Collatz conjecture and Prime Numbers Distribution

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Collatz Conjecture and Prime Numbers Distribution

Abstract

This paper introduces a proof for Collatz Conjecture based on the distribution of Prime numbers and its composites. Then, we will introduce a formula that includes Colltaz function main Cycle (1,2,4) that evaluate to value = 1 for any Natural Number. Also, we will introduce other formulas that evaluates to value [0] or value [1/2] for any real number. Also, we introduced a flipping point formula that will reverse the +ev and -ev numbers on the line number for any Natural number N.

Keywords: Collatz Conjecture, Prime Number, Distribution, 3x+1 problem.

1. Introduction

1.1 Pyramid distribution.

Stratring from Natural number 7 we can generate any Prime number and its composite that is > 7

Just by a sereies of adding fours and two to natural number 7.

+4

+2

7	
7	11
13	17
19	23
25	29
31	35
37	41
43	47
49	53
55	59
61	65
67	71
73	77
79	83
85	89
91	95
97	101
103	107
109	113
115	119
121	125
127	131
133	137
139	143
145	149
151	155
157	161
163	167
169	173
175	179
181	185
187	191

And once we reached [7] in Collatz conjecture its odd then adding one it goes to 8 and then 4 and then 2 and then 1.

Therefore, any prime number and its composites will go eventually to 1.

$$Therefore;\ for\ any\ natural\ number\ N\ ;$$

$$7+1\ *\ 4\ *N+1\ *2*N=7+6*N$$

$$7+\left(\frac{7-1}{6}\right)*\ 4\ *N+\left(\frac{7-1}{6}\right)*2*N=M$$

$$M-7=6*N$$

$$M\ is\ Prime\ number\ \ or\ composite\ prime$$

$$M=\ 6*N+7$$

Therefore, for each Prime number or composite number M there will be Natural number N that its multiple of 6 will be exactly different away from the prime number by 7.

$$M-\ 6*N=\ 7$$

$$m_1 = 7+\frac{7-1}{6}\cdot 4\cdot 4+\frac{7-1}{6}\cdot 2\cdot 4+\left(\frac{7-1}{6}-1\right)\cdot 6$$

$$= 31$$

$$n_1 = 7+\frac{7-1}{6}\cdot 4\cdot 3+\frac{7-1}{6}\cdot 2\cdot 3+\left(\frac{7-1}{6}-1\right)\cdot 6$$

$$= 25$$

$$o_1 = 7+\frac{7-1}{6}\cdot 4\cdot 2+\frac{7-1}{6}\cdot 2\cdot 2+\left(\frac{7-1}{6}-1\right)\cdot 6$$

$$= 19$$

$$p_1 = 7+\frac{7-1}{6}\cdot 4\cdot 1+\frac{7-1}{6}\cdot 2\cdot 1+\left(\frac{7-1}{6}-1\right)\cdot 6$$

$$= 13$$

$$q_1 = 7+\frac{7-1}{6}\cdot 4\cdot 0+\frac{7-1}{6}\cdot 2\cdot 0+\left(\frac{7-1}{6}-1\right)\cdot 6$$

$$= 7$$

Any natural number N <= 7 already satisfies Collatz conjecture

For any Natural number N > 7 and any $S = \left\{\dots.,-\frac{3}{2},-1,-\frac{1}{2},0,\frac{1}{2},1,\frac{3}{2},2,\frac{5}{2},3,\frac{7}{2},4,\frac{9}{2},5,\dots..\right\}$there will be some number M that satisfies this formula

$$7+1*4*S+1*2*S=M$$

$$7+\left(\frac{7-1}{6}\right)*4*S+\left(\frac{7-1}{6}\right)*2*S=M$$

$$7+\left(\frac{6}{3}\right)*2*S+\left(\frac{6}{3}\right)*1*S=M$$

$$7+2*2*S+2*1*S=M$$

$$7+6*S=M$$

$$at\ S=-\frac{3}{2};M=-2;because\ 7+1*4*-\frac{3}{2}+1*2*-\frac{3}{2}=-2$$

$$at\ S=-1;M=1;because\ 7+1*4*-1+1*2*-1=1$$

$$at\ S=-\frac{1}{2};M=4;because\ 7+1*4*-\frac{1}{2}+1*2*-\frac{1}{2}=4$$

$$at\ S=0;M=7;because\ 7+1*4*0+1*2*0=7$$

$$at\ S=\frac{1}{2};M=10;because\ 7+1*4*\frac{1}{2}+1*2*\frac{1}{2}=10$$

$$at\ S=1;M=13;becasue\ 7+1*4*1+1*2*1=13$$

$$at\ S=\frac{3}{2};M=16;becuase\ 7+1*4*\frac{3}{2}+1*2*\frac{3}{2}=16$$

$$at\ S=2;M=19;bcause\ 7+1*4*2+1*2*2=19$$

$$7+\left(\frac{7-5}{6}\right)*4*S+\left(\frac{7-5}{6}\right)*2*S=M$$

$$7+\left(\frac{7-5}{6}\right)*4*-1+\left(\frac{7-5}{6}\right)*2*-1=5$$

$$7+\left(\frac{7-5}{6}\right)*4*-\frac{1}{2}+\left(\frac{7-5}{6}\right)*2*-\frac{1}{2}=6$$

$$7+\left(\frac{7-5}{6}\right)*4*1+\left(\frac{7-5}{6}\right)*2*1=9$$

Similarly, the product of any two numbers can be represented as [7], which will fall into Collatz main cycle [4,2,1]

For any two natural number [m] and natural number [n] there will be a new number K = m *n

Such that

$$7+\left(\frac{m-1}{6}\right)*\ 4\ *n+\left(\frac{m-1}{6}\right)*2*n+\left(\frac{n-1}{6}-1\right)*6=m*n$$

$$7+\left(\frac{m-1}{3}\right)*\ 2\ *n+\left(\frac{m-1}{3}\right)*n+(n-7)=m*n$$

$$7=-\left(\frac{m-1}{3}\right)*\ 2\ *n-\left(\frac{m-1}{3}\right)*n-(n-7)+m*n$$

$$h_1 = -\frac{67-1}{3}\cdot 2\cdot 97-\frac{67-1}{3}\cdot 97-(97-7)+67\cdot 97$$

$$= 7$$

$$i_1 = \frac{7+1}{2}$$

$$= 4$$

$$j_1 = \frac{4}{2}$$

$$= 2$$

$$k_1 = \frac{2}{2}$$

$$= 1$$

2. Collatz Conjecture

2.1 Number line Flipping point Formula.

we can generalize the prime numbers distribution formula.

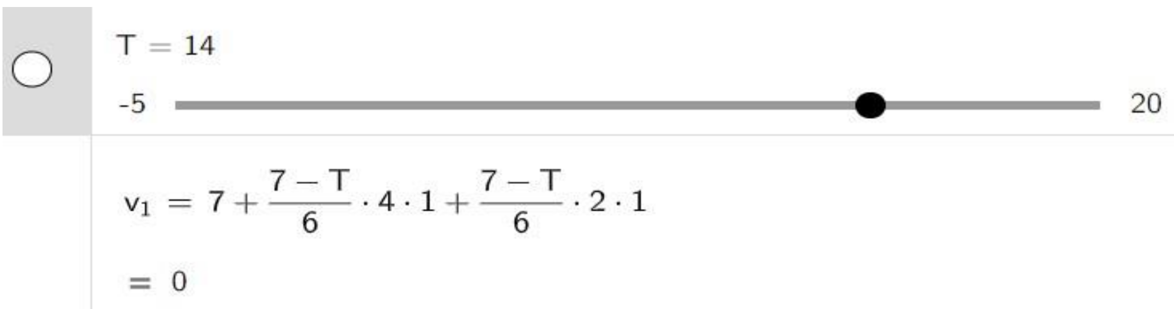
$$So\ using\ this\ genral\ formula\ we\ can\ represent\ any\ Natural\ number\ as\ \{7+\ some\ number\}$$

$$7+\left(\frac{7-T}{6}\right)*\ 4\ *1+\left(\frac{7-T}{6}\right)*2*1=L$$

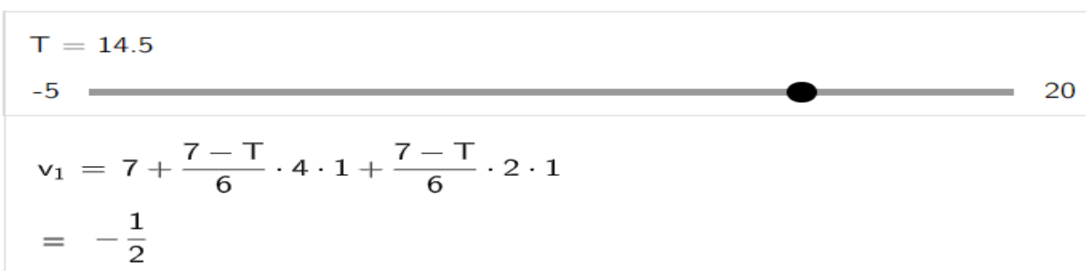
$$7+\left(\frac{7-T}{6}\right)*\ 4\ *1+\left(\frac{7-T}{6}\right)*2*1=\begin{cases}-ev\ number\ At\ T>14\\ \quad 0\ \ At\ T=14\\ +ev\ number\ at\ T<14\end{cases}$$

Which is basically flipping the Line number (-ev and +ev) sides.

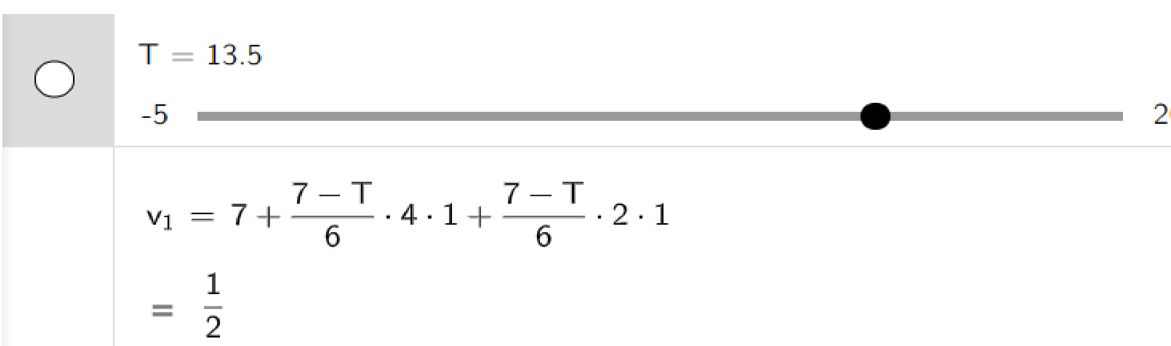
At T = 14 L =0



At T > 14 L is negative number



At T < 14 L is positive number



$T = 7.5$

-5 20

$$v_1 = 7 + \frac{7 - T}{6} \cdot 4 \cdot 12 + \frac{7 - T}{6} \cdot 2 \cdot 24$$

$$= -1$$

$T = 7$

-5 20

$$v_1 = 7 + \frac{7 - T}{6} \cdot 4 \cdot 12 + \frac{7 - T}{6} \cdot 2 \cdot 24$$

$$= 7$$

$T = 7$

-5 20

$$v_1 = 7 + \frac{7 - T}{6} \cdot 4 \cdot 24 + \frac{7 - T}{6} \cdot 2 \cdot 24$$

$$= 7$$

$T = 7.5$

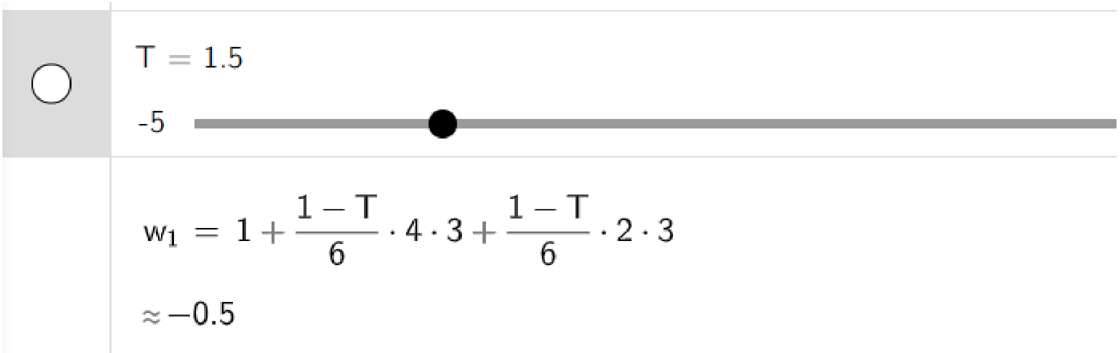
-5

$$v_1 = 7 + \frac{7 - T}{6} \cdot 4 \cdot 12 + \frac{7 - T}{6} \cdot 2 \cdot 12$$

$$= 1$$

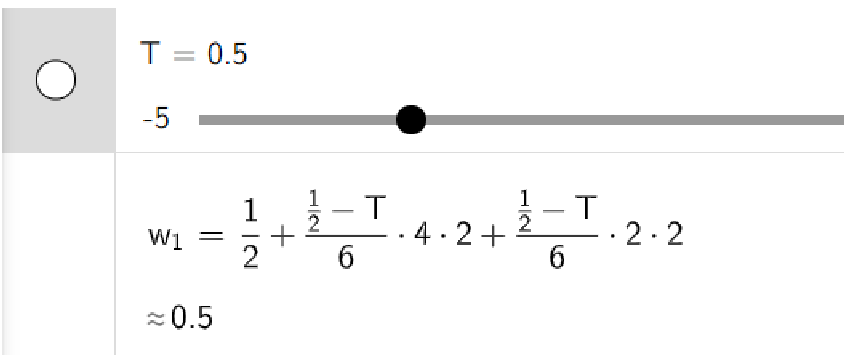
And to generalize this flipping formula more we can use any number including 1 instead of 7.

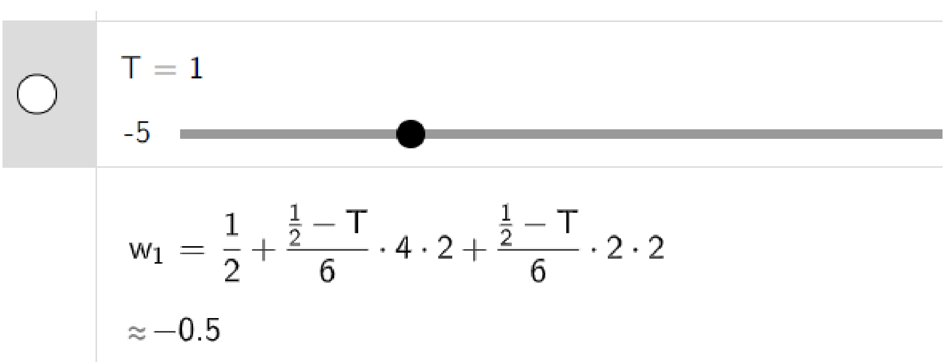
$$1 + \left(\frac{1 - T}{6}\right) * 4 * 2 + \left(\frac{1 - T}{6}\right) * 2 * 2 = \begin{cases} -ev\ number\ At\ T > 1 \\ 1\ \ At\ T = 1 \\ +ev\ number\ at\ T < 1 \end{cases}$$



So basically if we choose the flipping number to be A

$$A + \left(\frac{A-T}{6}\right) * 4 * 2 + \left(\frac{A-T}{6}\right) * 2 * 2 = \begin{cases} -ev\ number\ At\ T > A \\ A\ \ At\ T = A \\ +ev\ number\ at\ T < A \end{cases}$$





And if the formula is

$$A + \left(\frac{A-T}{6}\right) * 4 * 1 + \left(\frac{A-T}{6}\right) * 2 * 1 = \begin{cases} -ev\ number\ At\ T > A \\ 0\ At\ T = 2 * A \\ +ev\ number\ at\ T < A \end{cases}$$

$T = 1$

-5

$$w_1 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 4 \cdot 1 + \frac{\frac{1}{2} - T}{6} \cdot 2 \cdot 1$$

$= 0$

$T = 14$

-5

$$v_1 = 7 + \frac{7 - T}{6} \cdot 4 \cdot 1 + \frac{7 - T}{6} \cdot 2 \cdot 1$$

$= 0$

Based on this general formula any number will meet a flipping point once T = 2 * A.

For any Natural number

And for A =1/4

$T = 0$

-5

$$w_1 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot 1 + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot 1$$

≈ 0.5

$T = 0.5$

-5

$$w_1 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot 1 + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot 1$$

$= 0$

To generalize this formula more

$$A+\left(\frac{A-T}{6}\right)*\ 4\ *\frac{1}{B}+\left(\frac{A-T}{6}\right)*2*\frac{1}{B}=\begin{cases}-ev\ number\ At\ T>A\\ A\ At\ T=A\\ +ev\ number\ at\ T<A\end{cases}$$

$T = 1$

-10

$$w_1 = \frac{1}{4}+\frac{\frac{1}{4}-T}{6}\cdot 4\cdot\frac{1}{2}+\frac{\frac{1}{4}-T}{6}\cdot 2\cdot\frac{1}{2}$$

≈ -0.125

$$v_1 = \frac{1}{4}+\frac{\frac{1}{4}-T}{6}\cdot 4\cdot\frac{1}{3}+\frac{\frac{1}{4}-T}{6}\cdot 2\cdot\frac{1}{3}$$

$= 0$

$$a_2 = \frac{1}{4}+\frac{\frac{1}{4}-T}{6}\cdot 4\cdot\frac{1}{4}+\frac{\frac{1}{4}-T}{6}\cdot 2\cdot\frac{1}{4}$$

$= \frac{1}{16}$

$$c_2 = \frac{1}{4}+\frac{\frac{1}{4}-T}{6}\cdot 4\cdot\frac{1}{5}+\frac{\frac{1}{4}-T}{6}\cdot 2\cdot\frac{1}{5}$$

$= \frac{1}{10}$

$$b_2 = \frac{1}{4}+\frac{\frac{1}{4}-T}{6}\cdot 4\cdot\frac{1}{6}+\frac{\frac{1}{4}-T}{6}\cdot 2\cdot\frac{1}{6}$$

$= \frac{1}{8}$

$$d_2 = \frac{1}{4}+\frac{\frac{1}{4}-T}{6}\cdot 4\cdot\frac{1}{7}+\frac{\frac{1}{4}-T}{6}\cdot 2\cdot\frac{1}{7}$$

$= \frac{1}{7}$

For A = 1/4

$T = 0.5$	$g_2 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot \frac{1}{1} + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot \frac{1}{1}$ $= 0$	**B = 1**
$T = -\frac{1}{4}$ ≈ -0.25	$j_2 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot \frac{-1}{2} + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot \frac{-1}{2}$ $= 0$	**B = -0.5**
$T = -\frac{1}{2}$ ≈ -0.5	$k_2 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot \frac{-1}{3} + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot \frac{-1}{3}$ $= 0$	**B = -1/3**
$T = 1$	$v_1 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot \frac{1}{3} + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot \frac{1}{3}$ $= 0$	**B = 1/3**
$T = 1.5$	$c_2 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot \frac{1}{5} + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot \frac{1}{5}$ $= 0$	**B = 1/5**
$T = 2$	$d_2 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot \frac{1}{7} + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot \frac{1}{7}$ $= 0$	**B = 1/7**
$T = 2.5$	$f_2 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot \frac{1}{9} + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot \frac{1}{9}$ $= 0$	**B = 1/9**
$T = 3$	$e_2 = \frac{1}{4} + \frac{\frac{1}{4} - T}{6} \cdot 4 \cdot \frac{1}{11} + \frac{\frac{1}{4} - T}{6} \cdot 2 \cdot \frac{1}{11}$ $= 0$	**B =1/11**

For A =1/2

$T = -0.5$	$j_2 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 4 \cdot \frac{-1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 2 \cdot \frac{-1}{2}$ $= 0$	**B = -2 1/B = -1/2**
$T = 1$	$g_2 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 4 \cdot \frac{1}{1} + \frac{\frac{1}{2} - T}{6} \cdot 2 \cdot \frac{1}{1}$ $= 0$	**B =1 1/B = 1**
$T = 1.5$	$w_1 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 4 \cdot \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 2 \cdot \frac{1}{2}$ $= 0$	**B = 2 1/B = 1/2**
$T = 2$	$v_1 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 4 \cdot \frac{1}{3} + \frac{\frac{1}{2} - T}{6} \cdot 2 \cdot \frac{1}{3}$ $= 0$	**B =3 1/B = 1/3**
$T = 2.5$	$a_2 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 4 \cdot \frac{1}{4} + \frac{\frac{1}{2} - T}{6} \cdot 2 \cdot \frac{1}{4}$ $= 0$	**B =4 1/B = 1/4**
$T = 3$	$c_2 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 4 \cdot \frac{1}{5} + \frac{\frac{1}{2} - T}{6} \cdot 2 \cdot \frac{1}{5}$ $= 0$	**B =5 1/B = 1/5**
$T = 3.5$	$b_2 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 4 \cdot \frac{1}{6} + \frac{\frac{1}{2} - T}{6} \cdot 2 \cdot \frac{1}{6}$ $= 0$	**B =6 1/B = 1/6**
$T = 4$	$d_2 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} \cdot 4 \cdot \frac{1}{7} + \frac{\frac{1}{2} - T}{6} \cdot 2 \cdot \frac{1}{7}$ $= 0$	**B = 7 1/B = 1/7**

2.2 Collatz Conjecture.

The generalization for the prime number distributions or more accurately the Flipping point Formula.

$$A+\left(\frac{A-T}{6}\right)*\ 4\ *\frac{1}{B}+\left(\frac{A-T}{6}\right)*2*\frac{1}{B}=\begin{cases}-ev\ number\ At\ T>\dfrac{B+1}{2}\ \ and\ A=\dfrac{1}{2}\\ 0\ At\ T=\dfrac{B+1}{2}\ \ and\ A=\dfrac{1}{2}\\ +ev\ number\ at\ T<\dfrac{B+1}{2}\ \ and\ A=\dfrac{1}{2}\end{cases}$$

$$This\ means\ we\ will\ have\ a\ flipping\ point\ when\ A=\frac{1}{2}\ ;$$

$$and\ T=\frac{B+1}{2}\ for\ any\ natrual\ value\ of\ B$$

And if B = 1; this general formula will be.

$$A+\left(\frac{A-T}{6}\right)*\ 4\ *1+\left(\frac{A-T}{6}\right)*2*1=\begin{cases}-ev\ number\ At\ T>A\\ 0\ At\ T=2*A\\ +ev\ number\ at\ T<A\end{cases}$$

Another point sum of each two consequence [B] numbers

$$\left(\frac{1}{2}+\left(\frac{\frac{1}{2}-T}{6}\right)*\ 4\ *1+\left(\frac{\frac{1}{2}-T}{6}\right)*2*1\right)+\ \left(1+\left(\frac{1-T}{6}\right)*\ 4\ *(B-1)+\left(\frac{1-T}{6}\right)*2*(B-1)\right)$$
$$=\ \left(1+\left(\frac{1-T}{6}\right)*\ 4\ *B+\left(\frac{1-T}{6}\right)*2*B\right)$$

This means for each number [B] can be written in this formula. $\left(1+\left(\frac{1-T}{6}\right)*\ 4\ *B+\left(\frac{1-T}{6}\right)*2*B\right)$

And can be represented as sum of two number the number before it (B -1) + the formula when A = ½ and B = 1. For any value T. as shown in previous equation.

$$u_2 = \frac{1}{2} + \frac{\frac{1}{2} - F}{6} \cdot 4 \cdot 1 + \frac{\frac{1}{2} - F}{6} \cdot 2 \cdot 1$$

$$= -2$$

F = 3

B = 1 ; A = 1/2

$$t_2 = 1 + \frac{1 - F}{6} \cdot 4 \cdot 6 + \frac{1 - F}{6} \cdot 2 \cdot 6$$

$$= -11$$

B -1 = 7-1 = 6

$$s_2 = 1 + \frac{1 - F}{6} \cdot 4 \cdot 7 + \frac{1 - F}{6} \cdot 2 \cdot 7$$

$$= -13$$

B = 7

S2 = t2+u2 = -11 -2 = -13

Or in other words we can say that if A = 1 the difference between each two consequence numbers [B] in the same formula = the value of the formula at A = ½ and B =1.

And this is because

$$T - 1 = \left(\frac{1}{2} + \left(\frac{\frac{1}{2} - T}{6}\right) * 4 * 1 + \left(\frac{\frac{1}{2} - T}{6}\right) * 2 * 1\right) ; for\ any\ natural\ value\ of\ T$$

And

$$2 - T = \left(1 + \left(\frac{1 - T}{6}\right) * 4 * 1 + \left(\frac{1 - T}{6}\right) * 2 * 1\right) ; for\ any\ natural\ value\ of\ T$$

And as these are two consequence numbers then.

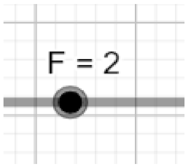
$$2 - T - 1 = T - 1$$

$$1 - T = T - 1$$

As the flipping point is at T = 2 * A = 1. And this is the point reach Zero.

So, we have two flipping points for each number T.

1) When A = ½ then T = 2 * A = 1 then T-1 = 0 reach Zero at T =1.
2) When A = 1 then T = 2 * A = 2 then 2-T =0 reach Zero at T = 2.



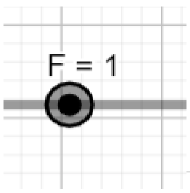
$$b_3 = 1 + \frac{1 - F}{6} \cdot 4 \cdot 1 + \frac{1 - F}{6} \cdot 2 \cdot 1$$

$$= 0$$

$$c_3 = 2 - F$$

$$= 0$$

First Flipping Point



$$e_3 = \frac{1}{2} + \frac{\frac{1}{2} - F}{6} \cdot 4 \cdot 1 + \frac{\frac{1}{2} - F}{6} \cdot 2 \cdot 1$$

$$= 0$$

$$d_3 = F - 1$$

$$= 0$$

Second Flipping Point

For any Real number T ≠0 this Formula = Zero.

$$0 = \frac{1}{2} + \frac{\frac{1}{2} - T}{6} * 4 * \frac{1}{T} + \frac{\frac{1}{2} - T}{6} * \ 2 * \frac{1}{T} + \left(\frac{\frac{T}{2} - \frac{1}{2}}{T} \right)$$

$$\frac{1}{2} + \frac{\frac{1}{2} - T}{6} * 4 * \frac{1}{T} + \frac{\frac{1}{2} - T}{6} * \ 2 * \frac{1}{T} = -\left(\frac{\frac{T}{2} - \frac{1}{2}}{T} \right)$$

$$\frac{T}{2} + \frac{\frac{1}{2} - T}{6} * 4 + \frac{\frac{1}{2} - T}{6} * \ 2 = -\left(\frac{T}{2} - \frac{1}{2} \right)$$

$$T + \frac{\frac{1}{2} - T}{6} * 4 + \frac{\frac{1}{2} - T}{6} * \ 2 = \frac{1}{2}$$

For any Natural number T we can make it equal to ½ using this formula

And this also can be written as for any real value T including T =0.

$$T + \frac{1}{2} + \frac{\frac{1}{2} - T}{6} * 4 + \frac{\frac{1}{2} - T}{6} * \ 2 = 1$$

Which conclude Collatz conjecture each number will reach 1.

$$T+\frac{1}{2}+\frac{\frac{1}{2}-T}{6}*4+\frac{\frac{1}{2}-T}{6}*\ 2=1\ ;for\ any\ real\ value\ T$$

And not only for ½ but also for any value A any Number T can be converted to 2* A using this formula.

$$T+\frac{A-T}{6}*4+\frac{A-T}{6}*\ 2+A=2*A\ ;for\ any\ real\ value\ T$$

If any sequence of operations applied on any number N will make sure this number will be natural number as if it even will be divided by 2 and if odd, we will add one and then divide by 2 again.

So, any number in Collatz sequence will be natural number and using our formula it can reach 1. As it is clear the formula doing the same as Collatz function also include factors of 2 and adding ½ as in the odd case [(3n +1)/2]

And if this formula can be considered as a sequence of adding 4 and adding 2 to a Number T; we can say that no matter the value of several collatz sequence eventually will reach to this formula and then will reach [1] eventually for any [T].

As long the Collatz function collectively between its operation steps reverse the operation that is done in previous steps.

We do not care how many times Colltaz function will be applied if there is a formula that brings back any number to [1] and this what Collatz conjecture states. And this is what we showed here there is a formula that includes Collatz function and brings any Number [T] to [1].

$$T+\frac{1}{2}+\frac{\frac{1}{2}-T}{6}*4+\frac{\frac{1}{2}-T}{6}*\ 2=1\ ;for\ any\ real\ value\ T$$

And to elaborate more on Collatz function and this formula any number T can reach [Zero] using this formula.

$$0=\frac{1}{2}+\frac{\frac{1}{2}-T}{6}*4*\frac{1}{T}+\frac{\frac{1}{2}-T}{6}*\ 2*\frac{1}{T}+\left(\frac{\frac{T}{2}-\frac{1}{2}}{T}\right)\ for\ any\ T\ \neq 0$$

For example, if T = 274133054632352106267

This formula will equal [0].

Conclusion

First, we showed the prime numbers and its composite distribution formula. Then we showed hot this formula can be generalized and showed the concept of the number line flipping points formula for any natural number. Then we showed how this formula includes Colltaz function main Cycle (1,2,4) that evaluates to value = 1 for any Natural.

Finally, we similarly showed formulas that have Collatz function main Cycle [1,2,4] and evaluates to value [0] or value [1/2] for any real number. Which gives a logical proof and formula from Riemann hypothesis as well.

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