Final Exam
Review / Study Guide
CS 1571, Fall 2017
Scope and Format

- Chapters 7-22 (sections from the syllabus)
  - Lectures (notes/in class)
  - Textbook
  - Homework assignments

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

- Question types same as midterm
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
  – 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
Machine Learning

- Decision tree learning details
- Information gain computation
- Supervised learning literacy
- Evaluation approaches and metrics
Decision Making

• Formalize/solve making a rational decision given uncertain outcomes, using both expected value and utility.
Natural Language Processing

• Language Modeling
• Ngrams
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)