75 Days of Code
Day 43
Problem no : 841
Problem Title : Keys and Rooms
Type : Graph / DFS

There are n rooms labeled from 0 to n - 1 and all the rooms are locked except for room 0. Your goal is to visit all the rooms. However, you cannot enter a locked room without having its key.

When you visit a room, you may find a set of distinct keys in it. Each key has a number on it, denoting which room it unlocks, and you can take all of them with you to unlock the other rooms.

Given an array rooms where rooms[i] is the set of keys that you can obtain if you visited room i, return true if you can visit all the rooms, or false otherwise.

Example 1:

Input: rooms = [[1],[2],[3],[]]
Output: true
Explanation:
We visit room 0 and pick up key 1.
We then visit room 1 and pick up key 2.
We then visit room 2 and pick up key 3.
We then visit room 3.
Since we were able to visit every room, we return true.
Example 2:

Input: rooms = [[1,3],[3,0,1],[2],[0]]
Output: false
Explanation: We can not enter room number 2 since the only key that unlocks it is in that room.

Constraints:

n == rooms.length
2 <= n <= 1000
0 <= rooms[i].length <= 1000
1 <= sum(rooms[i].length) <= 3000
0 <= rooms[i][j] < n
All the values of rooms[i] are unique.

Solution

Using DFS works for this problem:

- Start in Room 0 because you have the key to it.
- Look at the keys in Room 0 and see where they lead.
- If there's a key to a room you haven't visited, go to that room.
- In the new room, repeat steps 2-3.
- Keep doing this until you've visited all the rooms or can't go further.
- If you've visited all the rooms, you're successful. If not, you can't visit all rooms.

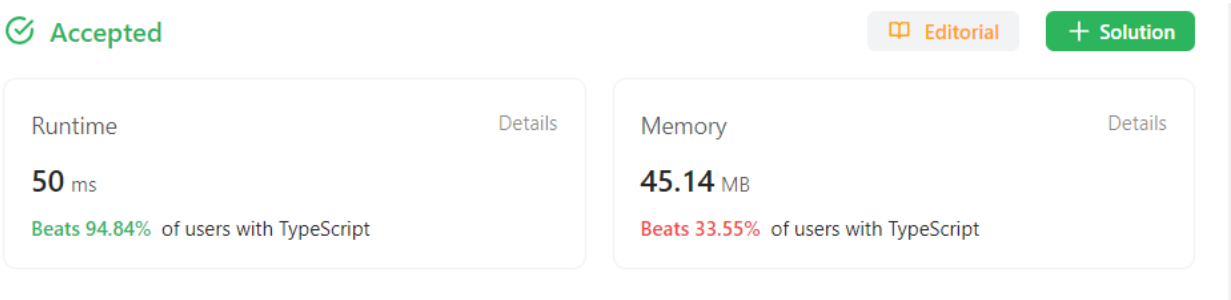
```typescript
function canVisitAllRooms(rooms: number[][]): boolean {
  const allRooms = rooms.length;
  const visited: Set<number> = new Set();

  const dfs = (room: number): void => {
    visited.add(room);

    for (const key of rooms[room]) {
      if (!visited.has(key)) {
        dfs(key);
      }
    }
  };

  dfs(0);

  return visited.size === allRooms;
}
```



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