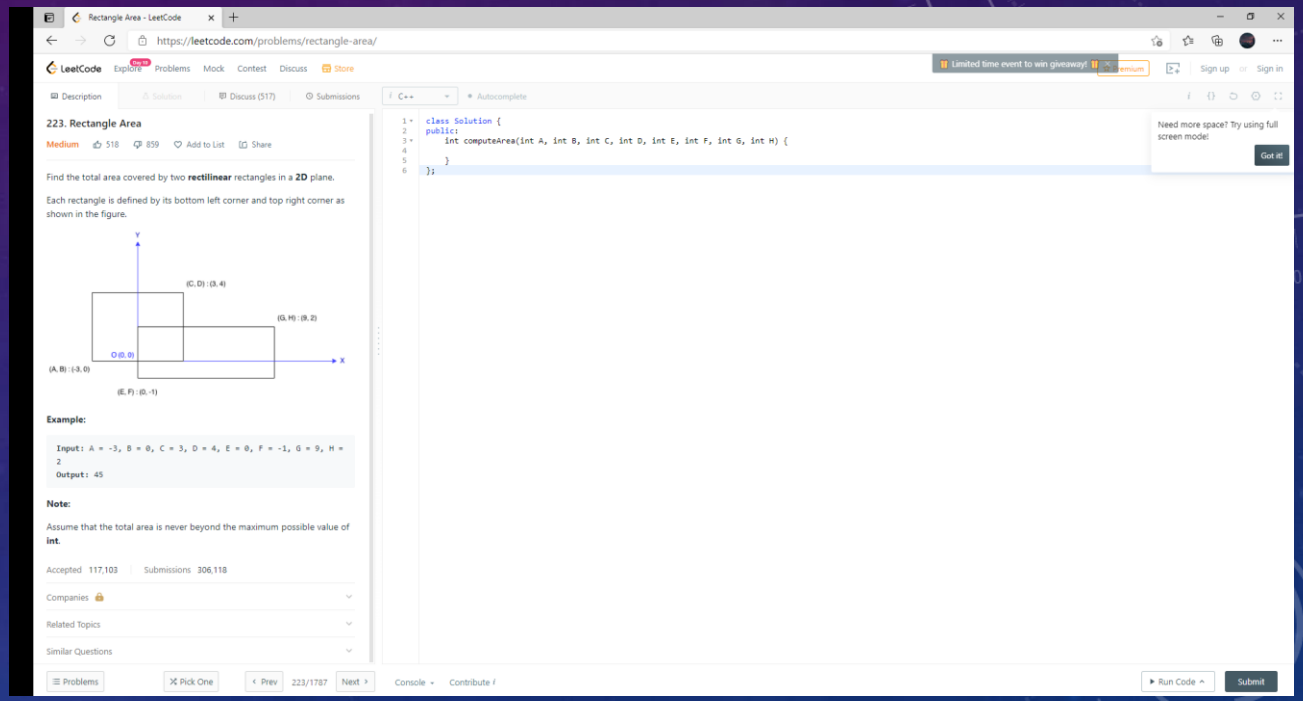
CS3201(2020/2) TERM PROJECT

NGUYEN HA DUONG_6128301

PROBLEM INFO

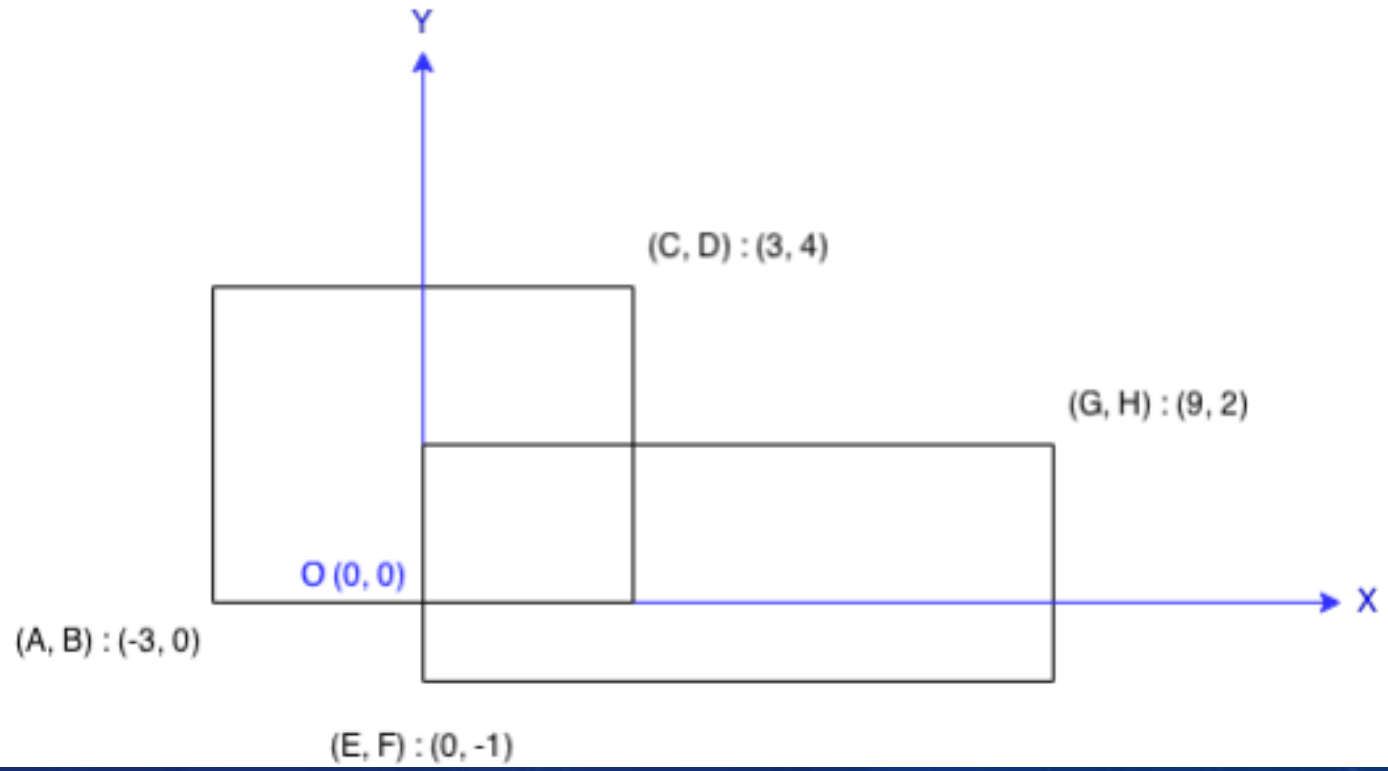
- Problem Name: Rectangle Area
- Difficulty : Medium
- Link to the problem : Rectangle Area - LeetCode



PROBLEM INTRODUCTION

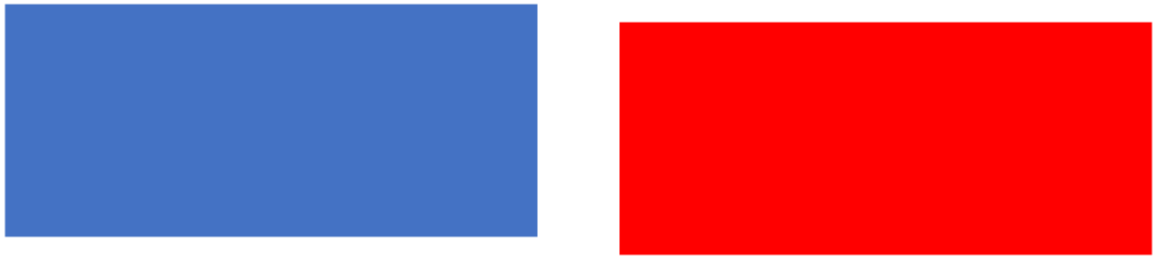
Find the total area covered by two **rectilinear** rectangles in a **2D** plane.

Each rectangle is defined by its bottom left corner and top right corner as shown in the figure.



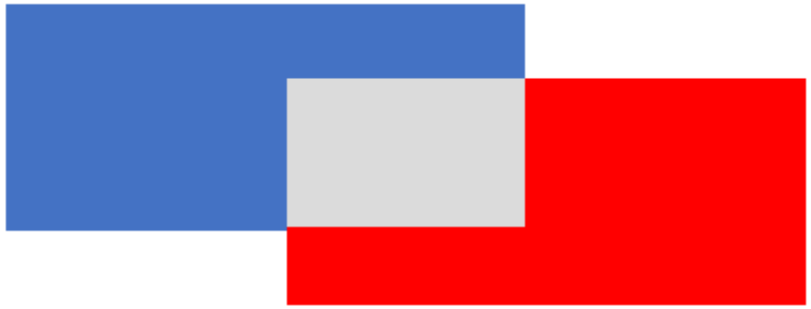
PROBLEM ANALYSIS

a, 2 rectangles do not overlap each other:



c,1 rectangle in the other rectangle:

b,2 rectangles overlap each other:

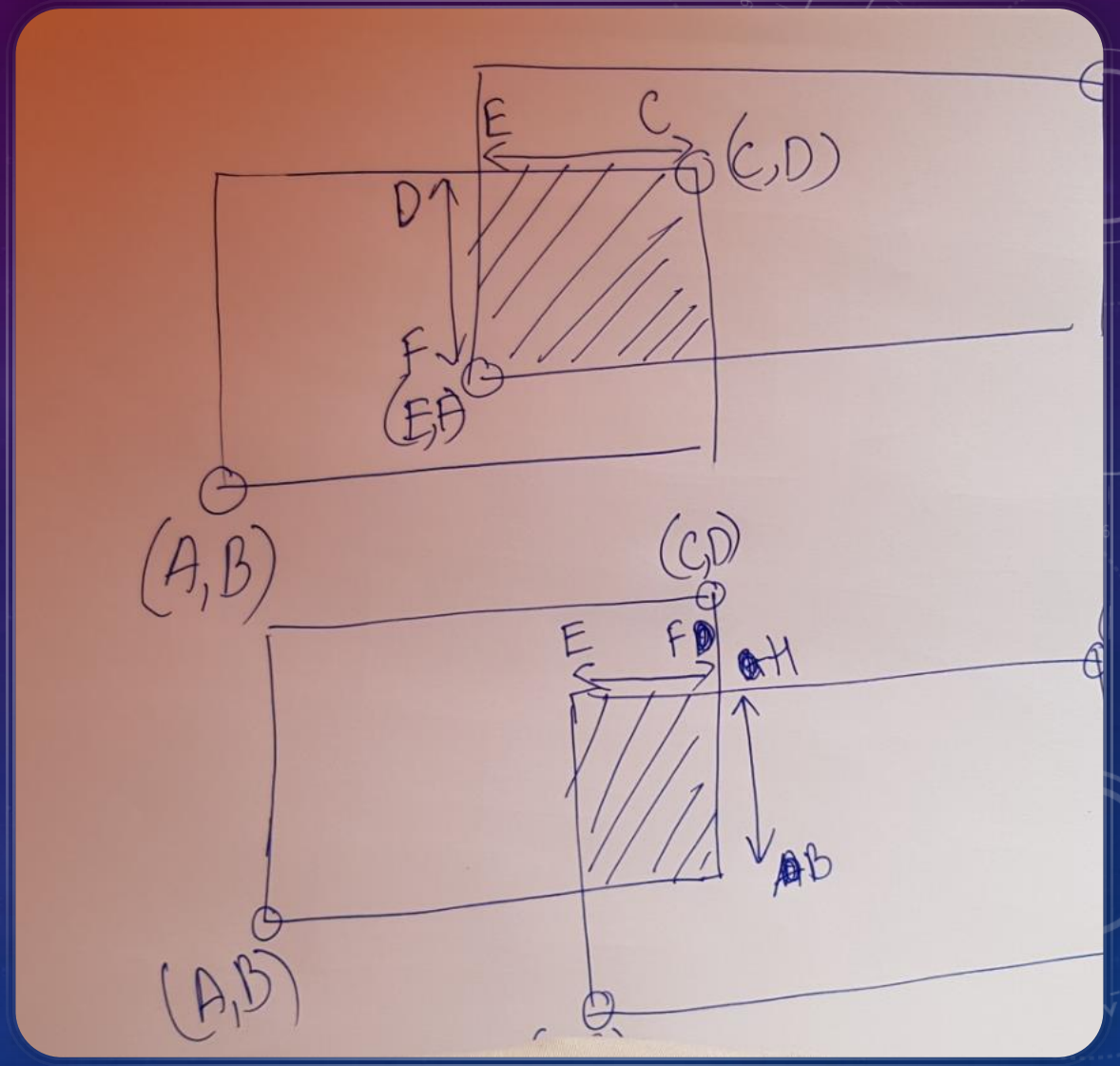


PROBLEM SOLUTION

- Divide into 2 cases: overlapped && not overlapped.
- If the problem is not overlapped: sum the Area of the 2 rectangles.
- Else : Sum up the Area of the 2 rectangles and then minus the Area of the overlapped part.

CALCULATE THE AREA OF THE OVERLAPPED PART

- In order to calculate the area of the overlapped part. We take the minimum value of x and y of 2 top-right and the max value of x and y of 2 bottom-left value.
- The new 2 point are the 2 conner of the overlapped area
- => Able to calculate the area of the overlapped part.



CODE_PYTHON

```python
class Solution(object):
    def computeArea(self, A, B, C, D, E, F, G, H):
        S1 = abs(A-C) *abs(B-D)
        S2 = abs(E-G) *abs(F-H)

        if (A < G and B < H and E < C and F < D):
            return S1 + S2 - (max(A,E) - min(C, G))*(max(B,F) - min(D,H))
        return S1 + S2

```

(*) Additional:

```python
class Solution(object):
    def computeArea(self, A, B, C, D, E, F, G, H):
        S1 = abs(A-C) *abs(B-D)
        S2 = abs(E-G) *abs(F-H)

        if ( E >= C or F >= D or G <= A or H <= B ):
            return (S1 + S2)
        return  S1 + S2 - (max(A,E) - min(C, G))*(max(B,F) -
min(D,H))
```

SUBMISSION

Submission Detail

3082 / 3082 test cases passed.

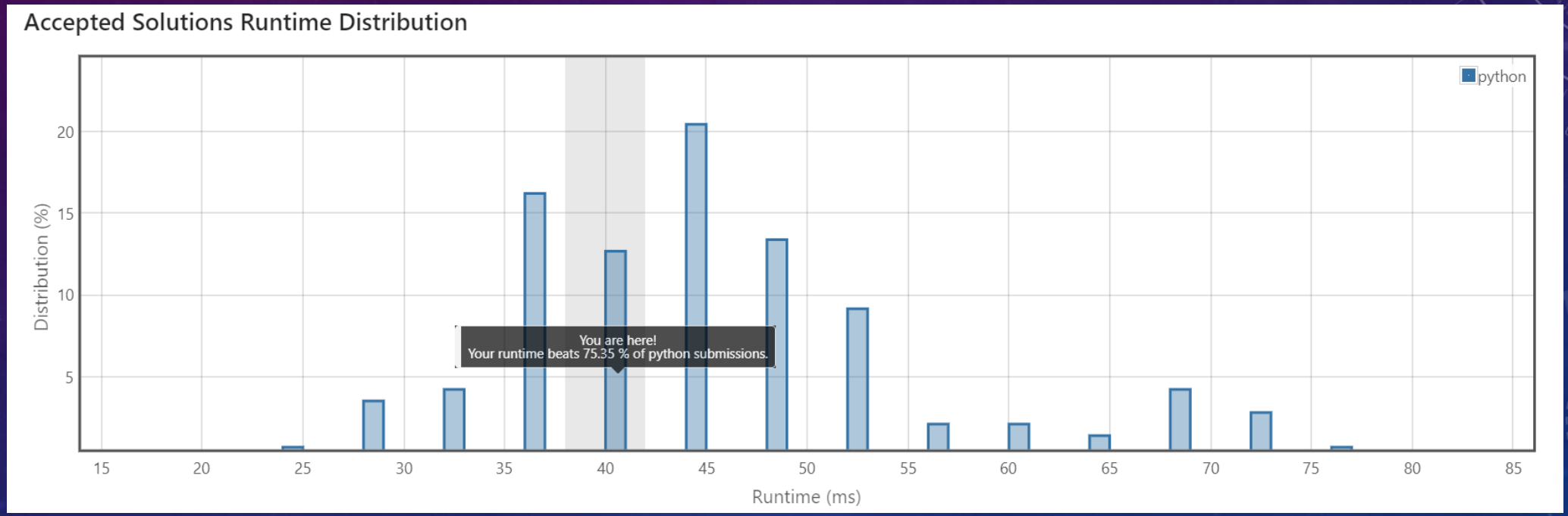
Status: **Accepted**

Runtime: **40 ms**

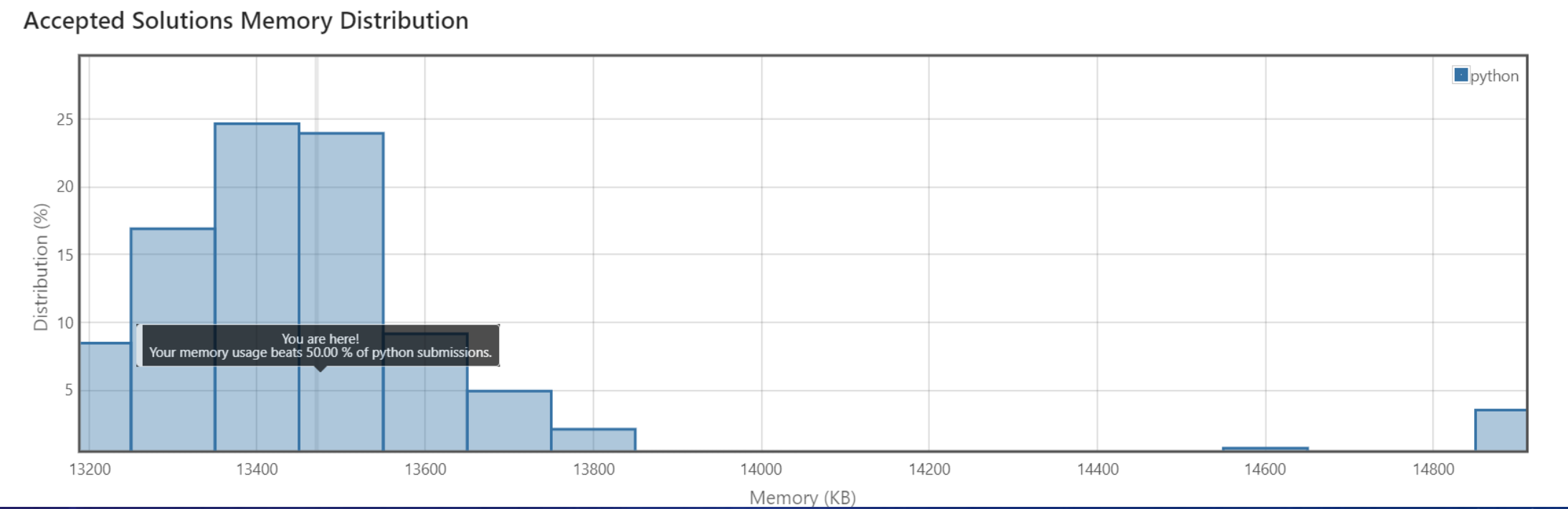
Memory Usage: **13.5 MB**

Submitted: **2 hours, 45 minutes ago**

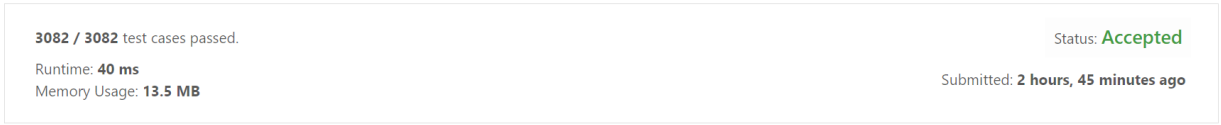
RUNTIME AND MEMORY EVALUATION



RUNTIME AND MEMORY EVALUATION



Thank you!



Addition: I forgot to put the picture of submission detail on my report.