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Exercise 4.2.24: Hamiltonian path in DAGs. Given a DAG, design a linear-time algorithm to determine whether there is a directed path that visits each vertex exactly once.

Solution:

Recall Hamiltonian path is a path that visits every *vertex* atmost exactly once. Eulers path reaches every *edge* exactly once but can pass through a vertex more than once(since vertices may well be crossed more than once). So Hamiltonian is mainly for vertices while eulers is more for reachability of edges.

Something like 0,1,2,3,4,5,6 is a VALID path, Topological path, and a hamiltonian path.

Good concept: If we do topological sort and see direct edge between 2 nodes, then it is a hamiltonian path. We can't have edge going in opposite direction for topological order(TO). If only one unique path topological order, then it is a Hamiltonian path. If you have consecutive edges, then also a Hamiltonian path.