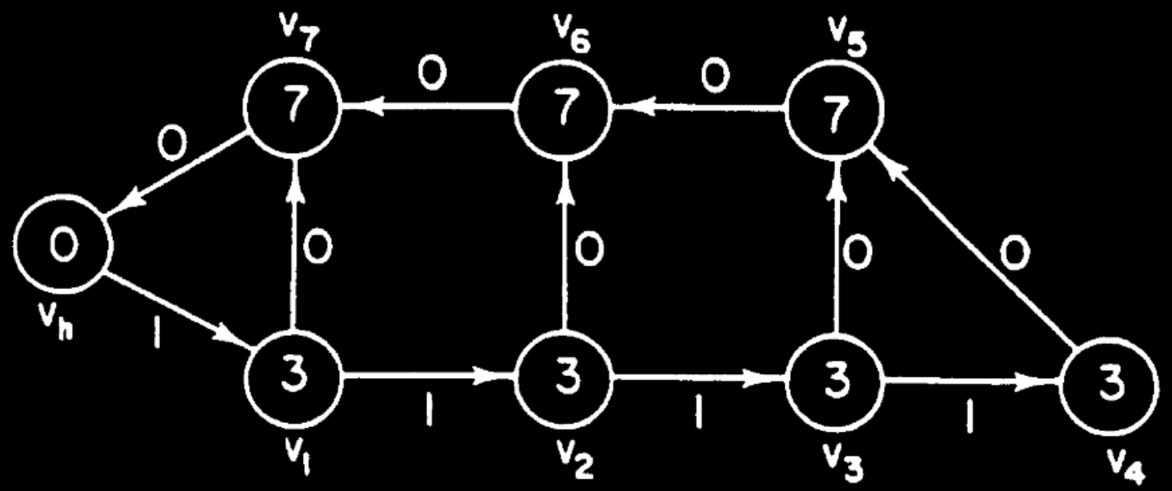
The problem

A *retiming* of a circuit $G = \langle V, E, d, w \rangle$ is a function $r : V \mapsto \mathbb{Z}$ that transforms G into $G_r = \langle V, E, d, w_r \rangle$, where

$$w_r(e) = w(e) + r(v) - r(u).$$



Algorithm CP

Compute the clock period $\Phi(G)$ for a synchronous circuit G.

1. Let G_0 be the (acyclic) subgraph of G that contains precisely those edges $e : w(e) = 0$.

2. Perform a topological sort on G_0.

3. Go through the vertices in the topological order. For each vertex v

   A. if there is no incoming edge to v, set $\Delta(v) \leftarrow d(v)$;

   B. otherwise, set $\Delta(v) \leftarrow d(v) + \max\{\Delta(u) : u \xrightarrow{e} v \text{ and } w(e) = 0\}$.

4. $\Phi(G) = \max\{\Delta(v)\}$.