ISSN: 2454-9940

INTERNATIONAL JOURNAL OF APPLIED SCIENCE ENGINEERING AND MANAGEMENT

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www.ijasem.org

INTERNATIONAL JOURNAL OF APPLIED SCIENCE ENGINEERING AND MANAGEMENT

ISSN2454-9940www.ijsem.org

Vol 8, Issuse.3Aug 2020

Using Storage Systems to Provide Frequency Control PRIME NUMBERS ANALYSIS AND THE RIEMANN HYPOTHESIS: An Investigation into Prime Numbers

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***Abstract:**Many different elements of topology, cryptography, and other fields rely on prime theory calculations. This article examines prime number theory from a fresh perspective in an effort to give new measurements and insights into the arrangement of prime numbers. Python's prime package package was used for the computations, which can be installed as a module using pip install prime package.*

Introduction

Euler and his colleagues had laid the groundwork for prime analysis, which the Riemann Hypothesis built on. The conclusions of the Riemann Hypothesis are used to further investigate the nature of prime numbers in this work. As mathematics is the sole means of expressing the universe apart from our personal perspective, prime numbers are found throughout the discipline. Perception. Primate number theory is so very important in practically every field of excellent reason for this investigation is provided. I'll begin by saying that by examining the best-selling items and putting together a system to categorise them. Then, go further into the examination of quadrants before concluding this article with the direct prime formulas. Python was used for all of the research in this publication.as well as pre-packaged best products available. Two unique primes will be defined as prime products in this study. In this case, p1 is divided by p2. items that are of the highest quality of two primes are employed in the IT sector to secure information.'sill start by putting up the context for my discussion of prime. products. There is just one prime plane MP in which all prime products pp may be found. And it's possible that Planes flying in formation. The dominating plane of any prime may exist on numerous planes. On numerous planes at the same time, he is known as "Optimus Prime". In order to determine the prime factorization formula, for a certain plane of travel Optimus is a brand.Unsolved issues abound in number theory, which deals with prime numbers, and have been attempted by the finest minds for centuries. Mathematical propositions that have yet to be proved, but which we firmly believe in, are some of the open questions. The term "conjecture" or "hypothesis" is used to describe such unsubstantiated theories. We've previously touched on the idea that there may be an unlimited number of pairs of prime integers that are only separated by two digits. Even numbers may be expressed as the sum of two prime numbers, according to Goldbach's conjecture, a well-known theory. For instance, 16 = 13 + 3 + 54 = 47 + 7 = 76. Achieving any of the above will earn you everlasting fame.3Riemann's hypothesis, perhaps the most famous unresolved issue in mathematics, was presented by the same Bernhard Riemann cited before. An 1859 study by Riemann outlined a hypothesis about how far away from the real value of the number of primes to x, (x), was an estimate offered by Riemann's prime number theory. Or to put it another way, what can be stated about "error term" in prime number theorem — the discrepancy between the true amount and the proposed formula? This is one of the seven challenges for which the Clay Foundation will award a $1,000,000 prize to the person who finds a solution! If you haven't been swayed by this award yet, maybe it will.What's the big deal? Who is interested in it? The complexity and inherent beauty of a problem are the primary criteria used by mathematicians when evaluating a solution. Both of these attributes apply highly to prime numbers.

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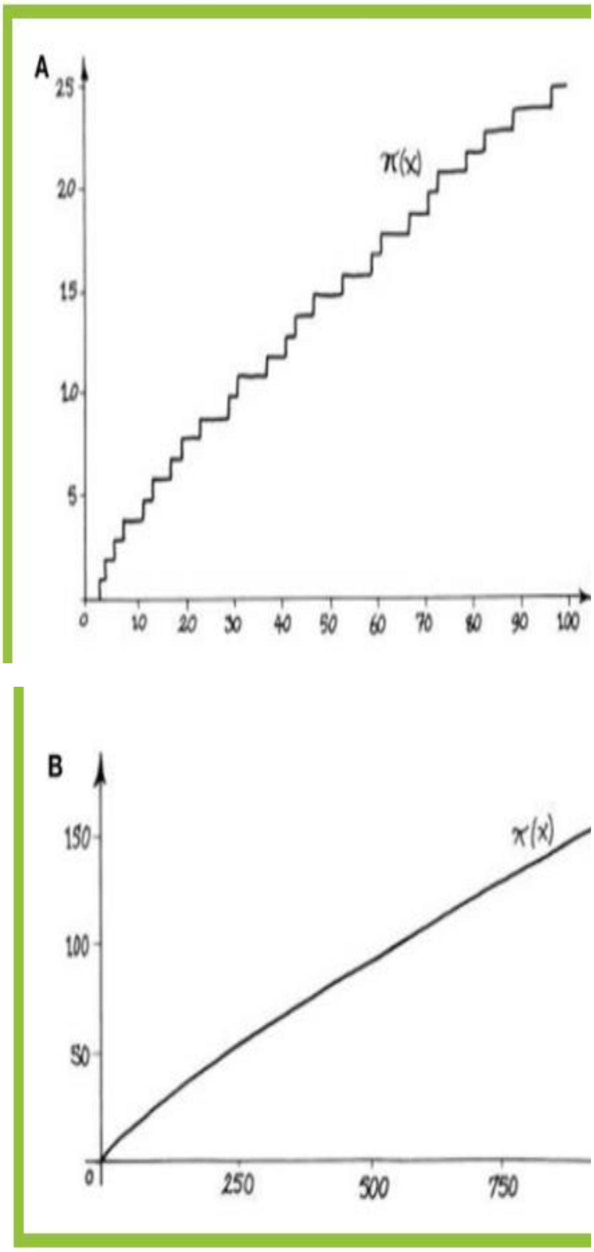
However, there are practical applications for prime numbers as well. In the last several decades, research on prime numbers has had a significant impact on encryption (the science of encrypting secret communications). Earlier, we addressed a hypothetical novel by Carl Sagan, in which an alien civilization uses prime numbers to communicate with humans. While the employment of prime numbers for civilian and military reasons isn't hypothetical, there is one much "hotter" area: encrypted communications. A debit card is required for ATM withdrawals, and all data sent between the card and the machine is encrypted. RSA (named for its inventors—Rivest, Shamir, and Adleman) is based on the principles of prime numbers, like many other methods for encryption. Still, there is much to learn about the origins of prime numbers. So, their saga is far from finished...

Glossary

If you want to express a large number as the sum of two smaller ones, you'd use a composite number.Number that cannot be expressed as the product of two smaller numbers, such as 7 or 23, is known as a prime number (non-composite).To show the truth of a mathematical theorem, a proof is constructed using a succession of logical arguments. The proof is based on verified assumptions, or on previously established theorems.In mathematics, a mathematical theorem is defined as a claim made in the language of mathematics that is either true or false in a certain context.Assumption: A mathematical assertion that has been made with the expectation that it is true but has not yet been confirmed. The "confidence in validity" might be derived through verifying particular situations, computational evidence, or mathematical intuition. Mathematical hypotheses are still open to debate.

PERIODICITY OF USE OF PREMIUM NUMBER

Are prime numbers more common than other numbers? How many prime numbers are there between 1,000,000 and 1,001,000 (one million and one million plus one thousand) and how many are there between 1,000,000,000 and 1,000,001,000? Does anybody know how many prime numbers there are between 1 trillion (1,00,000,000,000) and 1 trillion plus 1000?According to calculations, prime numbers grow scarcer as the number of digits increases. How can you define just how unusual these things are in terms of a mathematical theorem? A conjecture (also known as a hypothesis) is a mathematical statement that is thought to be true but has yet to be confirmed. The "confidence in validity" might be derived through verifying particular situations, computational evidence, or mathematical intuition. Mathematical hypotheses are still open to debate. born in 1793 by Carl Friedrich Gauss, one of the greatest mathematicians of all time, at the age of 16. The contemporary study of prime numbers owes much to the nineteenth-century mathematician Bernhard Riemann (Figure 1), who invented many of the instruments now commonly used. Only in 1896 was a formal proof of the theorem produced, a century after it had been stated. Incredibly, the French Jacques Hadamard and Belgian de la Vallee-Poussin both offered evidence in the same year! (Figure 1). That both guys were born around the same time as Riemann is worth noting for historical context's sake alone. Their proof, known as "the prime number theorem," was so significant that it was dubbed such.It is impossible to examine the intricacies of the proof of the prime number theorem here since it requires a level of mathematics that is beyond our scope. To put it another way, the theorem of prime numbers asserts that the number of digits in x is inversely proportional to the frequency of prime numbers around x. A "window" of length 1,000 around one million will have 50% more primes than a "window" of length 1,000 around one billion (the ratio is 9:6, just like the ratio between the number of zeroes in one billion and one million), and about twice as many primes as the same window around one trillion (the ratio is 9:6, just like the ratio between the number of zeroes in one billion and one million) (where the ratio of the number of zeroes is 12:6). There are 75 prime numbers in the first window, 49 in the second, and only 37 in the third, between one trillion and one trillion plus one thousand, according to computer simulations of prime numbers.A graph depicting the same data is provided below (Figure 3). In the range x 100 and again for x 1,000, you can observe how the number (x) of primes up to x varies. Notice how the graph climbs by one every time we encounter a new prime on the x-axis (Figure 3A). Graph patterns are difficult to see at this size. To establish that we can identify infinitely huge intervals in which there are no prime numbers, we only need to look at a graph. When it comes to twin primes, a well-known hypothesis claims that there are infinitely many, if not infinite, pairs of primes that have a difference of two between them. This would translate to a "step" in our graph with a width of two. However, when seen at a greater scale, the graph seems to be smooth (Figure 3B). The prime number theorem is shown by this smooth curve on a huge scale.



There are graphs that illustrate x, the number of primes. Panel A shows a step-like graph with an x range of 0 to 100. Panel B has a wider scale and a smoother graph since x in this panel runs from 0 to 1,000.Even while a mathematical event seems to operate randomly at a smaller scale, it exhibits regularity (smoothness) at a larger one, and as the size increases, the regularity becomes more precise. This is how probability systems, like coin tossing, operate. Though no one coin flip can be predicted in advance, it is statistically certain that if the coin is impartial, it will land on the heads half the time. Although the prime number system is not probabilistic, in many respects it acts as if it were picked at random, which is unexpected.

(2.1) $$p_\omega(n) = |\frac{\pi(n-1)}{3}(6*n+1)| \pm 1$$

(2.2) $$p_\omega(n) = |\frac{5*\pi(n-1)}{3}(\frac{6n}{5}+1)| \pm 1$$

Primes in the First Quadrant. The Jamell Circle's initial quadrant primes are located in quadrant 37. Prime numbers are calculated as follows:

(3.1) $$p(n) = |\frac{\pi}{3}(6*n+1)| \pm 1$$

Primitive numbers and their products in the first quadrant are all those that are not a multiple of 3. Primes in the bottom fourth of the Fourth Quadrant may be found.the Jamell Circle's Jamell Quadrant. All prime numbers except 1 are included. Theyare figured out using the following formula:

(4.1) $$p(n) = |\frac{5*\pi}{3}(\frac{6n}{5}+1)| \pm 1$$

All prime numbers less than 1 and prime powers, known as p n when p is prime, are in the Fourth Quadrant primes. Super Primes are the fifth and final tier of Primes. Prime numbers and prime products determined from either quadrant+1 is considered super primes. They are figured out as follows:

(5.1) $$p(n) = |\frac{\pi}{3}(6*n+1)| + 1$$

(5.2) $$p(n) = |\frac{5*\pi}{3}(\frac{6n}{5}+1)| + 1$$

5.1. Super Primes of the First Quadrant. Super primes in the first quadrant are known as first quadrant super primes. Numbers like 3, 5, 9or 11 and multiples of 3 are not included in super first quadrant primes. The apex of the food chain is the aircraft is 'unsaturated,' as well. How many times a prime number appears in a row is called "saturation. “Based on a certain plane of reference. The number of times a prime is tallied if it's saturated is one. When the plane is counted (calculated) several times, it is referred to be "super saturated. “To be unsaturated, anything must not be considered as part of the plane's total. There are more people reduce the saturation of the plane with saturated or super-saturated priming. Plane The number of primes on the plane divided by the total may be used to determine saturation. How many primes there are in the range.

$$Sat_{plane} = N_p/S_{p} \quad (5.3)$$

Where Np is the number of primes counted in the range of the plane and Sp is the 64-total number of primes that exist in the range.

$$p_{\omega}(n) = |\frac{\pi(n-1)}{3}(6*n \quad (5.4)$$

$$p_{\omega}(n) = |\frac{5*\pi(n-1)}{3}(\frac{6n}{5} \quad (5.5)$$

These are some of the most powerful super primes in the fourth quadrant. The Fourth Quadrant. Except for 1 and 1, all prime numbers and prime products are included in super primes. This plane's primes are extremely saturated. Unsaturated plane in the fourth quadrant.

Primes that aren't quite there. Saturated plane and primes result in sub primes, which are primes or products of primes determined in either quadrant 1. They are figured out as follows:

$$p(n) = |\frac{\pi}{3}(6*n+1)| \quad (6.1)$$

$$p(n) = |\frac{5*\pi}{3}(\frac{6n}{5}+1) \quad (6.2)$$

6.1. Subprime in the First Quadrant. All prime numbers in the first quadrant that are not multiples of three are referred to as first quadrant subprime, and this excludes the prime powers of 1, 3, and 7. This aircraft's primes are saturated, but the plane as a whole is not.First quadrant subprime may be calculated using the following formula:

$$p(n) = |\frac{\pi}{3}(6*n+1)| \quad (6.3)$$

Sub-primes in the fourth quadrant. The super81-saturated prime numbers and prime products in the fourth quadrant are subprime. Prime numbers and their products are included, with the exception of 1. The Fourth Quadrant subplan may be described as. unsatisfied. Subprime in the fourth quadrant are calculated using the following formula:

$$p(n) = |\frac{5*\pi}{3}(\frac{6n}{5}+1)| - 1 \quad (6.4)$$

7. Prime Formualae. The general formula for calculating

$$p(n) = |\frac{\pi(n-1)}{3}(6*n+1)| \pm 1 \quad (7.1)$$

$$p(n) = |\frac{5*\pi(n-1)}{3}(\frac{6n}{5}+1)| \pm 1 \quad (7.2)$$

The Jamell-Prime-Calculating functions are the names I've given to these equations. I've come up with a new definition of prime to go along with these equations.Prime numbers are only divisible by themselves and by one (1).that's 1 instead of 2.This definition replaces the old one that said a prime number was one that was divisible by itself.It's 93 by itself, plus 1 and everything higher than zero. As a result, the number 2 is not included in the94 prime number definitions. A crucial announcement has just been made, and there are just two more to go!The Megatron is 95 redefinitions.

Conclusion

Prime theory is important for calculating many various aspects in topology, cryptog-5 raphy and more. This article approaches prime number theory from a different angle to provide new 6 metrics and insights into the configuration of prime numbers. The calculations were performed using 7 the python package prime package which is available as a module

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