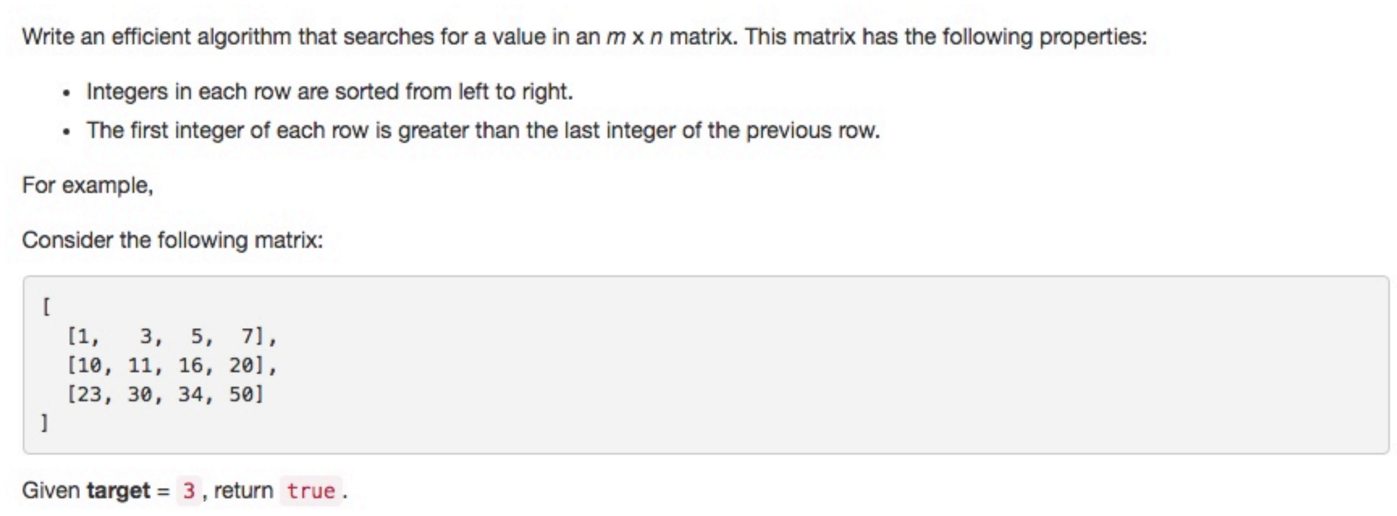
074. Search a 2D Matrix

074 Search a 2D Matrix

- **Binary Search**+array

Description



Write an efficient algorithm that searches for a value in an *m* x *n* matrix. This matrix has the following properties:

- Integers in each row are sorted from left to right.
- The first integer of each row is greater than the last integer of the previous row.

For example,

Consider the following matrix:

```
[
  [1,   3,  5,  7],
  [10, 11, 16, 20],
  [23, 30, 34, 50]
]
```

Given **target** = `3`, return `true`.

1. Thought line

2. Binary Search+array

```cpp
class Solution {
private:
    void binarySearchMatrix(vector<vector<int>>& matrix, int st, int ed, int target, bool& res){
        if (matrix.empty()||st>ed||res) return;

        if (st==ed){
            // corner case
            for (int i = 0; !matrix[st].empty()&&i<=matrix[st].size()-1; ++i)
                if (matrix[st][i]==target)
                    res = true;
            return;
        }
        int midRow = (st+ed)/2, n = matrix[midRow].size()-1;
        if (target>matrix[midRow][n])
            binarySearchMatrix(matrix, midRow+1, ed, target, res);
        else
            binarySearchMatrix(matrix, st, midRow, target, res);

    }
public:
    bool searchMatrix(vector<vector<int>>& matrix, int target) {
        bool res = false;
        binarySearchMatrix(matrix, 0, matrix.size()-1, target, res);
        return res;
    }
};
```