Bases Between Given Exponents (BBGE)

Language specification

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Table of Contents

Description

Bases Between Given Exponents (BBGE) is a theoretical, esoteric, non-Turing complete programming language dedicated to printing the results of problems of the nature: “Output all bases between these bounds for which the product of raising the base(s) to a given exponent is also a whole number for which another base can be raised to a second exponent”. Hence Bases Between Given Exponents(BBGE).

Example

“Code golf challenge: Print out a list of numbers from 1-10000 who's square is also a cube number”(2020, Cass). This can also be expressed as: “find all the bases between 1 and 10,000(inclusively) for which the following statement is true: $\sqrt[3]{base^2} = whole\,number$ ”. Using the syntax highlighted by the BNF, this would give “b1-10000g2e3e” which when written in BBGE style pseudo code gives: “bases 1-10000 given exponent 2 and exponent 3”. “b1-10000g2e3e” would output: “1 8 27 64 125 216 343 512 729 1000 1331 1728 2197 2744 3375 4096 4913 5832 6859 80000 9261”.

BNF

<program>	::=	<bases><between><given><exponents>
<bases>	::=	b
<between>	::=	<lowerBound>“-”<upperBound>
<lowerBound>	::=	<numberValue>
<upperBound>	::=	<numberValue>
<given>	::=	g
<exponents>	::=	<exponent><exponent>
<exponent>	::=	<numberValue>e
<numberValue>	::=	<digit> |<digit><numberValue>
<digit>	::=	0|1|2|3|4|5|6|7|8|9

References

Will Cass, 2020, Bundle of Sticks, Telegram, 20:08, July 24th