Theory Of Holistic Decomposition Of Any Set Of Given Primes As One Or More Sets Each With Some Periodicity Of The Prime Number's Basis Position Number

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ABSTRACT

In this research investigation, the author has detailed the Theory Of Holistic Decomposition Of Any Set Of Given Primes As One Or More Sets Each With Some Periodicity Of The Prime Number's Basis Position Number.

Key Words: Functional Analysis

INTRODUCTION

The aforementioned Sets which form the Prime Trends are of much importance in Functional Analysis as it allows us to decompose data into Trends with unique Natural Periodicity.

THEORY (AUTHOR'S MODEL OF THEORY OF HOLISTIC DECOMPOSITION OF ANY SET OF GIVEN PRIMES AS ONE OR MORE SETS EACH WITH SOME PERIODICTY OF THE PRIME NUMBER'S BASIS POSITION NUMBER)

Say any Set S , is given all of whose elements belong to the Set of Prime Numbers. Let the Cardinality of the Set be n . Furthermore, these numbers are arranged in an ascending order. The following entire analysis is valid while we consider 1 as the First Prime or while we consider 2 as the First Prime.

Now if we represent the Set of Prime Numbers by p_j then $S(1)=p_{j\min}$ and $S(n)=p_{j\max}$. Here, the index represents the Prime Basis Position Number of the Prime p . For example, if 2 is considered as the first prime, then the Prime Basis Position Number of the Prime 2 is , of the Prime 3 is 2, of the Prime 5 is 3, of the Prime 7 is 4 and so on so forth.

We now create Subsets of S in a fashion such that $S_r=\{p_{j\min+rl}\}$

with $r=0,1,2,....,g$ and $l=0,1,2,....,\frac{(n-1)}{g}$ and $g\le\left(\frac{n-1}{2}\right)$ for n odd

and
$S_r=\{p_{j\min+rl}\}$

with $r=0,1,2,....,g$ and $l=0,1,2,....,\frac{n}{g}$ and $g\le\left(\frac{n}{2}\right)$ for n even.

where all S_r

A simple way to find these sets is detailed below using a method detailed below:

For the given set S, we index the elements with their Prime Position Basis Numbers. Let this Set be J. We now do Cartesian cross product of J with J i.e., we find J X J. Now for these n^2 number of ordered pairs (u,v), we find the absolute value of the difference $\delta_{(u,v)}$ between them. We now separately collect all the u, v's for $\delta_{(u,v)}=1$, $\delta_{(u,v)}=2$, $\delta_{(u,v)}=3$,……., $\delta_{(u,v)}=\left(\frac{n-1}{2}\right)$ if n is odd or $\delta_{(u,v)}=\left(\frac{n}{2}\right)$ if n is even and call them as a set each. The thusly gotten sets are the desired sets.

Once, we get the locations (Prime Metric Basis Positions Numbers Of The Primes of the given Set S) of the thusly Decomposed Sets of the given Set S, we can now write the Decomposed Sets of Set S in terms of the Primes representing their Prime Basis Position Numbers.

This will be explained using an Example below:

Example:

$S=\{3,5,7,13,29,31,53,61,67\}$

Then

$J=\{3,4,5,7,11,12,17,19.20\}$

Here, 1 is taken as the first Prime.

We now create a table of difference between u and v of the ordered pairs of J X J as shown

Table 1: *Table of difference between u and v of the ordered pairs of J X J*

	3	4	5	7	11	12	17	19	20
3	0	1	2	4	8	9	14	16	17
4	1	0	1	3	7	8	13	15	16
5	2	1	0	2	6	7	12	14	15
7	4	3	2	0	4	5	10	12	13
11	8	7	6	4	0	1	6	8	9
12	9	8	7	5	1	0	5	7	8
17	14	13	12	10	6	5	0	2	3
19	16	15	14	12	8	7	2	0	1
20	17	16	15	13	9	8	3	1	0

Needless to mention, the Set with u,v difference equal to 1 is the Set J itself. We now find all the pairs with u, v difference = 2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17

Table 2: *Table of distilled Non Unique Prime Trends*

2	{3,5,7} {17,19}	
3	{4,7} {17,20}	
4	{3,7,11}	
5	{7,12,17}	
6	{5,11,17}	
7	{4,11} {5,12,19}	
8	{3,11,19} {4,12,20}	
9	{3,12} {11,20}	
10	{7,17}	
11	None	
12	{5,17} {7,19}	
13	{7,20} {4,17}	
14	{3,17} {5,19}	
15	{4,19} {5,20}	
16	{3,19} {4,20}	
17	{3,20}	

These Sets

{3,5,7} which is {3,7,13}

{17,19} which is {53,61}

{4,7} which is {5,13}

{17,20} which is {53,67}

{3,7,11} which is {3,13,29}

{7,12,17} which is {13,31,53}

{5,11,17} which is {7,29,53}

{4,11} which is {5,29}

{5,12,19} which is {7,31,61}

{3,11,19} which is {3,29,61}

{4,12,20} which is {5,31,67}

{3,12} which is {3,31}

{11,20} which is {29,67}

{7,17} which is {13,53}

{5,17} which is {7,53}

{7,19} which is {13,61}

{7,20} which is {13,67}

{4,17} which is {5,53}

{3,17} which is {3,53}

{5,19} which is {7,61}

{4,19} which is {5,61}

{5,20} which is {7,67}

{3,19} which is {3, 61}

{4,20} which is {5,67}

{3,20} which is {3,67}

can be called the Sets gotten by *Holistic Decomposition Of The Given Set S Of Primes As One Or More Sets Each With Some Periodicity Of The Prime Number's Basis Position Number*.

This set of Sets can also be called as the *Primality Tree Set* of the Given Primes Set S.

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