Parallel Courses III

You are given an integer n, which indicates that there are n courses labeled from 1 to n. You are also given a 2D integer array relations where relations[j] = [prevCourse$_j$, nextCourse$_j$] denotes that course prevCourse$_j$ has to be completed **before** course nextCourse$_j$ (prerequisite relationship). Furthermore, you are given a **0-indexed** integer array time where time[i] denotes how many **months** it takes to complete the (i+1)th course.

You must find the **minimum** number of months needed to complete all the courses following these rules:

- You may start taking a course at **any time** if the prerequisites are met.

- **Any number of courses** can be taken at the **same time**.

Return *the **minimum** number of months needed to complete all the courses*.

Note: The test cases are generated such that it is possible to complete every course (i.e., the graph is a directed acyclic graph).

Example 1:

3 months
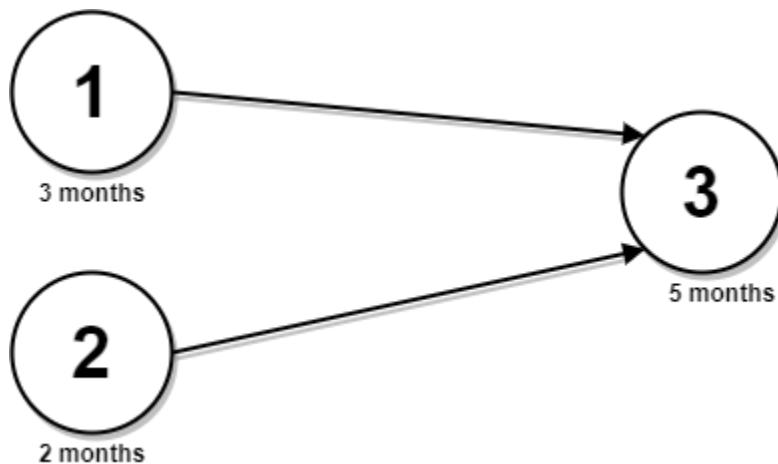
5 months

2 months

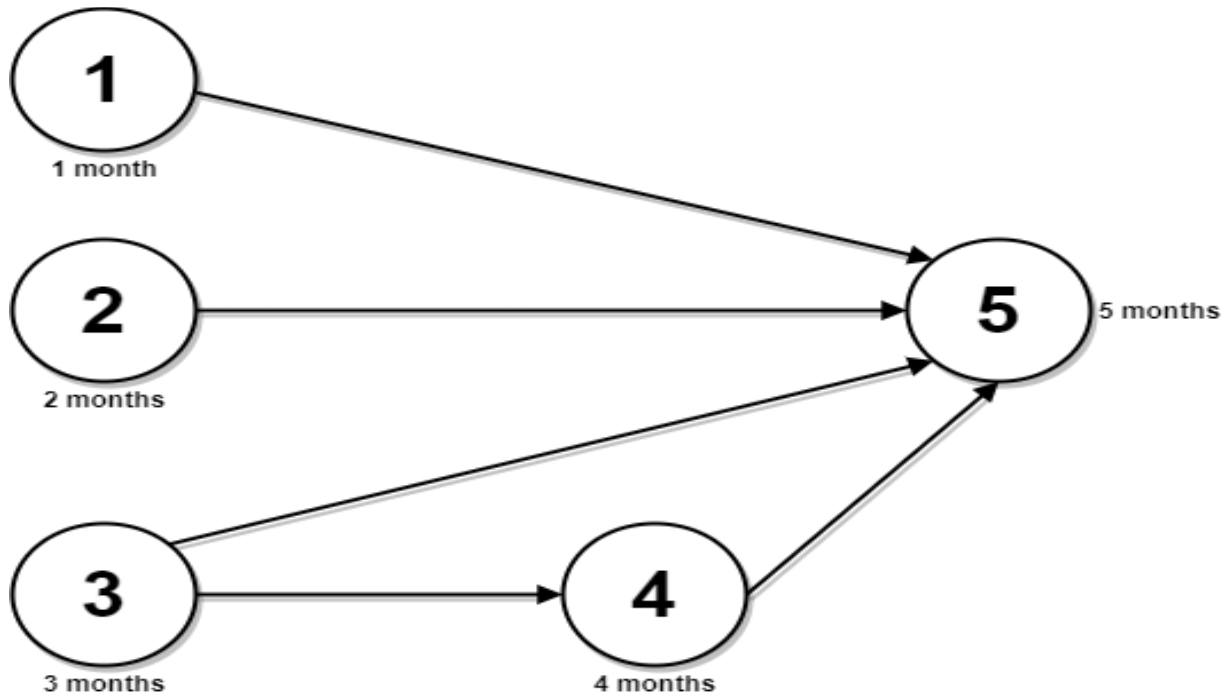**Input:** n = 3, relations = [[1,3],[2,3]], time = [3,2,5]

Output: 8

Explanation: The figure above represents the given graph and the time required to complete each course.

We start course 1 and course 2 simultaneously at month 0.

Course 1 takes 3 months and course 2 takes 2 months to complete respectively.

Thus, the earliest time we can start course 3 is at month 3, and the total time required is 3 + 5 = 8 months.

Example 2:

Input: n = 5, relations = [[1,5],[2,5],[3,5],[3,4],[4,5]], time = [1,2,3,4,5]

Output: 12

Explanation: The figure above represents the given graph and the time required to complete each course.

You can start courses 1, 2, and 3 at month 0.

You can complete them after 1, 2, and 3 months respectively.

Course 4 can be taken only after course 3 is completed, i.e., after 3 months. It is completed after 3 + 4 = 7 months.

Course 5 can be taken only after courses 1, 2, 3, and 4 have been completed, i.e., after max(1,2,3,7) = 7 months.

Thus, the minimum time needed to complete all the courses is 7 + 5 = 12 months.

Constraints:

- $1 <= n <= 5 * 10^4$
- $0 <= relations.length <= min(n * (n - 1) / 2, 5 * 10^4)$
- relations[j].length == 2
- $1 <= prevCourse_j, nextCourse_j <= n$
- $prevCourse_j != nextCourse_j$
- All the pairs [prevCourse_j, nextCourse_j] are **unique**.
- time.length == n
- $1 <= time[i] <= 10^4$
- The given graph is a directed acyclic graph.