Final Exam
Review / Study Guide
CS 2710, Fall 2010
Scope and Format

• Primarily Chapters 10 and on (sections from the syllabus), but still need to know basics from first part of course
  – Lectures (notes/in class)
  – Textbook
  – Homework assignments

• Closed book, in-class exam
  – no make-up possibilities

• Question types same as midterm
  – True/false
  – short-answer
  – representation/problem solving
KR/Planning

• Representation and Inference
  – STRIPS
  – POP
  – GraphPlan
  – SatPlan

• Planning and KR 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
Decision making

A person wants to buy a car and she must decide between two used cars, car A and B. Car A costs $1,500, but its value is estimated to be at $2,000 if it is of good quality, so the buyer can make $500 by buying the car. If the quality is bad, the costs of repairs are $700 in which case the buyer would lose $200. Car B costs $1,150 which is $250 below its market value. Even if it is in bad condition, the repairs will cost at most $150.

The buyer knows that the chances that car A is of good quality are 0.7 and the chances that car B is of good quality are 0.8.

1. [4 points] Assume that the buyer's objective is to maximize the expected monetary value of her purchase. What is the best car to buy? Justify your answer.

2. [1 point] Why does money not always behave as a utility function? Explain in one or two sentences using the context of the car buying example above.
Machine Learning

- Decision tree learning
- Information gain computation
- Learning curves
- Training/development/testing/cross-validation
- Evaluation metrics
Communication

• (P)CFGs – writing and using
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).