

Homework 1: Bayesian Networks, Chapter 3

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Given a directed acyclic graph G , we defined two sets of independencies associated with G :

1. The set of local independencies

$$I_\ell(G) = \{(X \perp Y | Z) \mid Y \text{ is not a descendant of } X \text{ and } Z \text{ is the set of parents of } X\}$$

2. The set of independencies, which is based on the notion of d-separation, defined in class

$$I(G) = \{(X \perp Y | Z) \mid X \text{ and } Y \text{ are d-separated given } Z\}$$

Prove that $I_\ell(G) \subseteq I(G)$.