

# Fractran

FRACTRAN is a Turing-complete esoteric programming language invented by the mathematician John Horton Conway.

A FRACTRAN program is an ordered list of positive fractions  $P=(f_1, f_2, \dots, f_m)$ , together with an initial positive integer input  $n$ .

The program is run by updating the integer  $n$  as follows:

- for the first fraction,  $f_i$ , in the list for which  $nf_i$  is an integer, replace  $n$  with  $nf_i$  ;
- repeat this rule until no fraction in the list produces an integer when multiplied by  $n$ , then halt.

Conway gave a program for primes in FRACTRAN:

17/91, 78/85, 19/51, 23/38, 29/33, 77/29, 95/23, 77/19, 1/17, 11/13, 13/11, 15/14, 15/2, 55/1

Starting with  $n=2$ , this FRACTRAN program will change  $n$  to  $15=2 \times (15/2)$ , then  $825=15 \times (55/1)$ , generating the following sequence of integers:

2, 15, 825, 725, 1925, 2275, 425, 390, 330, 290, 770, .....








After 2, this sequence contains the following powers of 2:

$2^2=4$ ,  $2^3=8$ ,  $2^5=32$ ,  $2^7=128$ ,  $2^{11}=2048$ ,  $2^{13}=8192$ ,  $2^{17}=131072$ ,  $2^{19}=524288$ , .....

which are the prime powers of 2.

---

Write a function that takes a fractran program as a string parameter and returns the first 10 numbers of the program as an array. If the result does not have 10 numbers then return the numbers as is.

	<code>fractran</code> should be a function.
	<code>fractran("3/2, 1/3")</code> should return an array.
	<code>fractran("3/2, 1/3")</code> should return <code>[2, 3, 1]</code> .
	<code>fractran("3/2, 5/3, 1/5")</code> should return <code>[2, 3, 5, 1]</code> .
	<code>fractran("3/2, 6/3")</code> should return <code>[2, 3, 6, 9, 18, 27, 54, 81, 162, 243]</code> .
	<code>fractran("2/7, 7/2")</code> should return <code>[2, 7, 2, 7, 2, 7, 2, 7, 2, 7]</code> .
	<code>fractran("17/91, 78/85, 19/51, 23/38, 29/33, 77/29, 95/23, 77/19, 1/17, 11/13, 13/11, 15/14, 15/2, 55/1")</code> should return <code>[2, 15, 825, 725, 1925, 2275, 425, 390, 330, 290]</code> .