CS444

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Constraint Satisfaction Problems

- A CSP has three components:
  - X is a set of variables: $\{X_1, ..., X_n\}$.
  - D is a set of domains: $\{D_1, ..., D_n\}$.
  - C is a set of constraints.
    - Each C_i has the form $\langle scope, relation \rangle$
    - E.g.:
      $\langle (X_1, X_2), X_1 \neq X_2 \rangle$

Australia Map Coloring Example

- $X = \{WA, NT, Q, NSW, V, SA, T\}$
- $D_i = \{red, green, blue\}$ for all i.
- $C = \{SA \neq WA, SA \neq NT, ...\}$

Magic Squares example

Solving CSPs

- Constraint Propagation
- Search