2664. The Knight's Tour Premium

Medium | Topics | Companies

Given two positive integers `m` and `n` which are the height and width of a **0-indexed** 2D-array `board`, a pair of positive integers `(r, c)` which is the starting position of the knight on the board.

Your task is to find an order of movements for the knight, in a manner that every cell of the `board` gets visited **exactly** once (the starting cell is considered visited and you **shouldn't** visit it again).

Return *the array* `board` *in which the cells' values show the order of visiting the cell starting from 0 (the initial place of the knight).*

Note that a **knight** can **move** from cell `(r1, c1)` to cell `(r2, c2)` if `0 <= r2 <= m - 1` and `0 <= c2 <= n - 1` and `min(abs(r1 - r2), abs(c1 - c2)) = 1` and `max(abs(r1 - r2), abs(c1 - c2)) = 2`.

Example 1:

> **Input:** m = 1, n = 1, r = 0, c = 0
> **Output:** [[0]]
> **Explanation:** There is only 1 cell and the knight is initially on it so there is only a 0 inside the 1x1 grid.

Example 2:

> **Input:** m = 3, n = 4, r = 0, c = 0
> **Output:** [[0,3,6,9],[11,8,1,4],[2,5,10,7]]
> **Explanation:** By the following order of movements we can visit the entire board.
> (0,0)->(1,2)->(2,0)->(0,1)->(1,3)->(2,1)->(0,2)->(2,3)->(1,1)->(0,3)->(2,2)->(1,0)

Constraints:

- `1 <= m, n <= 5`
- `0 <= r <= m - 1`
- `0 <= c <= n - 1`
- The inputs will be generated such that there exists at least one possible order of movements with the given condition

Seen this question in a real interview before? 1/5

Yes No

Accepted **5.7K** | Submissions **7.7K** | Acceptance Rate **73.6%**

Topics

Array Backtracking Matrix

Companies

0 - 6 months

Microsoft 3

Discussion (13)