class Solution:

def maximalRectangle(self, matrix: List[List[str]]) -> int:

r, c=len(matrix), len(matrix[0])

if r==1 and c==1:

if matrix[0][0]=='1': return 1

else: return 0

h=[0]\*(c+1)

maxArea=0

for i, row in enumerate(matrix):

st=[-1]

row.append('0')

for j, x in enumerate(row):

# build h

if x=='1': h[j]+=1

else: h[j]=0

# mononotonic stack has at leat element -1

while len(st)>1 and (j==c or h[j]<h[st[-1]]):

m=st[-1]

st.pop()

w=j-st[-1]-1

area=h[m]\*w

maxArea=max(maxArea, area)

st.append(j)

return maxArea