Final Exam
Review / Study Guide

CS 1571, Fall 2008

Scope and Format

• Primarily Chapters 7-14 (sections from the syllabus), but still need to know search (Chapters 3-4)
  – Lectures (notes/in class)
  – Textbook
  – Homework assignments

• Closed book, in-class exam (Pitt exam schedule)
  – no make-up possibilities

• Question types same as midterm
  – multiple choice
  – short-answer
  – representation/problem solving
Search

• Problem Formulation (e.g., search space, operators, initial state, goal condition)

• Problem Solution (e.g., the methods for searching the search space)

• Properties of search methods (e.g., completeness, optimality, space and time complexity)

• Terminology

Propositional and First Order Logic

• Given an English description, translate it into propositional and/or FOL and/or Horn Clauses

• Given sentences in logic, prove whether a statement is entailed
  – Truth tables
  – Chaining
  – Resolution

• Compare and contrast different types of logic
  – Unification
  – Reduction to propositional
  – Search
KR/Planning

- Representation and Inference
  - Situation Calculus
  - STRIPS
  - POP
- Translation/Comparison
  - English -> Representation
  - Representation A -> Representation B
  - Relation to Search

Uncertainty

- Motivation/Differences from Logic
- Representation
  - random variables, atomic events
  - prior and conditional probability
  - definitions and axioms
  - distributions
- Inference via full joint distribution
- Bayes Rule
- (Conditional) Independence
Bayesian Networks

• Translation from English into a network
• Compute the probability of some outcome using the network
• Explanation and comparison of networks
  – Are two events in the network (conditionally) independent?
  – If multiple networks can model a scenario, why is one better than the other?
  – Comparison with FOL solution

Summary

• You should be able to formalize/represent a problem intuitively described in English
• You should be able to solve such a problem, once represented
• You should know the correct terminology

• You should be able to translate one formal representation into another
• You should be able to compare, contrast, and evaluate all the different representation and reasoning methods (e.g., with respect to expressiveness/tractability tradeoffs)