

# Problem 1136: Parallel Courses

## Problem Information

**Difficulty:** Medium

**Acceptance Rate:** 61.91%

**Paid Only:** Yes

**Tags:** Graph, Topological Sort

## Problem Description

You are given an integer `n`, which indicates that there are `n` courses labeled from `1` to `n`. You are also given an array `relations` where `relations[i] = [prevCoursei, nextCoursei]`, representing a prerequisite relationship between course `prevCoursei` and course `nextCoursei`: course `prevCoursei` has to be taken before course `nextCoursei`.

In one semester, you can take **any number** of courses as long as you have taken all the prerequisites in the **previous** semester for the courses you are taking.

Return **the minimum** number of semesters needed to take all courses\_. If there is no way to take all the courses, return `-1`.

**Example 1:**



**Input:** `n = 3, relations = [[1,3],[2,3]]` **Output:** `2` **Explanation:** The figure above represents the given graph. In the first semester, you can take courses 1 and 2. In the second semester, you can take course 3.

**Example 2:**



**Input:** `n = 3, relations = [[1,2],[2,3],[3,1]]` **Output:** `-1` **Explanation:** No course can be studied because they are prerequisites of each other.

**\*\*Constraints:\*\***

\* `1 <= n <= 5000` \* `1 <= relations.length <= 5000` \* `relations[i].length == 2` \* `1 <= prevCoursei, nextCoursei <= n` \* `prevCoursei != nextCoursei` \* All the pairs `[prevCoursei, nextCoursei]` are **\*\*unique\*\***.

## Code Snippets

### C++:

```
class Solution {
public:
    int minimumSemesters(int n, vector<vector<int>>& relations) {

    }
};
```

### Java:

```
class Solution {
    public int minimumSemesters(int n, int[][] relations) {

    }
}
```

### Python3:

```
class Solution:
    def minimumSemesters(self, n: int, relations: List[List[int]]) -> int:
```