Task A2. GAME

John and George play the following game: John chooses one integer \( x \) in the set \( A_n = \{1, 2, 3, ..., n\} \). George has to guess the value of \( x \). Players play by consecutive moves \( = 1, 2, ... \). In the \( k \)-th move of the game, George chooses a subset \( B_k \) of \( A_n \) and John says YES, if \( x \) belongs to \( B_k \) or NO, otherwise. In case of answer NO, George pays John \( a \) euros; in case of answer YES, George pays John \( b \) euros. We want to know the minimum amount of euros that George has to pay in order to find \( x \), regardless of John's choice.

Write a program \texttt{game} that calculates the wanted minimum amount.

Input:
On the first line of the standard input are given three integers \( n, a, \) and \( b \), separated by a space.

Output:
On the standard output, print out one integer, that is equal to the wanted minimum amount of euros.

Constraints:
\( 1 < n < 10^{18} \)
\( 0 < a, b < 1 \ 000 \)

Grading:
Subtask 1 (26 points): \( 1 < n < 10 \ 000, \ 0 < a < 1 \ 000, \ 0 < b < 1 \ 000; \)
Subtask 2 (38 points): \( 10 \ 000 \leq n < 10 \ 000 \ 000, \ 0 < a < 1 \ 000, \ 0 < b < 1 \ 000; \)
Subtask 3 (36 points): \( 10 \ 000 \ 000 \leq n < 10^{18}, \ a = 1, \ 0 < b < 1 \ 000. \)

Your program will get points for a given subtask only if all test cases for that subtask are passed successfully.

Example:

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
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<tbody>
<tr>
<td>5 1 2</td>
<td>4</td>
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</table>

Explanation:
George can find \( x \) for 4 euros, in the following way:
George selects set \( B_1 = \{1, 2\} \).

- If John’s answer is YES, George pays 2 euros and then selects set \( B_2 = \{1\} \). If the next answer is YES, George pays another 2 euros and the game ends (the chosen integer was 1), otherwise he pays another 1 euro and the game ends (the chosen integer was 2).
- If John’s answer is NO, George pays 1 euro and selects the set \( B_2 = \{3\} \). If the next answer is YES, George pays another 2 euros and the game ends (the chosen integer was 3), otherwise he pays another 1 euro and selects the set \( B_3 = \{4\} \). If the last answer is YES, George pays another 2 euros and the game ends (the chosen integer was 4), otherwise George pays another 1 euro and the game ends (the chosen integer was 5).