

# CPSC 322, Practice Exercise

## Arc Consistency

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### 1 Directed Questions

- What does it mean for an arc to be consistent?
- How can we enforce consistency of an arc  $\langle X, r(X, \bar{Y}) \rangle$  ?
- What does it mean for a network to be arc consistent?
- What are the possible outcomes of the arc consistency algorithm?

### 2 Arc Consistency

Consider the case where the arc consistency algorithm terminates and some domains have multiple values. Is there guaranteed to be a solution? Consider the CSP problem in Figure ??.

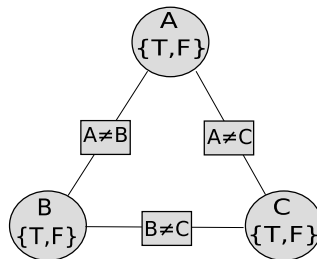


Figure 1: Sample Constraint Network

### 3 Learning Goals

You can:

- Build a constraint network for a set of constraints.
- Verify whether a network is arc consistent.
- Define/read/write/trace/debug the arc consistency algorithm. Compute its complexity and assess its possible outcomes.
- Define/read/write/trace/debug domain splitting and its integration with arc consistency.