Exam #2 - Review Sheet - Ramsey SP09
CSI 460: Artificial Intelligence

1. Local Search Algorithms

    (a) iterative improvement - constant space
    (b) Hill-climbing, options: random restarts, random sideways moves
    (c) Simulated annealing
    (d) Local beam search
    (e) Genetic Algorithms
    (f) Continuous state spaces, discretization, gradients, Newton-Rhapson iterations

2. Constraint Satisfaction Problems

    (a) Map-Coloring
    (b) Constraint Graph, directed and undirected
    (c) Varieties: Discrete Variables: Finite vs Infinite domains. linear constraints vs nonlinear. Continuous Variables
    (d) Varieties: Unary, Binary and higher-order constraint. Some constraints are "soft" and are just preferences
    (e) Examples of CSPs
    (f) Incremental search: try all until finding a legal one!
    (g) Backtracking Search (DFS) when a final assignment is conflicting, backtrack and change a single variable
    (h) Minimum remaining values, degree heuristic, least constraining value, forward checking, constraint propagation (arc consistency)

3. Adversarial Search

    (a) branching factor
    (b) utility of a state
    (c) state of the art, Chess in 1950 with Turing, machine learning, pruning
    (d) inefficiency is severely punished
    (e) optimal moves
    (f) minimax, initial state, successor fn, terminal test (terminal states), utility function
    (g) alpha-beta pruning
    (h) cutoff-test (Depth limit, quiescence search), terminal-test, eval vs utility
    (i) nondeterminism, expectiminimax