

PromptScratchpadOur Solution(s)Video Explanation

Run Code

Solution 1Solution 2

```
1 // Copyright © 2020 AlgoExpert, LLC. All rights reserved.
2
3 // O(j + d) time | O(j + d) space
4 function topologicalSort(jobs, deps) {
5   const jobGraph = createJobGraph(jobs, deps);
6   return getOrderedJobs(jobGraph);
7 }
8
9 function createJobGraph(jobs, deps) {
10  const graph = new JobGraph(jobs);
11  for (const [prereq, job] of deps) {
12    graph.addPrereq(job, prereq);
13  }
14  return graph;
15 }
16
17 function getOrderedJobs(graph) {
18  const orderedJobs = [];
19  const {nodes} = graph;
20  while (nodes.length) {
21    const node = nodes.pop();
22    const containsCycle = depthFirstTraverse(node, orderedJobs);
23    if (containsCycle) return [];
24  }
25  return orderedJobs;
26 }
27
28 function depthFirstTraverse(node, orderedJobs) {
29  if (node.visited) return false;
30  if (node.visiting) return true;
31  node.visiting = true;
32  for (const prereqNode of node.prereqs) {
33    const containsCycle = depthFirstTraverse(prereqNode, orderedJobs);
34    if (containsCycle) return true;
35  }
36  node.visited = true;
37  node.visiting = false;
38  orderedJobs.push(node.job);
39  return false;
40 }
41
42 class JobGraph {
43   constructor(jobs) {
44     this.nodes = [];
45     this.graph = {};
46     for (const job of jobs) {
47       this.addNode(job);
48     }
49   }
50
51   addPrereq(job, prereq) {
52     const jobNode = this.getNode(job);
53     const prereqNode = this.getNode(prereq);
54     jobNode.prereqs.push(prereqNode);
55   }
56
57   addNode(job) {
58     this.graph[job] = new JobNode(job);
59     this.nodes.push(this.graph[job]);
60   }
61
62   getNode(job) {
63     if (!(job in this.graph)) this.addNode(job);
64     return this.graph[job];
65   }
66 }
67
68 class JobNode {
69   constructor(job) {
70     this.job = job;
71     this.prereqs = [];
72     this.visited = false;
73     this.visiting = false;
74   }
75 }
76
77 exports.topologicalSort = topologicalSort;
78
```