

The movie studio *Greenlight Casting Couch* are remaking their classic musical *Bit Players* — soon to become a multi-season streaming sensation. The closing scene of the musical, itself a remake of an earlier stage production, involved the entire chorus line in a dazzling display of raising and lowering their hats. It was a simpler time.

At each moment in the scene, the entire cast was in a straight line, with each cast member's hat either *on* or *off* their head. Positions in the line were numbered left (from 1) to right, and cast positions remained the same throughout the scene. Cast members wore pin-striped suits and bowler hats, except for those whose position in the line was a power of 2 (1st, 2nd, 4th, 8th, ...) who wore checkered blazers and straw boaters.

The choreography was notoriously difficult, as the wearing of the straw boaters depended on some of the bowler hats. Consider the binary representation of the positions in the line. The checkered cast looked at the bowler-hatted cast members whose representation had a 1 where their representation also had a 1. If an even number of the bowler hats were *on* heads they would ensure their boater was *off* their head; if an odd number of bowler hats were *on* heads their boater would also be *on* their head.

For example, suppose there were 10 cast members:

- The checkered cast member in position 2 would look at the cast in positions 3, 6, 7 and 10;
- If all of those members had their bowlers *on*, they would have their boater *off*.

SAMPLE INPUT 1

6
011110

The choreography called for each valid combination of hats to be shown during the scene, in increasing numerical order (if the line was viewed as a number with *on* hats as 1s and *off* hats as 0s). For example, with 6 cast members, the choreography would show the line in the following sequence: 000000 → 001011 → 010101 → 011110 → 100110 → 101101 → 110011 → 111000.

SAMPLE OUTPUT 1

4

Freeze frames of the musical show that in some cases *one* of the hats (either a bowler or boater) was incorrectly *on* or *off*. Fortunately the choreography means that with a single incorrect hat it is always possible to tell which is the incorrect hat.

SAMPLE INPUT 2

6
111110

The first line of input will consist of a single integer, c ($1 \leq c < 64$) indicating the number of cast members. The next line will contain a number containing c digits, each a 1 or a 0 (representing a hat that is *on* or *off* respectively). This line will either be a valid line in the sequence of lines, or contain a single incorrect digit.

SAMPLE OUTPUT 2

4

You should output a single integer i , indicating that the (corrected if necessary) input line comes i^{th} in the sequence of lines in the scene.