

1. round, 24. october 2009.

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Aladin was walking down the path one day when he found the strangest thing. **N** empty boxes right next to a weird alien machine. After a bit of fumbling around he got the machine to do something. The machine now accepts 4 integers **L**, **R**, **A** and **B**. After that hitting the big red glowing button labeled "NE DIRAJ" causes the machine to go crazy and follow the next routine:

- Set the number of stones in the box labeled **L** to **A** modulo **B**.
- It proceeds to fly to the box labeled **L**+1, and set the number of stones there to  $(2 \cdot \mathbf{A}) \bmod \mathbf{B}$ .
- It proceeds to fly to the box labeled **L**+2, and set the number of stones there to  $(3 \cdot \mathbf{A}) \bmod \mathbf{B}$ .
- Generally, it visits each box labeled between **L** and **R**, and set the number of stones there to  $(\mathbf{X} - \mathbf{L} + 1) \cdot \mathbf{A} \bmod \mathbf{B}$ . where **X** is the box label.
- After it visits the box labeled **R**. It settles down for further instructions.

During the game Aladin wonders what is the total number of stones in some range of boxes.

Write a program that simulates the device and answers Aladins questions.

### INPUT

The first line contains two integers  $N$  i  $Q$  ( $1 \leq N \leq 1\,000\,000\,000$ ) ( $1 \leq Q \leq 50\,000$ ), number of boxes and number of queries.

The next  $Q$  lines contain information about the simulation.

If the line starts with 1, than it follows the format "1 L R A B" ( $1 \leq L \leq R \leq N$ ) ( $1 \leq A, B \leq 1\,000\,000$ ), meaning that Aladin keyed in numbers **L**, **R**, **A** and **B** in the device and allowed the device to do its job.

If the line starts with 2, than it follows the format "2 L R" ( $1 \leq L \leq R \leq N$ ). Meaning that Aladin wonders how many stones in total are ther stones are in boxes labeled **L** to **R** (inclusive).

### OUTPUT

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For each query beginning with 2 output the answer to that particular query. Queries should be processed in the order they are given in the input.

### SCORING

Test cases worth 30% total points have  $N$  and  $Q \leq 1000$ .

Test cases worth 70% total points have  $Q \leq 1000$ .

### SAMPLE TESTS

<p><b>input</b></p> <pre>6 3 2 1 6 1 1 5 1 2 2 1 6</pre> <p><b>output</b></p> <pre>0 3</pre>	<p><b>input</b></p> <pre>4 5 1 1 4 3 4 2 1 1 2 2 2 2 3 3 2 4 4</pre> <p><b>output</b></p> <pre>3 2 1 0</pre>	<p><b>input</b></p> <pre>4 4 1 1 4 7 9 2 1 4 1 1 4 1 1 2 1 4</pre> <p><b>output</b></p> <pre>16 0</pre>
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#### First sample description:

The boxes start containing  $\{0, 0, 0, 0, 0, 0\}$ , 0 stones in total.

After that the device sets the stones to  $\{1 \bmod 2, 2 \bmod 2, 3 \bmod 2, 4 \bmod 2, 5 \bmod 2, 0\} = \{1, 0, 1, 0, 1, 0\}$ , or 3 stones in total.