Q. Intergalactic Census Sequence Analysis

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Time limit:   0.5 seconds
Memory limit:  65535 kBytes
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Description

In response to recent escalations in computational demand, the Intergalactic Census Bureau (ICB) has issued a task of extraordinary technical and strategic importance. This mission, categorized under "High Galactic Priority," aims to enhance population modeling accuracy across interstellar regions by leveraging a numerical dataset with cosmic implications. The specific numeric patterns embedded within this dataset are believed to affect high-energy astrophysical simulations and facilitate projections for interstellar census efforts that span multiple spatial and temporal dimensions.

To proceed, the ICB requires the assistance of a skilled analyst capable of processing an at least one-length sequence, hereinafter referred to as sequence S. This sequence must be parsed and analyzed to support critical functions within the Bureaus overarching framework. While this appears a straightforward extraction of information, its true complexity is deeply tied to the positional, modular, and cumulative properties hidden within the values.

Each element of S is a positive integer of up to six digits, with the exception of a terminating '0' that signifies the end of the sequence. This '0' is not part of the data to be analyzed and should be excluded from all calculations. As an ordered collection of numeric data, the structure of S was crafted under specific cosmic simulation requirements, and each integer within it plays a unique role in contributing to the Bureaus model calibration efforts. The sequence is composed to hold essential positional significance, in that particular values and their relative positions correspond to parameters influencing the ICBs quantum telemetry validations. Additionally, each numeric digit within S is to be considered as carrying intrinsic computational weight, with potential interactions unfolding across positions.

The objective of this task is to conduct an exhaustive analysis of the sequence, identifying the position of a distinct element based on dynamic cumulative conditions that develop as elements in the sequence are processed. Specifically:

1. As you traverse through S, calculate a running cumulative sum of the individual digits across all elements encountered up to and including the current element; This cumulative digit sum forms the basis for the validation check.

2. For each element in S, determine whether this cumulative digit sum equates to the remainder when the current element is divided by the standard intergalactic base year, which is always the current year; This modulo operation is essential, providing an alignment of the data with temporal anchoring crucial for intergalactic time-series analyses.

3. Identify the position (1-based indexing) of the first element that meets the above criteria, which aligns its remainder under division by the base year with the cumulative digit sum obtained up to that point; This position is critical for parameterization within the ICB model.

4. The sequence ends when the value '0' is encountered, and this '0' should not be included in any processing or calculations; In the event that no such element within S meets the specified condition, output the value '-1' to indicate the absence of any qualifying element.

Once you have identified the position of the first element that satisfies the condition, output this position (1-based indexing). If no element satisfies the condition, output '-1'. No additional formatting, whitespace, or extraneous characters should accompany this output, as it will be integrated into the high-precision ICB modeling infrastructure. This precision is vital to ensure compatibility with the Bureau's data ingestion systems, enabling direct impact on the quantum population flux calculations and furthering the Bureau's intergalactic simulation capabilities.

Input

The input contains a single line consisting of positive integers, and a final 0.

Output

The output should contain a single number.

Constraints

- $1 \leq s_i < 1000000$ - elements of the sequence
- There is no information regarding the number of sequence elements.

Example

Input	Output
31 7094 66127 9198 4 6702 645242 9534 720600 227 193079 16883 296 8 781699 269 336895 345 58257 747708 0	18