C++ Assignments | Binary search - 2 | Week 10

1. **Write a program to apply binary search in array sorted in decreasing order.**
2. You have a sorted array of infinite numbers, how would you search an element in the array?
3. You are given an `m x n` integer matrix `matrix` with the following two properties:

- Each row is sorted in non-decreasing order.
- The first integer of each row is greater than the last integer of the previous row.

Given an integer `target`, return `true` *if* `target` *is in* `matrix` *or* `false` *otherwise*.

You must write a solution in `O(log(m * n))` time complexity.

`Example 1:`

`Input:` `matrix = [[1,3,5,7],[10,11,16,20],[23,30,34,60]], target = 3`

`Output:` `true`

`Example 2:`

`Input:` `matrix = [[1,3,5,7],[10,11,16,20],[23,30,34,60]], target = 13`

`Output:` `false`

4. There is an integer array `nums` sorted in non-decreasing order (not necessarily with **distinct** values).

Before being passed to your function, `nums` is **rotated** at an unknown pivot index `k` (`0 <= k < nums.length`) such that the resulting array is `[nums[k], nums[k+1], ..., nums[n-1], nums[0], nums[1], ..., nums[k-1]]` (**0-indexed**). For example, `[0,1,2,4,4,4,5,6,6,7]` might be rotated at pivot index `5` and become `[4,5,6,6,7,0,1,2,4,4]`.

Given the array `nums` **after** the rotation and an integer `target`, return `true` *if* `target` *is in* `nums`, *or* `false` *if it is not in* `nums`.

You must decrease the overall operation steps as much as possible.

`Example 1:`

`Input:` `nums = [2,5,6,0,0,1,2], target = 0`

`Output:` `true`

`Example 2:`

`Input:` `nums = [2,5,6,0,0,1,2], target = 3`

`Output:` `false`

Note:- Please try to invest time doing the assignments which are necessary to build a strong foundation. Do not directly Copy Paste using Google or ChatGPT. Please use your brain😀.
