

Problem 1203: Sort Items by Groups Respecting Dependencies

Problem Information

Difficulty: Hard

Acceptance Rate: 65.63%

Paid Only: No

Tags: Depth-First Search, Breadth-First Search, Graph, Topological Sort

Problem Description

There are `n` items each belonging to zero or one of `m` groups where `group[i]` is the group that the `i`-th item belongs to and it's equal to `-1` if the `i`-th item belongs to no group. The items and the groups are zero indexed. A group can have no item belonging to it.

Return a sorted list of the items such that:

* The items that belong to the same group are next to each other in the sorted list. * There are some relations between these items where `beforeItems[i]` is a list containing all the items that should come before the `i`-th item in the sorted array (to the left of the `i`-th item).

Return any solution if there is more than one solution and return an **empty list** if there is no solution.

Example 1:

Input: n = 8, m = 2, group = [-1,-1,1,0,0,1,0,-1], beforeItems = [[], [6], [5], [6], [3, 6], [], [], []]

Output: [6,3,4,1,5,2,0,7]

Example 2:

Input: n = 8, m = 2, group = [-1,-1,1,0,0,1,0,-1], beforeItems = [[], [6], [5], [6], [3], [], [4], []]

Output: [] **Explanation:** This is the same as example 1 except that 4 needs to be before 6 in the sorted list.

****Constraints:****

```
* `1 <= m <= n <= 3 * 104` * `group.length == beforeItems.length == n` * `-1 <= group[i] <= m - 1` * `0 <= beforeItems[i].length <= n - 1` * `0 <= beforeItems[i][j] <= n - 1` * `i != beforeItems[i][j]` * `beforeItems[i]` does not contain duplicates elements.
```

Code Snippets

C++:

```
class Solution {  
public:  
    vector<int> sortItems(int n, int m, vector<int>& group, vector<vector<int>>& beforeItems) {  
  
    }  
};
```

Java:

```
class Solution {  
public int[] sortItems(int n, int m, int[] group, List<List<Integer>>  
beforeItems) {  
  
}  
}
```

Python3:

```
class Solution:  
    def sortItems(self, n: int, m: int, group: List[int], beforeItems:  
List[List[int]]) -> List[int]:
```