Problem Description

In the quantum archives of the Andromeda Nebula, ancient data crystals store knowledge in binary sequences. The Celestial Archivists have discovered that certain substrings, called *diverse*, resonate with cosmic energy when all their contiguous k-length fragments are unique. A substring t of the binary sequence s is deemed *diverse for parameter* k if every contiguous fragment of length k within t appears exactly once. The total cosmic resonance of s is defined as the sum of diverse substrings across all valid parameters $k \geq 1$.

Your mission, as a newly certified Archivist, is to compute this cosmic resonance for a given binary string. The challenge lies in the quantum entanglement of substrings and parameters—each substring may contribute to multiple k values, but only when its k-length fragments exhibit absolute uniqueness. Failure to account for all entangled pairs (t, k) will destabilize the archive's quantum coherence.

Formally, for a binary string s of length n, count all pairs (t, k) where:

- t is a substring of s,
- $k \geq 1$,
- $|t| \geq k$, and
- all contiguous substrings of t of length k are pairwise distinct.

Input

The first line contains an integer n ($1 \leq n \leq 2 \times 10^5$), the length of the binary string.
The second line contains the binary string s of length n, consisting only of `0` and `1`.

Output

Output a single integer representing the total cosmic resonance—the sum of diverse substrings over all valid $k \geq 1$.

Constraints

- $1 \leq n \leq 2 \times 10^5$
- s contains only characters `0` and `1`

Sample

```
Input:
3
010

Output:
9
```

Explanation:
For $s =$ `010`:

- $k = 1$: Substrings `0`, `1`, `0` (length 1), `01`, `10` (length 2) are diverse $\Rightarrow$ 5 substrings
- $k = 2$: Substrings `01`, `10` (length 2), `010` (length 3) are diverse $\Rightarrow$ 3 substrings

- $k = 3$: Substring `010` (length 3) is diverse $\Rightarrow$ 1 substring

Total resonance: $5 + 3 + 1 = 9$.