Logic, Logic Only

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Abstract

In this article, the intention is to introduce a theory about the origin of everything. The initial goal is to answer whether there is something rather than nothing. This question has preoccupied philosophy and science to this day. The answer to this question lies in the understanding that logic in its essence refers to nothingness (NOT IS - NEGATES ITSELF - SELF-NEGATION - NEGATES BEING). The self-denial of nothingness (the primordial logic) generates logical expansions that characterize the foundations of the central limit theorem. These logical expansions characterize the foundations of the central limit theorem. The steps of the logical expansion governed by probability described in the central limit theorem correspond to consciousness, the largest logical wave in a population, and its aspects: infinity, waves, time, space, fundamental forces, dark matter, dark energy, antimatter, and black hole. In other words, the infinite negation of logic (self-denial of nothingness) generates logical expansions that probabilistically will form logical waves and their sub-waves, establishing what is the fundamental nature of reality, knowledge, and existence. Logical expansions occur in the absence of time, which defines the logical essence as a generalized infinite recurrence, a constant, analogous to the infinite numbers or points that make up the interval of any given line.

Keywords: logic. nothing. everything. logical expansion. central limit theorem. consciousness. infinite. waves. time. space. fundamental forces. dark matter. dark energy. antimatter. black hole. observer and life.

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Introduction

The reasoning of this text arose as an answer to the most essential question that philosophy can formulate and that science and philosophy have not been able to fully answer so far, which is: whether there is something instead of nothing, or why is there something instead of nothing? This question was first asked by the philosopher Gottfried Wilhelm Leibniz in a letter in 1697 and is often described as the greatest philosophical question (LEIBNIZ, 1697).

The answer to that question comes from the answer of what logic is. In exploring what logic [is] and what it [IS NOT], it gave rise to a theory about the origin of everything, all things. Logic in its essence refers to nothingness, what [IS NOT], that is, it denies itself (negates itself). The self-negation of primordial logic can be abstracted recursively (negates itself, infinitely) into three axioms that are the basis of the central theorem of this theory.

The logic [NOT BEING] is in conformity with NOTHING, because if on the one hand the logic [IS NOT], on the other hand [is] its opposite, that is, illogical and unchanging. In this duality, one has existence grounded by a logic that [IS NOT], while [is] illogical, unchanging and non-existent.

The text is organized according to the following hierarchy:

1. Logic
   - 1.1. Logical expansion
   - 1.2. Central limit theorem
   - 1.3. Consciousness
     - 1.3.1. Infinite
     - 1.3.2. Waves
       - 1.3.2.1. Wavelength and amplitude
       - 1.3.2.2. Entanglement
       - 1.3.2.3. Jump
     - 1.3.3. Time
     - 1.3.4. Space
     - 1.3.5. Fundamental forces
     - 1.3.6. Spiral and orbit
       - 1.3.6.1. Orbits
       - 1.3.6.2. Dark matter and dark energy
     - 1.3.7. Antimatter
     - 1.3.8. Black hole
     - 1.3.9. Observer and life
       - 1.3.9.1. Senses

Initially, it is defined what logic [is] and especially what [IS NOT], so its consonance with nothingness is presented. It is then described how this primordial logic, the essence of any logic, develops through its logical expansion. Then it is observed that the samples combined at each stage of this expansion characterize the fundamentals of the central limit theorem, generating new logics (logical waves and sub-waves). These are the logical aspects responsible for saying what is the fundamental nature of reality, knowledge, and existence.

1 Logic

According to the online English dictionary Collins(LOGIC..., 2021), the word logic refers to:

1. The system and principles of reasoning used in a specific field of study;
2. The relationship and interdependence of a series of events, facts, etc;
3. Necessary connection or outcome, as through the working of cause and effect.

The word logic or any of its principles or expressions, classical or non-classical, express a cause and consequence relationship or chained facts. Movement, change and transition can be distinguished as the essence of the above definitions. The word logic, in its essence, fits perfectly with the definition of nothing - [NOT BEING]. Logic is centered on change and change is centered on that which [IS NOT], since that which [is] (being), cannot cease to be in order to transform. Change requires that at some point something ceases to be what it was in order to be transformed. In Palmer (2020) Parmenides, the philosopher of the unity and identity of being, says that continuous change is the main characteristic of [NOT BEING]. For Parmenides the [being] is one (singular), eternal, ungenerated, and unchanging.

In this duality, existence is based on logic, which [IS NOT - NEGATES ITSELF], while [is - being] illogical, immutable and non-existent. In this way, [being] limits existence by defining the non-existent, the immutable and the illogical while [IS NOT] *ad infinitum.*

Figure 1 – Primordial Logic analogy

Line used to represent and validate the concept of primordial logic.

In Figure 1, the straight-line analogy is used to facilitate reasoning. Based on this Figure, the following observations (axioms) can be extracted in relation to the points **0**, **1** and the **interval** between them:

Point 1 - [1,1] It is illogical, as it is the unfractionated total of the straight-line, in this case the primordial premise of the logic [NOT BEING] was not met.

Point 0 - [0,0] It is illogical, since it is a null point incapable of denying itself. All logic or sublogic (logical fraction) must continue to deny itself, since this is the primordial premise of logic. Logic [IS NOT] in its essence, primordially.

Interval -]0,1[The logic is only possible in the fractional representation of the line, that is, between the interval of the points **0** and **1**. A fraction of the line denies being the line, since it is only a part of it. Subintervals, in the same way, are also capable of infinite negate themselves, guaranteeing the primordial premise of logic (negation of itself) in the interval and its subintervals.

Probably, these axioms or features of primordial logic (the essence of everything and by consequence of this study) are the foundations of the basic cognitive processes that have supported and continue to support, for example, the creation and development of numbers. The logic's negations to itself form a logical expansion that represents changes or inequalities. These inequalities (differences) can be represented by symbols of a language, and numbers are a convenient cognitive abstraction for this representation.

The initial, final and intermediate points represented in the straight line in the Figure 1 are consonant with the natural numbers, readjusting the scale of the symbols that represent each logical moment as needed for the expansion. They are also consonant with positive real numbers, those represented without operations, such as fractions, roots and others (finite decimals).

Figure 2 – First logical moment

Fractionated line in two intervals representing the first logical moment.

In Figure 2 the joining of the dash to the straight line is the representation of a logical negation (logical moment). From the negation of the logic in [be] arise these two logical subintervals or two sublogics (intervals of the straight line). In this first logical moment, the segment in blue represents the negation of the logic in [be] the illogical whole (the straight line). In the second logical moment, the two subintervals of the straight line or sublogic are able to negate themselves, guaranteeing the primary premise of logic, [NOT BE] infinitely. In Figure 3 a logical expansion with the first three logical moments is shown.

The logical essence [NOT BEING] is analogous to an abstract constant, that is, its infinite negations and subnegations transcend time. All these infinite negations take place in the absence of time. The inability of logic to negates itself, even for a small interval, would make logic [be] illogical in that interval, which would break the primordial premise of logic, [NOT BEING]. Logic is like an algorithm composed only of a self-executing constant, a generalized recursion and infinite, a simultaneous sequence. The experience of time is driven by consciousness, not by the simultaneous nature of the sequence, but by the order of that sequence, which is nothing more than the observation of the order of the changes of each logical moment.

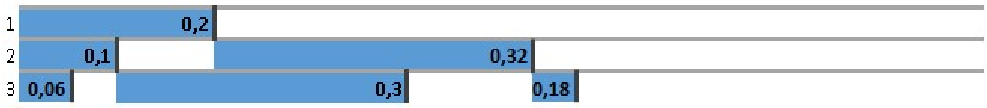
It is simpler to visualize this simultaneous sequence by imagining a horizontal bar in black . This bar is formed by infinite black vertical slices or lines. So there are infinite ways to negate the first logical moment and each infinitesimal slice of the bar will be the beginning of a different sequence or expansion. When determining any of the slices for the first logical moment, immediately all other slices of the population (in the left and right ranges of the chosen slice) are different expansions for the second logical moment, and so on. In other words, expansions are generalizations, and there is no slash range that has not already been negated for any logical moment.

So this simultaneous sequence is an infinite and generalized recursion in the absence of time, the best definition of constant, which according to the English online dictionary Collins(CONSTANT. . . , 2021), is something that repeats itself continuously, uninterruptedly and permanently, something unalterable.

1.1 Logical expansion

Primordial logic (negation of self) creates infinite logical expansions. A logical expansion is analogous to a universe. The first logical moment is the beginning of one of these expansions, but there are infinite possibilities of negation of the first logical moment, which reveals infinite logical expansions.

Figure 3 – Initial logical moments



Example of the first three moments of an expansion.

Based on Figure 3, the following observations can be extracted in relation to the first, second and third logical moments:

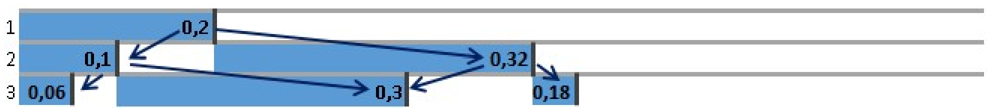
First logical moment The negation of the primordial logic to itself, subdivides it into two units, two sublogics. Although these parts have different proportions, they express the same amounts of points or possibilities of change, since they are representations of the primordial logic, which *ad infinitum*. The fractional part in blue represents the proportion of the logical negation to its unity.

Second logical moment It is generated by the negation of the two primordial sublogics fractionated in the first logical moment, that is, the second logical moment is a negation of the first. In the impossibility of these sublogics continuing to negate themselves, even for a brief instant, would make them unable to negate their two units of the whole and consequently to make it [be]. The fractional parts in blue represent the proportion of the logical negation to their respective units.

Third logical moment It follows from the negation of the second logical moment, just as the second logical moment follows from the negation of the first, and so on.

With each negation or subnegation of the primordial logic, its new values are influenced by the adjacent values of the previous logical moment. In the figure 4, the primordial logic negates itself by generating the first logical moment with the value [0,2]. In the second logical moment, its subdivisions are contained within the boundary imposed by the value of the first logical moment. The points of the third logical moment, for example, suffer the impositions of the values of the second logical moment, which in turn suffer the imposition of the first. Pascal's triangle has interesting properties about this relationship.

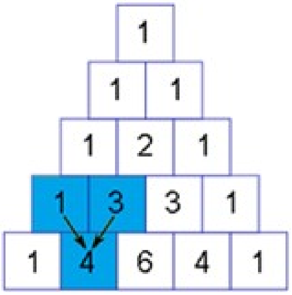
Figure 4 – Logical expansion enforcement



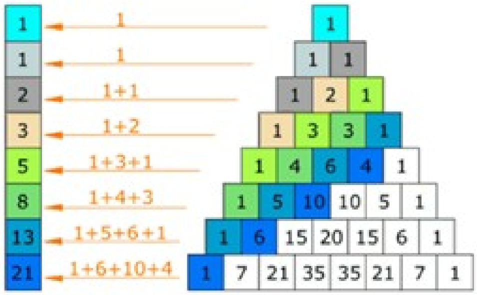
Cumulative imposition on descending logical moments.

In Pascal's triangle, Figure 5a, each number is the closest two numbers above added together. This number represents how many different possible paths lead to it. For example, the number [4] in Figure 5a represents the four different paths leading to it. The binomial coefficients found in Pascal's triangle represent only the amounts of impositions suffered by each value of a logical moment. Another interesting aspect of Pascal's triangle is the Fibonacci sequence, Figure 5b (PIERCE, 2018b).

Figure 5 – Features of Pascal's triangle



(a)



(b)

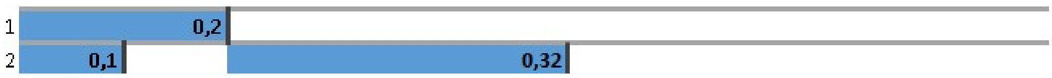
Source: MathsIsFun, 2019. [1]

1.2 Central limit theorem

Based on the axioms seen in Figure 1, the following theorem is discriminated: If the parts of the subintervals are subparts of the entire interval, then these subparts summed are part of the entire interval.

Thus, in Figure 6, the negation of the first logical moment negates [being], while the subnegations of the other logical moments are subparts that subnegate [being], so these subparts only negate [being] when added together or unified according to the first logical moment.

Figure 6 – Subdivided logical moments

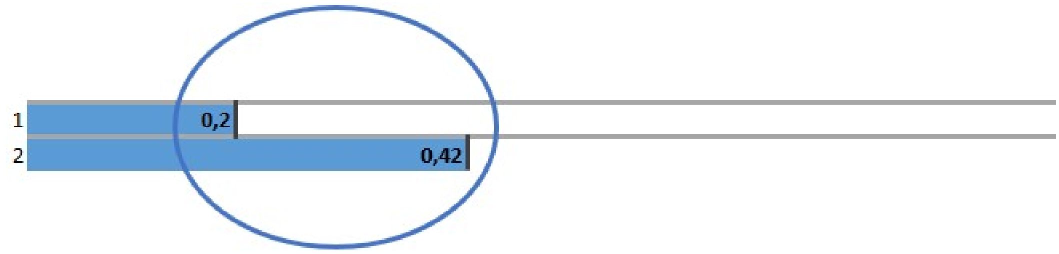


Example of the first two moments of an expansion.

In Figure 7 the representation of the first and second logical moments from Figure 6 can be seen as logical units.

[1] <www.mathsisfun.com/pascals-triangle.html>

Figure 7 – Unified logical moments



Example of the first two unified moments of an expansion.

The dynamics of the theorem described above and its essential axioms of logic are cognitively observable through the mathematical construction of the natural numbers, readjusting the scale of the symbols representing each logical moment as needed by the logical expansion. Mathematics supports the addition operation, necessary in the representation of the above theorem, with Presburguer's arithmetic, which is consistent, complete, and decidable (PRESBURGER. . . , 2021).

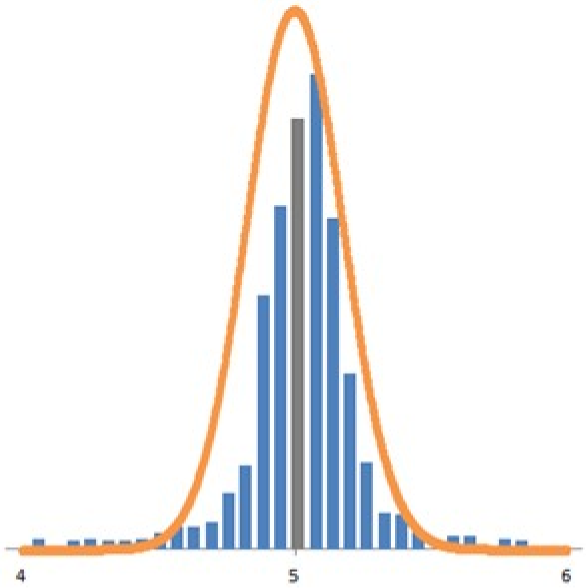
The theorem and its essential axioms of logic can also be cognitively observable by the mathematical construction of positive real numbers (represented without operations such as fractions, roots and others - the finite decimals), which is supported by the mathematical theory of the ordered field - a subset of the real numbers greater than or equal to zero and closed for the sum and product operations. The product operation and its properties are not necessary for the dynamics of the theorem and its essential axioms of logic (ORDERED. . . , 2021). The ordered field mathematical theory is a first-order mathematical theory, with all its axioms described by first-order logic, making it complete and decidable (REAL. . . , 2021).

It is important to note that logic in its essence is not subject to mathematics, but all mathematics is restricted to logic, and therefore some of its simplest constructions may come closer to essential logic than others.

The unity present in the negation (first logical moment) and in the logical subnegations (other logical moments) is the characteristic that corresponds to the central axis of the central limit theorem. This theorem states that the sample distribution of a population approaches a normal distribution as the sample sizes increase, regardless of the shape of the population distribution. This is especially true for sample sizes greater than 30. A simple test that demonstrates this fact is the rolling of unbiased dice. The higher the dice roll number, the more likely the graph will look like the normal distribution graph (GLEN, 2019). The appendix A explains the Distribution_PROB algorithm in order to clarify the probabilistic essence of the central limit theorem.

It is important to note, as shown in Figure 8, that the probabilistic balance or synchronism to the right and left of the median, caused by the distribution of unified logical moments, can illustrate the doctrine of opposites of Heraclitus of Ephesus (GRAHAM, 2021).

Figure 8 – Probabilistic synchronism of the opposite samples with respect to the median



Example of a distribution that approximates the normal distribution.

In the table 1 is the probability of the binomial distribution between 100 and 10000 samples, in line with the unified samples, Figure 7, or sample averages treated in the central limit theorem.

The binomial distribution behaves like the tossing of coins (heads or tails), in the case of the first row of the table, distribution of 100 samples, there are 101 possibilities, from 0 to 100, as if 100 coins were tossed adding their sides up, which can be 0 for heads and 1 for tails, for example. So if all 100 coins tossed come out heads, the sum is 0, and if they all come out tails, the sum is 100. This sum is a combination of possibilities, not a permutation, that is, in permutation [0, 1] is a possibility other than [1, 0], in combination it is 1 possibility, but with 2 probabilities of occurrence. Therefore, the sum corresponding to 100% of the heads or 100% of the tails corresponds to 1 possibility each, while the other sums have a higher possibility of occurrence. For this first row of the table, 100 coins, 99.994% of all possibilities sum between 31 and 70.

The construction of this table was performed with the general binomial probability formula (which represents a uniform distribution) using the algorithm BinomialDistribuion_PROB explained in Appendix A (PIERCE, 2018a).

$$f(k; n, p) = \binom{n}{k} p^k (1-p)^{n-k}$$

The binomial distribution was used in this section of the study, but other discrete distributions could be used, such as the unbiased dice roll, and the observations in this study would remain the same because the central limit theorem is independent of the shape of the population distribution (FROST, 2018).

Table 1 – Probability of binomial distribution

Target	Range Sum	Range		Total Samples	Samples in the Range	% of Samples in the Range	Subset of ≈ 28% of the Range Samples
99,99%	99,994%	31	70	**101**	**39**	**38%**	72,87%
99,99%	99,992%	73	128	**201**	**55**	**27%**	71,11%
99,99%	99,991%	117	184	**301**	**67**	**22%**	72,73%
99,99%	99,990%	162	239	**401**	**77**	**19%**	70,62%
99,99%	99,991%	207	294	**501**	**87**	**17%**	73,64%
99,99%	99,991%	253	348	**601**	**95**	**15%**	72,96%
99,99%	99,991%	299	402	**701**	**103**	**14%**	72,69%
99,99%	99,990%	346	455	**801**	**109**	**13%**	72,69%
99,99%	99,991%	392	509	**901**	**117**	**12%**	72,86%
99,99%	99,991%	439	562	**1001**	**123**	**12%**	73,16%
99,99%	99,991%	486	615	**1101**	**129**	**11%**	73,54%
99,99%	99,991%	533	668	**1201**	**135**	**11%**	71,45%
99,99%	99,991%	580	721	**1301**	**141**	**10%**	72,06%
99,99%	99,990%	628	773	**1401**	**145**	**10%**	72,68%
99,99%	99,991%	675	826	**1501**	**151**	**10%**	73,31%
99,99%	99,990%	723	878	**1601**	**155**	**9%**	71,76%
99,99%	99,991%	770	931	**1701**	**161**	**9%**	72,49%
99,99%	99,990%	818	983	**1801**	**165**	**9%**	73,20%
99,99%	99,990%	866	1035	**1901**	**169**	**8%**	71,90%
99,99%	99,990%	914	1087	**2001**	**173**	**8%**	72,67%
99,99%	99,990%	1394	1607	**3001**	**213**	**7%**	71,86%
99,99%	99,991%	1877	2124	**4001**	**247**	**6%**	72,47%
99,99%	99,990%	2363	2638	**5001**	**275**	**5%**	72,38%
99,99%	99,990%	2850	3151	**6001**	**301**	**5%**	72,75%
99,99%	99,990%	3338	3663	**7001**	**325**	**4%**	72,32%
99,99%	99,990%	3827	4174	**8001**	**347**	**4%**	72,18%
99,99%	99,990%	4316	4685	**9001**	**369**	**4%**	72,23%
99,99%	99,990%	4806	5195	**10001**	**389**	**3%**	72,42%

Table generated by BinomialDistribuion_PROB algorithm with binomial distribution from 100 to 10000. [2]

Target Percentage of samples observed;

Range Sum Percentage that **"Range"** reached **"Target"**, from median to edges;

Range Range of samples where **"Target"** was reached from **"Total Samples"**;

Total Samples Shows the total evaluated range, in the case of the first row of the table the value 101 corresponds to the possibilities from 0 to 100;

Samples in the Range Quantity of samples from **"Range"**;

Percent of Samples in the Range Percentage that **"Range"** represents of **"Total Samples"**;

Subset of ≈ 28% of the Range Samples This range is a subset of **"Range"**, formed from the median, adding 14% to the right and left, totaling 28%. These 28% correspond

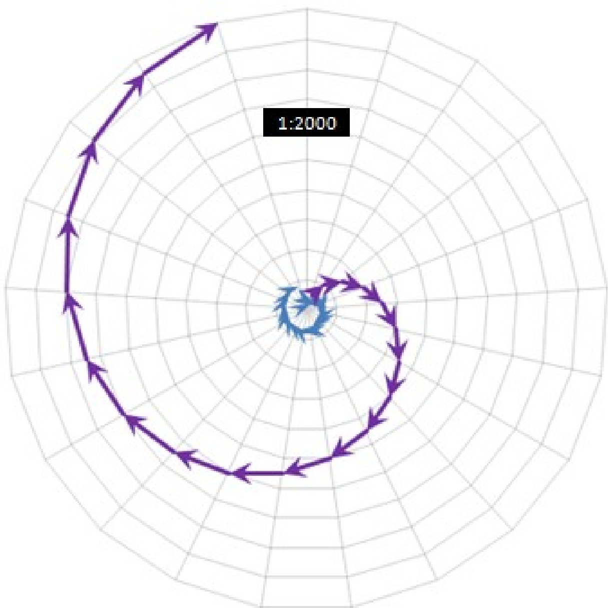
[2] Appendix A is dedicated to clarifying the BinomialDistribuion_PROB algorithm and validating the general binomial probability formula used by it.

to approximately 72% of **"Samples in the Range"**, which in turn correspond to 99.99% of the total population. The remainder, which represent 72% of the size of the **"Range"** correspond to approximately 28% of the samples. This matches the Pareto Principle also known as the 80/20 rule and which can also be 70/30 or 90/10 for example (PARETO. . . , 2021).

It can be seen in Table 1 that as the samples increase, the percentage occupied by 99.99% of the samples **"% of Samples in the Range"** tends to decrease more and more slowly, although the amount of samples representing this percentage tends to increase **"Samples in the Range"**.

The column of **"Range in the Samples"** from Table 1, blue arrows in the graph of Figure 9, will be getting closer and closer to the center of the graph proportionally. Although the amount of **"Range in the Samples"** increases, the proportion they take in **"Total Samples"** decreases. The purple arrows in the graph represent the column **"Total Samples"** of Table 1.

Figure 9 – Comparison of total samples with a range of 99.99%



The purple arrows represent the "Total Samples" column and the blue arrows the "Range Samples" column of Table 1. [3]

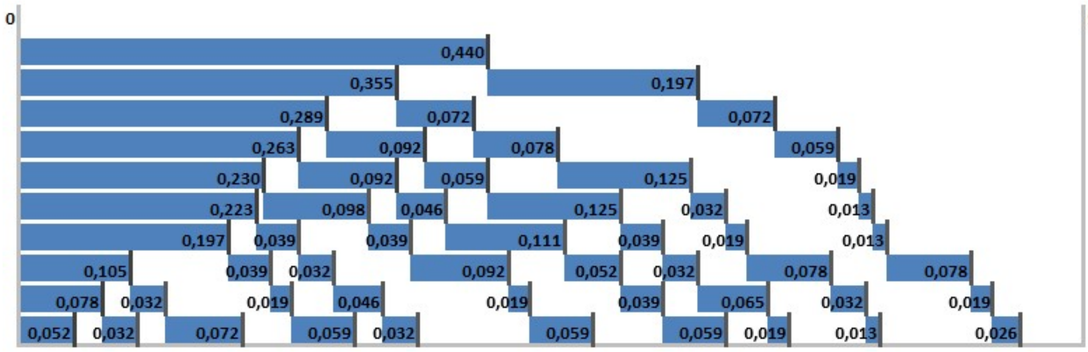
At <https://www.mathsisfun.com/data/quincunx.html> there is a tool called Quincunx or Galton Board that dynamically exemplifies what the above pictures show. An explanation of how this tool works can be found at <https://www.mathsisfun.com/data/quincunx-explained.html>.

[3] The graph in Figure 9 represents the first 20 rows of Table 1, as they suffer equal increments of 100 samples in each row. Rows 21 onwards are incremented by 1000 samples on each row.

1.3 Consciousness

A logical moment can be formed by a division (first moment) or by logical subdivisions (other moments).

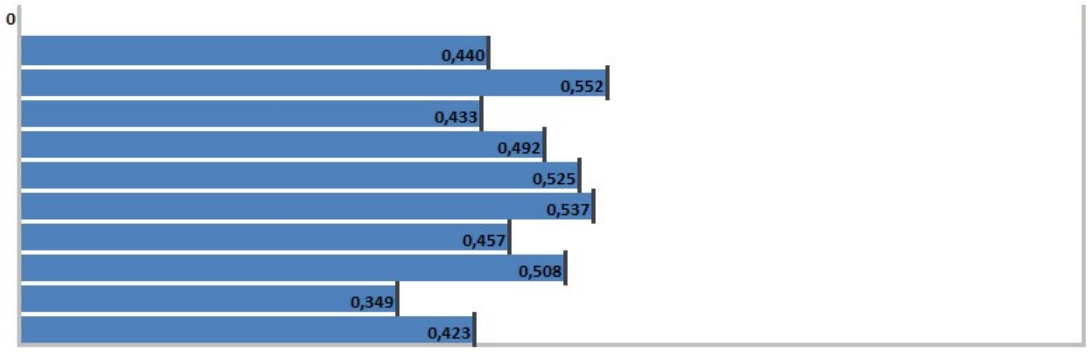
Figure 10 – Logical interval



Example of a logical interval with ten logical moments.

Consciousness is the logical moments of an expansion represented in its units.

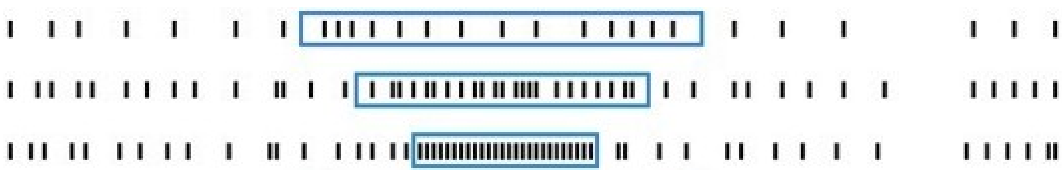
Figure 11 – Conscious logical interval



Example of a conscious logical interval with ten units of logical moments.

It can be seen in Table 1 that the probability of 99.99% of the samples in a population (Range), which increase in quantity as the logical moments increase, tends to be increasingly in the center of the logical interval and this centralization tends to infinity.

Figure 12 – Centralization of 99.99% of the samples



Tendency to center the range of 99.99% of the samples.

Consciousness tends toward the representation of a logical wave, the largest logical wave in a population (a histogram of the normal distribution) as shown in the figure 8. All of the aspects listed below are inherent in the logical abstraction called consciousness.

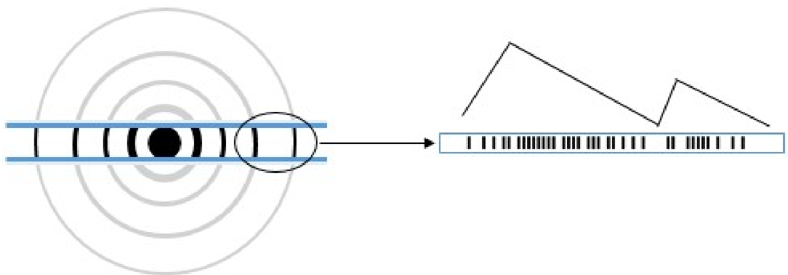
1.3.1 Infinite

One of the most important aspects that the negation of nothingness brings (negation of self), is infinity, that is, in any logical interval the infinite fits again. The primordial logic that started the entire logical interval is the same found in its subsequent intervals (subintervals). This substantiates how a high-level logic like the human subconscious explains primordial logic, since it is not necessary to go back to the first logical moment of the interval to deduce it, as this phenomenon is omnipresent throughout the interval.

1.3.2 Waves

Probabilistically, the distribution of new samples from a population tends to concentrate more samples toward the median of the population as the frequency of samples increases in this direction. However, the distribution of these samples with uniform growth frequencies is infinitesimal compared to the random possibilities of this growth. Thus, the tendency of these growth frequencies toward the median, together with the very low (infinitesimal) probability of this growth being uniform, leads to frequencies in the waveform. The relationship of the density or amplitude of a wave to its length is detailed in the next subsection.

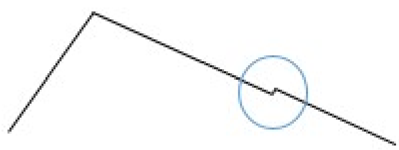
Figure 13 – Waveform



Wave pattern inferred by the trend of this distribution with higher frequencies towards the population median and very low probability of uniform growth of these frequencies.

Merging one wave into another eliminates its discrepancy and makes that wave cease to exist and become part of the first wave, which has its peak closer to the median, in this example. A wave doesn't die, it just merges with another wave closer to it.

Figure 14 – Wave unification

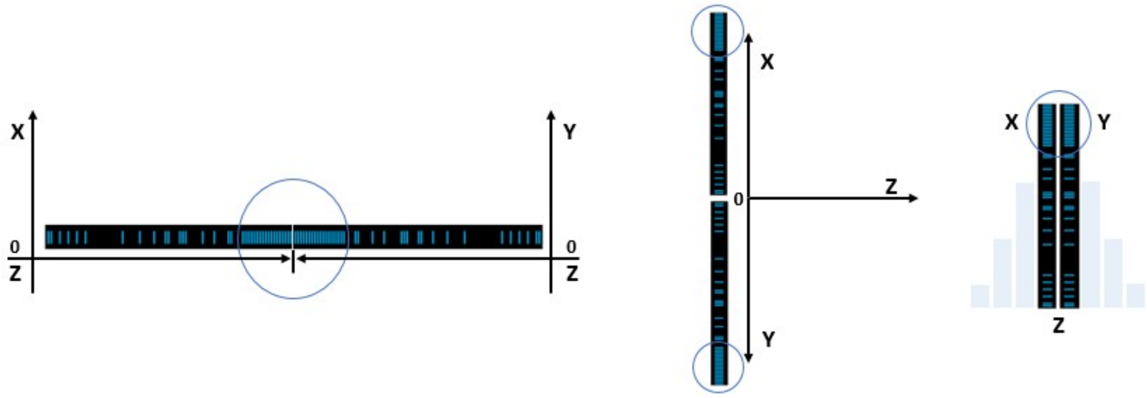


Waves being unified to exemplify the uniform growth of the samples.

1.3.2.1 Wavelength and amplitude

The histogram is used in the figures in this subsection and later to facilitate visualization and understanding of the distribution of samples in a population, because it represents very well the density curves of a population, according to the different views of the Figure 15, representing only one interval or wavelength paired by the median of the population.

Figure 15 – Histogram in different views



Different ways of population representation in a histogram.

The length and amplitude of waves establish a quantity-per-interval or unit relationship. These units are established by wave entanglement, as seen in the next subsection. Thus, amplitude is the density of a wavelength, the density of some interval.

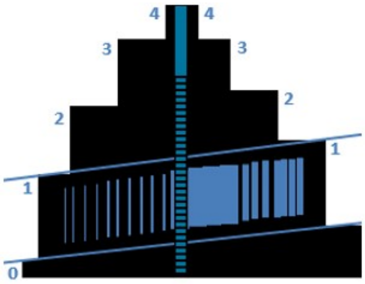
When adding a new sample to the population, the entire interval is proportionally distributed to match that sample, as shown in Figure 16.

Figure 16 – Interval expansion

Expanding the interval by adding new samples.

Another important factor is that new samples tend to be more distributed at the peak of the interval, probably the densest place in the wave. In Figure 17 the peak is represented in the upper part of the subinterval that makes up the peak of the wave (because it is the densest interval that makes up the peak and because the upper part of the interval is closer to the population median). However, the peak can be at any other point in the subintervals that make up the peak of a wave.

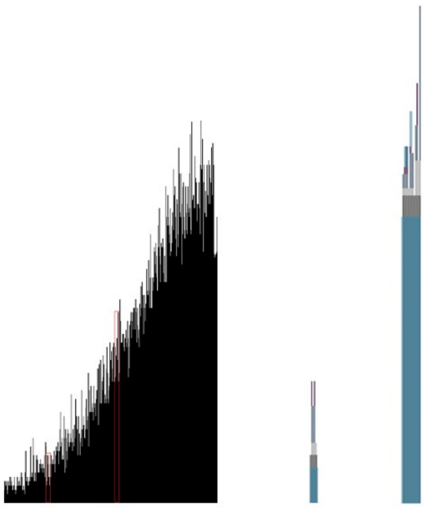
Figure 17 – Wave amplitude - peak



Trend of the highest concentration of samples in the subintervals of a wave.

In large intervals with many logical moments a smaller discrepancy of wave amplitudes is observed. In such intervals large systems of objects can be observed. The larger the intervals, the more balanced they grow towards the population median (probabilistically) as seen in Figure 18. The lowest wave (dark blue) is the base wave of the system, that is, the wave that formed the other waves. Wave systems can be complex, having several nested waves. More complex intervals with this feature can represent, for example, the universe, then galaxies, stars, planets, etc.

Figure 18 – Wave amplitude at large intervals or lengths



Smaller wave discrepancy at large intervals.

In smaller intervals and with many logical moments a greater discrepancy in wave amplitudes is observed. In these intervals smaller object systems can be observed. The smaller the intervals are, the more unbalanced they will grow towards the population median (probabilistically) as seen in the figure 19. The lowest wave (dark blue) is the base wave of the system, that is, the wave that forms other waves. More complex wave systems with this feature can represent, for example, the atom, which is very small, present in huge quantities, and the particles orbiting its nucleus (electrons) are much more distant from it.

Figure 19 – Wave amplitude at small intervals or lengths

High wave discrepancy at small intervals.

1.3.2.2 Entanglement

The most similar samples in terms of frequency and distribution are the samples that are part of the same wave. They are non-overlapping, opposite frequencies that complete each other.

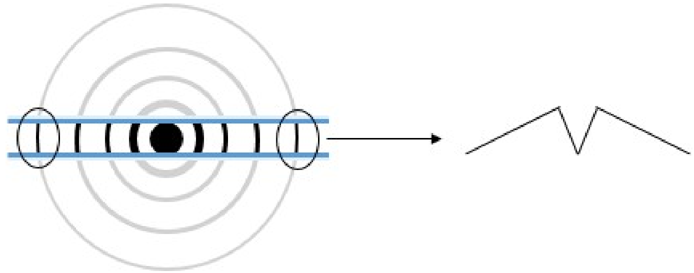
Probabilistically, the two complementary parts of a wave tend to be at approximately equal distances, equidistant from the median, but this is not a rule and the complementary parts of a wave may be at different distances from the median. The phenomenon of parity of the parts of a wave is called wave entanglement.

These pairs tend to be formed by probability, where equal wavelengths have the same probability of samples distribution at two or more different points in the population.

Intervals with similar temporal frequencies and spatial distributions are intervals formed by the same probabilistic unit, that is, intervals that have the same probabilistic scenario or context at a given logical moment. Being in the same probabilistic scenario (probabilistic units), these intervals have their samples in the same space-time scenario, which is called space-time lattice and is formed by the largest probabilistic unit in the population (all the samples in the population intermediated by the median).

These entanglements form smaller waves (subconsciousnesses), similar to the largest wave in the entire interval, usually entangled by the population median (consciousness). Consciousness is the logic of the entire interval, while it forms subconsciousnesses or sublogics, like small waves of a larger wave.These small waves are similar to the pattern of the larger wave. Thus, a change in the larger wave (consciousness) are also changes in the smaller waves (subconsciousnesses) - a change that is induced indirectly by subconsciousnesses, analogous to the compression of gas in a cylinder, where by adding a new molecule of gas in the partially filled cylinder, closer or tighter these molecules will be inside it. The opposite is also true, a new sample in a subconsciousness that is directly observed by it is also a change of the consciousness and will be induced indirectly by other subconsciousnesses, as shown in the Figure 27.

Figure 20 – Subconsciousness



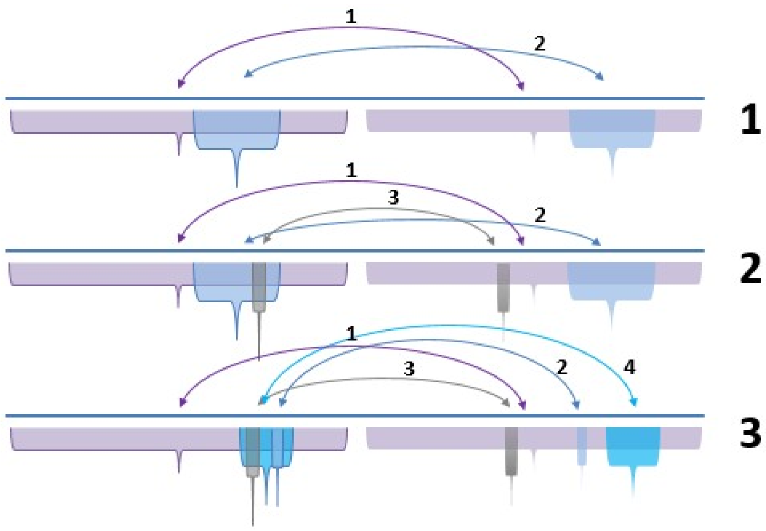
The wave pattern forms subconsciousnesses similar to the pattern created by consciousness, as seen in Figure 8.

The entanglement of waves can occur at different levels or intervals, as seen in Figure 21, which forms nested wave systems. The borderless braces (right) identify the intervals at which a new sample triggered the jump, as seen in the next subsection. The numbered arcs indicate the order of the entanglements. An entanglement can occur equidistantly from the median without the jump, like the first entanglement (violet).

The largest entanglement is shown in the examples in Figure 21 as the first entanglement (violet), which occurred when that interval was the smallest, probably. Large intervals tend to be kept ordered by the reordering of their subintervals subsequently. The largest wave is commonly entangled by the population median.

The smaller intervals get entangled first, and these reorders caused by them allow the union of larger intervals. The meeting of two already entangled intervals does not entail a new entanglement, only the sum of these waves, because they are already entangled.

Figure 21 – Wave entanglement levels - wavelengths



Examples of entanglement levels of waves or levels of wavelengths.

The possible wavelengths of a population are defined by these levels of wave entanglement. Thus, regardless of the order of the jumps, larger entanglements are the longer wavelengths and smaller entanglements are the shorter wavelengths, which allows larger waves to have smaller subwaves.

Every entanglement is a wave and the meeting of two entanglements does not lead to a new entanglement, only the sum of these waves, because they are already entangled.

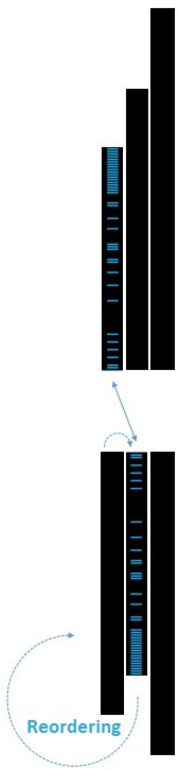
The entanglement occurs in very small intervals. Once entangled, each new sample can cause movement, depending on the more or less rarefied environment. Larger intervals are formed by adding smaller intervals already entangled through movement and by adding new samples.

1.3.2.3 Jump

The jump is a reordering done by wave entanglement, as the samples of the entangled pairs are no longer equivalent with the addition of new samples from one side of the pair. The jump occurs on one side of a pair of waves and is a reordering.

In Figure 22 the entanglement of waves (represented by columns of a histogram to facilitate the visualization of the interval) is observed. The reordering made by the entanglement causes a jump in the coordinates (X, Y and Z) according to the Space subsection.

Figure 22 – Reordering - jump



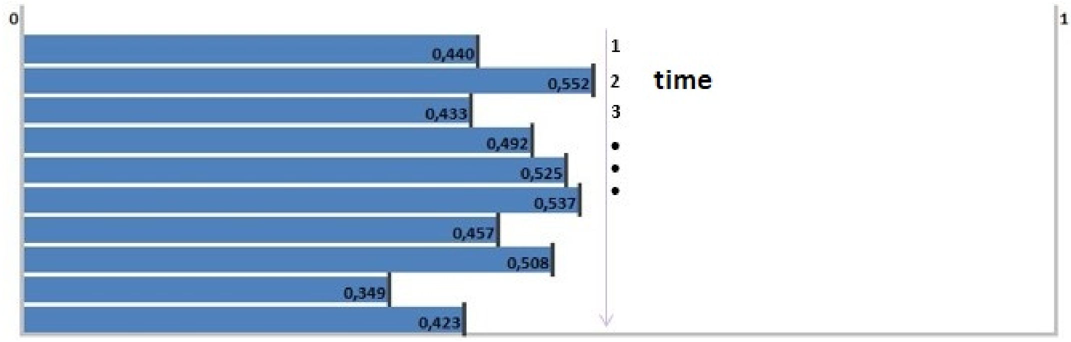
Jump caused by non-equivalence of the entangled pair with the addition of new samples on one of its sides.

As an example, a photon entering the electron's interval can unbalance one side of the electron's entangled pair, which makes it jump, but since the electron's interval is small and the photon is fast (because it is even smaller) it quickly leaves the electron's interval, which becomes unbalanced again and returns to the energy level equivalent to the one before the jump.

1.3.3 Time

Time is the addition of new logical moments between existing moments as the self-negation of primordial logic proceeds. The changes are cumulative and as the number of logical moments increases, the less relevant each new moment within the conscious interval will be. One in a hundred is more relevant than one in a thousand.

Figure 23 – Time



Progression of time as logical moments advance.

In the introduction to this paper it was presented that primordial logic is a sequence of negations of itself at time zero, that is, at no time between its negations does logic [being], guaranteeing the primordial premise of the logical constant, [NOT BEING]. Thus, logic is an infinite, simultaneous and generalized sequence, a constant. In the observer-driven experience of time, the ordering of each sequence is the essence of this logical quantity and therefore more relevant than its origin, which is of a simultaneous nature, transcending time.

Each population has a different order in its sequence and it is this order that gives rise to the logical quantity called time. It is this order of the universe or of consciousness that will give the notion of what happens before or after, that is, the past, the present and the probabilistic future prospections.

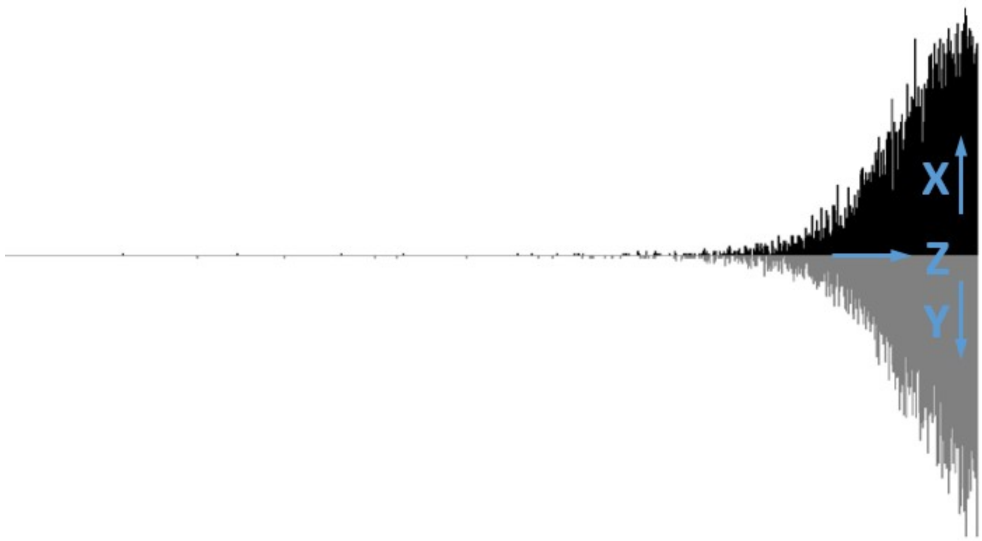
Another important factor when observing time (the observer is more detailed in the consciousness subsection – Observer and life) is that, probabilistically, subconsciousnesses or intervals closer to the population median will have a larger addition of new samples in their intervals, which are directly observed by these subconsciousnesses. On the other hand, subconsciousnesses far from the population median will have a smaller addition of samples in their intervals and are subject to a larger number of indirectly induced changes, as shown in Figure 20. This phenomenon of temporal observation provided by the probability of the population distribution avoids the twin paradox (PERKOWITZ, 2013).

Prospections of the observer's future are based on the probabilistic distribution of the population and, therefore, on the probabilistic distribution of each sub-interval of the population. The universe tends to be probabilistic, while random at levels of detail (which makes events different), yet predictable at some level, as shown in Figures 10 and 11.

1.3.4 Space

In Figure 24, the sample density of a population is shown, where pairs tending to the same probabilistic distribution are placed side by side and represented in histogram form. The formation of these pairs comes from wave entanglement.

Figure 24 – Entangled pairs represented in three spatial dimensions



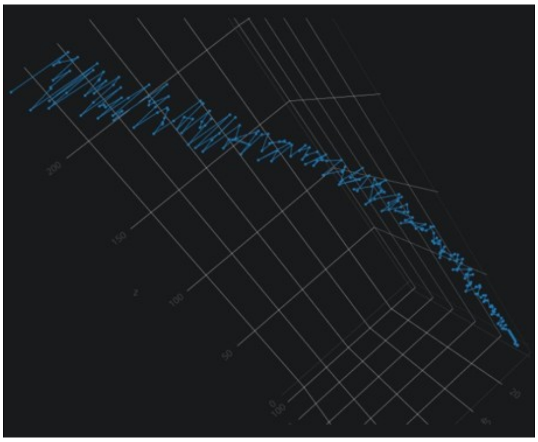
Example of entangled waves, represented in histogram form and obtained by the Logic_WavePattern algorithm. [4]

The area grows quadratically to the increase in the amplitude of a wave (columns of the histogram), since the jump caused by the entanglement of the waves and the probabilistic distribution of samples in the interval naturally tend to maintain an equivalent growth in the pairs that form a wave. This aspect configures the inverse square law, which will be further explored in the subsection of Gravitational force.

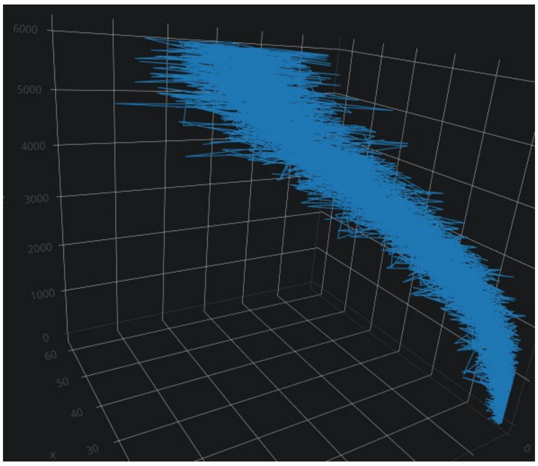
By plotting the spatial dimensions of the graph of Figure 24 on a 3D distribution graph and distributing their endpoints (neglecting their volumes and possible internal points), something like a spiral is obtained (like eddies in water or air), even on very small data volumes (few logical moments), as in Figures 25a and 25b. The points tend to move in a spiral shape approximately, as shown in the next subsection.

[4] The Logic_WavePattern algorithm can be seen in Appendix A.

Figure 25 – 3D scatter plots generated with points similar to Figure 24



(a) 15,000 samples or moments



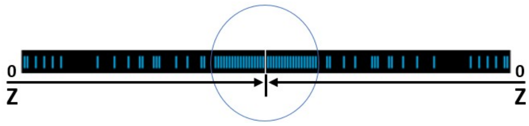
(b) 200,000 samples or moments

The histogram on the wave pattern and the data for generating the 3D scatter plots can be obtained by running the Logic_WavePattern algorithm. [5]

Probabilistically, the high concentration of samples in a population is at its peak, towards the median of the population. Thus, due to the probabilistically high concentrations of samples in smaller and smaller intervals of a wave, the peak will occupy a smaller and smaller proportional subinterval within the population, as seen in Figure 26. The figure 9 is based on Table 1 and also demonstrates this feature that within the population peak can demonstrate an approximately homogeneous and flat universe in its distribution even though its samples tend to the reference line.

[5] The Logic_WavePattern algorithm can be seen in Appendix A and the 3D scatter plots can be accessed at: <https://chart-studio.plot.ly/create/?fid=ren.stuchi:5&fid=ren.stuchi:4> e <https://chart-studio.plot.ly/create/?fid=ren.stuchi:7&fid=ren.stuchi:6>

Figure 26 – Flat universe

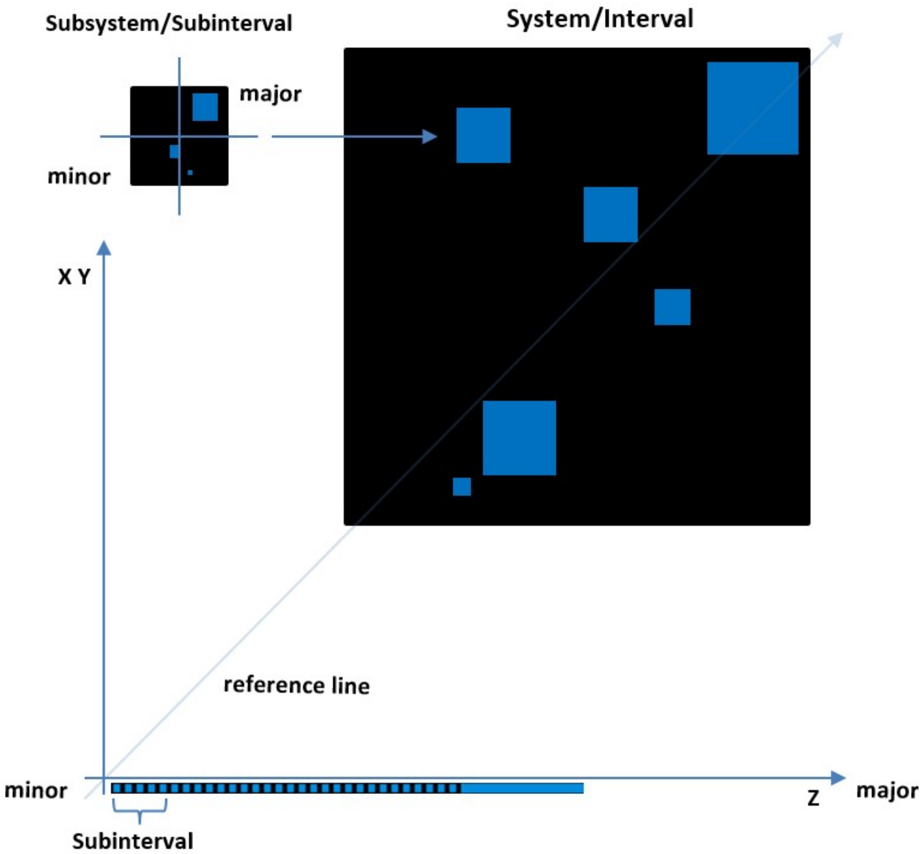


Concentration of 99% of samples.

Obviously the representation and motions of the interval or its entangled subintervals cannot be faithfully represented in 1 or 2 dimensions, as entanglement is inherent (inseparable) essence of 3 dimensions.

Each new sample is time and also space (movement or change). Each new sample added within a subinterval will cause it to move according to the distribution of its new samples. The interval that contains subintervals can move in any direction, but in the same way that the samples in a distribution in 1D (Z axis of Figure 27) are concentrated in the highest value part of the plane, in 2D or 3D is analogous and the same occurs, as shown in the Figure subrange 27. Both the interval and the subintervals tend to have their highest sample concentrations towards their inner reference line and the reference lines of their upper intervals. This makes something approximating a histogram representation come naturally. The interval and its subintervals have their sizes in X, Y and Z proportional to their sizes within the population in 1D representation (Z-axis of Figure 27), so their internal scales are related to the number of samples that they have.

Figure 27 – Spatial distribution and movement



Spatial distribution and movement of subintervals and population interval.

A new sample in a subinterval moves this and its upper intervals, because a change in a subinterval is also a change in its upper intervals. The movement is continuous and its time and space scales are relative to the basic unit of the population (1 sample [space] to each new sample from the population [time]). For example, a subinterval may be moving in one direction at 2 samples (space) at each new sample of the population (time) and will continue in this motion until it receives two opposing internal samples or collides with some sample in its motion, in more or less rarefied environments, that slows it down or causes it to stop (laws of dynamics).

The entanglement occurs in very small intervals and they form at the base of their upper intervals, according to the Z-axis. Once entangled, each new sample can cause movement, depending on the more or less rarefied environment. Larger intervals are formed by adding smaller intervals already entangled through movement and by adding new samples, as per the Entanglement subsection. Thus the movement of electrons within the atom is not totally continuous, because the jumps cause new entanglements that redefine their positions, configuring layers.

A subinterval can naturally leave the gravitation of its upper interval. This occurs most easily with very small and fast intervals (many samples concentrated in a small interval - peak) favored by their movement in a rarefied environment due to their size.

It is very difficult to know the position of the interval or a subinterval by looking at a 1D representation, because each new sample moves the subinterval and the interval and this interaction requires a calculation for representation that would take until a naturally 3D representation again.

Every subinterval when it is entangled arises at the bottom of its upper interval. Then adding new samples into this subinterval that has just emerged will cause it to move up into its upper interval, and this is the direction of all entanglements that do not have subintervals, to move up as they add samples and speed toward the reference line. But the environment may not be rarefied, which makes this movement difficult (and may keep it stationary depending on how dense that environment is). Thus, in Figure 28 an interval that does not yet contain subintervals is displayed, so it moves up and gains speed with each new sample it receives, and its rise will either be centralized if its samples are evenly distributed or with a centralized peak, or it will be skewed to the right or left as the highest concentration of samples is more on one side than the other (it is more common for the concentration of samples to be toward the population median).

Figure 28 – Interval without subintervals

Moving an interval without subintervals.

Intervals that have subintervals can move in any direction, since their subintervals can receive jumps and through these new entanglements the position of these subintervals are reset to the base of their upper interval and thus this interval can have a destruction of subintervals in any direction, whether they are denser or less dense, as the subinterval in Figure 27.

1.3.5 Fundamental forces

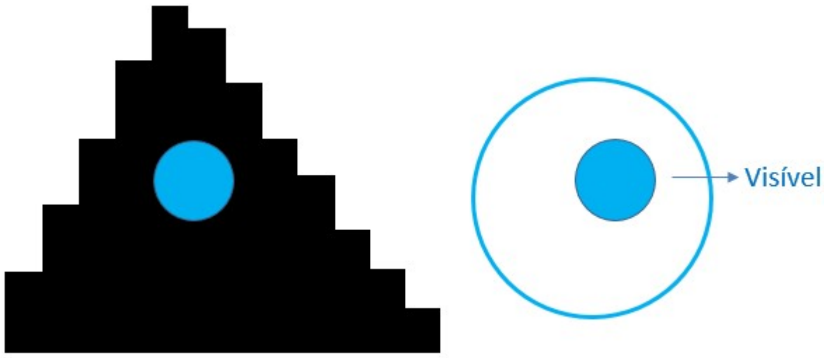
The gravitational force, the electromagnetic force and the nuclear force correspond to the so-called fundamental forces of nature. These fundamental forces are not forces as such, but probabilistic aspects of population distribution and wave entanglement.

1.3.5.1 Gravitational force

The gravitational force is not a force itself, but an aspect of the probability of distributing new samples towards the population median, according to the central limit theorem. This probabilistic sense makes waves have a probable path to follow within the population, that is, the peak of population samples or the peak of the largest wave in the population. In the same way, they also make the samples within an interval have a probable path to follow, the peak of samples of the interval or the peak of the wave. These sample peaks are usually the most easily observable part of the sample interval since they occupy a not so small area.

In Figure 29 it can be seen that the most easily observable part is slightly to the right at the peak of the wave. This wave tends to move up and to the right, in a diagonal direction to the peak of its upper interval. It can also be seen in this figure that it has a slightly higher density of samples on the right, and these samples are more evenly distributed. This density and uniformity indicates the probabilistic path this interval is traveling and its speed in that direction (the higher this density and uniformity).

Figure 29 – Gravitational force



Gravitational aspect - the probabilistic direction of the distribution of new samples within an interval.

As seen in the Wavelength and amplitude subsection, the area of an interval grows quadratically, since the jump caused by the entanglement of the waves and the probability distribution of the samples tends to maintain an equivalent growth in the pairs that form a wave. This aspect configures the inverse square law, where, in the case of gravity, the closer the objects, the greater the probabilistic chances of new samples of the smaller object heading towards the larger object (since the larger object tends to be the peak of wave - the probabilistic direction within the wave). Thus, for being within a smaller square area and, consequently, having less possibility of movement, it ends up increasing the chances of these objects approaching with a much smaller amount of logical moments. On the other hand, the more distant the objects, the larger the area, the greater the positioning possibilities and the more logical moments are needed for the approach, featuring less attraction. Probability can also drive away more rarefied objects that should be further away from the denser and more easily observable part of a wave, as in the case of helium gas, for example. The distribution of new samples in the rarefied intervals is slower than in the denser intervals (otherwise they would not be rarefied), so these dense particles receive more samples in a shorter amount of time, occupying the front of the less dense particles.

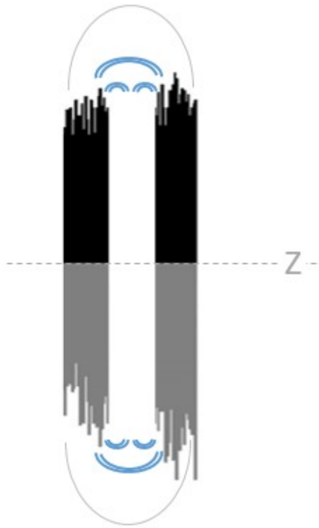
1.3.5.2 Electromagnetic force

The electromagnetic force is not a force in itself, but an aspect of the entanglement of waves that intensifies at intervals or wavelengths with low entropy and with the spatial approximation (reduction of differences in the X, Y and Z axes) of these intervals.

Electromagnetism is related to intervals similar to the more uniform wave side found in Figure 29 (right), but with low entropy, that is, the same structure that facilitates the movement of objects added to the low entropy, which facilitates jumps. When intervals have low entropy, their approximation, either naturally through the structure that facilitates movement or through the distribution of new samples capable of creating this structure, such as electrification, makes the wave pairs of one interval very similar to the wave pairs of the other interval, which makes many of these pairs viable for wave entanglement to finding more ideal pairs in the other interval and vice versa. In this way, a rearrangement occurs between the intervals through wave entanglement, and this rearrangement makes these intervals more equalized (low entropy).

The blue lines in the figure 30 show where the exchange of wave pairs by wave entanglement is most frequent, that is, where the waves are most probable to be similar. This is why magnets try to rotate to connect when they are face to face with the same pole. The gray line shows connections that occur in a much smaller number.

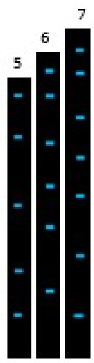
Figure 30 – Electromagnetic force



Increased possibilities of wave entanglement due to probabilistic equalization in close and low entropy objects.

Figure 31 shows an example of low entropy.

Figure 31 – Electromagnetic force - entropy



Increased possibilities for wave entanglement due to low entropy.

The electromagnetic aspect is closely related to the low entropy of an interval and the possibility of entanglement of its pairs with surrounding pairs. The low entropy of an interval indicates that its samples are in some sort of order within it.

Probabilistically, the most similar wave pairs are found in the closest regions (blue lines in the figure 30). This occurs due to the growth of the number of samples towards the median of the population, however it is not a rule and the poles may reverse, that is, have more connections with the region of lower probability, even though most of the pairs that make up this region are increasing towards the median.

1.3.5.3 Nuclear force

The same probabilistic aspects that govern gravity and that can be seen in Figure 29 also govern the so-called nuclear forces. The difference is that in nuclear forces the intervals are smaller allowing a much larger amount of jumps and their waves are more discrepant, as shown in Figure 19.

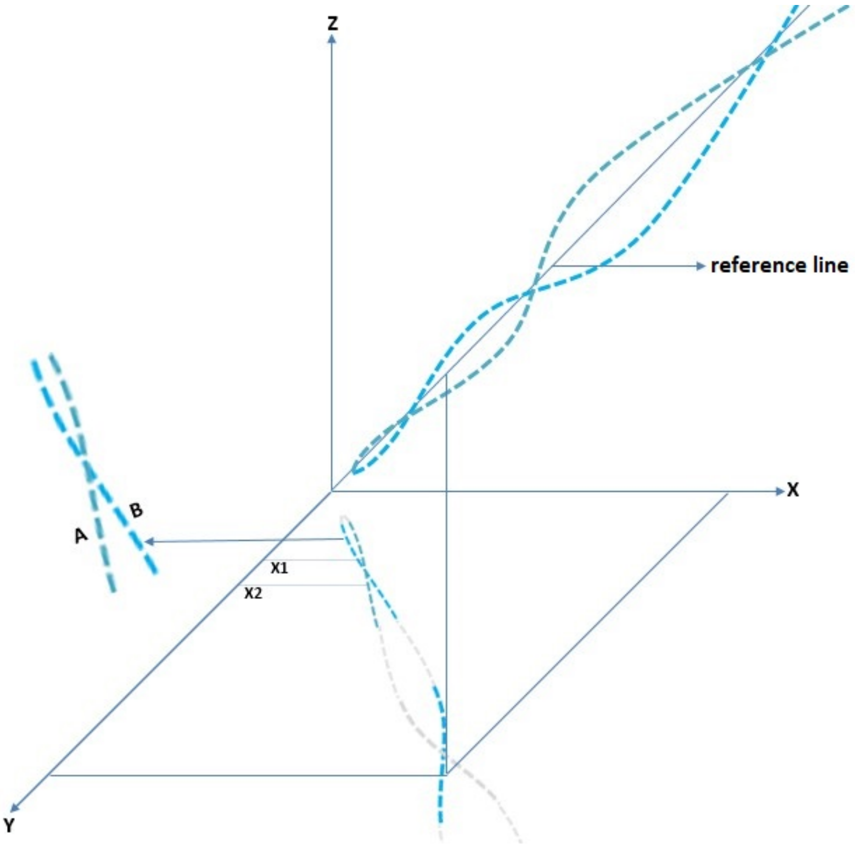
The strong and weak nuclear forces represent large concentrations of logic moments per population interval, a high density in a small interval. The large concentration of these samples is at the peak of the interval, which occupies a smaller and smaller subinterval within the wave (proportionately), due to the high concentration of samples in smaller and smaller intervals, as shown in Figure 9.

The penetration of these small and dense intervals by an excessive amount of logical moments (another similar interval), in a short period, causes the countless pairs of their subintervals to oscillate, potentiating the jumps. In this way the subintervals jump continuously, progressively and quickly until the probability distribution of the population normalizes the entire interval afterwards. Along with the jumps that will cause movements in large numbers of particles or intervals around them, there are a huge number of frictions at tremendous speeds caused by the collision of these small particles that cause great shock waves.

1.3.6 Spiral and orbit

As the X, Y, and Z coordinates of the entangled pairs of a population tend to increase, their arrangement in a three-dimensional coordinate system will follow a diagonal reference between these three axes, as shown in Figure 32. The observed spiral pattern does not invalidate other possible movements in space. Often, it is not possible to immediately observe the spiral pattern in the movements of an interval (subinterval), yet this pattern underlies many of these movements. Taking human movements, for example, there are predominant cycles of going and coming home, going to and from work, waking up and sleeping, that is, habits are similar to movements in cycles (spiral movements).

Figure 32 – Three-dimensional coordinate system



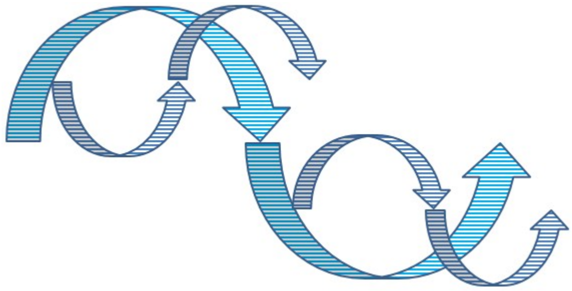
Probabilistic reference line for distribution of a population in a three-dimensional plane.

In Figure 32 points X1 and X2 can also be observed. These points were mirrored in X and Y coordinates to facilitate the observation that even at the bottom of the spiral the interval continues to add samples, albeit in smaller amounts than when going up to the top of the spiral. The dashed lines show the most probable paths to the A and B intervals. Thus, when a part of the interval is at its maximum midpoint (X and/or Y axes) the probabilistic tendency is that it receives fewer samples than the part of the interval that is at its minimum midpoint. This spiral effect is more noticeable the larger an interval and its quantity of samples, as the more probable and stable these paths will be.

The continuous motion in a rarefied environment also helps in the formation and maintenance of the spirals. As the samples are added to the subintervals their velocities tend to increase towards the reference line, and because this addition is not uniform (varying between peaks and valleys) and the motion is approximately continuous the subintervals can drift or slide from one side of the reference line to the other.

Each interval or subinterval (wavelength) has its own reference line. Just as within a meter there are centimeters, millimeters, etc., within an interval and subinterval there can be numerous other subintervals.

Figure 33 – Intervals and reference lines



Spirals at different intervals and their reference lines.

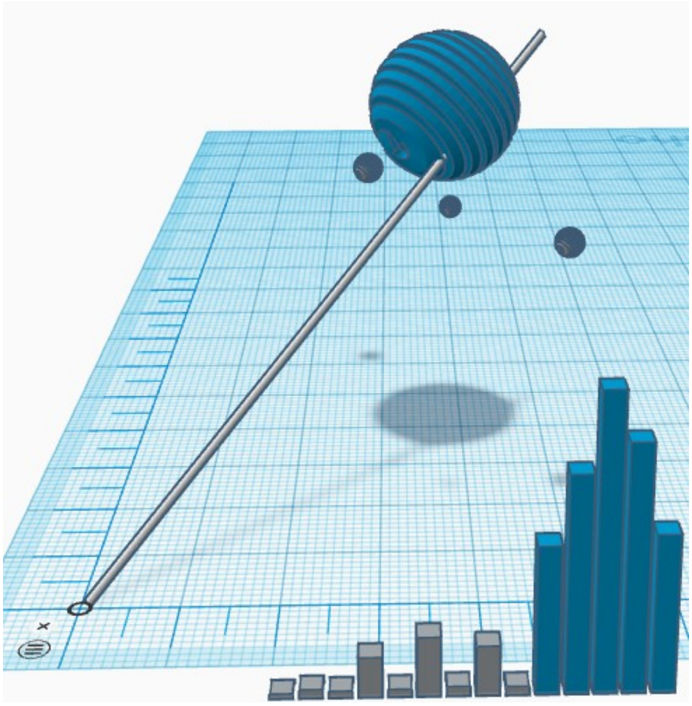
1.3.6.1 Orbits

Orbit can be defined in this study as the concept of the spirals plus the orientation of a probabilistic peak (gravity) instead of the reference line of the spirals, only.

Systems that orbit as described earlier (in spiral - oriented by the reference line) are systems or intervals in which their peak is subdivided into subintervals and do not form a center of gravity, that is, all subintervals of the peak are not concentrated in one point of the system, thus orbiting the reference line of the interval. Probably galaxy clusters and superclusters are examples of this orbit. The spiral orbit (oriented by the reference line) is not restricted to large systems, this orbit is a feature that can happen in any size of interval.

Another type of orbit is defined when the subintervals that orbit the peak of the wave (which represents approximately 99.9% of the samples in the interval) decrease their orbit speed as they move away from the peak. In Figure 34 the columns of the histogram in blue represent the peak of the wave. This decrease in velocity occurs gradually as these gray intervals move away from the peak of the wave, thus receiving a smaller amount of samples decreasing their acceleration. The solar system is possibly an example of this type of orbit. Atomic orbits may also resemble this type of orbit due to the differences in energies between the layers structured by the jumps.

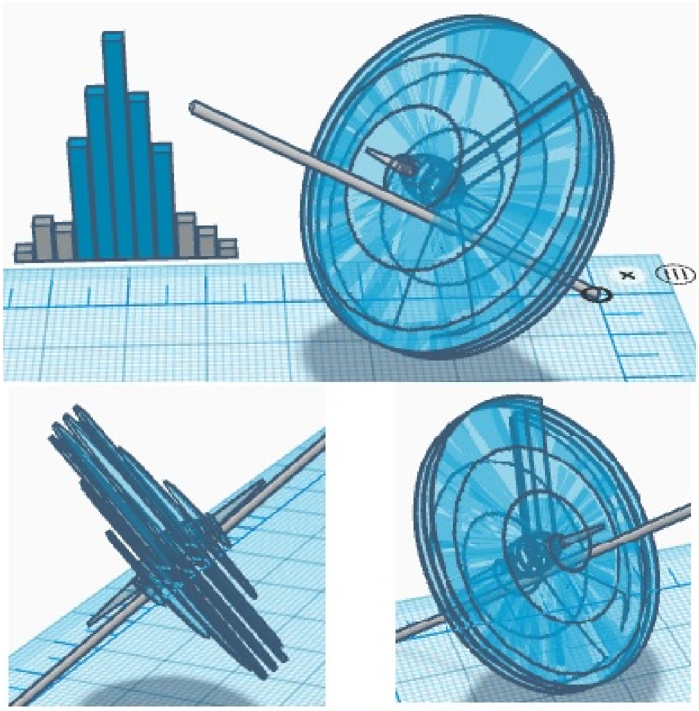
Figure 34 – Orbits of the subintervals outside the wave peak



The subintervals decrease in speed as they move away from the peak of the wave.

Yet another type of orbit is defined when the subintervals that orbit the peak of the wave maintain a constant average velocity regardless of the distance from the peak. This occurs because these subintervals are also part of the wave peak in blue, as shown in Figure 35. Thus, because these subintervals remain in orbit within the 99.9% subinterval of the wave, their velocities do not decrease. This 99.9% of the wave is most easily visible part, therefore, the observed part of the galaxies, probably. Perhaps this feature is also responsible for the rings of planets.

Figure 35 – Orbits of the subintervals inside the wave peak



The subintervals maintain their speed as they move away from the peak of the wave.

For the distance of the subintervals in orbit, gravity exerts more of an orientation than an attraction. But since the motion is practically continuous in rarefied environments and this orientation is permanent, the orbits are formed and maintained by the increasing speed of these subintervals, which tends to pull them apart.

The further the orbits are from the peak, the more uniformly their samples are internally distributed. When the gravitational attraction is stronger the samples are more intensely distributed in this direction. This more uniform distribution can influence atomic clocks, the human body, etc., as each sample influences time and space.

As stated in the subsection of space, a new sample in a subinterval moves it and its upper intervals. Also new samples in the upper interval move the lower intervals, as they are fractions of the same wave. In this way, a lower wave will remain in the upper wave when its velocity is less than the peak velocity of the upper wave and its path is not opposite to the upper wave's path. The movement of the upper wave drags its subintervals, which with lower probabilistic speeds will continue to move within its upper wave, because even with lower speeds they are dragged by the movement of the upper wave, which is also composed of the movement of its subintervals.

Doubling the amount of samples in an interval will not definitely double the speed of an interval, as it have twice as many samples to move, leaving the velocity unchanged. However, probabilistically, the greater the number of samples of a wave, the more these samples will be towards the population median and the less relevant the contrary samples become, which makes the probabilistic speed of wave peaks higher than the speed of their subintervals. This is not a rule and a subinterval may have a velocity greater than the peak of its upper wave or its movement may be contrary to the movement of the peak of the upper wave, causing it to naturally exit the gravitation of its upper wave (and this occurs more easily with very small and fast intervals favored by its movement in a rarefied environment due to its size).

1.3.6.2 Dark matter and dark energy

The intervals naturally move away with increasing speeds because they receive more samples towards the reference line or peak of the wave of their upper intervals and because they move in a rarefied environment.

Spirals can occur without the need for a concentrated wave peak, but when there is such a concentration in the wave peak, orbits can occur within or outside of 99.9% of peak samples, resulting in orbits that maintain their average velocity constant when away from the peak (within 99.9%) or orbits that decrease their velocities when away from the peak (out of 99.9%).

Therefore, dark matter and dark energy are neither matter nor energy, but probabilistic aspects of the distribution of samples in a population that resembles the normal distribution.

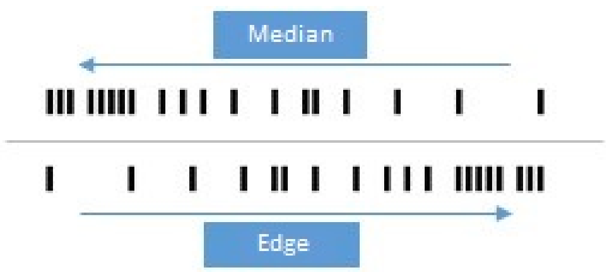
1.3.7 Antimatter

When an interval tends to concentrate its samples toward the median, which is the probable direction according to the central limit theorem, it is called matter. Antimatter is the opposite, when an interval tends to concentrate its samples in the direction opposite to the median.

The simplest way to visualize the probabilistic direction of samples of any wavelength is to look at the **probabilistic reference line**, as shown in Figure 32. The greater the amount of sample in an interval, the greater will be its probabilistic tendency towards the population median.

In the Figure 36 two identical intervals are shown with their samples at opposite concentrations.

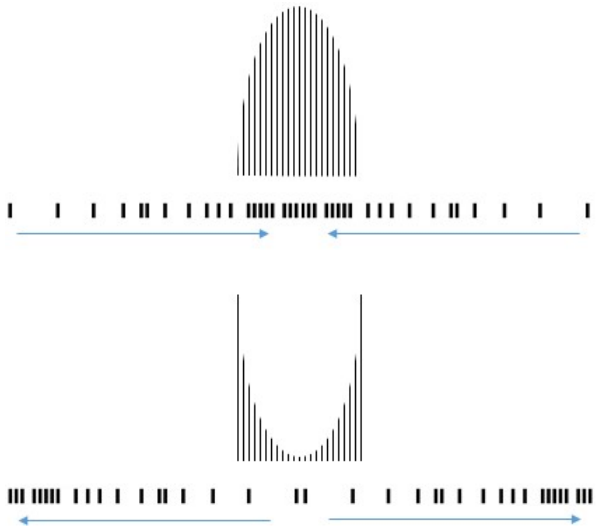
Figure 36 – Identical interval with its opposite sample concentrations



Identical interval distributed in opposite ways.

Merging or summing the opposite intervals in Figure 36 would make them a symmetric interval, that is, it would not be in any direction. The figure 37 shows one population with its samples concentrated toward the median and another with its samples concentrated toward the interval boundaries.

Figure 37 – Populations with their opposite sample concentrations

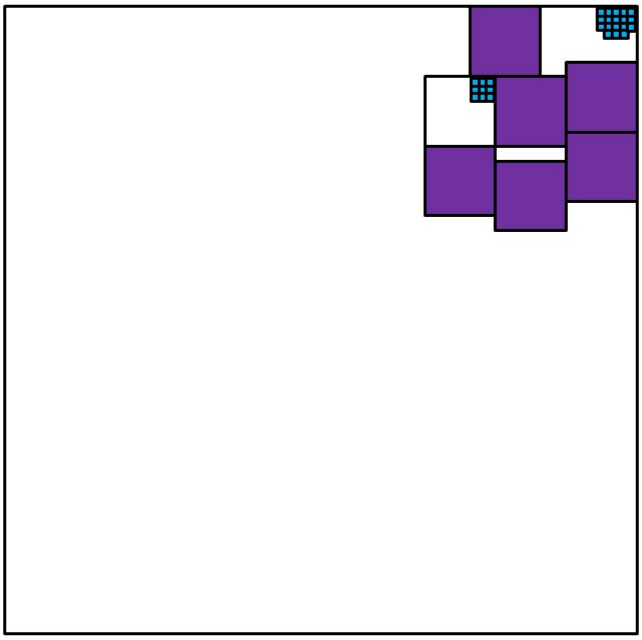


Populations distributed in opposite directions.

1.3.8 Black Hole

The area of an interval grows as new samples are added into the population, as Figure 16, and with the addition of other already entangled intervals, as shown by the upper right subinterval in Figure 38. However, intervals that receive a large amount of samples within the population tend to form more and more subintervals at different levels, which contracts the occupied area of these intervals (because of the wave entanglement from the smaller subintervals sustaining these approximately quadratic areas) as shown by the purple and blue subintervals in Figure 38. So this relationship of the size of the interval with its amount of samples and their subintervals is the aspect that can help describe the so-called black holes, where the peak of the wave will occupy a smaller and smaller proportional subinterval within the interval of the wave, even with an increasing concentration of samples. These peaks are often found from the middle to the front of an interval or system (the core or peak of the system).

Figure 38 – Interval contraction



Relationship of interval size and its possible contraction as new subintervals appear.

1.3.9 Observer and life

The wave intervals (wavelengths) that a subconsciousness (sublogic) is able to observe depend on the wavelengths of which the subconscious itself is composed. Among all the possibilities of intervals or wavelengths allowed by a population, the observer is in one of them.

The ability to compare or distinguish the order of changes in a sequence of samples is the logical ability of an observer, the observer of time (past and present).The speed of this observation is given by the range that the observer is able to compare, that is, how quickly the observer is able to distinguish small changes (few samples - few logical moments) will make it realize that larger changes take longer (many samples - many logical moments).

The logical ability to make probabilistic prospections, within the logical limitations of the observer and based on the probability of distribution of the observed interval or subinterval, is the essence of thinking and, therefore, of life. These prospections are based on the probability of distribution of each interval (in the direction of the interval) and, therefore, are related to pattern detection and future probabilistic possibilities.

The ability to compare or distinguish logical waves (subsets or subconscious) is the ability that defines the subject [I - me]. The reasonableness of this definition depends on the proportionality of this ability to compare.

Life [IS NOT], like any other logic. Typically, the most notable life forms are multiplied by being on the probabilistic average of the interval between their peaks and valleys, however different they may be. Something very discrepant or different from the average pattern of the interval tends not to multiply and remain.

1.3.9.1 Senses

The cognitive part of a wave is not observed directly, but rather the outside - the consciousness, the whole or more commonly a part of that whole. This observation may include the rest of the wave that the cognitive part is part of, which is also external to the cognitive part, and so the cognitive part may be a nested subinterval of another. The cognitive part of the human subconscious is probably where the largest wave peak of the human subset is found. This is where the greatest intensity of change is observed. This great intensity of change is largely characterized by human thinking (observation and probabilistic prospecting of an interval) that tends toward infinity, as well as the essence of logic, the [NOT BEING].In other words, the cognitive part is the part that is closest to logic in its essence and also to its totality (consciousness).

The taking of samples by human beings, through the senses, modifies them and these ripples act as adjustments or configurations. Each sense observes the sample population independently, as distinct frequency channels. Thus, eyesight can be seeing objects very far away and ears hearing sounds that are very close. The senses are limited by the waves that constitute the observer and their maximum observation capacity is limited in the maximum depth of the nested intervals observed.

An important feature of the process of observing small intervals is that they can be observed with particles or waves. In particle observation, the observer follows an interval represented by an entangled pair, observing its consistent shape and movement in space. In the particle effect, the consistency of the shape and its movements are established by the entangled pair, since the jump occurs on one side of the pair at a time, guaranteeing stability in the changes. In the interval observed as a wave, the observer follows one of the parts that make up the entangled pair, observing its movements and jumps, since the jumps are frequent in small intervals.

It may not be possible to observe the wave effect without entangling its pair. The high frequency of this interval causes it to rapidly transit in an area around it, which may make it easier for it to reach a specific point in space, such as the human eye, that collapses its particle effect. This collapse can occur in a wider location (such as a wall or screen), and observe its wave effect with the collapse of many samples.

1.4 Observations

Core The negation of logic to itself (nothingness) gave rise to three axioms that are the basis of the core theorem of this theory and the basis for existence. This theorem gives rise to waves and their main attribute, wave entanglement.

Logical rigidity If physical rigidity and its laws seem insurmountable, below it is logic, even more rigid and insurmountable, because outside logic is the non-existent, the illogical. Existence is contained in the possibilities of what is logical.

Mathematics Logic in its essence is not subject to mathematics, but all mathematics is restricted to logic, and therefore some of its simplest constructions may come closer to essential logic than others.

Good and evil Good and evil depend on the observer and are only valid possibilities among infinite others. Perhaps the greatest justice of the universe or logic is the non-exclusion of any path or possibilities. That is, if it is light, negation tends to darken, if it is hot to cool, etc. It is the struggle of opposites of Heraclitus of Ephesus.

Perfection The primordial logic is the simplest logic, it is the essence of existence. A logic as simple as it is efficient, as efficient as it is perfect:

Omnipotent The essence of all logical possibilities, that is, the essence of existence, because outside of logical possibilities is the illogical, the non-existent;

Omniscient Flow of all logical abstractions from consciousness to the subconsciousnesses;

Omnipresent Its fractions (negations) are in all existence.

These remarks refer to God, the consciousness of subconsciousnesses. Ultimately, God is Logic, from its infinitesimal and fundamental negation of itself to its infinite greatness. God is love, and the essence of love is attraction, which is also present in the fundamental "forces".

Reality As a logical possibility, the dream is as real as "reality". Perhaps the study of logical possibilities leads to paths where dreams can be as real as reality, since both are just logic, like lucid dreams, for example (ASPY et al., 2017). This may explain why other possible forms of "intelligent" life, when evolved, stop looking for this kind of life in a possible vast universe and look within themselves, where something much larger than the universe can be found, infinite.

Convergence Quantum jump and entanglement are some of the behaviors that already challenge the physical world, and may be the point of convergence with this new paradigm.

Final Considerations

This is a study of primordial logic that resulted in a theory about the origin of everything. All lines of reasoning in this study can be deepened and detailed.

Eventually it can be considered a philosophical and/or scientific study, however the basis of these two important branches is logic, the core of this theory.

The answer to the central question of this study (if there is something rather than nothing) comes from logic. The study of logic has given rise to a theory about the origin of all things. This theory answers what consciousness, waves, infinity, time, space, fundamental forces, dark matter, dark energy, antimatter, the black hole and the observer/life are.

May the model of this study be the beginning of a new era. An era where the human being can develop himself and see that he is the host of infinity. May this evolution turn dreams into reality and may it be possible to observe that reality is no different from a dream, since both are just logical.

The idea that something physical came out of nothing is inconsistent with the nature of nothing.

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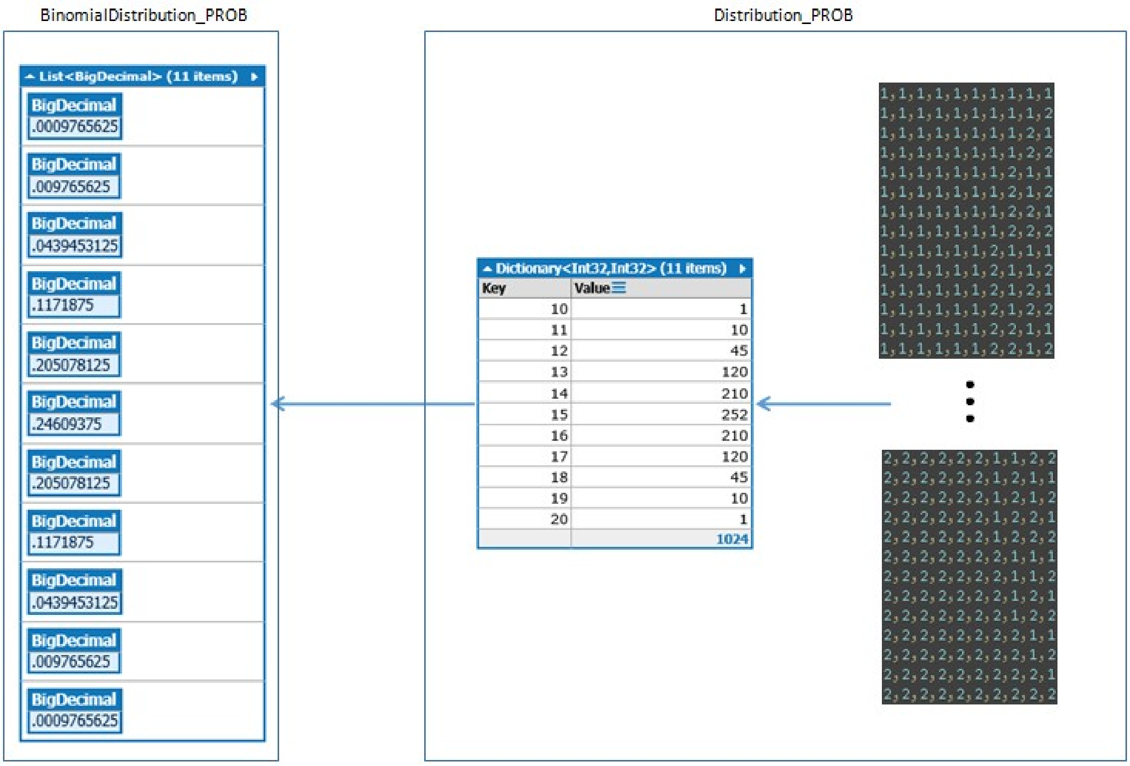
APPENDIX A – Algorithms

BinomialDistribution_PROB and Distribution_PROB

The BinomialDistribution_PROB algorithm generates the probability of distribution of an interval and uses the general binomial probability formula below. This algorithm has the same result as the Distribution_PROB algorithm, but the BinomialDistribution_PROB execution is much faster and has higher capacity because it uses large numbers like BigInteger and BigDecimal. Both algorithms were done in C# with LINQPad 5 [6]. The Figure 39 shows the results of the algorithms for the range 0 to 10, analogous to flipping 10 coins on the ground, adding up the values of the heads and tails, with the tails having the value one and the heads having the value two. The Distribution_PROB algorithm sums each of the 1024 possibilities [1,1,1,1,1,1,1,1,1,1,1,1 - 1,1,1,1,1,1,1,1,1,1,1,1, 2 - ....] and groups these values together. In the Distribution_PROB algorithm, this set of possibilities is a Cartesian product of the possible combinations, which makes this algorithm slow, but it is important to validate and facilitate understanding of the general binomial probability formula used in the BinomialDistribution_PROB algorithm (PIERCE, 2018a). In the Figure 39, the table within Distribution_PROB shows this grouping and the total number of possibilities, 1024. Dividing each grouped value by the total gives the probabilistic result achieved by the formula used in BinomialDistribution_PROB. For example, the probability that the sum of the 10 coins flipped is 12 is equal to 45/1024, or 0.0439453125 or 4.39%.

$$f(k;n,p) = \binom{n}{k} p^k (1-p)^{n-k}$$

Figure 39 – Results of the BinomialDistribution_PROB and Distribution_PROB algorithms



The Distribution_PROB algorithm intends to clarify the probabilistic essence of the central limit theorem.

The Distribution_PROB algorithm can also be used for the roll of 5 6-sided dice or 6 5-sided dice, for example. As can be seen in the Figure below, the probability distribution on the dice roll is similar to the binomial distribution (coins).

[6] LINQPad 5 is on <www.linqpad.net> and can be used in its free version (Standard edition) without expiration.

Figure 40 – Results of the Distribution_PROB algorithm

Dictionary<Int32,Int32> (26 items)

Key	Value
5	1
6	5
7	15
8	35
9	70
10	126
11	205
12	305
13	420
14	540
15	651
16	735
17	780
18	780
19	735
20	651
21	540
22	420
23	305
24	205
25	126
26	70
27	35
28	15
29	5
30	1
	7776

(a) 5 6-sided dice

Dictionary<Int32,Int32> (25 items)

Key	Value
6	1
7	6
8	21
9	56
10	126
11	246
12	426
13	666
14	951
15	1246
16	1506
17	1686
18	1751
19	1686
20	1506
21	1246
22	951
23	666
24	426
25	246
26	126
27	56
28	21
29	6
30	1
	15625

(b) 6 5-sided dice

The probability distribution on the dice roll is consonant to the binomial distribution.

BinomialDistribution_PROB [Code]

To execute the code snippet requires the implementation of BigDecimal, an example of that implementation can be seen, obeying proprietary software license rights, at (PARKER, 2018). This study does not distribute nor is it responsible for the portion of the code related to the BigDecimal implementation, these responsibilities being the responsibility of the executor of this software.

```
//https://www.mathsisfun.com/data/quincunx-explained.html
void Main()
{
    BinomailDistribuition.Possibilities = 10;
    var results = new List<BigDecimal>();
    results.Load();
    results.Print(true); //send false to print Table 1.
}

public static class BinomailDistribuition
{
    public static int Possibilities = 0;
    static int middleLeft = 0;
    static int middleRight = 0;
    static int resultCount = 0;

    public static void Load(this List<BigDecimal> results)
    {
        for (int i = 0; i <= Possibilities; i++)
        {
            var fatorLeft = Fatorial(Possibilities);
            var fatorRight = BigInteger.Multiply(Fatorial(i), Fatorial(Possibilities - i));
            BigInteger fat = BigInteger.Divide(fatorLeft, fatorRight);
            var powLeft = new BigDecimal(1, 0, 1000000000);
            var powRight = new BigDecimal(1, 0, 1000000000);
            if (i != 0)
                powLeft = BigDecimal.Pow(new BigDecimal(5, 1, 1000000000), i);
```

```
            if (i != Possibilities)
                powRight = BigDecimal.Pow(new BigDecimal(5, 1, 1000000000), (Possibilities - i));
            var prob = new BigDecimal(fat) * powLeft * powRight;
            results.Add(prob);
        }
    }

    public static BigInteger Fatorial(int value)
    {
        BigInteger fatorial = 1;
        for (int n = 1; n <= value; n++)
        {
            fatorial *= n;
        }
        return fatorial;
    }

    public static void Print(this List<BigDecimal> results, bool printTableProbability)
    {
        if (!printTableProbability)
        {
            var sum = results.Sum();
            var middle = (middleRight - middleLeft) / 2;
            var middlePercent = ((middleRight - middleLeft) * 14) / 100;
            var list = results.Where((x, i) => i >= middleLeft && i <= middleRight).ToList();
            var listPareto = list.Where((x, i) => i >= (middle - middlePercent)
                                            && i <= (middle + middlePercent)).ToList();
            var percentOfSum = (middleRight - middleLeft) * 100 / resultCount;
            var sumPercent = sum * new BigDecimal(100, 0, 1000000000);
            var paretoResult = new BigDecimal(0, 0, 1000000000);
            listPareto.ForEach(x => { paretoResult = paretoResult + x; });

            sumPercent.Dump("sum");
            middleLeft.Dump("middleLeft");
            middleRight.Dump("middleRight");
            (middleRight - middleLeft).Dump("itens of sum");
            percentOfSum.Dump("percent of sum");
            resultCount.Dump("total");
            paretoResult.Dump("20/80");
        }
        else
        {
            results.Dump(); //Valid Binomial distribution
        }
    }

    public static BigDecimal Sum(this List<BigDecimal> results)
    {
        resultCount = results.Count;
        middleLeft = resultCount / 2;
        middleRight = middleLeft * 2 < resultCount ? middleLeft + 1 : middleLeft;

        var sum = middleLeft != middleRight ? results[middleLeft] + results[middleRight] : results[middleRight];
        while ((sum * new BigDecimal(100, 0, 1000000000)) < new BigDecimal(9999, 2, 1000000000))
        {
            middleLeft--;
            middleRight++;
            if (middleLeft >= 0)
                sum = sum + results[middleLeft];
            if (middleRight <= Possibilities)
                sum = sum + results[middleRight];
        }
        return sum;
    }
}

//Exemple of BigDecimal class - https://github.com/dparker1/BigDecimal/blob/
//3e0a4f1ba4c72c0b28d6571fcc6259558be104bd/BigDecimal/BigDecimal.cs
```

Distribution_PROB [Code]

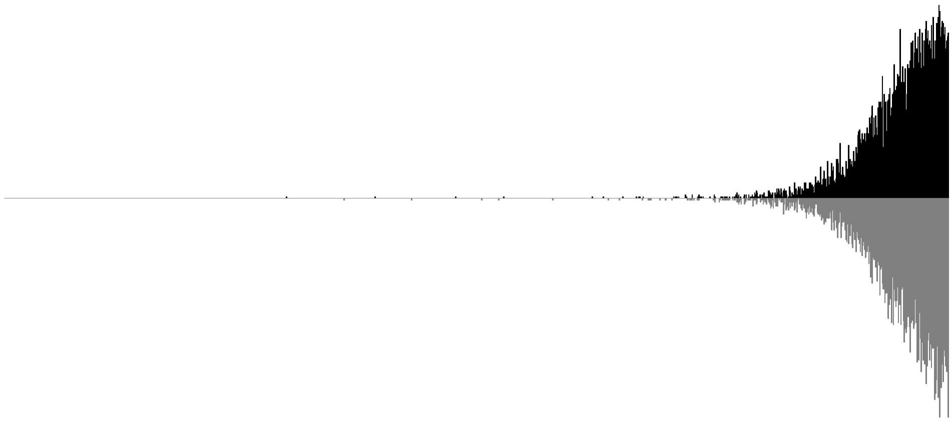
```
//https://exercicios.brasilescola.uol.com.br/exercicios-matematica/
//exercicios-sobre-probabilidade-condicional.htm#questao-1
void Main()
{
    var dice = 2; //Binomial distribution, dice = 2;
    var events = 10;
    var sampling = Math.Pow(dice, events);
```

```
    var cartesianProduct = dice.ToArrays(events).CartesianProduct();
    cartesianProduct.PrintGroup(events, dice);
}

public static class CartesianProductContainer
{
    public static IEnumerable<IEnumerable<int>> CartesianProduct(this IEnumerable<IEnumerable<int>> sequences)
    {
        IEnumerable<IEnumerable<int>> emptyProduct = new[] { Enumerable.Empty<int>() };
        var result = sequences.Aggregate(
            emptyProduct,
            (accumulator, sequence) =>
                from accseq in accumulator
                from item in sequence
                select new[] { accseq.Concat(new[] { item }).Sum() });

        return result;
    }

    public static IEnumerable<List<int>> ToArrays(this int dice, int events)
    {
        var result = new List<List<int>>();
        for (int j = 1; j <= events; j++)
        {
            var array = new List<int>();
            for (int i = 1; i <= dice; i++)
                array.Add(i);

            result.Add(array);
        }

        return result;
    }

    public static void PrintGroup(this IEnumerable<IEnumerable<int>> list, int events, int dice)
    {
        var listCountDict = Enumerable.Range(1, dice * events).ToDictionary(x => x);
        Group(listCountDict, list);
        listCountDict.Dump("Values");
    }

    public static void Group(Dictionary<int, int> dict, IEnumerable<IEnumerable<int>> list)
    {
        foreach (var key in dict.Keys.ToList())
            dict[key] = 0;

        foreach (var item in list)
            dict[item.First()]++;

        var zeroKey = 0;
        foreach (var item in dict)
            if (item.Value == 0)
                zeroKey = item.Key;
            else continue;

        for (int i = 1; i <= zeroKey; i++)
            dict.Remove(i);
    }
}
```

Logic_WavePattern

The Logic_WavePattern algorithm results in the display of a histogram that assumes the wave pattern when placed side by side each of the bars on the left and right side of the median. This histogram is generated from randomizing the values according to Figure 10 and Figure 11, following the central limit theorem.

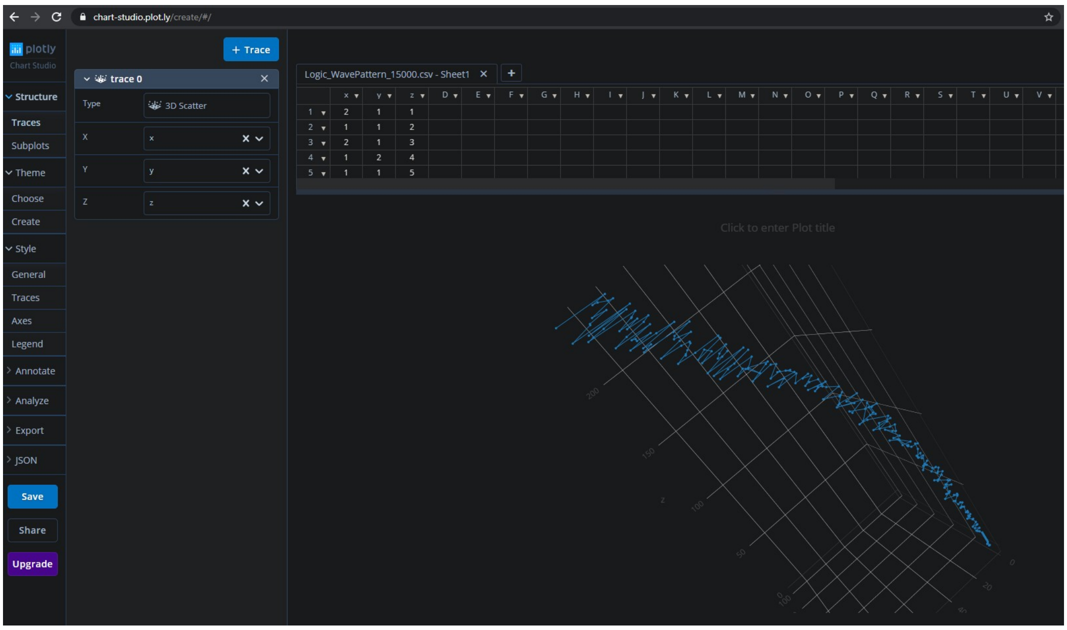
Figure 41 – Histogram in the wave pattern of the Logic_WavePattern algorithm



Randomly generated result displayed by the Logic_WavePattern algorithm.

Another result of the Logic_WavePattern algorithm is obtained from the LINQPad 5 console, which outputs a file in ".csv" format that can be imported into Plotly's Chart Studio <https://chart-studio.plot.ly/create> for generating a 3D scatter plot. The most important part of the graph are the points that represent the most easily visible part and that are most likely at the top of each histogram bar in the previous Figure. Lines are used to facilitate the visualization of spirals that are already starting to form even with very low volumes of data and without the entanglement of intervals (ordering).

Figure 42 – 3D scatter plot of the Logic_WavePattern algorithm



The example can be accessed at: <https://chart-studio.plot.ly/create/?fid=ren.stuchi:5&fid=ren.stuchi:4>.

Logic_WavePattern [Code]

```
//http://csharphelper.com/blog/2015/09/draw-a-simple-histogram-in-c/
//https://github.com/naudio/NAudio.WaveFormRenderer
```

```
[STAThread]
void Main()
{
  Application.EnableVisualStyles();
  Application.Run(new MainForm());
}

public partial class MainForm : Form
{
  public MainForm()
  {
    InitializeComponent();
  }
  //##########################################################################
  private const int LENGHT = 30000;
  private const int GROUP = 2;
  //##########################################################################
  private double m_dZoomscale = 1.0;
  public static double s_dScrollValue = .25;
  private Point MouseDownLocation;
  private Matrix transform = null;
  private NumbsOfCentralLimitTheorem.HistogramResult histogramResult = null;
  private bool printed = false;

  private void MainForm_Load(object sender, EventArgs e)
  {
    histogramResult = GetHistogramOfCentralLimitTheorem(LENGHT, GROUP);

    RectangleF data_bounds = new RectangleF(0, 0, histogramResult.Size, histogramResult.MaxValue * 2);
    PointF[] points =
    {
        new PointF(0, pictHistogram.ClientSize.Height),
        new PointF(pictHistogram.ClientSize.Width, pictHistogram.ClientSize.Height),
        new PointF(0, 0)
      };
    transform = new Matrix(data_bounds, points);
  }

  private void pictHistogram_Paint(object sender, PaintEventArgs e)
  {
    DrawHistogram(e.Graphics, pictHistogram.BackColor, histogramResult,
      pictHistogram.ClientSize.Width, pictHistogram.ClientSize.Height);
  }

  private void pictHistogram_Resize(object sender, EventArgs e)
  {
    pictHistogram.Refresh();
  }

  private void DrawHistogram(Graphics gr, Color back_color,
    NumbsOfCentralLimitTheorem.HistogramResult histogramResult, int width, int height)
  {
    PrintResult();
    gr.Clear(back_color);
    gr.Transform = transform;
    gr.ScaleTransform((float)m_dZoomscale, (float)m_dZoomscale);
    FillRectangle(gr, Color.Black, histogramResult.Up, histogramResult.MaxValue, false);
    FillRectangle(gr, Color.Gray, histogramResult.Down, histogramResult.MaxValue, true);
  }

  private void PrintResult()
  {
    if (!printed)
    {
      printed = true;
      var listTuple = new List<(float x, float y, float z)>();
      float previousValueOfZ = 0;
      for (int i = 0; i < histogramResult.Up.Count(); i++)
      {
        if (histogramResult.Up[i] != 0.0001f && histogramResult.Down[i] != 0.0001f)
        {
          if (histogramResult.Up[i] % 1 == 0)
            previousValueOfZ = (int)(previousValueOfZ + 1f);
          else
            previousValueOfZ += 0.1f;
          var tuple = (x: histogramResult.Up[i], y: histogramResult.Down[i], z: previousValueOfZ);
          listTuple.Add(tuple);
        }
      }
      Console.WriteLine("x,y,z");
      foreach (var tuple in listTuple)
        Console.WriteLine(tuple.x.ToString() + "," + tuple.y.ToString() + "," + tuple.z.ToString());
    }
```

```
    }

    protected void FillRectangle(Graphics gr, Color color, float[] arrayValues, float maxValue, bool down)
    {
      using (Pen thin_pen = new Pen(color, 0))
      {
        for (int i = 0; i < histogramResult.Down.Length; i++)
        {
          RectangleF rect;
          if (!down)
            rect = new RectangleF(i, maxValue, 1, arrayValues[i]);
          else
            rect = new RectangleF(i, maxValue - arrayValues[i], 1, arrayValues[i]);
          using (Brush the_brush = new SolidBrush(color))
          {
            gr.FillRectangle(the_brush, rect);
            gr.DrawRectangle(thin_pen, rect.X, rect.Y, rect.Width, rect.Height);
          }
        }
      }
    }

    protected void pictHistogram_OnMouseWheel(object sender, MouseEventArgs mea)
    {
      pictHistogram.Focus();
      if (pictHistogram.Focused == true && mea.Delta != 0)
        ZoomScroll(mea.Location, mea.Delta > 0);
    }

    private void ZoomScroll(Point location, bool zoomIn)
    {
      transform.Translate(-location.X, -location.Y);
      if (zoomIn)
        m_dZoomscale = m_dZoomscale + s_dScrollValue;
      else
        m_dZoomscale = m_dZoomscale - s_dScrollValue;
      transform.Translate(location.X, location.Y);
      pictHistogram.Invalidate();
    }

    private void pictHistogram_MouseDown(object sender, MouseEventArgs e)
    {
      if (e.Button == System.Windows.Forms.MouseButtons.Left)
        MouseDownLocation = e.Location;
    }

    private void pictHistogram_MouseMove(object sender, MouseEventArgs e)
    {
      if (e.Button == System.Windows.Forms.MouseButtons.Left)
      {
        transform.Translate((e.Location.X - MouseDownLocation.X)
          / 40, (e.Location.Y - MouseDownLocation.Y) / 40, MatrixOrder.Append);
        this.Refresh();
      }
    }

    private NumbsOfCentralLimitTheorem.HistogramResult GetHistogramOfCentralLimitTheorem(int length, int group)
    {
      var numbsOfCentralLimitTheorem = new NumbsOfCentralLimitTheorem();
      numbsOfCentralLimitTheorem.RandomResult(length);
      return numbsOfCentralLimitTheorem.GenerateHistogram(group);
    }
  }

  partial class MainForm
  {
    private System.ComponentModel.IContainer components = null;

    protected override void Dispose(bool disposing)
    {
      if (disposing && (components != null))
        components.Dispose();
      base.Dispose(disposing);
    }

    private void InitializeComponent()
    {
      this.pictHistogram = new System.Windows.Forms.PictureBox();
      ((System.ComponentModel.ISupportInitialize)(this.pictHistogram)).BeginInit();
      this.SuspendLayout();
      this.pictHistogram.Anchor = ((System.Windows.Forms.AnchorStyles)((((System.Windows.Forms.AnchorStyles.Top
            | System.Windows.Forms.AnchorStyles.Bottom)
            | System.Windows.Forms.AnchorStyles.Left)
```

```
          | System.Windows.Forms.AnchorStyles.Right)));
    this.pictHistogram.BackColor = System.Drawing.Color.White;
    this.pictHistogram.Cursor = System.Windows.Forms.Cursors.Cross;
    this.pictHistogram.Location = new System.Drawing.Point(8, 6);
    this.pictHistogram.Name = "pictHistogram";
    this.pictHistogram.Size = new System.Drawing.Size(550, 250);
    this.pictHistogram.TabIndex = 1;
    this.pictHistogram.TabStop = false;
    this.pictHistogram.Resize += new System.EventHandler(this.pictHistogram_Resize);
    this.pictHistogram.Paint += new System.Windows.Forms.PaintEventHandler(this.pictHistogram_Paint);
    this.pictHistogram.MouseWheel += new System.Windows.Forms.MouseEventHandler(this.pictHistogram_OnMouseWheel);
    this.pictHistogram.MouseDown += new System.Windows.Forms.MouseEventHandler(this.pictHistogram_MouseDown);
    this.pictHistogram.MouseMove += new System.Windows.Forms.MouseEventHandler(this.pictHistogram_MouseMove);
    this.AutoScaleDimensions = new System.Drawing.SizeF(6F, 13F);
    this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;
    this.ClientSize = new System.Drawing.Size(563, 262);
    this.Controls.Add(this.pictHistogram);
    this.Name = "MainForm";
    this.Text = "Logic_WavePattern";
    this.Load += new System.EventHandler(this.MainForm_Load);
    ((System.ComponentModel.ISupportInitialize)(this.pictHistogram)).EndInit();
    this.ResumeLayout(false);
  }

  internal System.Windows.Forms.PictureBox pictHistogram;
}

public class NumbsOfCentralLimitTheorem
{
  public float[] ResultList { get; set; }
  public int ResultLength { get; set; }
  public float[] LastList { get; set; }
  public float[] CurrentList { get; set; }
  public int SizeLastList { get; set; }
  public Dictionary<int, float> Histogram { get; set; }

  public NumbsOfCentralLimitTheorem()
  {
    SizeLastList = 2;
    StartLastList();
    StartCurrentList();
  }

  public float[] RandomResult(int length)
  {
    ResultLength = length;
    ResultList = new float[length];
    Random rnd = new Random();
    for (int x = 0; x < length; x++)
    {
      float lineSum = 0;
      for (int i = 1; i < SizeLastList; i++)
      {
        var lastValueLeft = LastList[i - 1];
        var lastValueRight = LastList[i];
        var rndValue = (float)rnd.NextDouble(lastValueLeft, lastValueRight);
        lineSum = lineSum + (rndValue - lastValueLeft);
        CurrentList[i] = rndValue;
      }
      if (lineSum != 0)
        ResultList[x] = lineSum;
      SizeLastList++;
      LastList = CurrentList;
      StartCurrentList();
    }
    return ResultList;
  }

  public HistogramResult GenerateHistogram(int group)
  {
    Histogram = new Dictionary<int, float>();
    var minValue = ResultList.Min();
    var maxValue = ResultList.Max();
    var rangeValue = maxValue - minValue;
    var amountOfGroups = ResultLength / group;
    var intervalValue = rangeValue / amountOfGroups;
    foreach (var value in ResultList)
    {
      int key = (int)(value / intervalValue);
      if (!Histogram.ContainsKey(key))
        Histogram[key] = 0;
      Histogram[key]++;
    }
```

```
    var histogramResult = HistogramResult.Get(Histogram);
    return histogramResult;
  }

  private void StartCurrentList()
  {
    var sizeCurrentList = SizeLastList + 1;
    CurrentList = new float[sizeCurrentList];
    CurrentList[0] = 0;
    CurrentList[sizeCurrentList - 1] = float.MaxValue / 2;
  }

  private void StartLastList()
  {
    LastList = new float[SizeLastList];
    LastList[0] = 0;
    LastList[SizeLastList - 1] = float.MaxValue / 2;
  }

  public class HistogramResult
  {
    public int Size { get; set; }
    public float MaxValue { get; set; }
    public float[] Up { get; set; }
    public float[] Down { get; set; }

    public static HistogramResult Get(Dictionary<int, float> histogram)
    {
      var histogramOrdered = histogram.OrderBy(k => k.Key);
      var result = new HistogramResult();
      var lengthOdd = histogram.Count % 2 > 0;
      var middle = histogram.Count / 2;
      var middleValue = histogramOrdered.ElementAt(middle).Key;
      result.Size = middleValue;
      result.MaxValue = histogram.OrderBy(k => k.Value).Last().Value;
      result.Up = ArrangeArray(new float[middleValue]);
      result.Down = ArrangeArray(new float[middleValue]);
      for (int i = 0; i < middle; i++)
      {
        var keyValue = histogramOrdered.ElementAt(i);
        result.Up[keyValue.Key] = keyValue.Value;
      }
      for (int i = lengthOdd ? middle + 2 : middle + 1; i < histogram.Count; i++)
      {
        var totalValue = middleValue * 2;
        var keyValue = histogramOrdered.ElementAt(i);
        result.Down[totalValue - keyValue.Key] = keyValue.Value;
      }
      return result;
    }

    private static float[] ArrangeArray(float[] array)
    {
      for (int i = 0; i < array.Length; i++)
        array[i] = 0.0001F;
      return array;
    }
  }
}

public static class rndExtension
{
  public static double NextDouble(this Random rng, double minimum, double maximum)
  {
    return rng.NextDouble() * (maximum - minimum) + minimum;
  }
}
```