

PromptScratchpadOur Solution(s)Video Explanation

Run Code

Solution 1Solution 2

```
9      return getOrderedJobs(jobGraph);
10    }
11
12    public static JobGraph createJobGraph(List<Integer> jobs, List<Integer[]> deps) {
13      JobGraph graph = new JobGraph(jobs);
14      for (Integer[] dep : deps) {
15        graph.addDep(dep[0], dep[1]);
16      }
17      return graph;
18    }
19
20    public static List<Integer> getOrderedJobs(JobGraph graph) {
21      List<Integer> orderedJobs = new ArrayList<Integer>();
22      List<JobNode> nodesWithNoPrereqs = new ArrayList<JobNode>();
23      for (JobNode node : graph.nodes) {
24        if (node.numOfPrereqs == 0) {
25          nodesWithNoPrereqs.add(node);
26        }
27      }
28      while (nodesWithNoPrereqs.size() > 0) {
29        JobNode node = nodesWithNoPrereqs.get(nodesWithNoPrereqs.size() - 1);
30        nodesWithNoPrereqs.remove(nodesWithNoPrereqs.size() - 1);
31        orderedJobs.add(node.job);
32        removeDeps(node, nodesWithNoPrereqs);
33      }
34      boolean graphHasEdges = false;
35      for (JobNode node : graph.nodes) {
36        if (node.numOfPrereqs > 0) {
37          graphHasEdges = true;
38        }
39      }
40      return graphHasEdges ? new ArrayList<Integer>() : orderedJobs;
41    }
42
43    public static void removeDeps(JobNode node, List<JobNode> nodesWithNoPrereqs) {
44      while (node.deps.size() > 0) {
45        JobNode dep = node.deps.get(node.deps.size() - 1);
46        node.deps.remove(node.deps.size() - 1);
47        dep.numOfPrereqs--;
48        if (dep.numOfPrereqs == 0) nodesWithNoPrereqs.add(dep);
49      }
50    }
51
52    static class JobGraph {
53      public List<JobNode> nodes;
54      public Map<Integer, JobNode> graph;
55
56      public JobGraph(List<Integer> jobs) {
57        nodes = new ArrayList<JobNode>();
58        graph = new HashMap<Integer, JobNode>();
59        for (Integer job : jobs) {
60          addNode(job);
61        }
62      }
63
64      public void addDep(Integer job, Integer dep) {
65        JobNode jobNode = getNode(job);
66        JobNode depNode = getNode(dep);
67        jobNode.deps.add(depNode);
68        depNode.numOfPrereqs++;
69      }
70
71      public void addNode(Integer job) {
72        graph.put(job, new JobNode(job));
73        nodes.add(graph.get(job));
74      }
75
76      public JobNode getNode(Integer job) {
77        if (!graph.containsKey(job)) addNode(job);
78        return graph.get(job);
79      }
80    }
81
82    static class JobNode {
83      public Integer job;
84      public List<JobNode> deps;
85      public Integer numOfPrereqs;
86
87      public JobNode(Integer job) {
88        this.job = job;
89        deps = new ArrayList<JobNode>();
90        numOfPrereqs = 0;
91      }
92    }
93  }
94 }
```