## Central European Olympiad in Informatics

Tîrgu Mureş, România
July 8 - 14, 2009
Contest Day 2
logs

## 100 points

Source code: logs.c, logs.cpp, logs.pas
Input files: logs.in
Output files: logs.out
Time limit: 0.6 s
Memory limit: $\quad 64 \mathrm{MB}$

## Task

Given an $\mathbf{N} \mathbf{x} \mathbf{M}$ binary matrix, find the area of the biggest rectangle consisting entirely of values of $\mathbf{1}$, knowing that you can permute the columns of the matrix.

## Constraints

- $1 \leq \mathrm{N} \leq 15000$
- $1 \leq M \leq 1500$
- $\mathbf{3 0 \%}$ of the test cases will have $\mathbf{N}, \mathbf{M} \leq 1024$
- In C/C++, it is recommended that you use fgets () to read the input. In Pascal, it is recommended to use readln () on a text file that has a large buffer. The following sample code shows how to do this:


At the end of these two pieces of code, $\mathbf{s}$ will contain the first line of the matrix.

## Input

The first line of the input file logs.in will contain two integers separated by one space: $\mathbf{N}$ and $\mathbf{M}$. The following $\mathbf{N}$ lines will contain $\mathbf{M}$ characters of $\mathbf{0}$ or $\mathbf{1}$, describing the matrix.

## Output

The only line of the output file logs. out will contain the area of the largest rectangle.

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## Example

| logs.in | logs.out | Explanation |
| :--- | :--- | :--- |
| 106 | 21 | By permuting the columns such that columns 2, |
| 001010 |  | 4 and 5 are adjacent you have a rectangle of area |
| 111110 |  | 21 (rows 2-8 and columns 2, 4, 5). |
| 011110 |  |  |
| 111110 |  |  |
| 011110 |  |  |
| 111111 |  |  |
| 110111 |  |  |
| 110111 |  |  |
| 000101 |  |  |
| 010101 |  |  |

