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Probabilistic Networks and Expert Systems

With 45 Illustrations

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Contents

ILLUSTRATION SAMPLE

under the re-representation of P as factorizing over $\mathcal{D}^m$, some of the conditional independence properties displayed in the original DAG $\mathcal{D}$, such as the one between *n5* and *n6* given *n2* in Figure 3.1, may lose their representation in graphical form. They still hold, but are now effectively buried in the quantitative component of the model. Only those conditional independence properties that retain a representation in the graph $\mathcal{D}^m$ are exploited in the further analysis.

3.2.2 From moral graph to junction tree

The passage from moral graph to junction tree proceeds in the same way, regardless of the type of the initial graph. The first stage is to add sufficient edges to the moral graph, to make the resulting graph $(\mathcal{K}^m)'$ *triangulated* or *chordal*. Algorithms to do this are discussed in Section 4.4 below. The result is shown in Figure 3.4. The joint distribution, which factorizes on the

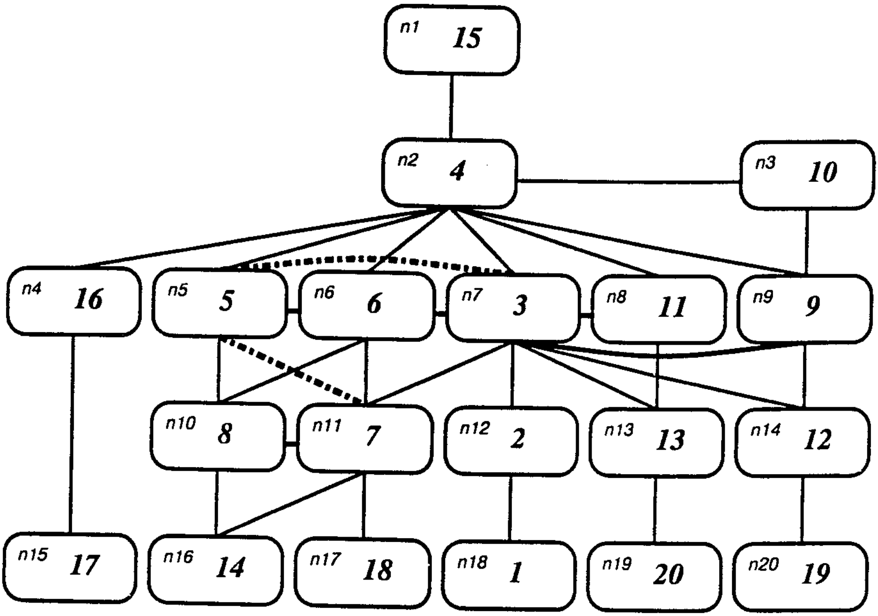

FIGURE 3.4. A triangulation of the moral graph of Figure 3.2, showing a perfect ordering of the nodes arising from maximum cardinality search (Algorithm 4.9).

moral graph $\mathcal{K}^m$, will also factorize on the larger triangulated graph $(\mathcal{K}^m)'$, since each clique in the moral graph will be either a clique or a subset of a clique in the triangulated graph. Hence, by a simple rearrangement of terms, we can transform the joint density into a product of factors on the