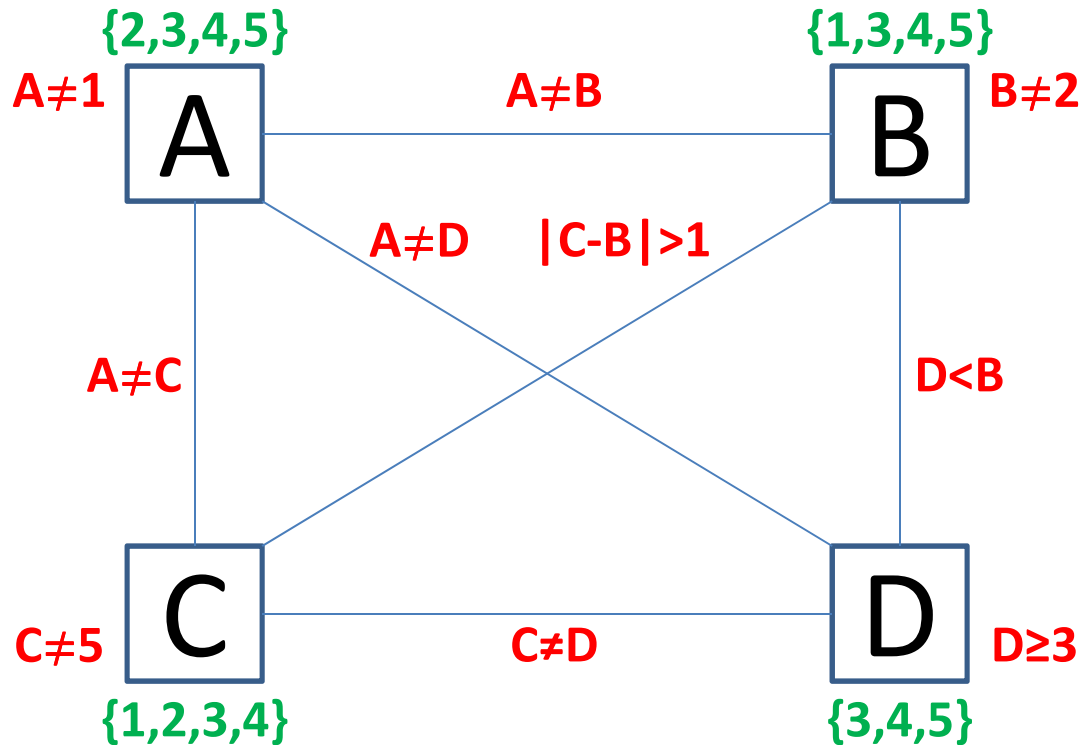


Exercises: Artificial Intelligence

Constraint Processing II & Waltz: The
4 Teachers problem

Problem Optimization

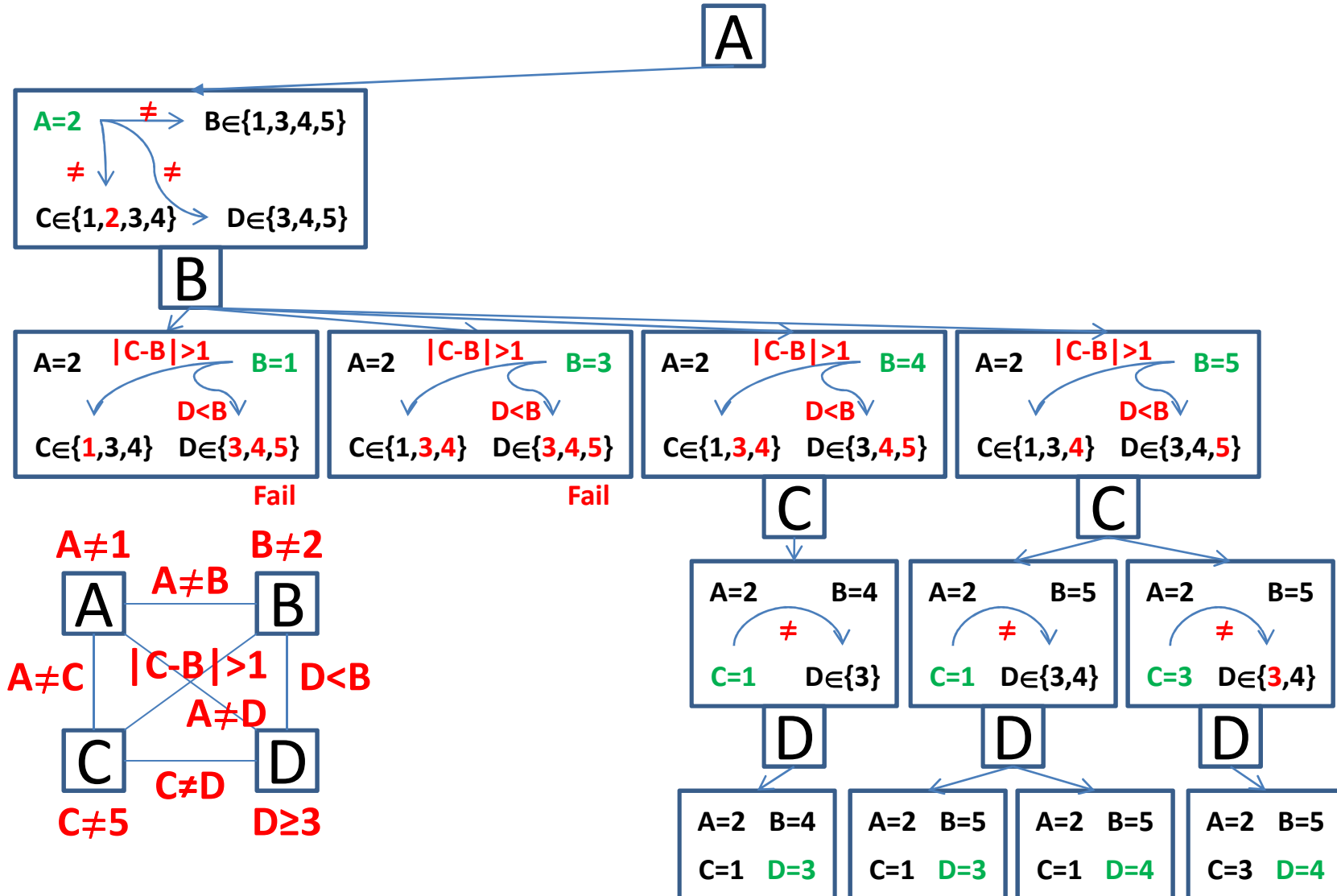
- Problem optimization:



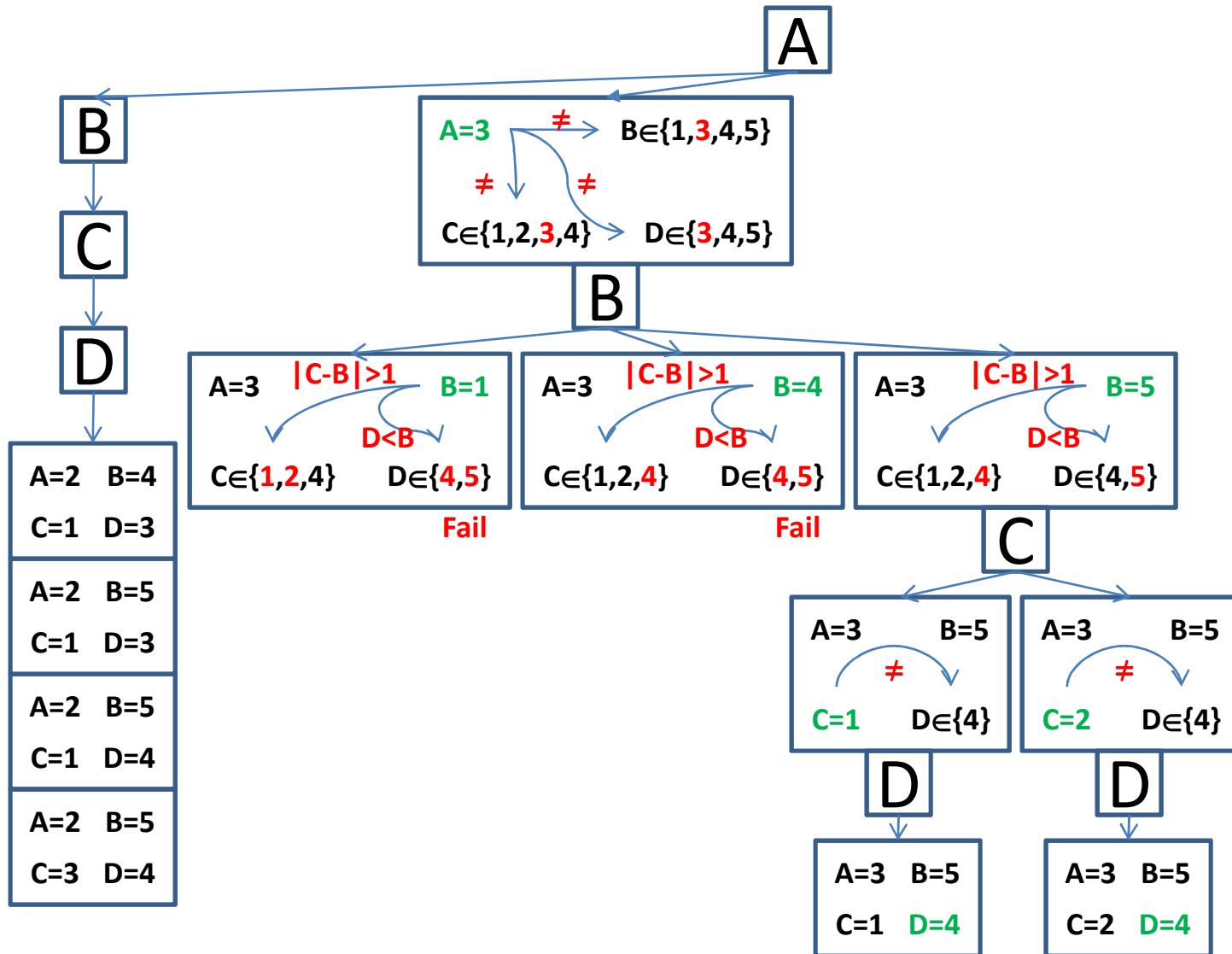
MiniMax & Constraint Processing: The 4 Houses problem

CONSTRAINT PROCESSING: FORWARD CHECKING

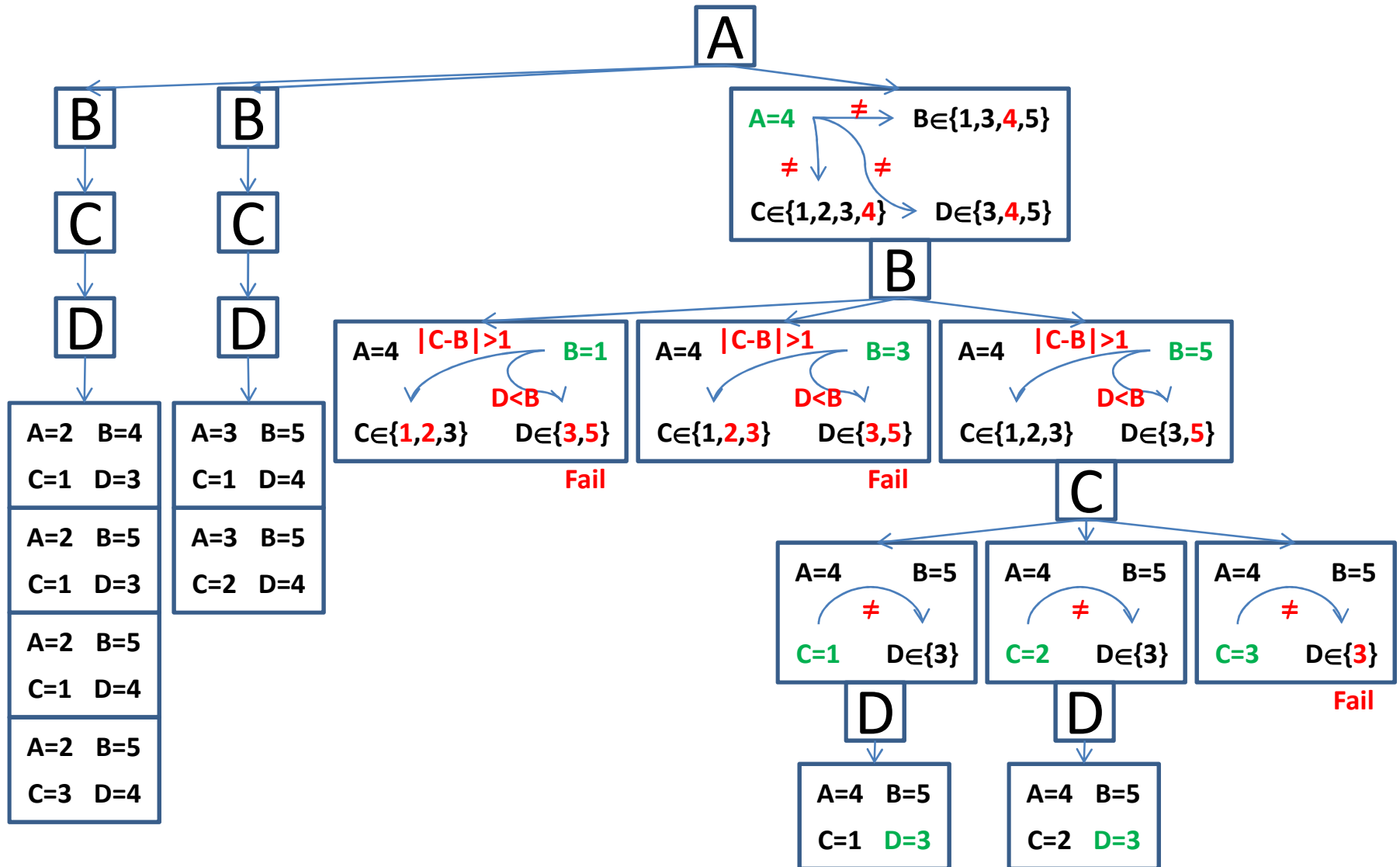
Forward Checking



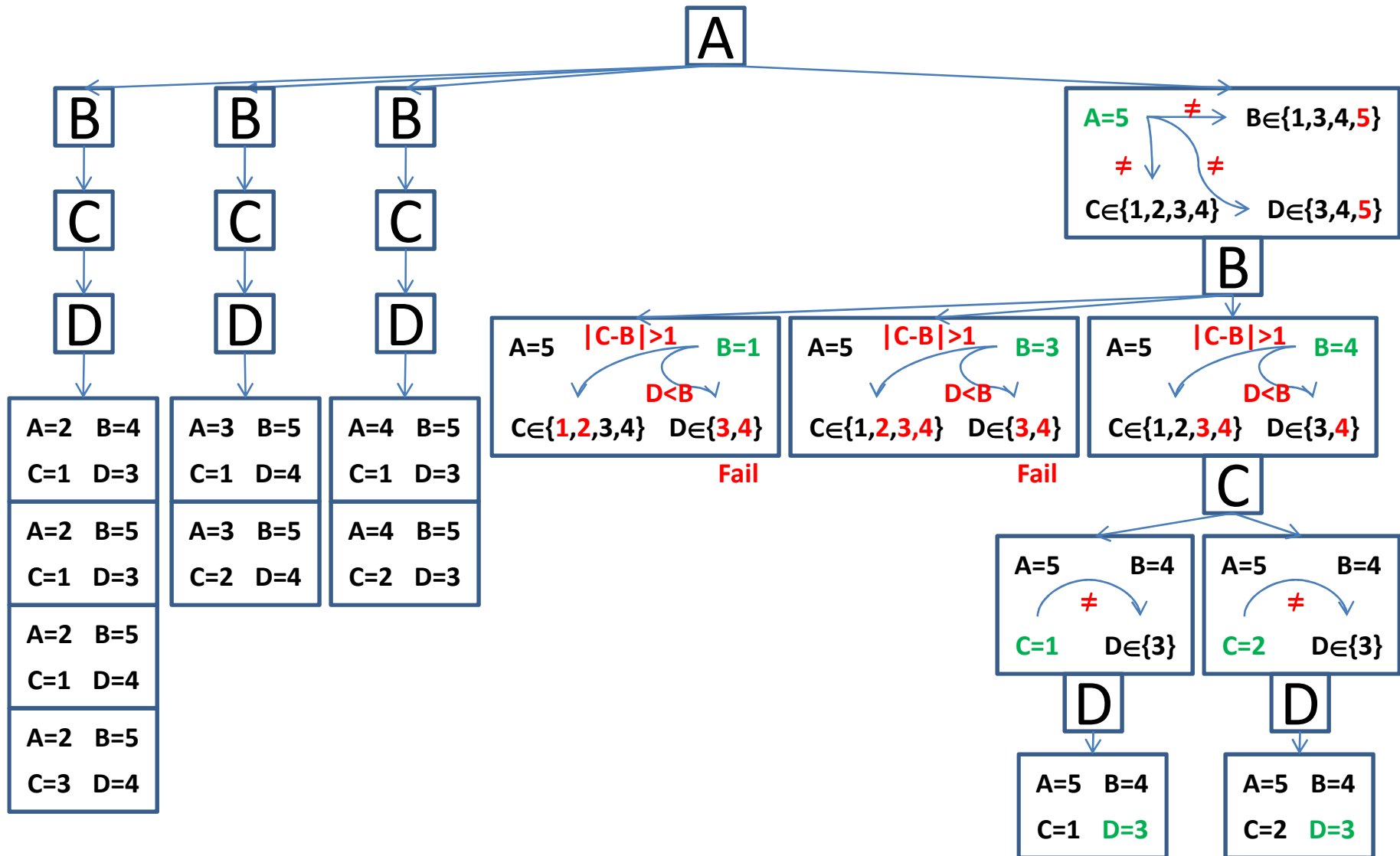
Forward Checking



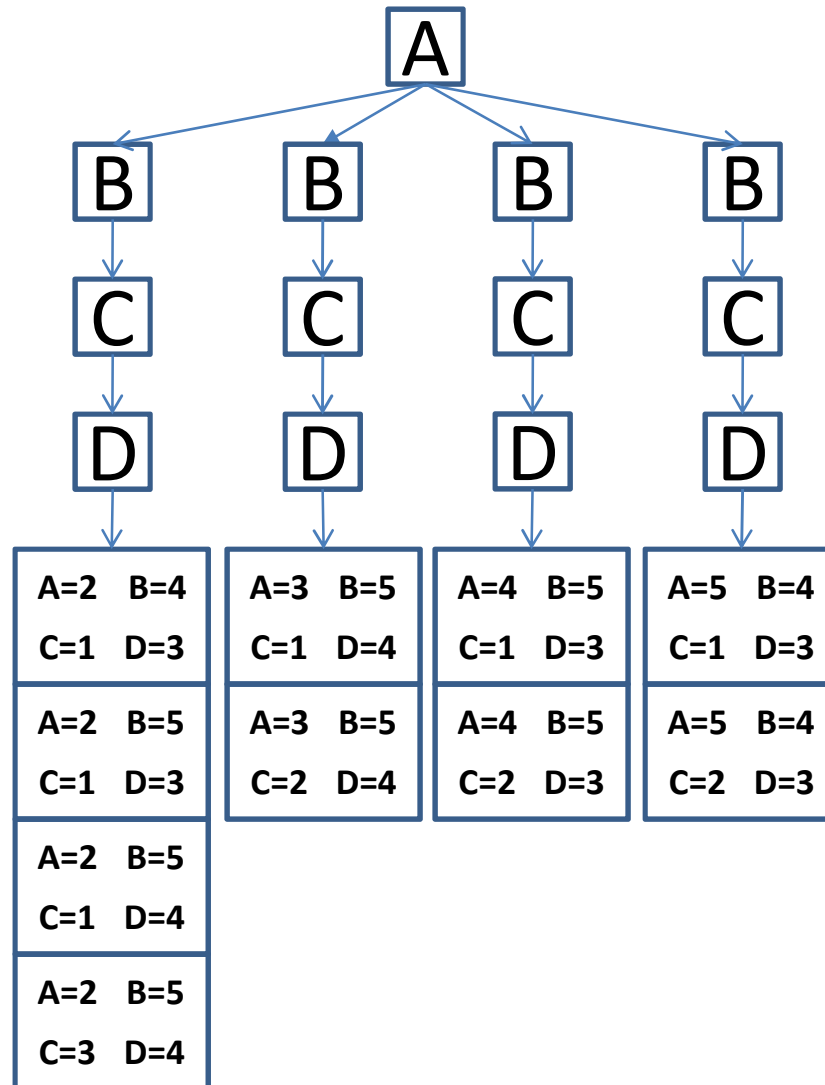
Forward Checking



Forward Checking



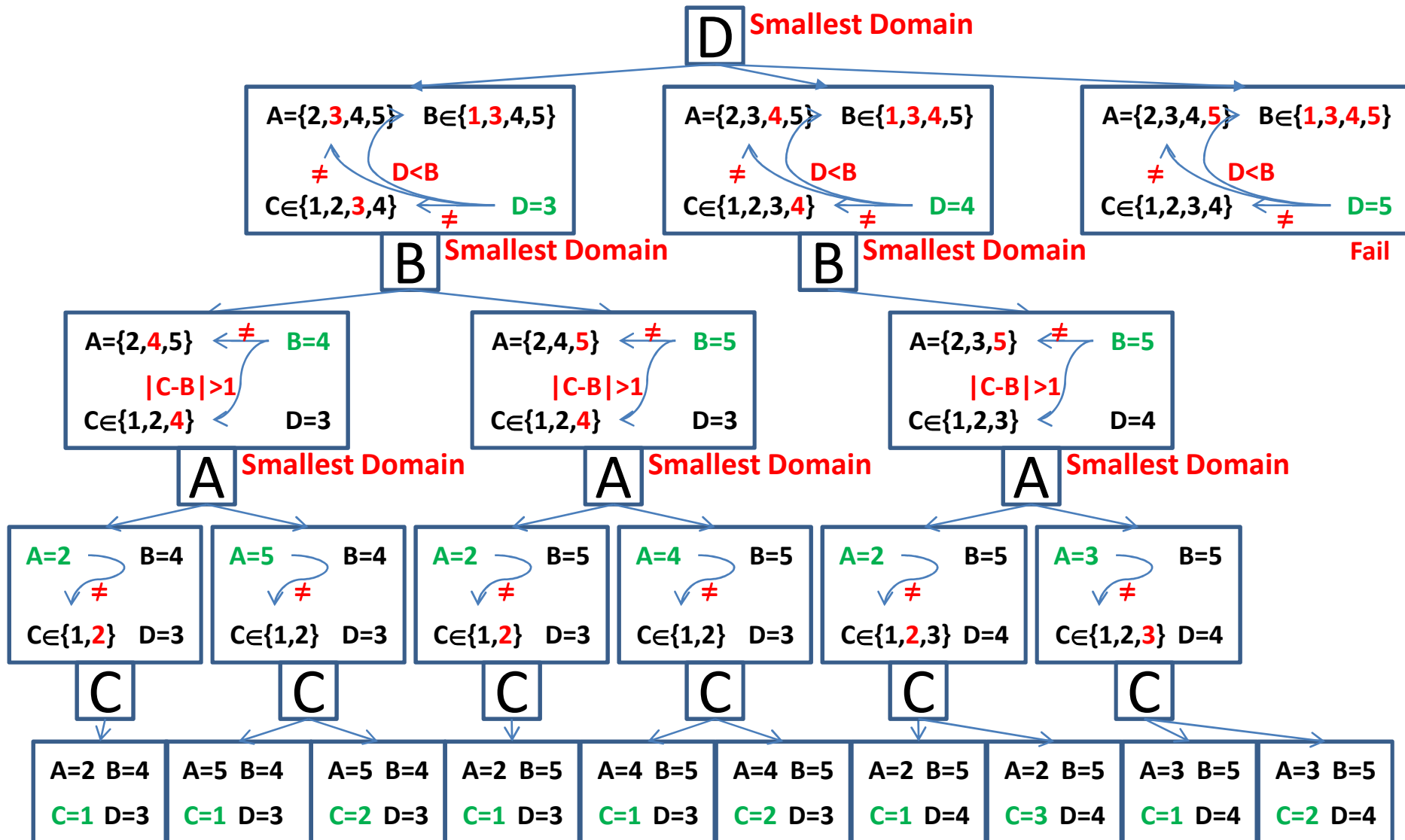
Forward Checking



MiniMax & Constraint Processing: The 4 Houses problem

CONSTRAINT PROCESSING: DYNAMIC SEARCH REARRANGEMENT FC

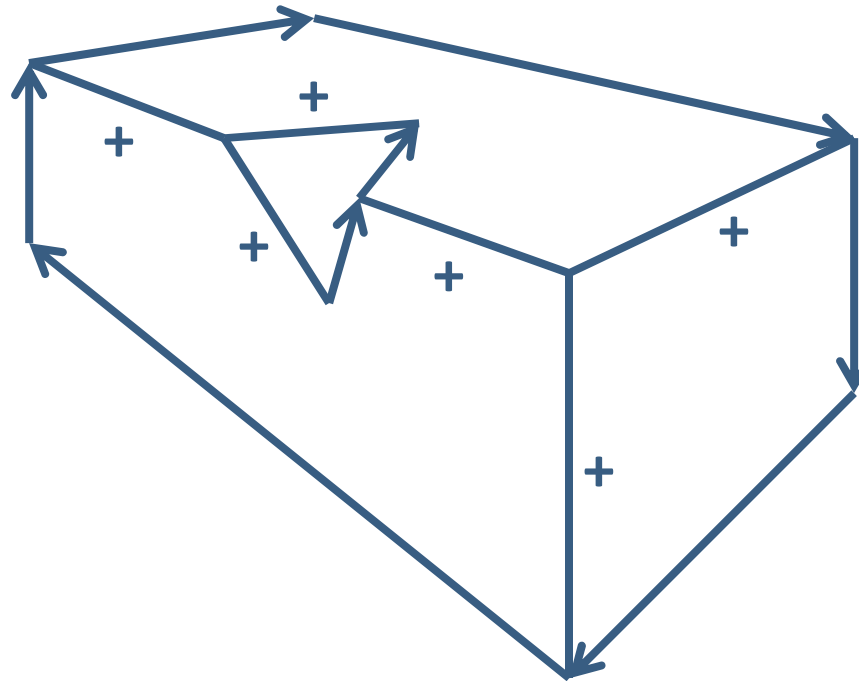
Dynamic Search Rearrangement FC



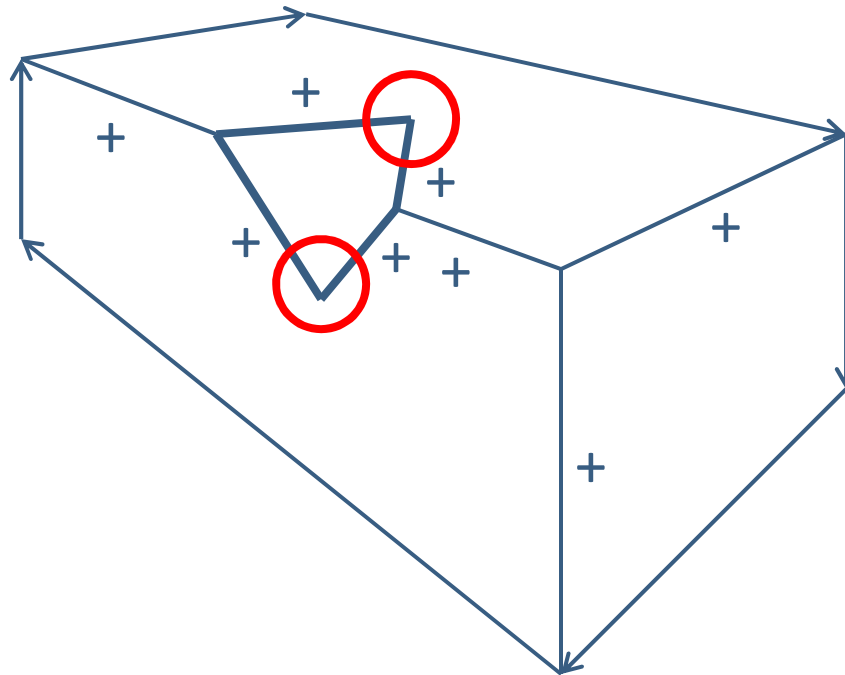
Exercises: Artificial Intelligence

Constraint Processing II & Waltz:
Waltz I

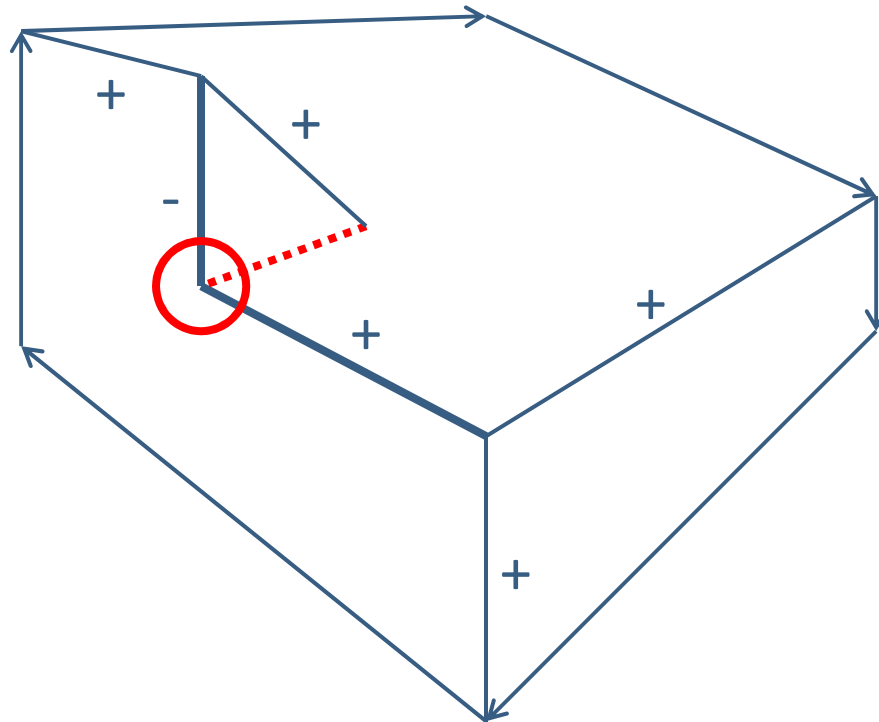
Solution



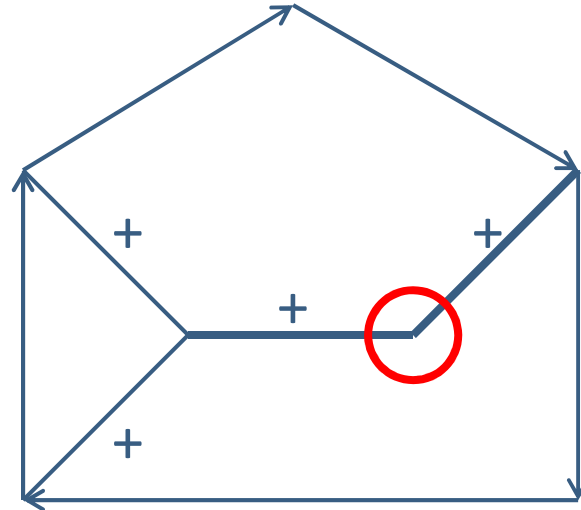
Solution



Solution

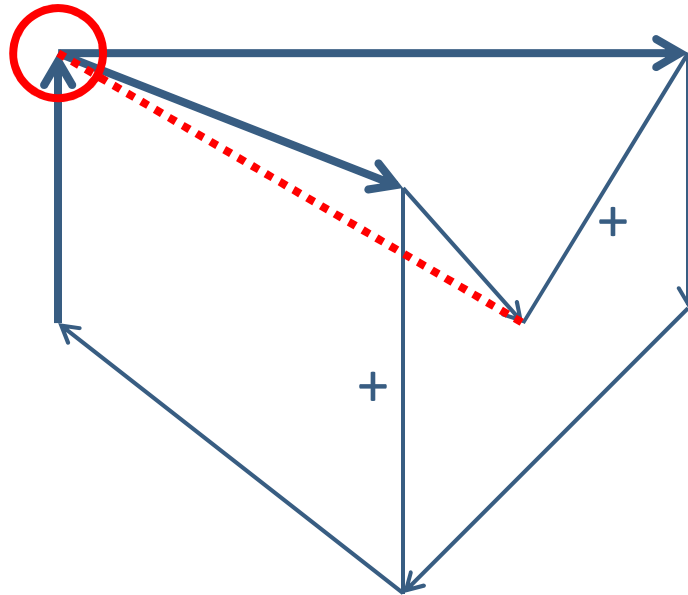


Solution



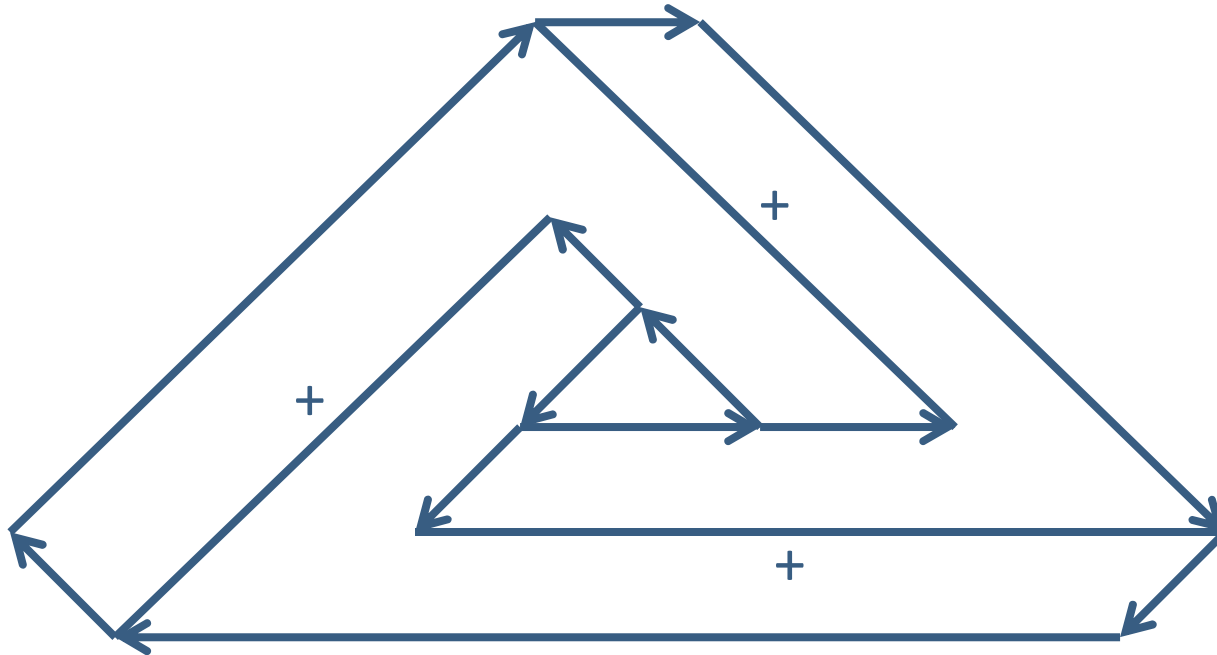
Solution

Line Drawing NOT allowed: 3-faced vertices!!



Solution

Drawing is locally correct, but is globally impossible.
Waltz procedure is local, thus, cannot detect this!

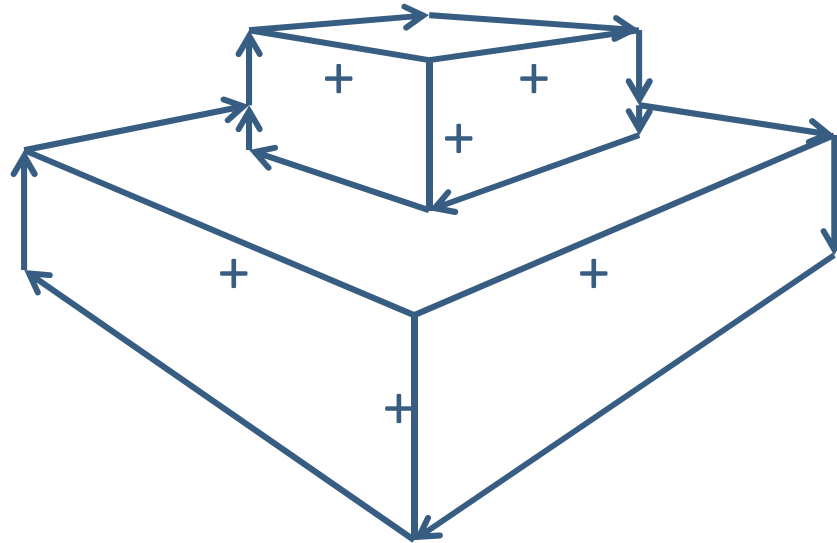


Exercises: Artificial Intelligence

Constraint Processing II & Waltz:
Waltz II

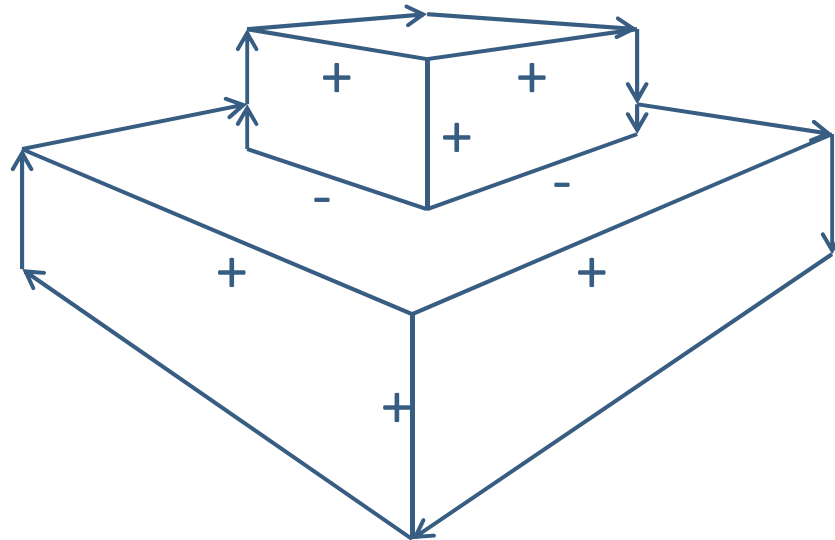
Solution

- Solution 1: Floating cube



Solution

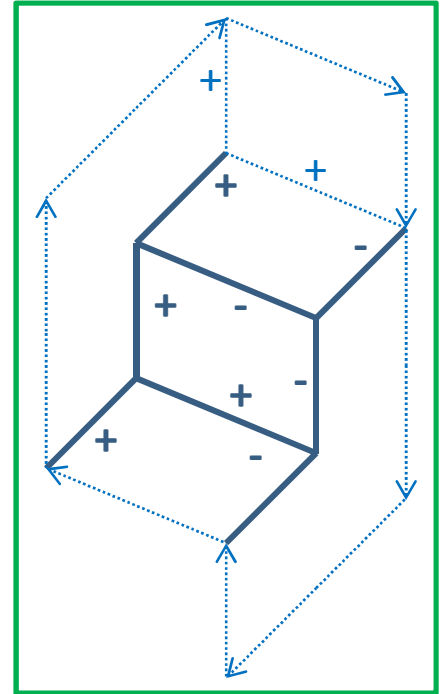
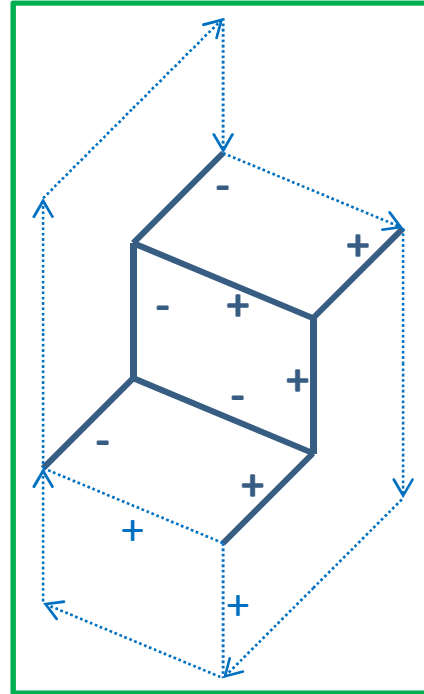
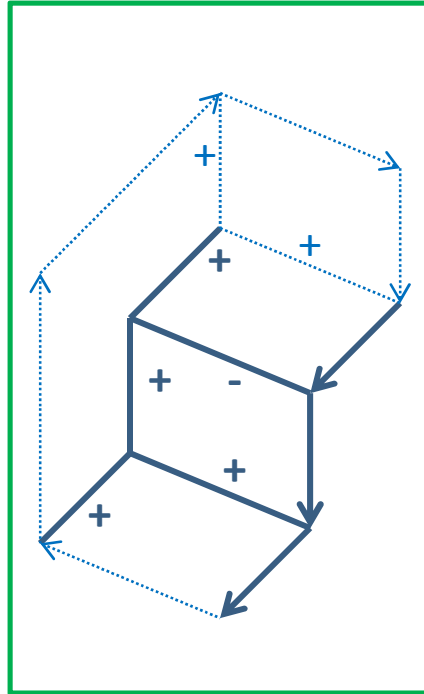
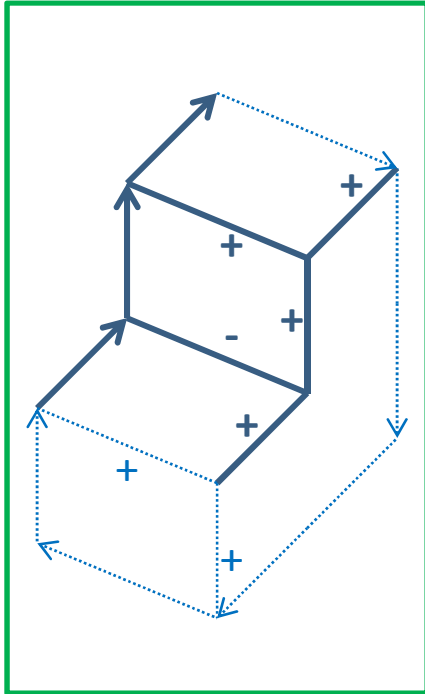
- Solution 2: Sitting cube



Exercises: Artificial Intelligence

Constraint Processing II & Waltz:
Waltz III

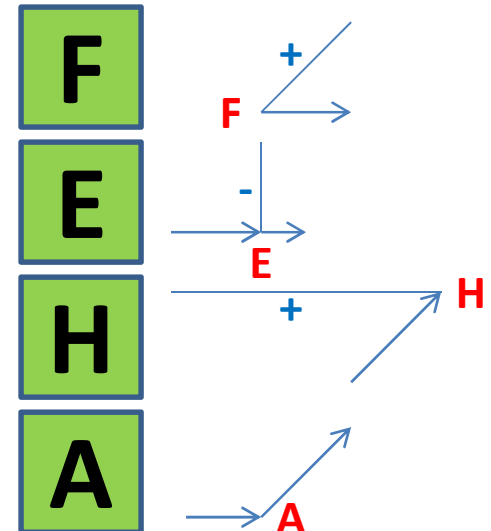
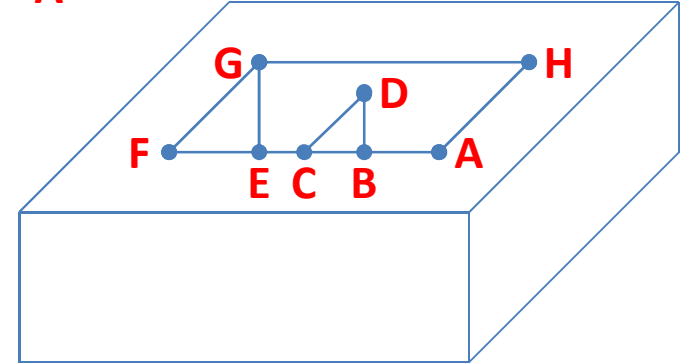
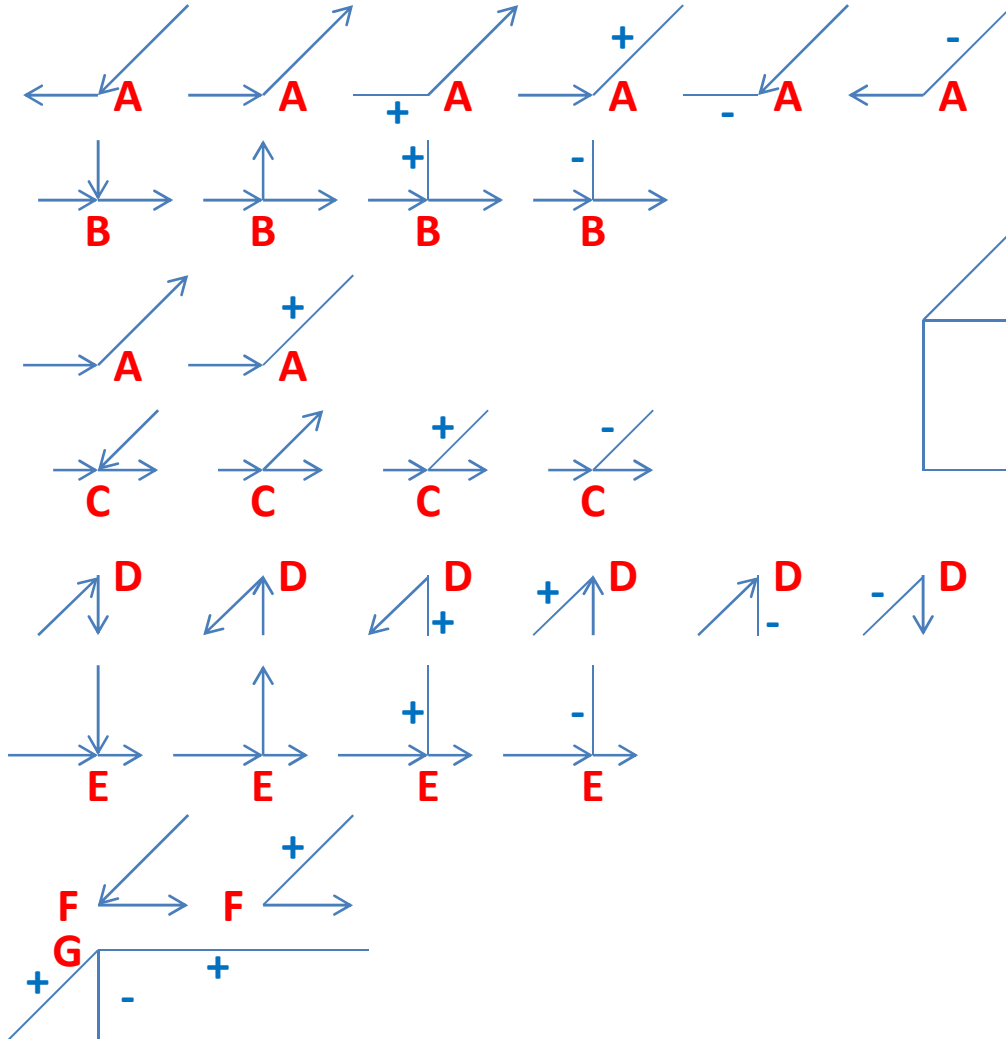
Solution



Exercises: Artificial Intelligence

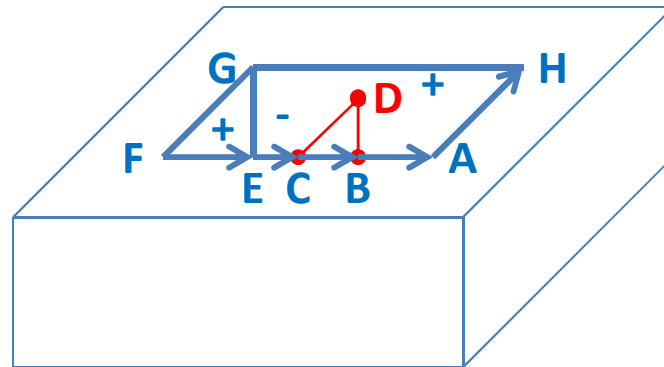
Constraint Processing II & Waltz:
Waltz IV

Solution



Solution

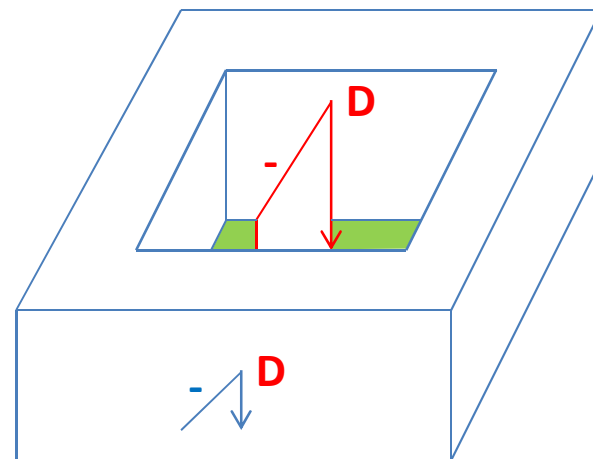
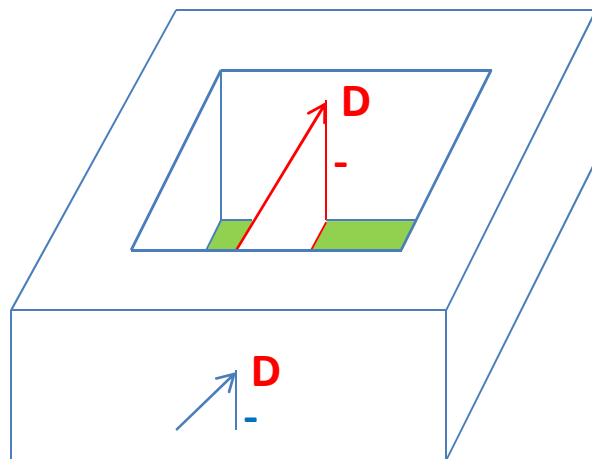
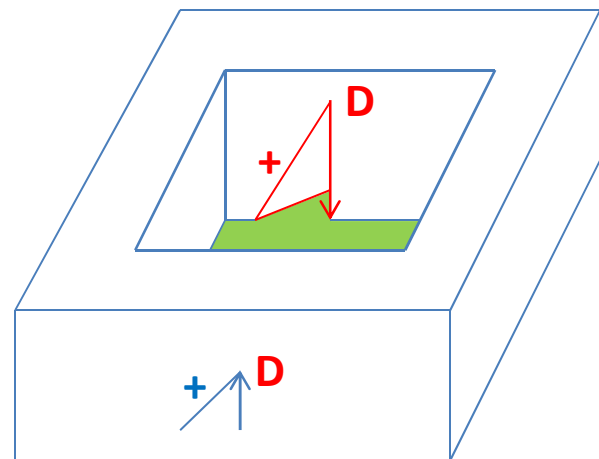
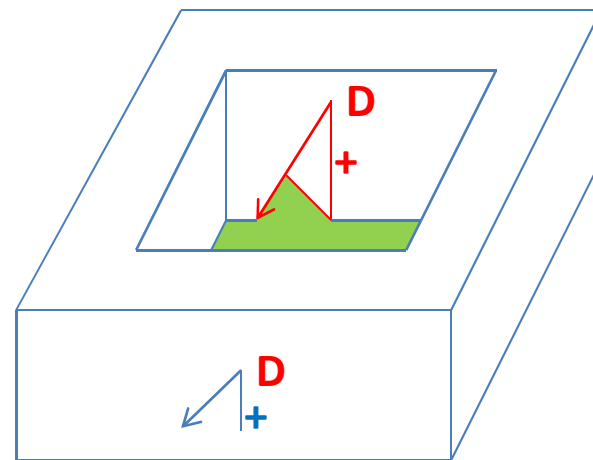
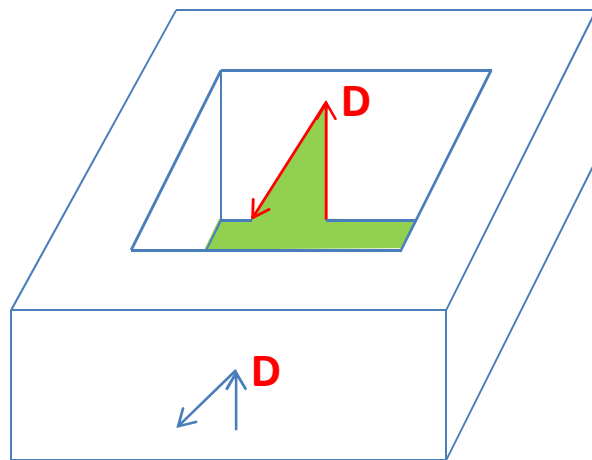
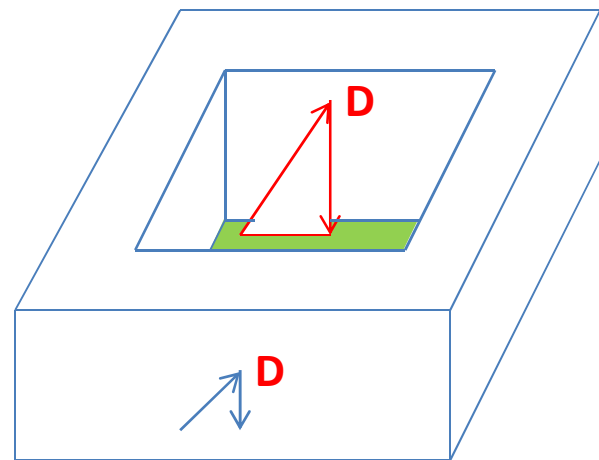
- We can determine **all nodes except for D**:



- **D** can still take **6 interpretations**:



Solution



Exercises: Artificial Intelligence

Constraint Processing II & Waltz:
Waltz V

Termination Waltz

- ***Waltz's procedure terminates if***
 - No possibilities for some vertex **OR**
 - No reduction of junction piles
- ***Waltz's procedure does not terminate if***
 - Only non-empty piles **AND**
 - Reduction of piles possible
- **BUT**
 - Piles are finite \implies Number of iterations finite
 \implies **Waltz's procedure terminates**