Principles of Artificial Intelligence
Vasant Honavar
Fall 2006
Department of Computer Science
Iowa State University

Problem set 5
Due October 26 2007

Note: The problems marked with ** are targeted primarily to students enrolled in ComS 572; Others are of course encouraged to solve such problems for extra credit.

1. (20 pts) Solve Problem 13.3 from the Russell and Norvig text.
2. (20 pts) Solve Problem 13.5 from the Russell and Norvig text.
3. (20 pts) Solve Problem 13.6 from the Russell and Norvig text.
4. (20 pts) Solve Problem 13.8 from the Russell and Norvig text.
5. (20 pts) Solve Problem 13.10 from the Russell and Norvig text.
6. (20 pts) Solve Problem 13.13 from the Russell and Norvig text.
7. (20 pts) Solve Problem 13.15 from the Russell and Norvig text.
8. (20 pts) Solve Problem 13.16 from the Russell and Norvig text.
9. (20 pts) Solve Problem 14.3 from the Russell and Norvig text.
10. (20 pts) Solve Problem 14.4 from the Russell and Norvig text.
11. (20 pts) Solve Problem 14.7 a, b, c from the Russell and Norvig text.
12. (20 pts) Consider the Bayesian network shown at:
    http://www.cs.iastate.edu/~cs572/example-d-separation.png.
    Answer the following questions:
    - Is A independent of D?
    - Is A independent of D given of C?
    - Is A independent of D given E?
    - Is A independent of D given B and C?
• Is $E$ independent of $D$?
• Is $E$ independent of $D$ given $B$?

13. ** (20 pts.) Solve Problem 14.7 d from the Russell and Norvig text.

14. ** (20 pts.) Solve Problem 14.8 from the Russell and Norvig text.

15. ** (20 pts.) Solve Problem 14.10 from the Russell and Norvig text.

16. (20 pts.) Solve Problem 16.3 from the Russell and Norvig text.

17. (20 pts.) Solve Problem 16.4 from the Russell and Norvig text for $M_1 = 10,000$ dollars

18. (20 pts.) Solve Problem 16.11 from the Russell and Norvig text.

19. **(20 pts.) Solve Problem 16.12 from the Russell and Norvig text.