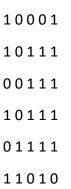
Maximal Rectangle Area LeetCode

Given a binary matrix representing a grid of '0's and '1's, you need to find the area of the largest rectangle that can be formed by considering the '1's in the matrix.

Example: Consider the following binary matrix:



Output: The maximal rectangle area that can be formed using the '1's in the given matrix is 12.

- 1. The problem can be solved using the "Largest Rectangle in Histogram" approach applied to each row in the matrix.
- 2. For each row in the matrix:
 - Update a histogram array that represents the heights of columns based on the presence of '1's.
 - Apply the "Largest Rectangle in Histogram" algorithm to find the largest rectangle area for the histogram.
 - Update the maximum area if a larger rectangle is found.
- 3. Return the maximum area as the final answer.

Approach 1: Maximal Rectangle area using stack based approach

- For each row in the matrix:
 - Update the histogram array based on the presence of '1's.
 - Calculate the largest rectangle area for the current histogram using the "Largest Rectangle in Histogram" algorithm.
 - Update the maximum area if a larger rectangle is found.

Time Complexity:

• Let N be the number of rows and M be the number of columns in the matrix.

- For each row, the time complexity of calculating the largest rectangle area is O(M).
- Overall time complexity: O(N * M).

Space Complexity:

- We use extra space to store the histogram array.
- Space complexity: O(M) (for storing histogram heights).