

36-707: Regression Analysis Homework 7 Solutions

Fall 2007

Problem 1 I gave full credit for effort.

Problem 2

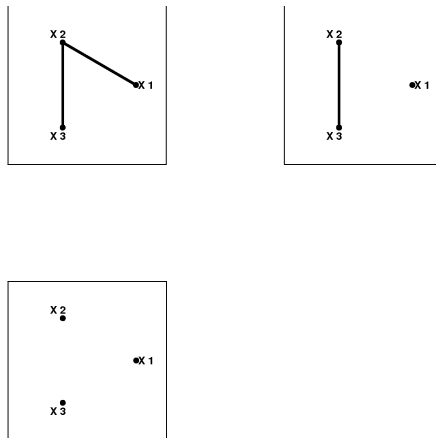


Figure 1: These are the graphs with the fewest number of edges that have the given independence relations for question 2.

Problem 3

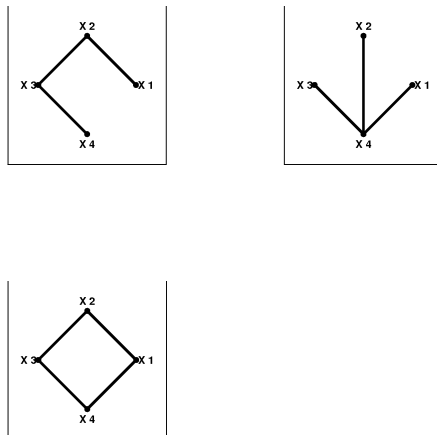


Figure 2: These are the graphs with the fewest number of edges that have the given independence relations for question 3.

Problem 4

a. Anything that wasn't hierarchical for example $\log(f(x)) = \psi_0 + \psi_1(x) + \psi_2(x) + \psi_{12}(x) + \psi_{13}(x)$

b. Consider $X \perp\!\!\!\perp Y|W, Z$ and $W \perp\!\!\!\perp Z|X, Y$. Then all of the variables are both ancestors and descendants which is impossible.

Problem 5

Both models imply $x_1:x_2:x_3$ and $x_2:x_3:x_4$

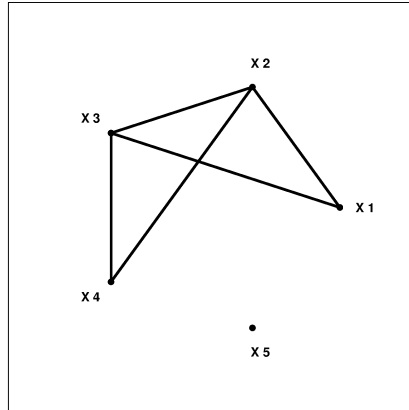


Figure 3: Graph for model described in question 5.

Problem 6

- a. $X_1 \parallel X_3 | rest, X_4 \parallel X_3 | rest, X_1 \parallel X_4 | rest$
- b. $X_1 \parallel X_3, X_4 | rest, X_2 \parallel X_4 | rest$
- c. $X_1 \parallel X_3 | rest, X_2 \parallel X_4 | rest$
- d. $X_1 \parallel X_4, X_5, X_6 | rest, X_2 \parallel X_6 | rest, X_4 \parallel X_3 | rest, X_4 \parallel X_6 | rest$