Topics covered by the midterm exam

1. What is AI (rational agent)?
    - Understand the basic concepts

2. Uninformed search (BFS, DFS, uniform-cost search, iterative deepening) – see HW1 for examples
    - Understand how they work on a state-space graph

3. Informed search (A*), heuristic function – see HW1 for examples
    - Understand how it works on a state-space graph

4. Local search (hill-climbing, simulated annealing, genetic algorithm) – Chapter 4
    - Understand how it works on a state-space graph

5. Adversarial search (minimax, alpha-beta pruning) – see HW 1 for examples
    - Understand how it works on a game tree

6. Propositional logic (transformation, CNF, resolution proof) – see HW1 and Quiz 1 for examples
    - Understand how to rewrite a given formula to CNF, and conduct resolution proof

7. First order logic (quantifiers) – Chapter 8 -- see Quiz 2 for examples
    - Understand first-order logic formulas with quantifiers

8. First order logic unification -- Chapter 9.2 – see Quiz 3 for examples
    - Understand how to conduct unification

9. First order logic resolution (transformation to CNF, Skolemization) – Chapter 9.5
    - Conduct a series of transformations to turn a given formula to CNF
    - Skolemization (to get rid of existential quantifiers)
    - Conduct resolution (via “unification”)

10. Planning (understanding the PDDL specification, action, pre-condition, effect) – Chapter 10.1
    - Understand the PDDL specification of a planning problem
    - Initial state, goal state, actions (pre-condition, effect)

Topics that won’t be tested in the mid-term exam

- Ontology and Semantic Networks
- Planning Graph, SAT-based Planning
- Implementation of SAT solvers (DPLL, conflict-driven clause learning, etc.)