F. Igor and Interesting Numbers

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Igor likes hexadecimal notation and considers **positive** integer in the hexadecimal notation *interesting* if each digit and each letter in it appears no more than t times. For example, if $t = 3$, then integers `13a13322`, `aaa`, `abcdef0123456789` are interesting, but numbers `aaaa`, `ababababab` and `1000000` are not interesting.

Your task is to find the k-th smallest *interesting* for Igor integer in the hexadecimal notation. The integer should not contain leading zeros.

Input

The first line contains the two integers k and t ($1 \le k \le 2 \cdot 10^9$, $1 \le t \le 10$) — the number of the required integer and the maximum number of times some integer or letter can appear in interesting integer.

It can be shown that the answer always exists for such constraints.

Output

Print in the hexadecimal notation the only integer that is the k-th smallest *interesting* integer for Igor.

Examples

input
17 1
output
12

input
1000000 2
output
fca2c

Note

The first 20 *interesting* integers if $t = 1$: `1`, `2`, `3`, `4`, `5`, `6`, `7`, `8`, `9`, `a`, `b`, `c`, `d`, `e`, `f`, `10`, `12`, `13`, `14`, `15`. So the answer for the first example equals `12`.