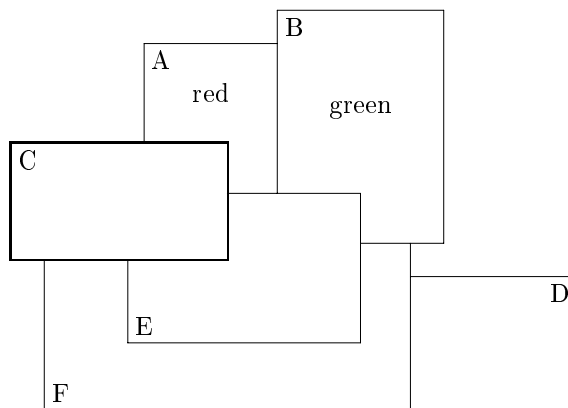# Constraint Satisfaction

Problem Definition (Map Coloring)

- Set of variables with domains: $A \in \{reg, green, blue\}, B \in \{reg, green, blue\}, ...$

- Constraints on variable assignments: $A \neq B, B \neq C, ...$

- Goal: variable assignments satisfying the constraints

Example: N-queens problem

Approaches

- Constraint Graph

- Backtracking Search

- Constraint Propagation (Forward Checking, Arc Consistency)

Heuristics

- Choose a variable with fewest values (after propagating the constraints).

- Choose a variable that appears in most constraints (minimizes the number of future steps).

- After selecting a variable choose a value that minimizes the constraints on the other variables (compare how $C = green$ and $C = blue$ affects E).