

# Principles of Artificial Intelligence

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Problem set 4

Due October 30 2009

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 13.7 from the Russell and Norvig text.
4. (20 pts.) Solve Problem 13.9 from the Russell and Norvig text.
5. (20 pts.) Solve Problem 13.11 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 14.1 a-d from the Russell and Norvig text.
10. (20 pts.) Solve Problem 14.2 from the Russell and Norvig text.
11. (20 pts.) Solve Problem 14.4 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.