Problema A

The Mayans

Arquivo fonte: themayans.{ c | cpp | java | py }

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The Mayan civilization, one of the most fascinating cultures in history, flourished in Mesoamerica for over 3,000 years. Known for their advanced knowledge of astronomy, mathematics, and writing, the Maya built incredible cities with stunning pyramids and temples. Their vibrant culture, rich in art, architecture, and spirituality, continues to captivate us today. The Maya's connection to the cosmos and their deep respect for nature made them a truly unique civilization, whose legacy still influences modern understanding of the world.

The Mayan numerical system was highly sophisticated and based on a vigesimal (base-20) system, which means it used the number 20 as its base, unlike our decimal (base-10) system. This system combined dots, bars, and a shell symbol to represent numbers.

• **Dots** represented values of 1.
• **Bars** represented values of 5.
• **The shell symbol** represented 0, one of the earliest uses of a zero in history, which was a remarkable concept for the time.

For example, a dot and a bar together would represent *6 (1+5)*. The Mayans also used positional notation, where the value of a symbol depended on its position, much like how our place values work in the decimal system.

This system was used for various purposes, including their intricate calendar systems, where it helped them track time, celestial events, and even create long-count calendars that could measure thousands of years. It was a key part of their advanced knowledge in mathematics and astronomy.

Since their system is based on *20*, they used twenty distinct symbols to represent values under twenty, including one for zero. The Figure A.1 shows these symbols.

Numbers greater than *19*, which require more than one digit, were written vertically in powers of twenty. The Mayans used powers of twenty, just as we, in Western culture, use powers of ten, a system that originated with the Hindu-Arabic numeral system.

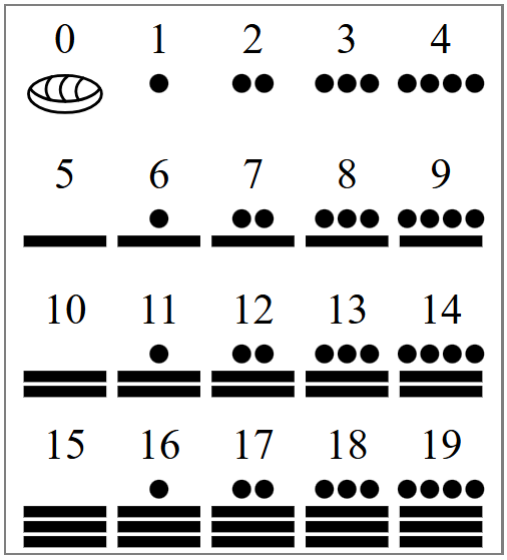

Figura A.1: The Mayan Symbols

So have a look at Figure A.2 for some examples:

Positional Coefficients	Example 1	Example 2	Example 3
$20^3 = 8000$			
$20^2 = 400$			
$20^1 = 20$			
$20^0 = 1$			
	1 x *20* + **7** x *1* Total = 27	**6** x *400* + **10** x *20* +**14** x *1* Total = 2614	**1** x *8000* + **8** x *1* Total = 8008

Figura A.2: Examples of Mayan System

Now that you know about the Mayan numeric system, your task is to write a computer program that converts Mayan numbers to decimal numbers. For the input of this program, the Mayan symbols, represented by dots, hyphens (for bars), and asterisks (for shells, which represent zero), will be input horizontally. For this conversion, the Mayan symbols must be read from bottom to top, with the characters written from left to right. When a Mayan number contains more than one digit, a single blank space will separate the digits.

For ilustration see Figure A.3.

The symbol  will be represented by	. (one dot)
The symbol  will be represented by	-.. (one hyphen and two dots)
The symbol  will be represented by	-- (two hyphens)
The symbol  will be represented by	--.... (two hyphens and four dots)
The symbol  will be represented by	* (one asterisk)

Figura A.3: Conversion from Pictographic to Digital

Input

The input consists of several lines, ending when a Mayan zero is encountered, e.g., when an asterisk is found. Each line contains a sequence of valid Mayan numeric symbols, limited to a maximum of *8* symbols. This means that the maximum possible decimal value is Vmax = $20^8 - 1$.

Each line is guaranteed to contain a valid combination of characters that results in a natural number.

Output

For each input line, convert and print the value represented by the symbols to our decimal system. The final asterisk must be converted as well, so the output ends with a zero, followed by a newline character.

Exemplo de Entrada 1	Exemplo de Saída 1
. --.. -. -- --.... . * * -... .... --- - - - -. -. -. -. -. -. -. -. *	32 2614 8008 4 8421 15 2105 8084210526 0