



Raising the Flag

Time Limit: 1.0 s | Memory Limit: 256 MiB

For centuries, the Kingdom of Numeria has relied on an extensive network of watchtowers to guard its borders. Each tower flies a signal flag that can be seen from neighbouring towers, allowing urgent messages to travel across the kingdom in a matter of minutes. Although messengers have repeatedly suggested that carrier pigeons would be cheaper, the Royal Treasury insists that watchtowers are much more impressive.

Every year, during the New Zenith Peace Celebration (NZPC), the Royal Signal Society performs an ancient ceremonial ritual. According to tradition, the ritual dates back to the reign of Queen Euleria II, who united Numeria after years of civil unrest. Historians argue endlessly over whether the ritual was originally intended as a military drill, a religious ceremony, or simply an excuse for the guards to avoid paperwork. Regardless of its origins, nobody has dared change it in over five hundred years.

The watchtowers are positioned along the kingdom's main road and are numbered from 1 to n . Before the ceremony begins, each tower's flag is either raised or lowered. During ritual round i , the performers visit every tower whose number is divisible by i and toggle its flag: a raised flag is lowered, and a lowered flag is raised.

For example, during the first round, every flag is toggled. During the second round, the flags at towers 2, 4, 6, ... are toggled. During the third round, the flags at towers 3, 6, 9, ... are toggled, and so on, until the n -th and final round.

Legend claims that the number of raised flags at the end of the ritual predicts the kingdom's fortunes for the coming year. Whether this is true is irrelevant, because the current King has become thoroughly convinced of it. After consulting with one particularly persuasive goat, the King has decided that the only acceptable outcome is exactly k raised flags.

As the kingdom's chief mathematician, you know that arguing with the King is considerably more difficult than solving mathematical problems. Instead, your task is to determine the initial positions of the flags so that, after the ritual has finished, exactly k flags are in a raised state.

Input

The input consists of one line with two integers:

- n ($1 \leq n \leq 10^6$), the number of watchtowers;
- k ($0 \leq k \leq n$), the King's favourite number of raised flags after the ritual.

Output

Output a single string of length n consisting only of the characters 0 and 1. The i -th character represents the initial state of the flag at tower i , where 1 indicates raised and 0 indicates lowered.

If multiple valid initial configurations exist, output any of them.



The watchtowers along the roads of Numeria.

Sample Input 1

10 4

Sample Output 1

0100000000

NZPC26 Sample Input 2

20 1

Sample Output 2

00010000100000010000

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