# MAXIMIZE THE SCORE

Editorial

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## 1 Key Observations

Since each operation is either multiplication or addition, the more nodes we traverse in a path, the more our score can increase.

If we choose a node $x$ with an incoming edge from $y$, we can potentially obtain a higher score by choosing node $y$ first. Therefore, we should start from nodes with no incoming edges. Let us call these nodes **Good** nodes.

We can use topological sorting to sort all the nodes and then traverse them in that order. There may be more than one **Good** node.

Let $dp[i]$ represent the maximum score that can be achieved by traveling from any Good node to the $i$-th node.

Then, for each node $x$ in topological order, we examine all the nodes $j$ that have edges leading to $x$ (using the reve rse adjacency list).

The state $dp[i]$ can then be defined as the maximum of all $dp[j]$ values, followed by the maximum score from applying either of the two operations at node $i$.

## 2 Complexity Analysis

- **Topological Sort:** $O(n + m)$
- **DP Computation:** For each node, we iterate over its predecessors — also $O(n + m)$

Hence, the overall time complexity is efficient for the given constraints: $n \leq 30$, $m \leq \frac{n(n-1)}{2}$.