Algorithm OPT1

Given a synchronous circuit G, determine a retiming r such that $\Phi(G_r)$ is as small as possible.

1. Compute W and D using Algorithm WD.

2. Sort the elements in the range of D.

3. Binary search among the elements $D(u, v)$ for the minimum achievable clock period. To test whether each potential clock period is feasible, apply the Bellman-Ford algorithm to determine whether the conditions in Theorem 7 can be satisfied.

4. For the minimum achievable clock period, use the values for the $r(v)$ found by the Bellman-Ford algorithm as the optimal retiming.

Algorithm OPT1

Complexity

- Time complexity: $\mathcal{O}(V^3 \log V)$.
- Space complexity: $\mathcal{O}(V^2)$.