

Artificial Intelligence

Chapters Reviews

Readings: Chapters 3-9, 11, 13, 14, 18, 20 of Russell & Norvig.

Topics covered in the final exam

- Solving problems by searching (Chap. 3)
 - How to formulate a search problem?
 - How to measure a search strategy?
 - What are popular uninformed search strategies?
- Informed search and exploration (Chap. 4)
 - What are the greedy best-first search and A*?
 - How to design and use a heuristic function?
 - What is local search? Hill-climbing? Simulated annealing?
 - What are Genetic Algorithms?

Topics covered in the final exam

- Adversarial Search
 - What's the minimax algorithm?
 - What's Alpha-Beta pruning?
- Propositional Logic (Chap. 7.1-7.5)
 - What are its syntax and semantics?
 - Validity vs. satisfiability?
 - How to obtain CNF?
 - What's the truth-table inference system?
 - What's the inference rule system?
 - What's resolution and its property?

Topics covered in the final exam

- Propositional Satisfiability (SAT) (Chap. 7.6)
 - How to formulate an instance of SAT?
 - What's a backtracking search?
 - What's DIMACS CNF format?
 - How to use local search for SAT?
- First-order Logic (Chap. 8)
 - What are its syntax and semantics?
 - What are quantifiers and their meaning?
 - What's a model of a FOL sentence?
 - How to use FOL to describe assertions and queries?

Topics covered in the final exam

- Inference in First-Order-Logic (Chap. 9)
 - Inference rules for quantifiers
 - Unification
 - Resolution
 - Resolution Strategies
 - Proof procedure
- Prolog (Chap. 9)
 - Prolog Syntax and Data Structure
 - Search Strategy
 - The Cut Operator
 - Close-word assumption and negation as failure

Topics covered in the final exam

- Planning (Chap. 11)
 - Planning as a search problem
 - STRIPS Language
 - State-Space Search
- Reasoning with Uncertainty (Chap. 13, 14)
 - Probability Basic
 - Full Joint Probability Distribution
 - Bayesian Networks

Topics covered in the final exam

- Learning (Chap. 18, 20.5)
 - Inductive Learning
 - Learning Decision Trees
 - Neural Networks
 - Perceptron Learning