

# CS599-Advanced Topics In Neural Computation and Statistical Learning

## Questions for Jordan&Bishop Chapter 2

1. What is a joint distribution?
2. What is a conditional distribution?
3. What is a marginal distribution?
4. What is statistical independence?
5. Why is the concept of graphical models useful?
6. What questions might we want to answer with statistical inference?
7. Why does knowledge of the joint distribution of all variables play such a central role?
8. How hard is it to find the joint distribution from data?
9. What is the difference between cyclic and acyclic graphs?
10. How can a joint distribution generically be factored into conditional distributions?
11. What does it mean to “factor a probability distribution”?
12. What is a topological ordering of graph nodes?
13. How can you prove independence in a graphical model?
14. What are evidence nodes?
15. What is Bayes Rule?
16. What is statistical elimination in a graphical model?
17. What is an elimination clique?
18. What is moralization and a “moral graph” in a graphical model?
19. How does the elimination algorithm work?
20. Why are undirected graphs useful for inference in graphical models?
21. What are the limitations of the elimination algorithm?
22. What is a Markov Chain?
23. What means “explaining away”?
24. Can graph separation directly used to find out about conditional independence?
25. How does the Bayes Ball algorithm work?
26. What is a Markov Random Field?
27. How does the graph-theoretic visualization of the conditional independence definition change for undirected graphs?
28. Can directed graphs always be represented as undirected graphs, and vice versa?
29. Are conditional probabilities a good local factorization in undirected graphs?
30. What is a maximal clique?
31. What is a good local representation for undirected graphs?
32. Are marginal distributions a candidate for local potential functions?
33. How does one calculate conditional probabilities in undirected graphs?