Intro to 20-sim: Bond Graphs

COMP155 / EMGT155
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1. Create iconic diagram of circuit

- $u_{in} =$ voltage source
- $C =$ capacitor
- $R =$ resistor
- $L =$ inductor
2. Split up reference points.

\[ u^\text{in} = \text{voltage source} \]
\[ C = \text{capacitor} \]
\[ R = \text{resistor} \]
\[ L = \text{inductor} \]
Electrical Diagram to Bond Graph

3. Replace elements by bond graph equivalents.

Note: Orientation of the bonds (the direction of the half arrow) is arranged (as much as possible) in the direction of the power flow from the source to the load elements.
Electrical Diagram to Bond Graph

4. Replace remaining knots with 0 junctions.

(No remaining knots in this example.)
Electrical Diagram to Bond Graph

- 5. Connect all elements and junctions with bonds, according to the layout of the electrical system.
6a. Simplify: Eliminate sources with zero output.
6b. Simplify: Eliminate loose junctions.
6c. Simplify: Eliminate junctions.