Module 11: Graphs

CPSC 110

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Learning goals

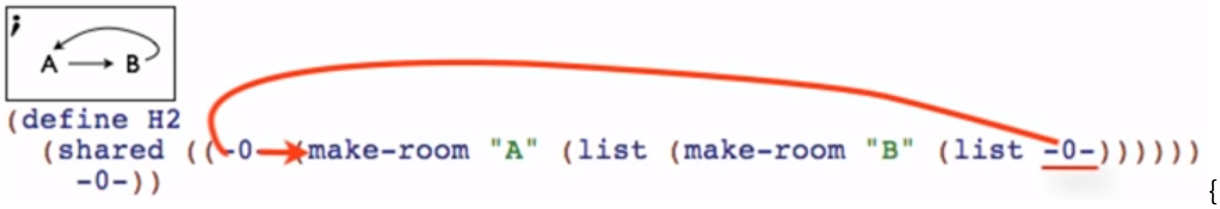
Key properties of graphs versus trees:

1. Include cycles
2. Can have multiple arrows leading to a single node

- Identify when domain information naturally forms a graph.
- Write data definitions for graphs.
- Construct cyclic data.
- Design templates that operate on graphs, using accumulators to prevent chasing infinite cycles in the graph.
- Ddesign functions that operate on graphs.

Cyclic Data

We use a keyword, `shared`, to textually create and represent cyclic structure.



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- H2 is a shared expression.
- `-0-` is a name for the result of the `make-room` expression for A.

Terminology

- **Acyclic Graph**: a graph without cycles
- **Directed Graph**: arrows go only in one direction
- **Directed Acyclic Graph (DAG)**: directed graph that cannot contain cycles; cannot visit the same node more than once by following edges