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Exercise sheet 11 - Machine Intelligence I

11.1 - Cliques

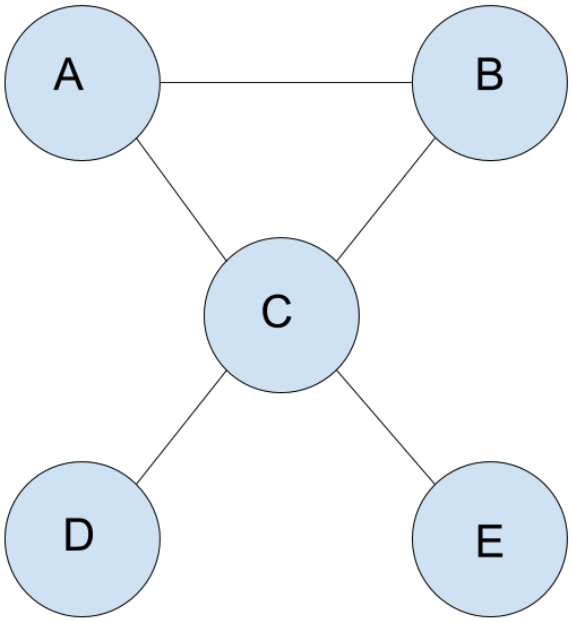
In the given graph, we have 10 vertices and 17 edges. These make up 10 1-vertex cliques and 17 2-vertex cliques. We also identify the 3-vertex cliques consisting of vertices
$\{A, C, H\}, \{A, C, G\}, \{B, C, D\}, \{B, C, G\}, \{C, H, I\}, \{G, H, I\}$. There is also one 4-vertex clique, among the vertices $\{C, G, H, I\}$.

11.2 - Cliques and Separators

(a)

The moralized graph of the DAG is an undirected graph where additional connections are added between nodes that share a child in the DAG.

Figure 1: Moralization of the DAG



(b)

The 1-vertex cliques are all the vertices of the moral graph, the 2-vertex cliques are formed by all the vertex pairs that are directly connected, and the

only 3-vertex in the graph consists of $\{A, BC\}$. The separators of the graph are $\{C\}, \{A, C\}, \{B, C\}, \{C, D\}, \{C, E\}, \{A, B, C\}, \{A, C, E\}, \{A, C, D\}, \{B, C, D\}, \{B, C, E\}$.