Kendama Challenge

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Naniwazu-kun is going to take on the traditional kendama challenge in a New Year's Eve music program. If at least K people succeed consecutively, the record will be broken. To maximize the probability of success as much as possible, he decided to challenge it with a team of N carefully selected players.

The N players will attempt the kendama in order from the 1-st to the N-th. The probability that the i-th player ($1 \le i \le N$) succeeds is $\frac{A_i}{B_i}$, and each player's success or failure is independent.

Find the probability that there exists at least one segment where K or more consecutive players succeed, modulo 998244353.

Input

In the first line, integers N, K are given separated by a space. ($1 \le K \le N \le 2 \times 10^5$)

In the following N lines, the i-th line contains integers A_i, B_i separated by a space. ($1 \le A_i \le B_i \le 998244352$)

Output

Output the probability modulo 998244353 in a single line.

Examples

standard input	standard output
2 2 1 1 1 2	499122177
5 4 1 1 1 1 1 1 1 1 1 10000	1
5 3 3 14 1 59 2 65 3 58 9 79	62790646

Note

For the first example:

Let S denote the event that player i succeeds, and F denote the event that player i fails.

The possible patterns and their probabilities are as follows:

- SS : $1 \times \frac{1}{2} = \frac{1}{2}$
- SF : $1 \times \frac{1}{2} = \frac{1}{2}$

Only SS contains a segment where at least 2 players succeed consecutively, and its probability is $\frac{1}{2}$.

Since $499122177 \times 2 \equiv 1 \pmod{998244353}$, output 499122177.

For the second example:

Even if Naniwazu-kun, who performs last, is not very skilled, it is fine as long as the helpers are reliable.

Definition of probability modulo 998244353

It can be proven that the required probability is always a rational number. Under the constraints of this problem, when the probability is expressed as a reduced fraction $\frac{y}{x}$, it is guaranteed that x is not divisible by 998244353.

In this case, there exists a unique integer z with $0 \leq z \leq 998244352$ such that $xz \equiv y \pmod{998244353}$. Output this z.