KHAN’S ALGORITHM

TIME COMPLEXITY ANALYSIS:

1. Constructing the in-degree vector and adjacency list takes O(V+E) time. This is because we need to iterate over all the edges to calculate the in-degree of each vertex and build the adjacency list.
2. Enqueuing all vertices with in-degree 0 initially takes O(V) time since we iterate once over all vertices. During the algorithm execution, each vertex is enqueued and dequeued at most once, so the total time for queue operations is O(V).
3. For each edge in the graph, we perform constant-time operations such as decrementing the in-degree of adjacent vertices. Since each edge is processed once, the total time for processing edges is O(E).

Finally the time complexity of Kahn’s algorithm is O(V+E) where V is the number of vertices and E is the number of edges in the graph. It is one of the method to solve topological ordering.