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The Mathematics of Quantification, and the New Paradigm,
which Re-Defines Binary Mathematics

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Note: The '^' sign is the Mathematical Symbol used to represent the Exponential Operation. Where ' $2^2 = 4$ ', is the same equation represented by ' $2 \times 2 = 4$ ' (Or, $2 * 2 = 4$), which is the Multiplicative equivalent.

Abstract

This paper provides the Mathematics for the New Paradigm Defining the Binary System. Furthermore, while the Mathematical foundation and Logical justification, which established the New Structure for the BINARY SYSTEM, were derived from The Mathematics of Quantification. The Mathematics itself, which is used in the New Binary System however, while providing the viable justification and the logical reasons that supports the change for the New Binary Model, is not quite so new. In fact, it can be said that the Mathematics of Quantification sustains a Cascading Effect, Producing a Profound Change in the Mathematics for the Entire Mathematical Field. But, the Mathematics for the New Binary System has a Historical Foundation, which dates to the beginnings of Mathematics itself.

"This work is Dedicated to my first and only child, 'Yahnay', who is; the Mover of Dreams, the Maker of Reality, and the 'Princess of the New Universe'. (E.T.)"

Introduction: The Discourse, which Quells the Arguments in Opposition

It is said: "Arrogance is the Defense using Words, A Pretense, which is the True Face of Ignorance, Hiding Behind the Mask of Intellectual Deception."

Whatever the case may, or may not be, I truly attempted without any doubts, to contact the entire World, and present to everyone, the Gift from the Beginnings of the Mathematics of Quantification. However, only one person responded, this time, and their presentation was an opposition, one that bespeaks of Arrogance...not the anticipated response from a professional Mathematician or Logician:

"Dear Mr. Terrell,

You are, as anybody else, free to prefer a nonstandard interpretation (or, rather, enumeration) of the binary system; there is no "true interpretation", and the ways to map integers to binary numbers is uncountable (as Cantor proved).

Nonetheless, the standard interpretation which you have chosen to attack is distinguished by one property which no other enumeration has: a simple arithmetic well-suited for the computers of our age. Addition, for example, can in the binary number system simply done as in the decimal system, except of course, that adding 1 to 1 yields 10, at any particular place. If you now take two numbers, say 9 and 5, translate them to their binary representations, and add them according to the rule mentioned:

```
00001001 <- 9
00000101 <- 5
+++++++=====
00001110 -> 14
```

and retranslate into the decimal system, you get 14. That means, addition in the binary system and in the decimal system are isomorphic, the same easy operation yields the same (correct) result in both number systems.

This is, in short, the reason why the standard interpretation of binary numbers is the one which computer scientists prefer, as it is easy to implement in electronic devices and hence forms the basis for modern-day computer chips.

Your interpretation of the binary numbers, to the contrary, does not have an arithmetic which is simple, as the zero digit can not function as neutral element anymore. It is therefore much clumsier to deal with.

Mathematicians do not accept claims at truth of any possible, non-selfcontradictory (= consistent) mathematical system. The times when mathematicians were thinking that their axiomatic systems, such as Euclid's axiomatics of geometry, were obvious truths and the only possible systems, they went away with the discovery of the consistency of non-Euclidean geometries in the early nineteenth century. Later on, logicians proved that mathematical truth is indeed equivalent to mathematical consistency.

To claim that there is a logical fault with the standard binary number system, you would have to derive a contradiction. This would have the interesting side effect of destroying the whole of current mathematics and rendering current computers unusable. I believe that you are right in your IETF draft which just expired, insofar as "no one has, or is capable" of deriving such a contradiction. That you make an exception for yourself, is, in my humble opinion, a sad indication of severe megalomania. I can only wish you to be healed of it and be able to spare your limited energies for endeavors not so futile as this one, though my experience with cases such as yours leaves me with little hope.

Sincerely yours,
Aleksandar Perovic

Chief Executive Administrator
The Electronic Library of Mathematics"

My work, as a Scientist and a Researcher, speaks for itself, and my accomplishments ascribes the definition of me and my abilities, which defies the boundaries imposed by the definitions of the words used in the many languages denoting Mankind's diversity. It is sad though, because I am spending a great deal of time, clarifying Elementary Concepts, once thought to be Well Understood by the Professionals who populate the Field of Study for which this Draft represents. And while, I advocate the necessity regarding the priority for Studying the Historical Documents comprising the intended Area of Research, prior to any Research Undertaking. It should be understood however, my advocacy sustains a Revolution against Dogma, and supports the belief that; 'Regardless of the Epitome granted by the Historical Documentation, to any individual, belief or acceptance of their work remains a challenge, which is reserved for continued Analysis, and the reflection upon the Classical Foundation from which the Laws, Rules, and Logic that support their work, were derived.' Needless to say, since Mankind is Not GOD, I stand Poised in the Ready, and will challenge his perception or interpretation for Reality, regardless of the underlining subject matter, or the intent his presentation is said to represent.

Notwithstanding my personal beliefs however, we can make use of the limited argument provided by 'Mr. Perovic', and derive not only the supporting Mathematics for the New Binary System, but provide the "...contradiction", which he claims is necessary to prove that the Modern Interpretation of the Method for Enumerating in the Binary System is wrong. Furthermore, what's nice about speaking with Mr. Perovic, is that, he reveals the Contradiction, unknowing to himself, that we need, as the focus for this argument, when he said:

"Nonetheless, the standard interpretation which you have chosen to attack is distinguished by one property which no other enumeration has: a simple arithmetic well-suited for the computers of our age. Addition, for example, can in the binary number system simply done as in the decimal system, except of course, that adding 1 to 1 yields 10, at any particular place."

Can you see the Foundation, which would allow the presentation of the Contradiction? In other words, you can not perform the operation of addition on the equation "1 + 1", because this would equate to "10". But, isn't this a Numbering System that is Governed by the Elementary Laws of Mathematics and Logical reasoning, which must ultimately obey the Laws from the Field Postulates and Set Theory? Furthermore, when dealing with the Binary System, should it be considered to be governed by slightly different Arithmetic Operations, and have different Logical consistency from that of the Unary System? And what about the overall Arithmetic Operations pertaining to Mathematics itself, isn't this wrong there too? Well...If it is, then what was Gregor Cantor actually saying? Perhaps, what he was actually saying, was that; 'If you are wrong, and you are consistently wrong in what you are saying or doing, then you can make it look correct, because it is Consistent.' Nevertheless, in any case, the Argument has been made, and a gradual development of the foundation supporting the New Paradigm for the Binary Mathematics will be set forth in the succeeding chapters.

Chapter I: Another look at the New Binary Paradigm

To establish the foundation, which would ultimately lead to the Final conclusion supporting the New Paradigm for the Binary System, and the "Contradiction", that would provide the necessary proof that the Modern Foundation is wrong. I must first provide a Table(s) Listing the related Numbering Systems, for comparison, and then reiterate parts of the Proof, which would allow the derivation of the New Paradigm for the Binary System. Where by, notice the Columns in Table 1A, each is a Representation of the same object, or each other, differing only in their Graphical Depiction:

TABLE 1A

1	2	3	4
Modern Binary System	New Binary System	Modern Positive Integers	Primitive Unary System
00	0	0	0
01	00	1	1
10	01	2	11
11	10	3	111
100	11	4	1111
101	100	5	11111
110	101	6	111111
111	110	7	1111111
1000	111	8	11111111
1001	1000	9	111111111
1010	1001	10	1111111111
1011	1010	11	11111111111
1100	1011	12	111111111111
1101	1100	13	1111111111111
1110	1101	14	11111111111111
1111	1110	15	111111111111111
10000	1111	16	1111111111111111

The examination of TABLE 1A, coupled with an understanding of the Elementary Operations for Addition in Binary Mathematics, the Laws from the Field Postulates, and Set Theory. Where it can be Clearly seen, that the Operation of Addition in the equation "1 + 1 = 10" is the "Contradiction", which is Not Violated Under the New Paradigm for the Binary System. Furthermore, I can also say, from its presentation, the Relationship between Columns '2' and '4' has been established as being Logically valid under the Rules and Laws, which govern the Field Postulates and Set Theory. And further state, it is also valid under the laws governing the Mathematics of Quantification. However, its proof, would be too taxing of a demand, which would require the knowledge of the Mathematics of Quantification. And in this case, it is totally unnecessary, because the Laws from Elementary Mathematics already has been shown to suffice for the establishment of the so called, "Proof by Contradiction" Argument, required by 'Mr. Perovic' response to the initial proof of the foundation, which established this New Paradigm for the Binary System.

In other words, 'Mr. Perovic' stated that the flaw in the Modern Method for Enumerating using Binary Notation, resulted from an Exception to the Mathematical Law Governing the Operation of Addition. That is, he stated; "...except of course, that adding 1 to 1 yields 10", which should be the Binary Notation that represents, or equals the Integer '3', provided at least one of the addends was a Binary Number. Furthermore, while the Argument can easily be closed, just from this little example, and of course, a comparison between Columns '2' and '4' from Table 1A, that would clearly establish the Method for Elementary Arithmetic Operations for this New Binary System...Still many would complain, regarding the missing rigor from the Logical Argument, which would unquestionably rule out any further opposition.

Nevertheless, prior to beginning the development of the foundation, which would allow for the derivation of the Methods for the Elementary Arithmetic Operations, I must first reiterate the conclusions supporting the proof that established the Foundation for the New Model representing the Binary System.

"...However, prior to any forthright Construction of Table Ic, following in sequence from Tables I, Ia, and Ib. It would facilitate the analysis of the logical argument, if we first reiterate the requirements that were logically developed, that established the foundational definitions and requirements, which would be the mandate for any Binary System to exist.

Binary Principles

1. Binary; Consisting of 2 Things, Elements, or Members.
2. Zero and the Null Set are implied by the same definition
3. Zero; Having no Quantity, Size, Members, or elements; representing a State of Condition of Nothingness.
4. Binary Set; Consisting of 2 and only 2, Elements or Members.
5. Union of Set; Combining the Elements or Members of 2 or more Sets, resulting in 1 Set containing the total, which represents the combined total of the Members from the initial Sets.
6. 'Equality': A Relationship, which provides a means to establish an Identity between 2 or more Objects being compared.
7. Binary Zero is represented by '00', since it is not empty, it is not equal to either the Zero Integer or the Null Set.

Now if you are satisfied with the list of Principles derived from, and associated with the Binary System, with the exception of 7. We can construct Table Ic, which represents another view for the Modern Method of Binary Enumeration.

TABLE Ic
 "The Modern Interpretation of the Binary System of Enumeration" Counting, using only "1's" and "0's"
 Depicting the Results from its current Presentation

	Exponential Enumeration / \	Binary Representation / \	Positive Integer / \
1.	$0^0 = 0$	00000000 = 0	0
2.	$2^0 = 1$	00000001 = 01	1
3.	$2^1 = 2$	00000010 = 10	2
4.	$2^F = 3$	00000011 = 11	3
5.	$2^2 = 4$	00000100 = 100	4
6.	$2^F = 5$	00000101 = 101	5
7.	$2^F = 6$	00000110 = 110	6

Notice that Table Ic maintains the 'One-to-One' validity as Table IIa. However, as with Tables I and II, their differences remain the same. In fact, any comparison with Table IIa maintains the same validity, except for their different starting points. In other words, Table Ic and Table IIa are 2 distinct Numbering Systems, that use the Binary Notation in a 'One-to-One Pairing' with the Integers to define and establish equality.

"Do we now have 2 Binary Systems, establishing a slightly different, and yet, equal relationship with the Set of Integers? I mean, what do we have here? Is it possible to have 2 distinct Binary Systems, whose difference represents a different 'One-to-One Pairing' with the Integers? Or are we to try once again, and decide, which one of the two Numbering Systems actually represents a True Binary System?"

TABLE IIa
 "The Reality of the Binary System of Enumeration"
 And the Series Generated when Counting, using
 only " 1's " and " 0's "

	Exponential Enumeration / \	Binary Representation / \	Positive Integer / \
1.	$0^0 = 0$	0	0
2.	$2^0 = 1$	00000000 = 00	1
3.	$2^1 = 2$	00000001 = 01	2
4.	$2^F = 3$	00000010 = 10	3
5.	$2^2 = 4$	00000011 = 11	4
6.	$2^F = 5$	00000100 = 100	5
7.	$2^F = 6$	00000101 = 101	6

Following the same investigative analysis used in earlier chapters, we can depict this difference graphically. That is, if we were now to extrapolate from the respective Binary Notations, as it would be given by the Integers' additive method of progression, which produces the counting series using successive additions of 1. We could then generate a number line, denoting a 'One-to-One Mapping' with the Integers that would more accurately depict these noted distinctions. Given respectively by figures 3 and 4, we have:

Fig 3.

1 2 3 4 = The Count of Total Number
-+--+--+ of Members in the Set
0 1 2 3 = The Elements or Members
Listed in Table Ic's Binary Set

Fig 4.

1 2 3 4 = The Count of Total Number
-+--+--+ of Members in the Set
1 2 3 4 = The Elements or Members
Listed in Table IIa's Binary Set

What the bottom row of numbers actually represents, is the total number of combinations, which will be generated from the Binary Set, {0,1}. However, these combinations are used in a way similar to the way the '1' is used in the Integers, which increments from right to left using and changing only the '0 or 1' notations from the Binary Set to generate a series of Binary Numbers. In other words, they generate a series governed by the operation of addition. That is, given respectively by figures 5 and 6, we have:

Fig 5.

{01}, {10}, {11}
2 3 4

Fig 6.

{00}, {01}, {10}, {11}
1 2 3 4

Well, how do you begin your count? I mean, if there are 5 objects to be counted, would your count start with 'Zero' or 'One'? Clearly, the Set of Integers from which the Counting Numbers were derived, was only a graphical depiction, to be used in such a way, as to render a picture of the Number to be represented, which used one or more of these members to achieve the desired result. And nothing more. In other words, the Set of Integers or Whole Numbers, maintains the additional distinction of being a short-hand representation for the Operation of Addition, from which the sequence of Numbers is derived from the Unary Set {1}.

Furthermore, I am sure you observed from figure 5, that the equating of Binary Zero to the Integer Zero reduced the number of combinations resulting from the Binary Set. Which is actually the cause which produces the SHIFT in the 'One-to-One Pairing' with the Integers. I mean, the assignment of the Beginning Point for any Numbering Systems is very important, because it sets the starting point that will be used for counting.

Moreover, further analysis of the resulting Combinations derived from both of the respective Binary Sets, using Tables Ic and IIa. Clearly shows the equality existing between each of these Sets, which is derived from the 'One-to-One Pairing' equating the Points on the Number Line, denoting the Integers, with the Binary Notations they respectively represent. If however, we mapped the results indicated by figures 5 and 6, using the respective mappings given by figures 3 and 4, we would establish the necessary proof for concluding, that the method derived for Counting using the Modern Interpretation is wrong. In other words, any 'One-to-One Mapping' with the Integers and the Combinations resulting from figures 5 and 6, would clearly show that the missing Set, given by the Combination {00}, would result in a inaccurate mapping denoting an Inequality with the Sequence of Counting Numbers derived from the Set of Integers; that is, the Set of Counting Numbers denoted by: {1,2,3,4,5,6,7,8,9,10}. In which case, the Universal Set " I ", for the Integers, would equal the Set denoted by:

Fig 7.

$$x|x \text{ is an element of } I = \text{Integers}$$

$$\{ \{ \dots -10, \dots -5, -4, -3, -2, -1 \} \quad \{0\} \quad \{1, 2, 3, 4, 5, \dots, 10\} \}$$

Where its number line mapping is given by:

Fig 8.

$$-10 + -9 \dots -5 + \dots -2 + -1 + 0 + 1 + 2 + 3 \dots 5 + \dots + 10$$

Nevertheless, the System of counting presently being used is a UNARY System, from which the sequence of Counting begins with the Number '1', and continues its progression using successive additions of the Number '1' to derive the next or succeeding numbers. And while it maybe called or labeled as being something different (i.e. Decimal System), it is nevertheless Unary. Furthermore, while Zero, '0', is used in every Numbering System (denoting its' universal application), it is not itself, a Number. It is only a symbolic notation, which represents emptiness, or lack of an Object to which it refers. Hence, Binary by definition, means '2', and nothing more. Therefore, when considering the construction of any Numbering System that employs or uses Binary Notation, we must first realize that the first '4' numbers are derived from the Total Number of Possible Unique Combinations, which are related to and derived from, the Sequenced Numbers or Elements depicted as being Members of the Binary Set. And further conclude, that all other succeeding Binary Numbers are derived from these Combinations. In which case, since the Binary Set equals {0,1}, the total number of Unique Combinations equals the set {00, 01, 10, 11}, which respectively represents the first '4' Binary Numbers whose mapping with the Set of Integers starts with the Number '1'.

Hence, the Correct Method for Enumeration in the Binary System is given by the Results displayed in Table IIa, and the Modern Interpretation for the Method of Enumeration in the Binary System is clearly wrong. But still, both methods clearly represent a Binary System. Notwithstanding however, while the conclusions derived with respect to each of these Systems remains unquestionably valid. It does not stop, nor prevent any decision regarding choice. In other words, for whatever reason, right or wrong, for now at least, it does not matter which Binary System is used. Because other than myself, no one has, or is capable of completing the necessary studies indicating some out come producing a harm, resulting from the effects for choosing the wrong System."

Chapter II: Developing the Mathematical Foundation for Arithmetic Operations

First and foremost, it should be pointed out, that while the Numbers in Binary Notation, as represented in Column '2', from Table 1A, are derived from the total number of Unique Combinations, which equals the set {00, 01, 10, 11}, and that they respectively represent the first '4' Binary Numbers whose mapping with the Set of Integers starts with the Number '1'. However, any further comparison of Columns '2' and '4' also reveals, that they are 'Incremented' or 'De-Incremented' using the same methods as those governing the Unary Set. That is, while the sequence of Counting does not begin with the Number '1', as such. It uses Number '1' to derive a progression, which uses successive additions of the Number '1' to derive the next, and the succeeding numbers in Binary Notation. What this actually means, or implies, is that, by definition, there can exist only '4' Numbers, which can be derived from the, and said to members of, the 'BINARY SET'. Everything else is a Synthetic Creation, which facilitates enumeration beyond a count of '4'. In which case, the 'Unary Set' contains only '1' Member, and all other numerals results from some combination, which builds upon, and are related to, the number '1'.

Furthermore, while this process is clearly depicted in Table 1A, any questions concerning the validity of such an Operation are easily quelled using the 'Axioms for Equality', which are derived from the Laws governing the Basic Arithmetic Operations of Elementary Mathematics. And in this particular case, the Elementary Mathematical Law of Governance, is the 'Substitution Law for Equality, which states; "If $A = B$, then A may be replaced by B , and B by A , in any Mathematical Statement without altering the Truth or Falsity of the statement." What this means, and is represented in Table 1A, is that, since $\{00\} = \{1\}$, then $\{00\}$ may be replaced by $\{1\}$, and $\{1\}$ by $\{00\}$, in any Mathematical Statement without changing or altering the value of the Mathematical Statement itself.

Nevertheless, I will not extend the argument beyond the Elementary Operations, which deal specifically with Addition and Subtraction, because these operations completely suffice in not only establishing the necessary proof, but clearly represents the ease and elegance of the Mathematical Operations, which represents the New Paradigm for the Binary Set. Not to mention, that it would be redundant to proceed any further, because the Modern Interpretation for Representing the Operation of Addition, in the Current Binary Set Notation, Fails the TEST, when one attempts to solve the Equation " $1 + 1 = 10$ "... Which is valid enough, to establish the necessary proof, especially since it does not yield an equivalent integer representation. In other words, it does not represent the integer '3' from a Binary Translation, and serves only to raise more questions regarding our present mathematical and logical concerns.

Nonetheless, if you are satisfied, and I sincerely hope that you are, we can, by example and comparison using Table 1A, show examples of Addition and Subtraction using the New Paradigm, which represents the Real Binary System.

Please note, when observing Table 1A, specifically Column '2', you should notice that the Progression beyond the Number represented by '00', 'Increments' the next Number by the same amount shown in Column '4', which represent the Number, or Integer, '1' under Column '3'. Where by, the Operation of Addition is given in Table 2A, and the Operation of Subtraction is shown in Table 3A:

Table 2A

Binary Addition	Integer Addition	Integer Equivalent
1. 00 + 1 = 01	1 + 1 = 2	2
2. 01 + 1 = 10	2 + 1 = 3	3
3. 10 + 1 = 11	3 + 1 = 4	4
4. 11 + 1 = 100	4 + 1 = 5	5
5. 100 + 1 = 101	5 + 1 = 6	6
6. 101 + 1 = 110	6 + 1 = 7	7
7. 110 + 1 = 111	7 + 1 = 8	8
8. 111 + 1 = 1000	8 + 1 = 9	9

Table 3A

Binary Subtraction	Integer Subtraction	Integer Equivalent
1. 00 - 1 = 0	1 - 1 = 0	0
2. 01 - 1 = 00	2 - 1 = 1	1
3. 10 - 1 = 01	3 - 1 = 2	2
4. 11 - 1 = 10	4 - 1 = 3	3
5. 100 - 1 = 11	5 - 1 = 4	4
6. 101 - 1 = 100	6 - 1 = 5	5
7. 110 - 1 = 101	7 - 1 = 6	6
8. 111 - 1 = 110	8 - 1 = 7	7

Clearly, Tables 2A and 3A provides an adequate representation for the Elementary Mathematical Operations of Addition and Subtraction, which can be easily verified using Table 1A, and hence, quells all further doubts about the Logic, and or Mathematical Operations that encompass the New Paradigm representing the Binary System. Furthermore, it can be easily shown, that the even more Complicated Mathematical Operations representing Multiplication and Division would follow the similar presentation. In other words, the conclusion representing the foundation, which Established this New Paradigm for the Binary System, remain unquestionably valid. And without a doubt, Gregor Cantor was truly wrong, regarding his conclusions. That is, this New Paradigm represents the True Binary Mathematical Operations... Where by, in the New Binary Mathematics, the Mathematics for the Binary Numbers and the Binary Logic is the same; Given by Equations '1' thru '5', noted below...We have:

1. $1 + 1 = 10$: In the New Paradigm for the Binary System, this Equals " $00 + 00 = 01$ ", and " $01 + 00 = 10$ ".
2. $00 + 00 = 01$: In the New Binary Mathematics
3. $00 + 01 = 10$: In the New Binary Mathematics
4. $01 + 01 = 11$: In the New Binary Mathematics
5. $10 + 00 = 11$: In the New Binary Mathematics

But, this pattern only follows the Unary Set for Progression, or Regression, which pertains to the value given by the Unary Set, {1}. Nevertheless, there is, contrary to the out spoken beliefs, a Binary Equivalent, which is performed first upon the Right Most Binary Pair; where {XX} would represent the Right most Binary Digit. Now! Keeping in mind that this is Pure Binary Mathematics that we will be dealing with. It should be understood, its' Rules will be somewhat different. Where by, in Pure Binary Mathematics, whether or not you are working with a Pair of Columns or a Single Column, something is always Carried to the Next Column, (or is understood to represent a particular Binary Value) provided that the Next Column Exist. In other words, in Pure Binary Mathematics, either a "1" or a "0" will Carry Over to the Next Column. And depending upon the Binary Value of the Digit in the Next Column, being either a "0" or a "1". And whether or not you are working with either a Single, Double, or some Multiple Column Arithmetic, will determine how the Carry will effect the Mathematics. To be more specific, the Digit being Carried is Governed by the equations given below (And Note, I will only be performing Single Column Mathematics);

1. $0 + 1 = 10$, where "1" Carry to "0" means use "0" in the Current Column and Carry the "1" to the Next Digit.

2. $1 + 1 = 11$, where "1" Carry to "1" means use "1" in the Current Column and Carry the "1" to the Next Digit.

3. $0 + 0 = 1$, where "0" Carry to "0" means use "0", ($0 + 0 = 1$) in the Current Column and Carry the "0" to the Next Digit; In which case, the Carry of "0" to "1" equals "10", and Carry "0" to "0" Equals "0"; given by Table 1A, we have "00" = "1".

The explanation for these results is given by the Results from the equations given below, and are respectively labeled as '1a' and '2a'.

$$1a. 00 + 01 = 10$$

$$2a. 01 + 01 = 11$$

$$3a. 00 + 00 = 01$$

$$4a. 10 + 00 = 11$$

Now Observe Equations '1a', '2a', '3a' and '4a', when the Right most Digit is Stripped away, which yields Equations '1b', '2b', '3b', and '4b', and stripping the Left Most Digit yields equations '1c', '2c', '3c', and '4c'. These Equations are said to be the Equations establishing the fundamental Mathematical Operations for Binary Logic, which would represent the "AND OPERATION"; Given by Table 1B, We have:

Table 1B

1b. $0 + 0 = 1$

1c. $0 + 1 = 0$

2b. $0 + 0 = 1$

2c. $1 + 1 = 1$

3b. $0 + 0 = 0$

3c. $0 + 0 = 1$

4b. $1 + 0 = 1$

4c. $0 + 0 = 1$

And these respective Arithmetic examples are representations of the "AND" Function, the "NOT" function can just as easily be deduced using the same methods. Nevertheless, the Mathematical Calculations involving the Binary Numbers, in which the Operation of Addition is performed, is given by Table 'Ex. 1a': we have:

Table Ex. 1a (ADDITION)

$$\begin{array}{r} 111 = 8 \\ 110 = 7 \\ \hline 1110 \end{array} \quad 15$$

$$\begin{array}{r} 1111 = 16 \\ 1010 = 11 \\ \hline 11010 \end{array} \quad 27$$

$$\begin{array}{r} 11111 = 32 \\ 10110 = 23 \\ \hline 110110 \end{array} \quad 55$$

$$\begin{array}{r} 111111 = 64 \\ 101011 = 44 \\ \hline 1101011 \end{array} \quad 108$$

$$\begin{array}{r} 100 = 5 \\ 100 = 5 \\ \hline 1001 \end{array} \quad 10$$

$$\begin{array}{r} 1000 = 9 \\ 1000 = 9 \\ \hline 10001 \end{array} \quad 18$$

$$\begin{array}{r} 10010 = 19 \\ 10010 = 19 \\ \hline 100101 \end{array} \quad 38$$

$$\begin{array}{r} 11011 = 28 \\ 11011 = 28 \\ \hline 110111 \end{array} \quad 56$$

Furthermore, it should be understood that the Arithmetic Operation of Subtraction follows the same Rules Derived for Addition, but Effect is the Reverse, which yields an Opposite result. Where by, Given by Table Ex. 2a, we have:

Table Ex. 2a (SUBTRACTION)

$$\begin{array}{r} 111 = 8 \\ 110 = 7 \\ \hline 00 = 1 \end{array}$$

$$\begin{array}{r} 1111 = 16 \\ 1010 = 11 \\ \hline 100 \quad 5 \end{array}$$

$$\begin{array}{r} 11111 = 32 \\ 10110 = 23 \\ \hline 1000 \quad 9 \end{array}$$

$$\begin{array}{r} 111111 = 64 \\ 101011 = 44 \\ \hline 10011 \quad 20 \end{array}$$

$$\begin{array}{r} 100 = 5 \\ 100 = 5 \\ \hline 0 \quad 0 \end{array}$$

$$\begin{array}{r} 1000 = 9 \\ 1000 = 9 \\ \hline 0 \quad 0 \end{array}$$

$$\begin{array}{r} 10010 = 19 \\ 10010 = 19 \\ \hline 0 \quad 0 \end{array}$$

$$\begin{array}{r} 11011 = 28 \\ 11011 = 28 \\ \hline 0 \quad 0 \end{array}$$

Note: It should be understood, that when dealing with Subtraction, '11 - 10 = 00' and '11000 - 10000 = 111', which follows the Rules provided above.

Needless to say, the "CONTRADICTION" now becomes the "CONFLICT", which is the Difference between the Mathematics pertaining to the Binary System itself, and the Mathematics for the Binary Logic associated with the Binary System. In other words, there is No Such Thing as a Derivation of a "Contradiction", 'Proof or Otherwise', within a Newly Created, or Logically Derived Numbering System. Because it can only be said to either violate the Standing Laws which Support it, or it Violates the Newly Derived Definitions, which are said to Define it. And in this case, the proof is derived from the conclusion; 'There is No Correlation between the total number of Unique Combinations that equals or depicts the Numerals Contained in the Modern Binary Set, ($\{00, 01, 10, 11\}$), and the Logically developed or Derived Mathematical Operations who's Results Support Binary Enumeration, which was logically derived from the Unary Set'. Furthermore, while support for this conclusion can be shown and demonstrated, using the Binary Mathematics involving the 'CIDR' Architecture. Even still, when using examples involving the 'CIDR' Architecture and Binary Mathematics, where ' $\{1111111\} = 2^7 = 128$ ' is valid using the Binary Mathematics involving the 'CIDR' Architecture, and ' $\{10000000\} = 2^7 = 128$ ' is valid using the Binary Method for Enumeration, which shows that '128' is not equal to '128', implies a "CONTRADICTION".

Nevertheless, what this shows or demonstrates, is that, there exist a Conflict with the Methods of Counting and the Logic for the Arithmetic Operations who's Derived Results, Sequenced Counting is said to Support.

'In other words, this alone however, does not represent a "Contradiction", or any statement having an "Opposite Result or Character", which would be a sufficient foundation to dispose the Modern Binary System. This is because the Results depicted in the Conclusion noted above are the Results from 2 distinct, and Different Binary Methods for Enumeration. Which does nevertheless, represent quite clearly, the "CONFLICT" within the Binary System itself. That is, the Difference between the Mathematics involving Binary Enumeration and the Mathematical Logic pertaining to the Results from the Mathematical Operations (or Computations) involving Binary Notation, represents a Conflict within the Supporting Foundation, from which the Binary System was logically derived.' (et 2002)

Hence, Zero once again, regains its Independence, the inherent Neutrality, which is the Property or Status belonging only to Zero; 'The Distinction of the Zero Property regarding it's inherent Neutrality, by definition, sets it apart from every Numbering System, or System of Counting'. In other words, there is Only One Logically Valid Binary System, and while anyone can create up to '4' New Binary System Representations, they would not All be Logically Valid. And Equally True, there is Only One Unary System, but it can not be Extended in any way, that would provide, or produce some of the other Alternatives, as seen in the Binary System.

Chapter III: The Mathematics of Quantification; Spectacles for Viewing
the Mathematical Possibilities

Nevertheless, whether or not you are familiar with Quantification, it should be clear, since its mention, The power of the Mathematics of Quantification is indeed daunting, and it should reign over the Entire Mathematical Field forever, without question. In fact, I am currently working on more of its promises, which includes the Subjects listed below. Moreover, it should be an added value to note, accomplishments in these areas would lead to 'Autonomous Machines', which could actually 'Think'. (e.g.: Computers, Probes, Space Vehicles, Medical Devices for Diagnoses, Robotics, and Independent, 'Thinking Weapons of Mass Destruction' that can be used either 'Offensively' or 'Defensively',... etc.)

1. Establishing the foundation for Ternary Logic
2. Establishing the Foundation for Multi-Variable Logic
3. The Correction of the Errors in the Logic and Mathematics in Fuzzy Logic
4. These Results could ultimately lead to the Development of Hardware for Artificial Intelligence

And while it should be understood, I definitely have my work cut out for me. It should be equally clear, that time does not always permit an explanation of the Elementary Concepts, which should be well understood by the Professionals who populate the intended Area of Study / Research.

Notwithstanding, the joys I derive from my work in the field of Mathematics, my actual objective is indeed the Natural Sciences, and perhaps the Engineering Sciences as well. But clearly, it is doubtful, that any of these works will every find as their home, the postings of the IETF's Web Page. Needless to say, they would indeed be well beyond the scope of the audience, who frequents Internet-Draft's Web Pages for the latest information regarding the standards governing Computer Technology.

And for this, I sincerely apologize.

Chapter IV: Security Considerations

This document, whose only objective was the explanation of the new foundation for the Binary System, which resulted from the Mathematics of Quantification, does not directly raise any security issues. Hence, there are no issues that warrant Security Considerations.

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{Note: The Multiplication and Division operations
for this New Binary System have been completed
as well. The decision however, was not to
include these Operations in this Draft,
because they are related to other works.}

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