

Lab Assignment 2

1. Given a string and a substring literal value with a direction value (0 or 1 means that the matching is from left to right or from right to left respectively), when the substring literal is matched from left to right with this string, the required output includes the substring content, matching direction and the number matched in the string. If required matching is from right to left, the substring must be reversed at first, and then matched with this string. Output the corresponding result.

Examples:

- Input:
string: "abcdcbabcd"
substring: "abc"
direction: 0
Output:
string: "abcdcbabcd"
substring: "abc"
direction: from left to right
number matched: 2
- Input:
string: "abcdcbabcd"
substring: "abcd"
direction: 1
Output:
string: "abcdcbabcd"
substring: "abcd"
direction: from right to left
reversed substring: "dcba"
number matched: 1

2. Given an integer $N > 1$, output it with the reverse order. Restriction: **DO NOT** convert N into type `str`.

Example:

Input:

12345

Output:

54321

3. Given any integer $N > 1$.
If N is odd, let $N = 3N + 1$.
If N is even, let $N = N/2$.
Repeat this until $N = 1$.
Output N at every step, separated by one space bar.

Example:

Input:

6

Output:

6 3 10 5 16 8 4 2 1

4. Given positive integers u, v , define the array $\{a_n\}$ as follow:

$$\begin{aligned} a_1 &= u + v \\ \begin{cases} a_{2m} &= a_m + u \\ a_{2m+1} &= a_m + v \end{cases}, m \geq 1 \end{aligned}$$

Let $S_m = a_1 + a_2 + \cdots + a_m (m \geq 1)$.

Output the first S_m which is a perfect square number (完全平方数) and larger than 10000.

Example:

Input:

3 4

Output:

12544

Explanation:

$a_1 = 7, a_2 = 10, a_3 = 11, a_4 = 13, a_5 = 14, \dots, a_{411} = 36, S_{411} = 12544$.