

**Definition 1.** *The unit length of a system cannot be greater than a length  $x$  in the very same system. Further,  $x$  can be greater than or equal to the system's unit length.*

**Statement 1.** *Consider two numbers  $a$  and  $b$  where  $a$  is greater than  $b$ , and their difference  $(a-b)$  equals a prime number  $p$  that is less than or equal to 12. Let  $k$  be defined as the sum of consecutive integers from  $b$  to  $a$ , where each term is increased by 1 (formally written as the summation of  $(i + 1)$  from  $i = a$  to  $i = b$ ). Where  $i$  decreases by 1 by each instance of the summation until  $i = b$ .*

*We then define  $z$  as the square root of  $(2k/a)$ . Next, we introduce epsilon, which can take one of four possible values: 1, 0, 1 minus the decimal part of  $z$ , or the decimal part of  $z$ . Using these values, we calculate  $L$  as the exclusive OR of  $(z - \text{epsilon})$  and  $(z + \text{epsilon})$ .*

*The conclusion of this theorem states that  $L$  must be either 2, 3, or 5. This property holds true for all values of  $a$  and  $b$  ranging from 1 to 101010100.*

**Statement 2.** *Let there be two states. An odd number of actions yields the final state being equal to the initial state. Whereas an even number of actions yields the opposing state as the final state (The opposite state).*

**Statement 3.** *This system describes a way to turn numbers into text strings and back again, ensuring that each number creates a unique string and each string can be converted back to its original number. Think of it as creating a two-way dictionary between numbers and text.*

*Length Determination* When we receive a number, we first need to figure out how long the resulting text string should be. We do this by finding the smallest string length that can accommodate our number. For example, if we have 95 possible characters to work with, a one-character string can represent numbers 0-94, a two-character string can handle the next 9,025 numbers, and so on. We keep counting until we find the right length bracket for our number.

*Position Calculation* After determining the length, we calculate where exactly our number sits within all possible strings of that length. Think of it like finding your seat number in a theater - first you know which row you're in (the length), then you need to find your specific seat (the position).

*Character Selection* To build our final string, we use a mathematical process similar to converting numbers between different number bases. We repeatedly divide our position number by the size of our character set, using the remainders to select characters from our predefined list. This process ensures that each number creates a different string.

*Mathematical Properties* The system guarantees several important features: 1. No two

different numbers will create the same string 2. You can always convert a string back to its original number 3. Bigger numbers create strings that come later in alphabetical order 4. When you add or subtract the original numbers, their corresponding strings follow logical patterns

*Practical Implementation* The system works with any set of characters, but typically uses standard text characters including letters, numbers, and symbols. Each character in the output string is carefully chosen to ensure it's valid and readable. The system is particularly careful about handling special characters and ensuring all text follows proper encoding rules.

*Performance and Limitations* The time and space needed to convert numbers grows logarithmically with the size of the number - meaning even very large numbers can be processed efficiently. However, the system only works with non-negative numbers, and when subtracting, the first number must be larger than the second to avoid negative results.

*Real-World Applications* This system is useful in various computing applications, such as: - Creating unique identifiers that are both human-readable and numerically ordered - Compressing numerical data into text strings - Generating sequential codes or references - Creating reversible number-to-text conversions for data storage

*Usage Guidelines* To use this system properly: 1. Only input positive numbers or zero 2. When subtracting, ensure the first number is larger than the second 3. Use a consistent, predefined set of characters 4. Maintain the same character order for all operations

This mapping system provides a reliable way to convert between numbers and text while preserving mathematical relationships and ensuring reversibility. It's particularly useful in computing applications where both human readability and numerical precision are important.

**Statement 4.** In reference to Statement 1:

To show that  $2, 3, 5$  spans all integers (including 0) by repeated addition or subtraction, it suffices to prove that every integer  $n$  can be written as an integer linear combination of 2, 3, and 5. In other words, we want to show that for all  $n$  in the integers, there exist integers  $a, b, c$  such that  $n = 2a + 3b + 5c$ .

The key is to notice that the greatest common divisor of 2, 3, and 5 is 1:  $\gcd(2, 3, 5) = 1$ . From elementary number theory (the Linear Combination or Bezout's Identity argument), if a set of integers has greatest common divisor 1, then there is some integer linear combination of them that equals 1. More explicitly, because  $\gcd(2, 3) = 1$ , we can already find integers  $x, y$  such that  $2x + 3y = 1$ . (Indeed, a simple choice is  $2 \cdot 2 + 3 \cdot (-1) = 4 - 3 = 1$ .)

Why this implies spanning all integers: Once we know we can get 1 from integer combi-

nations of 2,3,5, say  $1 = 2x + 3y + 5z$ , then for any integer  $n$ , we multiply that entire expression by  $n$  to get  $n = n \cdot 1 = n(2x + 3y + 5z) = 2(nx) + 3(ny) + 5(nz)$ , where  $nx$ ,  $ny$ ,  $nz$  are still integers. Hence any integer  $n$  can be obtained by some combination of 2, 3, and 5 (allowing addition or subtraction as needed).

*Direct "Concrete" Construction:* An even simpler way (not even using 5) is to notice that  $1 = 3 - 2$ . From 2 and 3 alone we can obtain 1 by subtracting 2 from 3. Once you have 1, you can get any integer  $n$  by repeatedly adding or subtracting 1 (namely, do  $1 + 1 + \dots + 1$  or  $-1 -1 - \dots - 1$ ).

Since 5 also belongs to the set, it does not hurt this argument; you already can generate all integers from 2,3, and certainly having 5 there as well does not restrict you—it still has  $\gcd(2,3,5) = 1$ .

Thus, by showing that 1 is an integer combination of 2, 3, and 5, we conclude that every integer can be expressed as a sum and/or difference of 2, 3, and 5. Hence, 2,3,5 spans the entire set of integers (including 0) under repeated addition and subtraction.