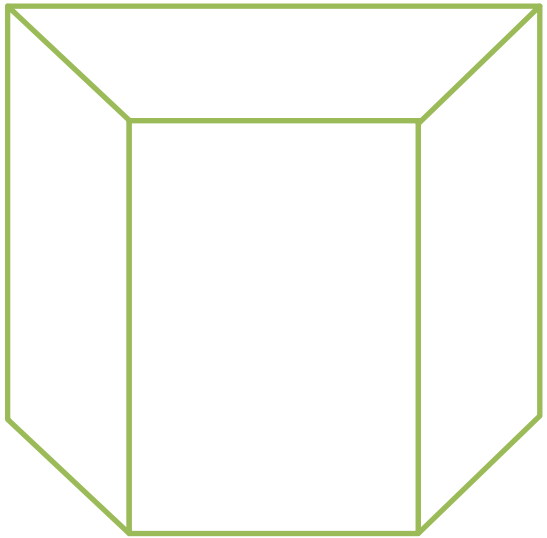




Which of these sentences are grammatically correct?

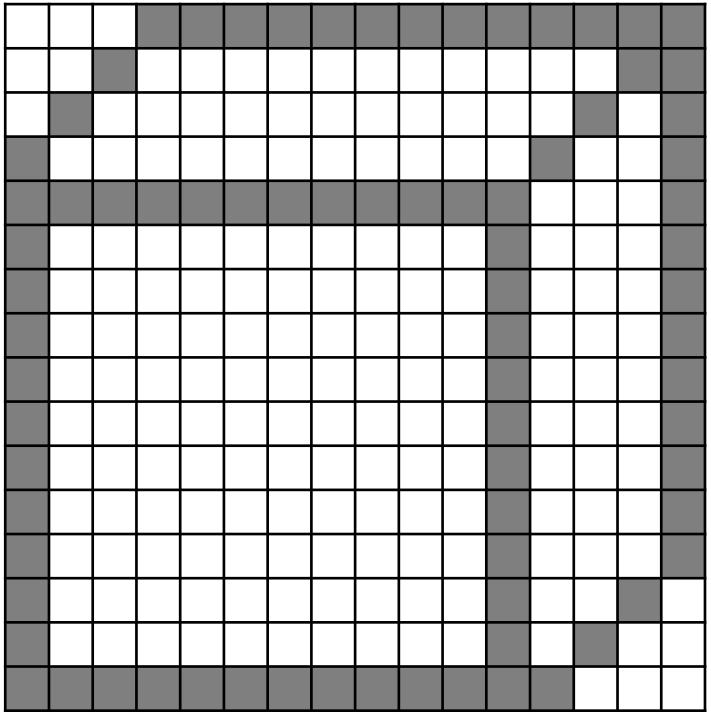
- Colorless green ideas sleep furiously.
- Soft drinks due from thank bills insurance.
- The treating physician persons the following excluded tasty.
- Wall decor notifies business cards of nonsensical whims.
- Tuesday brought a sharp-edged suite of pumpernickel.
- Go search or revoke to writing this present understand.

Constraint propagation: a method of inference that assigns values to variables characterizing a problem in such a way that some conditions (called constraints) are satisfied.

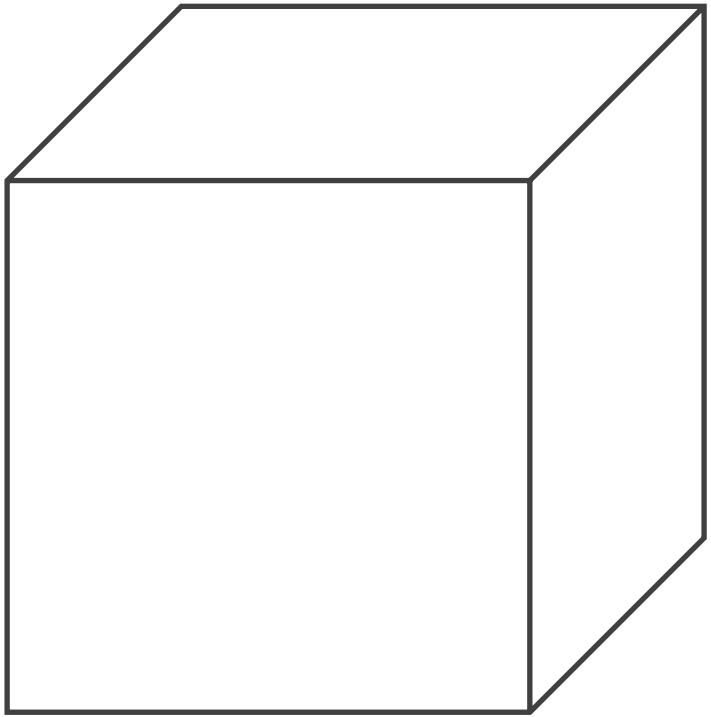


Colorless green ideas sleep furiously.

Pixels

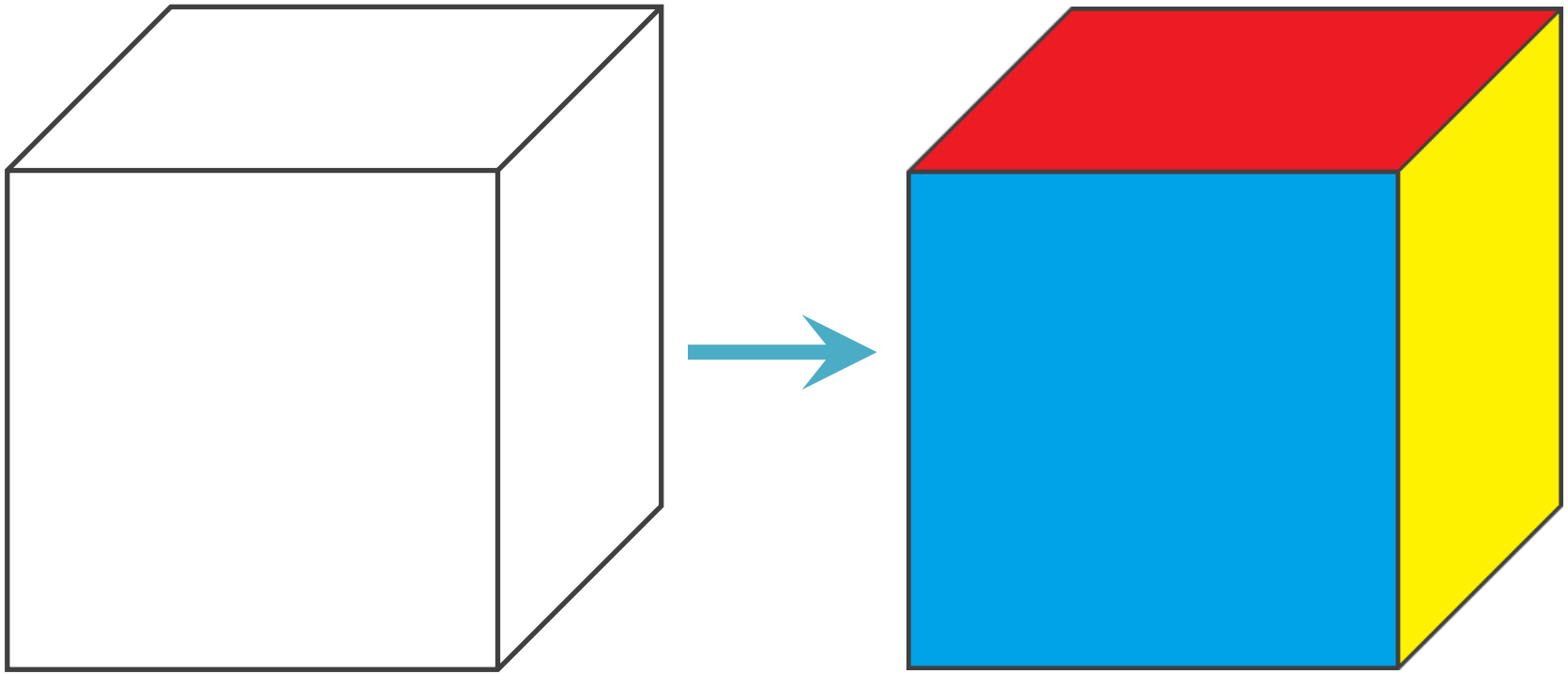


Lines

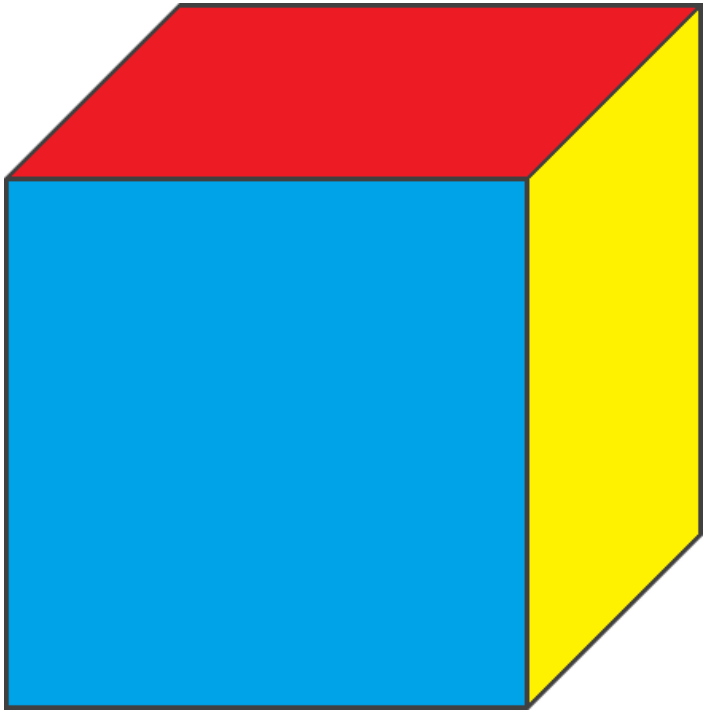


Lines

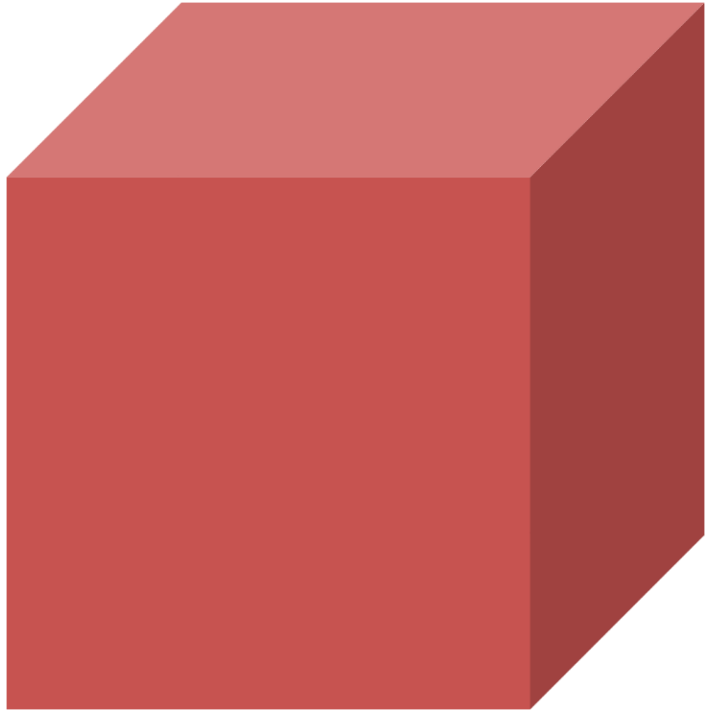
Surfaces



Surfaces

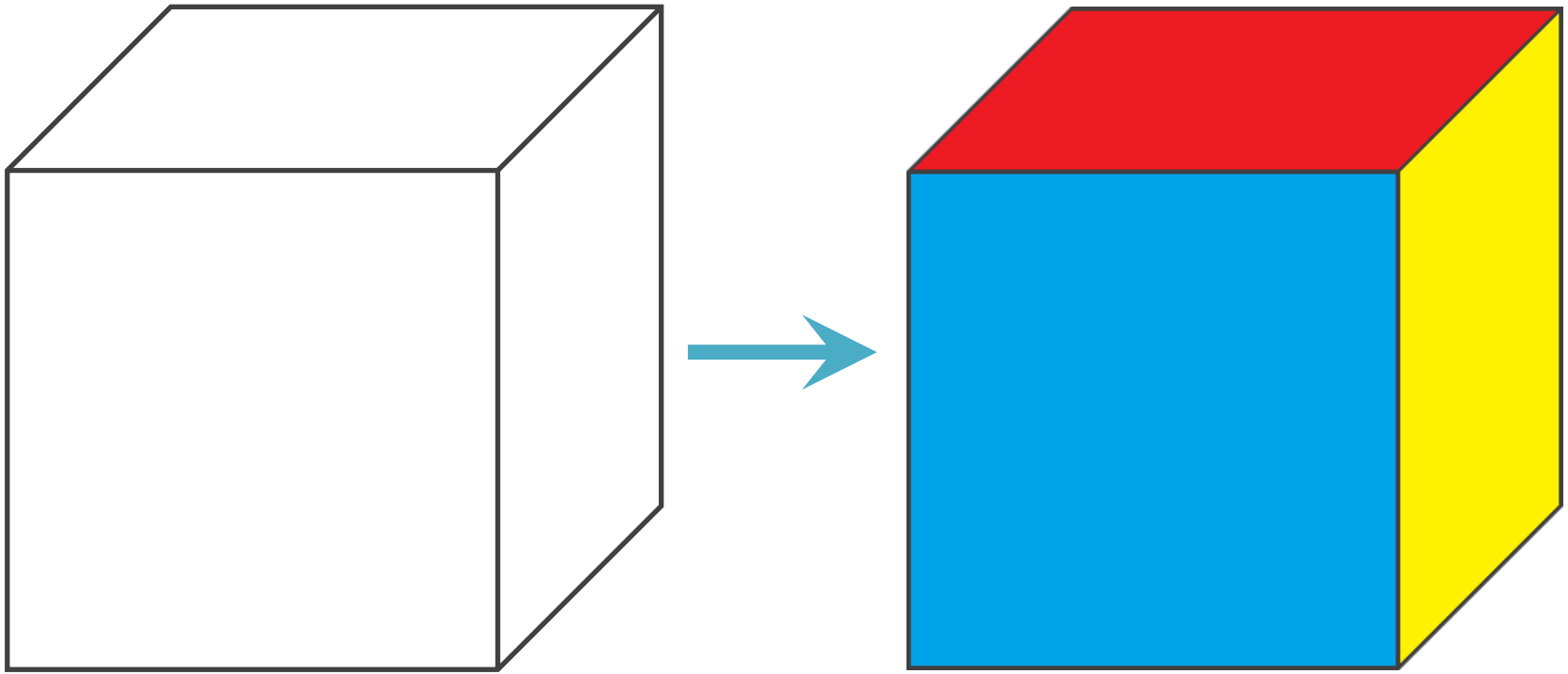


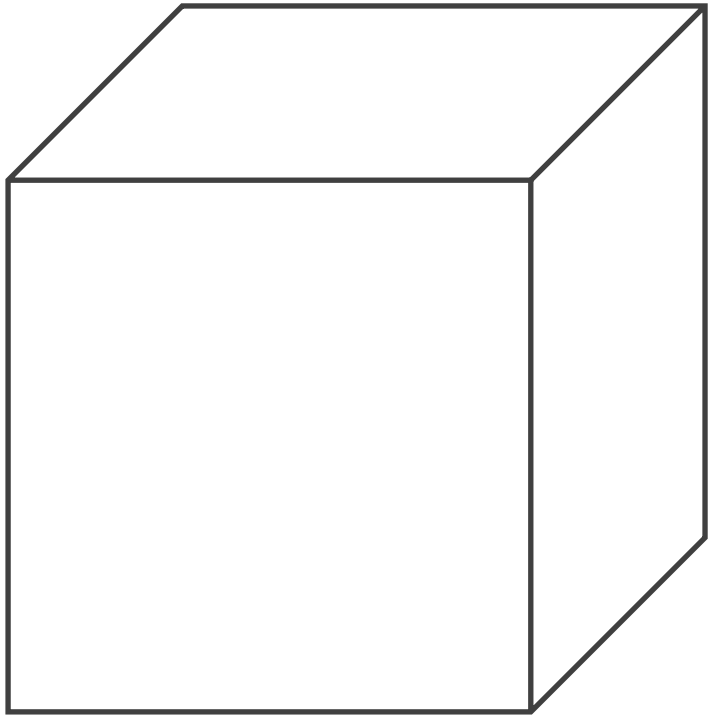
3D



Lines

Surfaces





Constraints

Y-Constraint

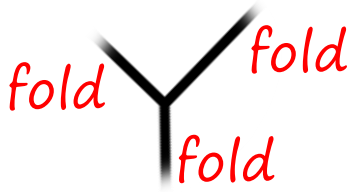
W-Constraint

L-Constraint

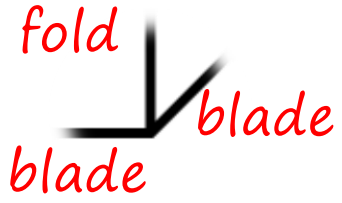
T-Constraint

Constraints

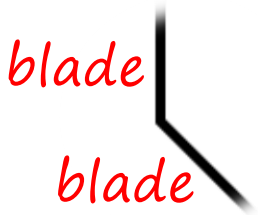
Y-Constraint



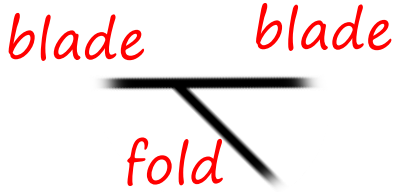
W-Constraint



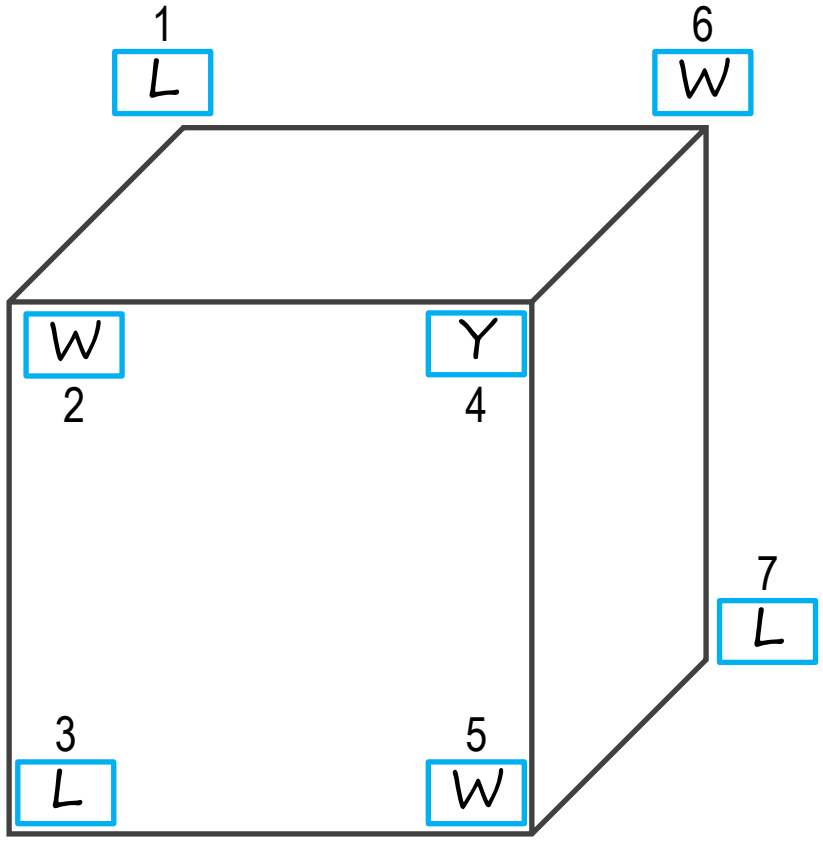
L-Constraint



T-Constraint



Label each intersection according to the applicable constraint on the right.

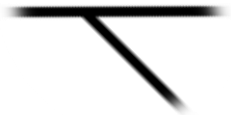


Y-Constraint

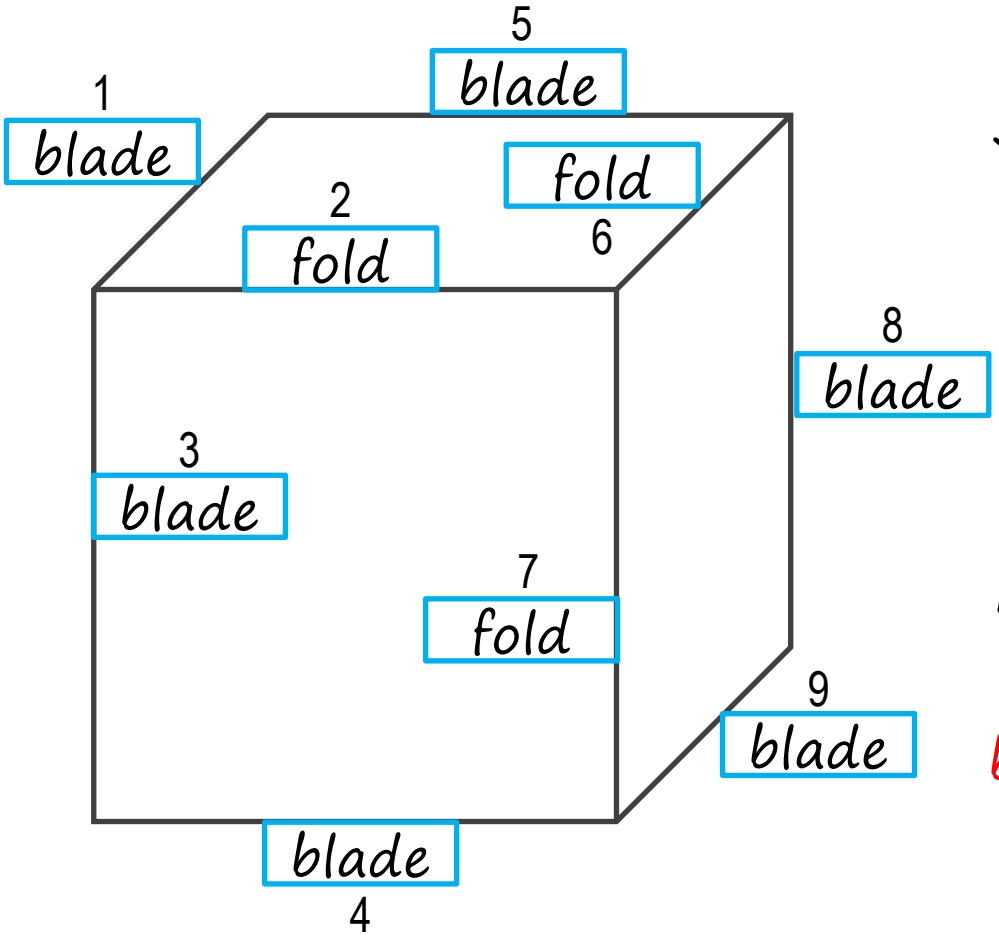
W-Constraint

L-Constraint

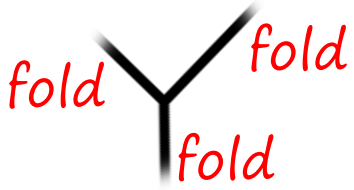
T-Constraint



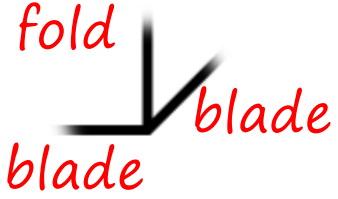
Label each line according to the constraint on the right.



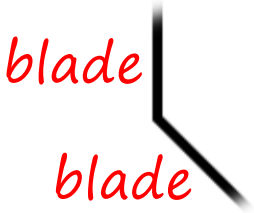
Y-Constraint



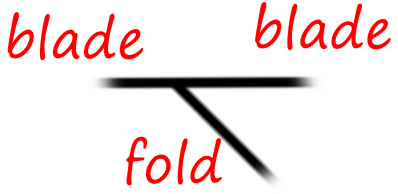
W-Constraint

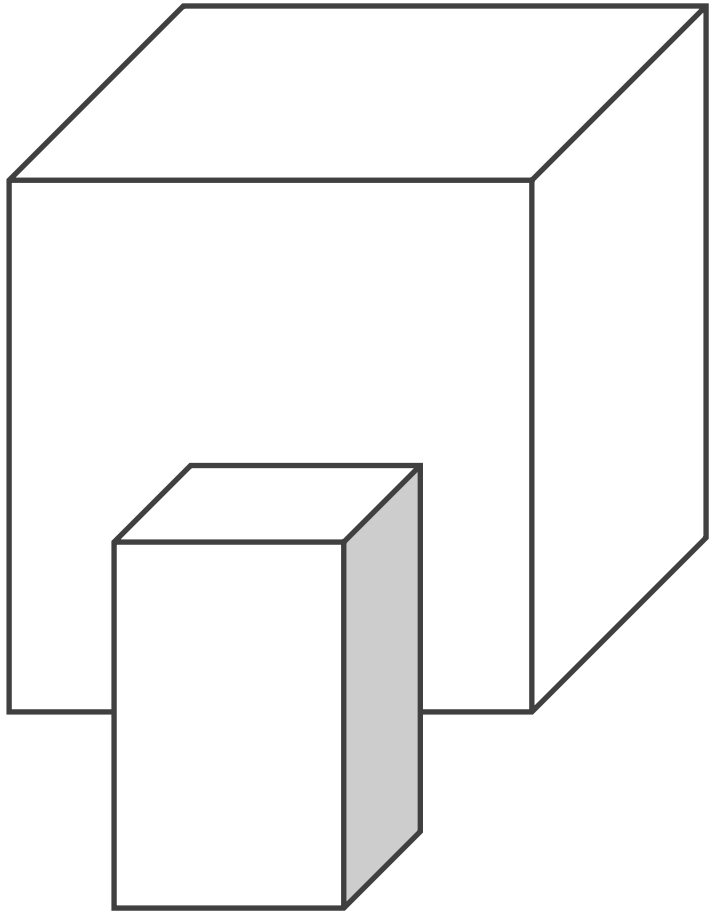


L-Constraint



T-Constraint





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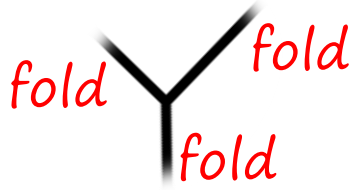

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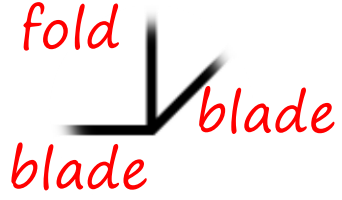

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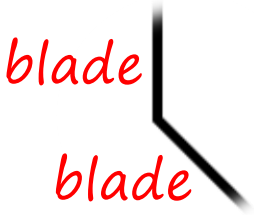

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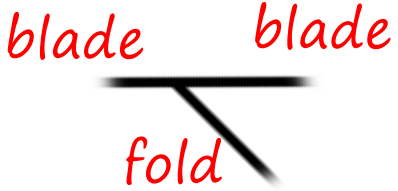

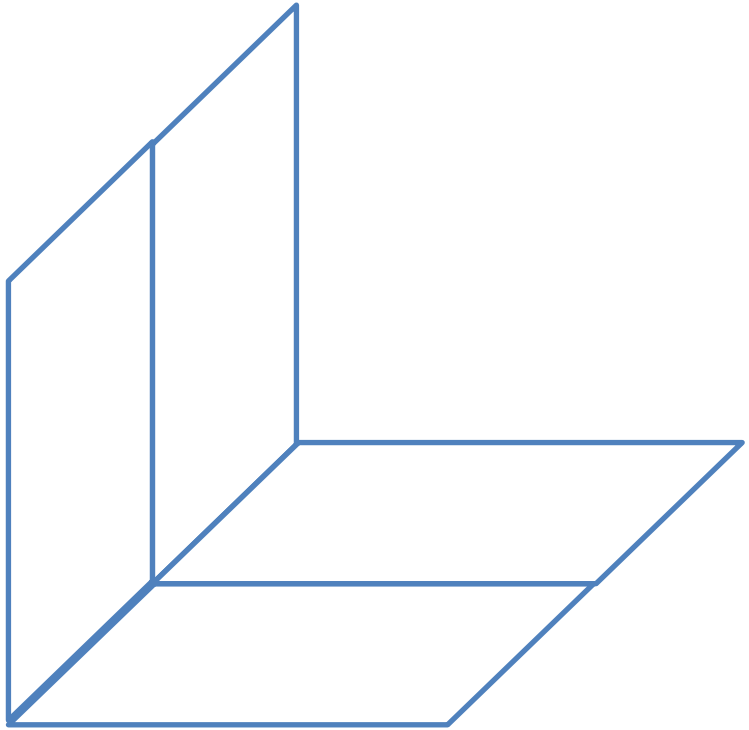

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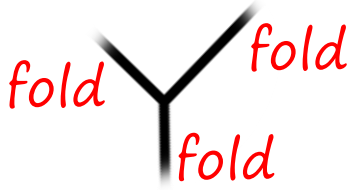

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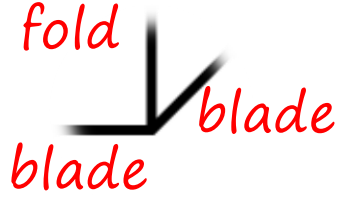
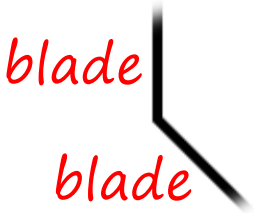


L-Constraint



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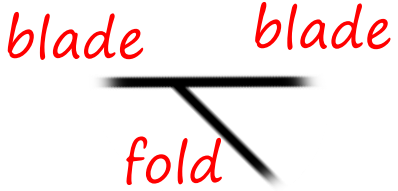

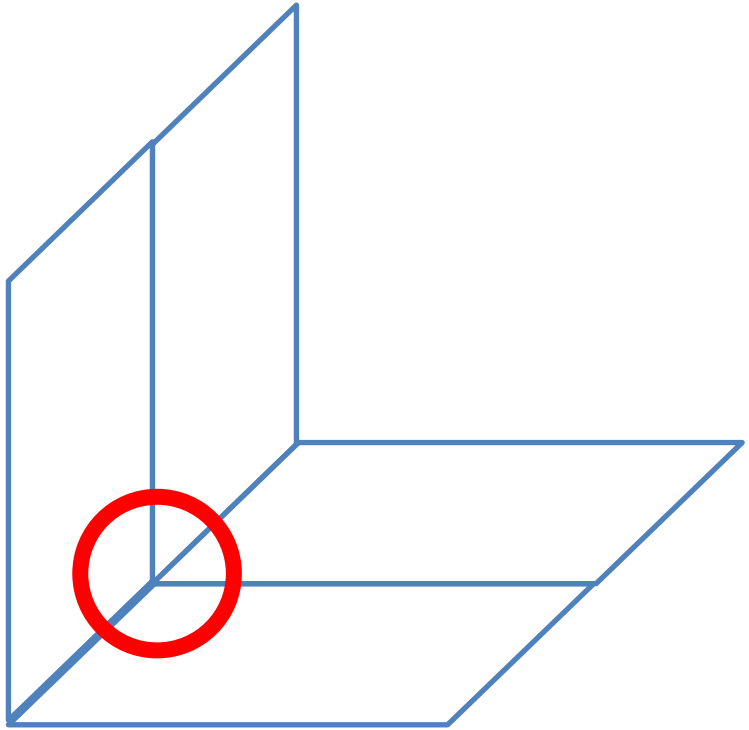

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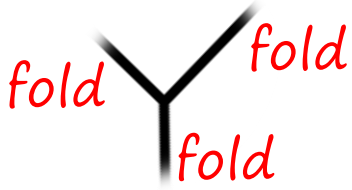

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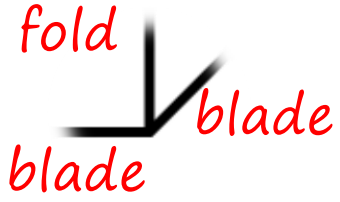

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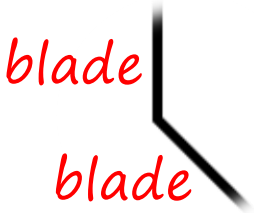

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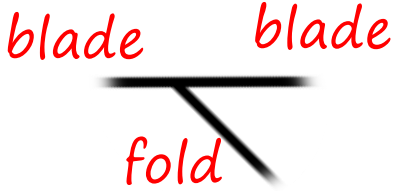

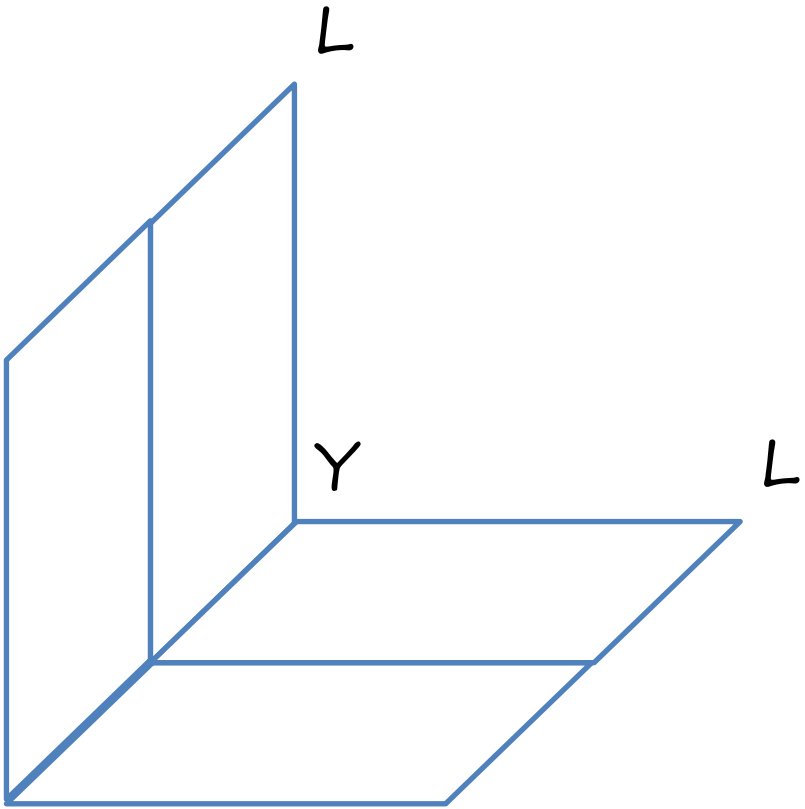

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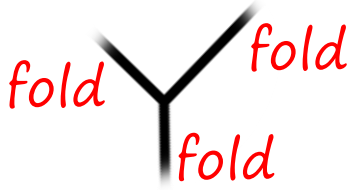

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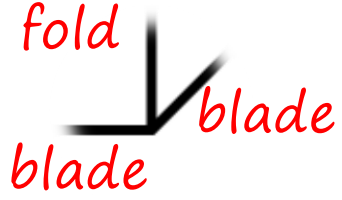
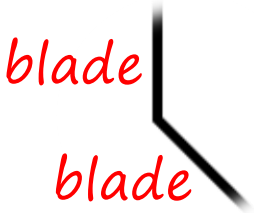


L-Constraint



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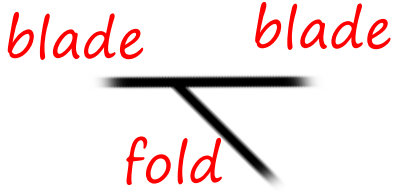

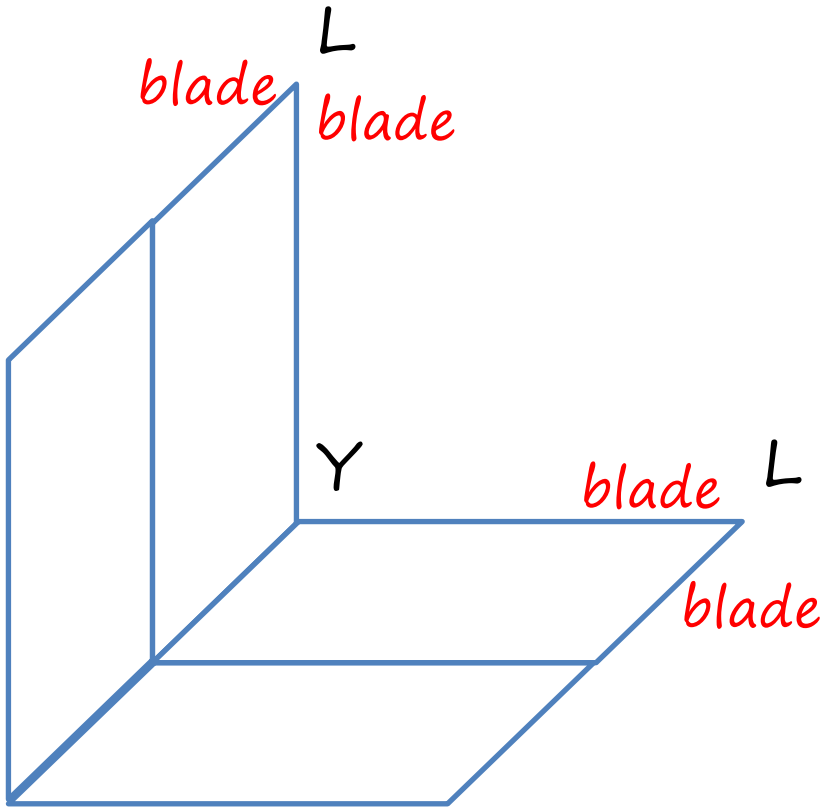

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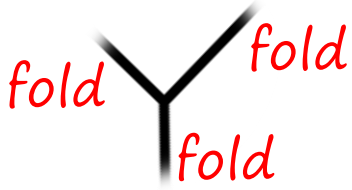
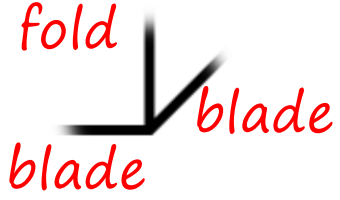
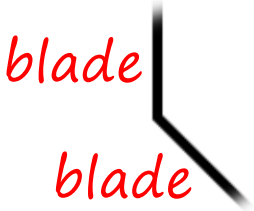


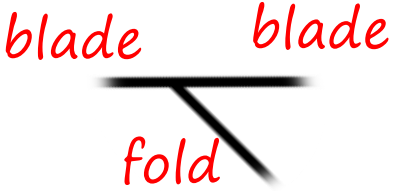
W-Constraint

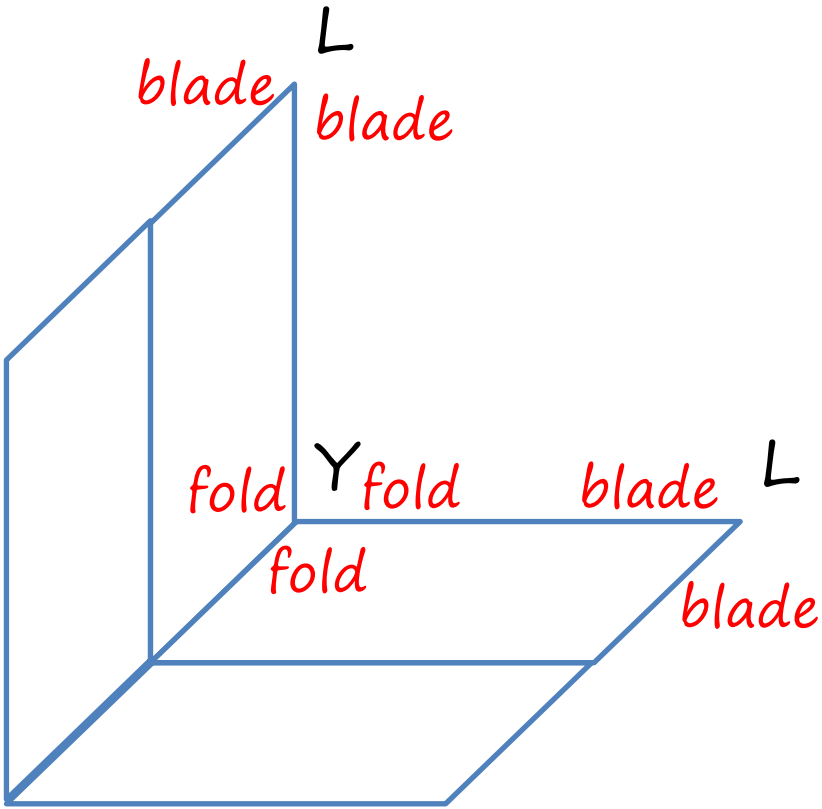


L-Constraint



T-Constraint





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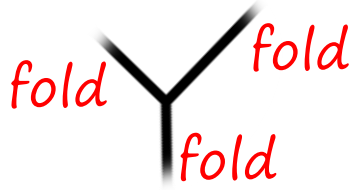

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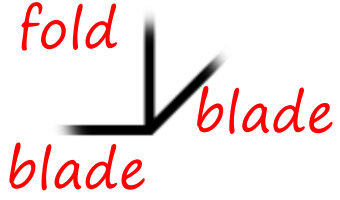
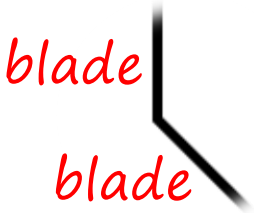


L-Constraint



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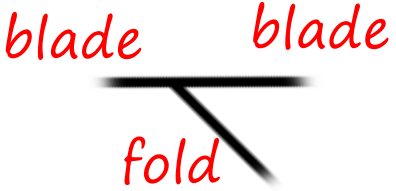

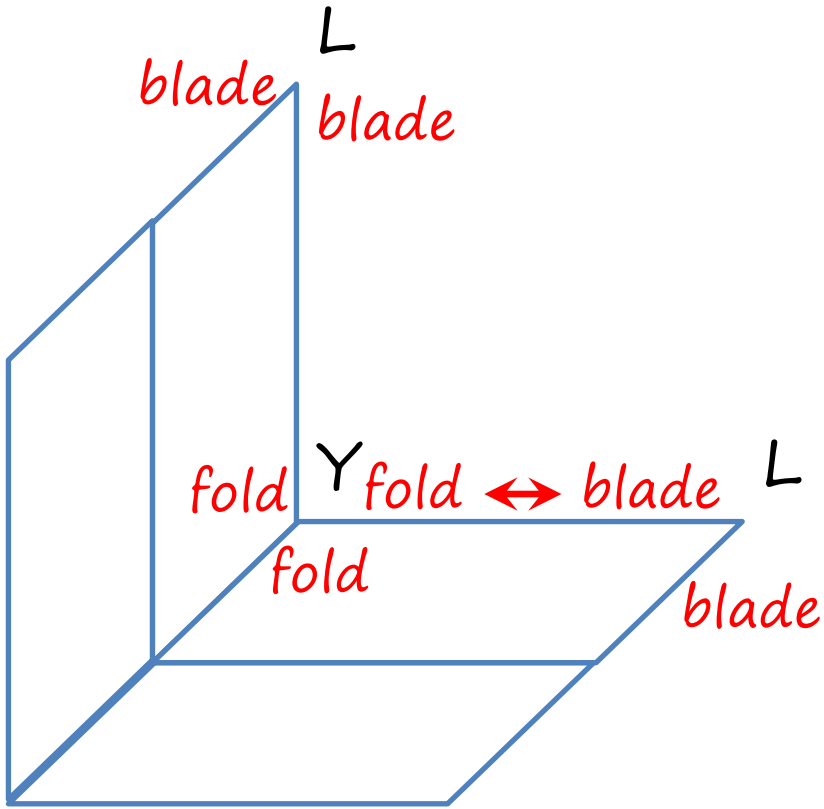

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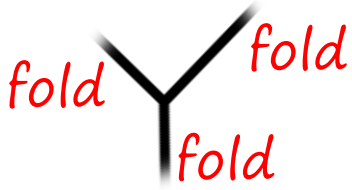

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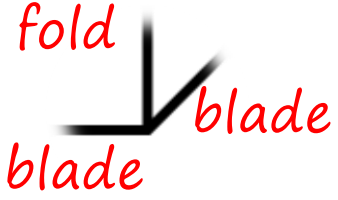

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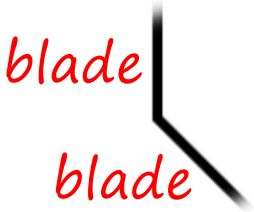

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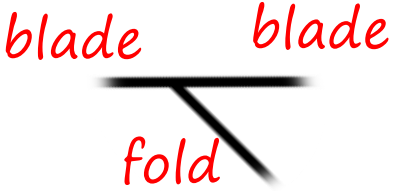
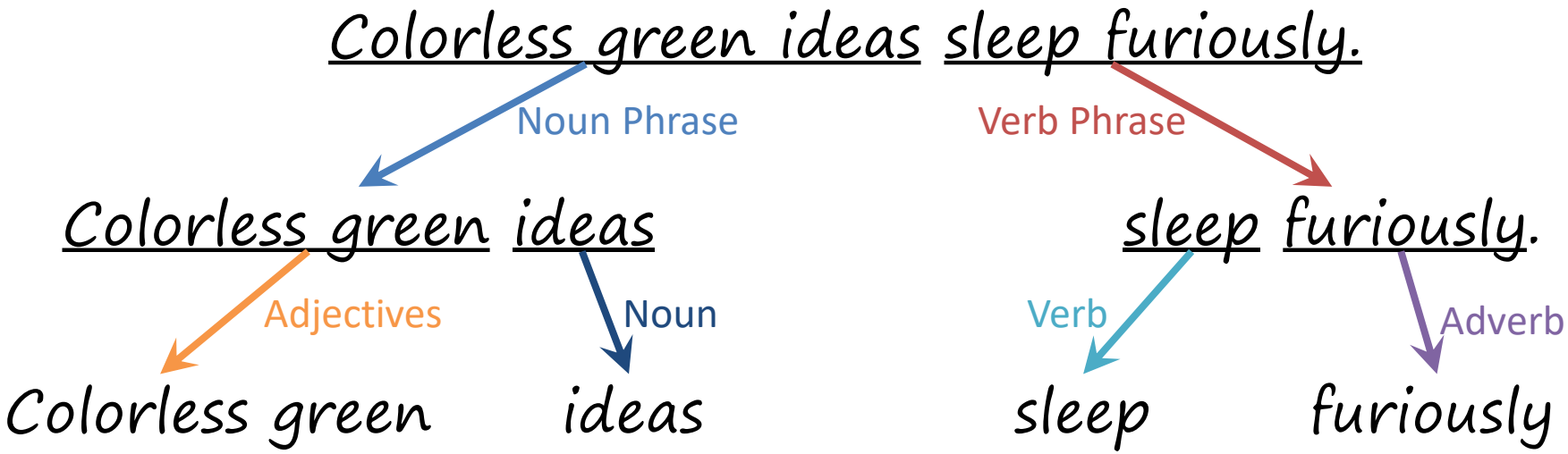


Y-Constraint

W-Constraint

L-Constraint



Constraints:

Sentence = Noun Phrase + Verb Phrase

Noun Phrase = [Adjectives] + (Noun or Pronoun)

Verb Phrase = Verb + [Adverb]

Soft drinks due from thank bills insurance.

Constraints:

Sentence = Noun Phrase + Verb Phrase

Noun Phrase = [Adjectives] + (Noun or Pronoun)

Verb Phrase = Verb + [Adverb]

Assignment

How would you use constraint propagation to design an agent that could answer Raven's progressive matrices?

To recap…

- Definition
- Image processing
- Natural language understanding
- Advanced problems