From model to simulation the acausal way

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Previously

Modelica

System described by equations

Structure

What is an ABD?

Assigning IO causality

Flattening

Corresponding operations

Transformation step

What is an ABD?

Computational blocks

Connected by undirected links

All ports are equivalent

Flattening

Goal: remove all hierarchy from a-causal model

Partially mixed with causalisation

Alternative approach

- Do not resolve in ABD compiler

Assigning IO causality

Some blocks have trivial output causality

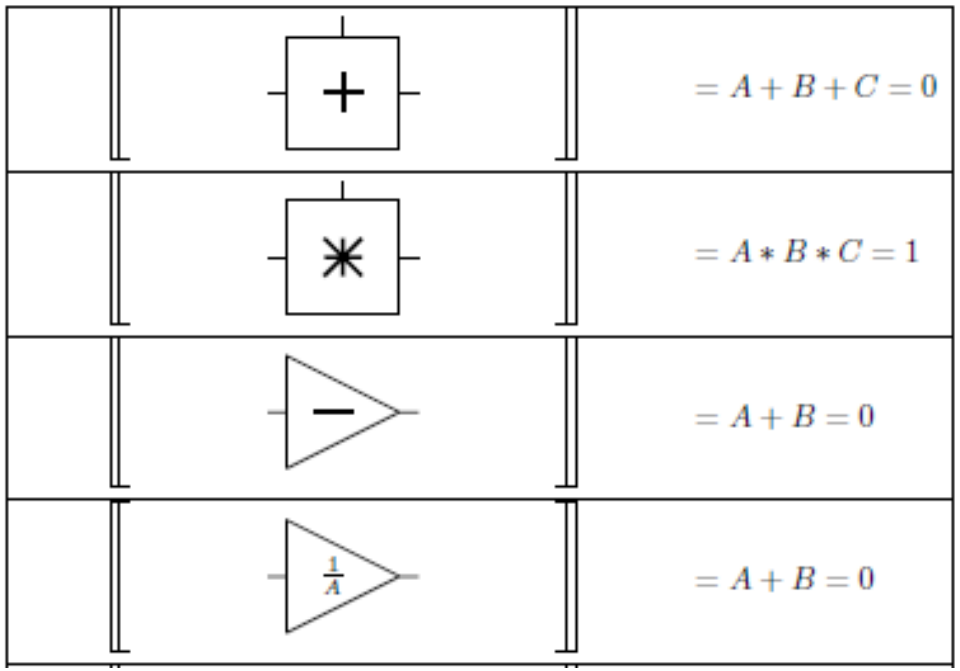
- Constant Block
- Input Block

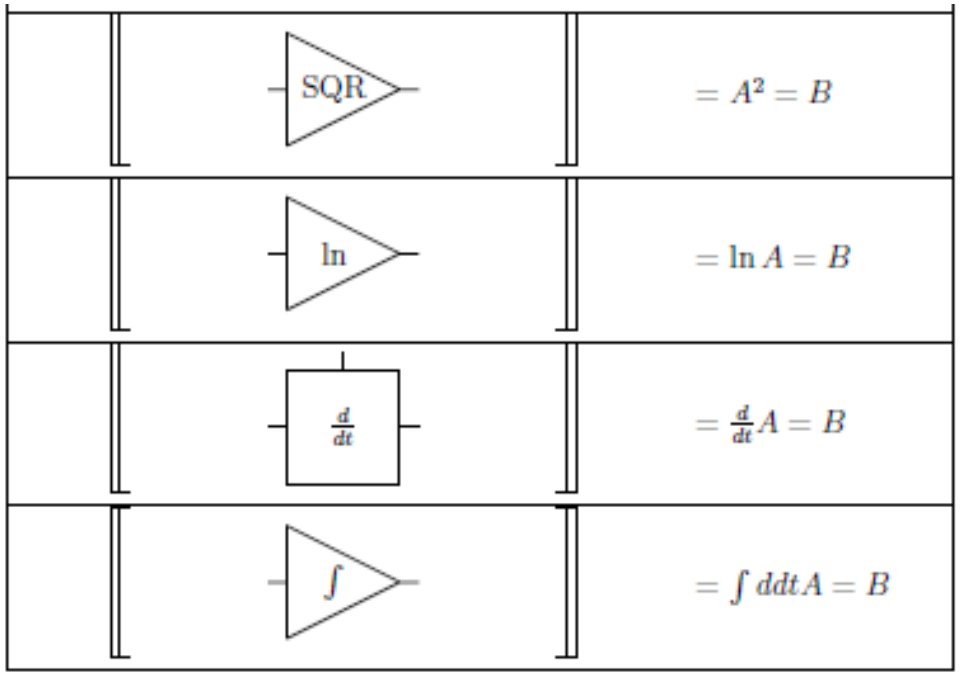
Port connected to output $\rightarrow$ input

Port connected to input $\rightarrow$ output

One output for every block

Corresponding operations





Transformation step

Natural a-causal blocks

- Just assign io causality

Unnatural a-causal blocks

- Unordered a-causal blocks
  - Transformation step necessary
- Ordered a-causal blocks
  - Choice of io differs

Testing the implementation

Unit tests

Two types

- Latex compiler tests
- CBD compiler tests

Latex compiler tests

Simple tests

1. Define an ABD
2. Check if the generated equations match (using regular expressions)

CBD compiler tests

1. Define a ABD
2. Generate the corresponding CBD
3. Run simulation of the resulting model
4. Test if output matches the expected output

Questions?