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WHEN IS A POSET ISOMORPHIC TO THE POSET OF CONNECTED INDUCED SUBGRAPHS OF A GRAPH?

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Abstract. Suppose G is a finite connected graph. Let $C(G)$ denote the inclusion ordering on the connected vertex-induced subgraphs of G. Resolving a problem posed by Steve Steinsaltz, we characterize posets that arise in this way. In particular, we show that, for a finite poset P, there exists a finite graph G such that $C(G) \cong P$ if and only if P is atom-height and properly semimodular. We present a similar characterization for infinite posets.

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