Omniscient Artist

Input file:	`standard input`
Output file:	`standard output`
Time limit:	8 seconds
Memory limit:	1024 megabytes

The background story in the Chinese statements is removed due to the translation difficulties. >_<

In addition to "adding one," there were many other experiences during the premiere of Little Cyan Fish. Various data structure problems appeared at the premiere. From "return"to "WBLT,"these problems were simply filled with dark humor —— or rather, their appearance merely reduced the number of problems in this scene by 1.

At that time, Little Cyan Fish's collaborator wanted to become an omniscient artist of data structures. On many nights, he found Little Cyan Fish by the stove to talk, sharing many stories and making many wishes. Regardless of what happened at that time, Little Cyan Fish only remembers arguing with him about whether data structure problems should appear in this competition.

In the blink of an eye, three years have passed, and Little Cyan Fish has gradually forgotten the content of both sides' arguments. Whether this collaborator is omniscient, Little Cyan Fish cannot know, but he indeed believes that he is not an artist. Perhaps different things have different kinds of romance, and not all humans can appreciate it.

That being said, this time, Little Cyan Fish wants you to experience the beauty of data structures. Now, Little Cyan Fish has given you n axis-parallel rectangular regions, with the i-th rectangle represented by four integers $x_{1,i}, x_{2,i}, y_{1,i}, y_{2,i}$.

In Little Cyan Fish's mind, there is a fixed positive integer m ($m \geq \sqrt{n}$). For each integer c such that $1 \leq m \cdot c \leq n$, Little Cyan Fish needs you to calculate the area of the region that is exactly contained by $m \cdot c$ rectangles.

Formally, the area of the region that is exactly contained by i rectangles is the number of integer points (x, y) that satisfy $\sum_{j=1}^{n} [x_{1,j} \leq x < x_{2,j}][y_{1,j} \leq y < y_{2,j}] = i$.

Input

The first line of input contains two integers n, m ($2 \leq n \leq 3 \times 10^5, \sqrt{n} \leq m \leq n$).

The next n lines each contain four integers, $x_{1,i}, x_{2,i}, y_{1,i}, y_{2,i}$ ($1 \leq x_{1,i} < x_{2,i} \leq n$, $1 \leq y_{1,i} < y_{2,i} \leq n$).

Output

Output a total of $\lfloor \frac{n}{m} \rfloor$ lines, each representing the area of the region that is exactly contained by $m, 2m, 3m, \ldots, \lfloor \frac{n}{m} \rfloor \cdot m$ rectangles.

Examples

standard input	standard output
9 3 6 8 4 5 6 9 1 3 1 5 1 9 6 8 7 9 5 6 2 9 2 8 1 2 1 8 5 9 2 4 5 7 7 9 2 6	4 0 0
10 4 1 2 1 6 3 9 8 9 2 3 1 9 2 8 8 10 3 7 2 10 1 7 2 7 5 6 2 6 5 8 3 7 6 7 4 7 1 4 7 10	7 0