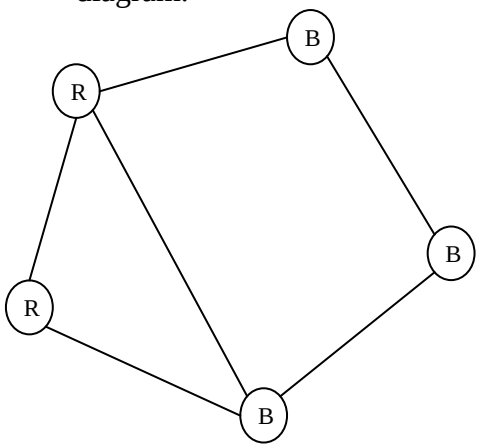
CSCI 3202 Final: Fall 2003

Name: _____

On my honor, as a University of Colorado at Boulder student, I have neither given nor received unauthorized assistance on this work. _____.

1. (10 Points) Consider the following 3 color graph coloring problem. Explain the MinConflict procedure by simulating its performance given the starting state in the diagram.



2. (5 Points) Precisely describe what it means when we say that a propositional logic knowledge-base entails a particular proposition.

3. (5 Points) Precisely describe what it means when we say that a propositional logic knowledge-base does not entail some particular proposition.

4. (10 Points) Consider the following Wumpus situation. The agent has traveled all the way to [1,4] where it finally detects a breeze. Show exactly what (and how) a logical agent can conclude about the presence of a pit in location [2,4]. Assume all the normal rules of the game apply.

1,4 B	2,4		
1,3	2,3		
1,2	2,2		
1,1	2,1		

5. (25 Points) Consider the following Belief Net problem. **Lung cancer** can cause **shortness of breath**; it can also reveal itself as a **spot** on a chest x-ray.

- **a)** Construct a belief net that captures these facts and show the tables that you would need.
- **b)** Given a patient with **shortness of breath** show how you would use the network to assess the probability of **lung cancer** in this patient.
- **c)** How would you assess the probability of a **spot** on an x-ray given **shortness of breath?**

6. (10 Points) The following question refers to the accompanying table. Given this data, construct a reasonable 2-dl decision list.

Training Instance	Label:	F1 Size	F2 Color	F3 Price
1	Yes	Large	Red	Expensive
2	Yes	Small	Green	Expensive
3	Yes	Large	Red	Cheap
4	Yes	Small	Blue	Expensive
5	Yes	Large	Red	Expensive
6	Yes	Small	Blue	Cheap
7	No	Large	Green	Cheap
8	No	Large	Blue	Expensive
9	No	Small	Red	Cheap
10	No	Small	Red	Cheap

7. (15 Points) At the core of most probabilistic language processing systems is the ability to assign a probability to a sequence of words.

a) Explain how this is normally done.

b) Describe two problems that are normally encountered with the basic method you described in part a) and give approaches to solving them.