Universal Recursive Scheme For Generating The Sequence Of Prime Numbers (Of 2nd Order Space)

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Abstract

In this research monograph, the author presents a novel '*Universal Recursive Algorithmic Scheme For Generating The Sequence Of Prime Numbers (Of 2^{nd} Order Space* [2]*)*'.

Theory

One can note that we can represent any *Asymmetric Universal Recursion Scheme* [3] as

$$\{x\} \leftrightarrow \{x-a\} \leftrightarrow \{x+b\}$$

One can simply *Normalize* it by simply doing the operation

$$\{x\} \leftrightarrow \left\{x-\left(\frac{a}{x}\right)\right\} \leftrightarrow \left\{x+\left(\frac{b}{x}\right)\right\}$$

i.e.,

$$\{x\} \leftrightarrow \left\{\frac{x^2-a}{x}\right\} \leftrightarrow \left\{\frac{x^2+b}{x}\right\}$$

Now, we consider the first three consecutive numbers starting from 0, i.e., {0, 1, 2} (that are supposed to indicate some (*Universal Recursion Scheme*) $0 \leftrightarrow 1 \leftrightarrow 2$.

We now re-write all possible 6 arrangements of $0 \leftrightarrow 1 \leftrightarrow 2$ namely:

Universal Asymmetric Recursion Scheme	***Normalized Universal Asymmetric Recursion Scheme*** $\{x\} \leftrightarrow \left\{\frac{x^2-a}{x}\right\} \leftrightarrow \left\{\frac{x^2+b}{x}\right\}$	***Values Of*** x, a, b	***Result***	***Finalized Pick From The Result***
$0 \leftrightarrow 1 \leftrightarrow 2$	$\{0\} \leftrightarrow \left\{\frac{(0)^2-(-1)}{0}\right\} \leftrightarrow \left\{\frac{(0)^2+2}{0}\right\}$	$x=0,\ a=-1,\ b=2$	Undefined	
$1 \leftrightarrow 2 \leftrightarrow 0$	$\{1\} \leftrightarrow \left\{\frac{(1)^2-(-1)}{1}\right\} \leftrightarrow \left\{\frac{(1)^2-1}{1}\right\}$	$x=1,\ a=-1,\ b=-1$	$1 \leftrightarrow 2 \leftrightarrow 0$	No New Prime Number To Select
$2 \leftrightarrow 0 \leftrightarrow 1$	$\{2\} \leftrightarrow \left\{\frac{(2)^2-(2)}{2}\right\} \leftrightarrow \left\{\frac{(2)^2-1}{2}\right\}$	$x=2,\ a=2,\ b=-1$	$4 \leftrightarrow 2 \leftrightarrow 3$	***3*** (Prime Number Nearest to 2)
$1 \leftrightarrow 0 \leftrightarrow 2$	$\{1\} \leftrightarrow \left\{\frac{(1)^2-(1)}{1}\right\} \leftrightarrow \left\{\frac{(1)^2+1}{1}\right\}$	$x=1,\ a=1,\ b=1$	$1 \leftrightarrow 0 \leftrightarrow 2$	No New Prime Number To Select
$0 \leftrightarrow 2 \leftrightarrow 1$	$\{0\} \leftrightarrow \left\{\frac{(0)^2-(-2)}{0}\right\} \leftrightarrow \left\{\frac{(0)^2+1}{0}\right\}$	$x=0,\ a=-2,\ b=1$	Undefined	

$2 \leftrightarrow 1 \leftrightarrow 0$	$\{2\} \leftrightarrow \left\{\frac{(2)^2-1}{2}\right\} \leftrightarrow \left\{\frac{(2)^2-2}{2}\right\}$	$x=2,\ a=1,\ b=-2$	$4 \leftrightarrow 3 \leftrightarrow 1$	***3*** (Prime Number Nearest to 2)

Now, noting that the next nearest *Prime Number* found being 3, we now use the set {0, 1, 2} given in the beginning and use its two highest {***Prime***} numbers and couple the recently found 3 to form a new set {1, 2, 3} and consequently a *Asymmetric Universal Recursion Scheme* $1 \leftrightarrow 2 \leftrightarrow 3$. Using the same above scheme we again find a similar table for $1 \leftrightarrow 2 \leftrightarrow 3$

Universal Asymmetric Recursion Scheme	***Normalized Universal Asymmetric Recursion Scheme*** $\{x\} \leftrightarrow \left\{\frac{x^2-a}{x}\right\} \leftrightarrow \left\{\frac{x^2+b}{x}\right\}$	***Values Of*** $x,\ a,\ b$	***Result***	***Finalized Pick From The Result***
$1 \leftrightarrow 2 \leftrightarrow 3$	$\{1\} \leftrightarrow \left\{\frac{(1)^2-(-1)}{1}\right\} \leftrightarrow \left\{\frac{(1)^2+2}{1}\right\}$	$x=0,\ a=-1,\ b=2$	$1 \leftrightarrow 2 \leftrightarrow 3$	No New Prime Number To Select
$2 \leftrightarrow 3 \leftrightarrow 1$	$\{1\} \leftrightarrow \left\{\frac{(2)^2-(-1)}{2}\right\} \leftrightarrow \left\{\frac{(2)^2-1}{2}\right\}$	$x=1,\ a=-1,\ b=-1$	$2 \leftrightarrow 5 \leftrightarrow 3$	***5*** (Prime Number Nearest to 3)
$3 \leftrightarrow 1 \leftrightarrow 2$	$\{3\} \leftrightarrow \left\{\frac{(3)^2-(2)}{3}\right\} \leftrightarrow \left\{\frac{(3)^2-1}{3}\right\}$	$x=2,\ a=2,\ b=-1$	$9 \leftrightarrow 7 \leftrightarrow 8$	***7*** (Prime Number greater than 5)
$2 \leftrightarrow 1 \leftrightarrow 3$	$\{2\} \leftrightarrow \left\{\frac{(2)^2-(1)}{2}\right\} \leftrightarrow \left\{\frac{(2)^2+1}{2}\right\}$	$x=1,\ a=1,\ b=1$	$4 \leftrightarrow 3 \leftrightarrow 5$	***5*** (Prime Number Nearest to 3)
$1 \leftrightarrow 3 \leftrightarrow 2$	$\{1\} \leftrightarrow \left\{\frac{(1)^2-(-2)}{1}\right\} \leftrightarrow \left\{\frac{(1)^2+1}{1}\right\}$	$x=0,\ a=-2,\ b=1$	$1 \leftrightarrow 3 \leftrightarrow 2$	No New Prime Number To Select
$3 \leftrightarrow 2 \leftrightarrow 1$	$\{3\} \leftrightarrow \left\{\frac{(3)^2-1}{3}\right\} \leftrightarrow \left\{\frac{(3)^2-2}{3}\right\}$	$x=2,\ a=1,\ b=-2$	$4 \leftrightarrow 3 \leftrightarrow 1$	No New Prime Number To Select

Now, noting that the next nearest Prime number found being 5, we now use the set {1, 2, 3} given in the beginning and use its two highest {***Prime***} numbers and couple the recently found 5 to form a new set {2, 3, 5} and consequently a *Asymmetric Universal Recursion Scheme* $2 \leftrightarrow 3 \leftrightarrow 5$. Using the same above scheme we again find a similar table for $2 \leftrightarrow 3 \leftrightarrow 5$

Universal Asymmetric Recursion Scheme	***Normalized Universal Asymmetric Recursion Scheme*** $\{x\} \leftrightarrow \left\{\dfrac{x^2-a}{x}\right\} \leftrightarrow \left\{\dfrac{x^2+b}{x}\right\}$	***Values Of*** $x,\ a,\ b$	***Result***	***Finalized Pick From The Result***
$2 \leftrightarrow 3 \leftrightarrow 5$	$\{2\} \leftrightarrow \left\{\dfrac{(2)^2-(-1)}{2}\right\} \leftrightarrow \left\{\dfrac{(2)^2+2}{2}\right\}$	$x=0,\ a=-1,\ b=3$	$4 \leftrightarrow 5 \leftrightarrow 7$	***7*** (Prime Number Nearest to 5)
$3 \leftrightarrow 5 \leftrightarrow 2$	$\{3\} \leftrightarrow \left\{\dfrac{(3)^2-(-2)}{3}\right\} \leftrightarrow \left\{\dfrac{(3)^2-1}{3}\right\}$	$x=1,\ a=-2,\ b=-1$	$9 \leftrightarrow 11 \leftrightarrow 8$	***11*** (Prime Number greater than 7)
$5 \leftrightarrow 2 \leftrightarrow 3$	$\{5\} \leftrightarrow \left\{\dfrac{(5)^2-(3)}{5}\right\} \leftrightarrow \left\{\dfrac{(5)^2-2}{5}\right\}$	$x=2,\ a=3,\ b=-2$	$25 \leftrightarrow 22 \leftrightarrow 2$	***23*** (Prime Number greater than 7)
$3 \leftrightarrow 2 \leftrightarrow 5$	$\{3\} \leftrightarrow \left\{\dfrac{(3)^2-(1)}{3}\right\} \leftrightarrow \left\{\dfrac{(3)^2+2}{3}\right\}$	$x=1,\ a=1,\ b=2$	$9 \leftrightarrow 8 \leftrightarrow 11$	***11*** (Prime Number greater than 7)
$2 \leftrightarrow 5 \leftrightarrow 3$	$\{2\} \leftrightarrow \left\{\dfrac{(2)^2-(-3)}{2}\right\} \leftrightarrow \left\{\dfrac{(2)^2+1}{2}\right\}$	$x=0,\ a=-3,\ b=1$	$4 \leftrightarrow 7 \leftrightarrow 5$	***7*** (Prime Number Nearest to 5)
$5 \leftrightarrow 3 \leftrightarrow 2$	$\{5\} \leftrightarrow \left\{\dfrac{(5)^2-2}{5}\right\} \leftrightarrow \left\{\dfrac{(5)^2-3}{5}\right\}$	$x=2,\ a=2,\ b=-3$	$25 \leftrightarrow 23 \leftrightarrow 2$	***23*** (Prime Number greater than 7)

Now, noting that the next nearest Prime number found being 7, we now use the set {2, 3, 5} given in the beginning and use its two highest {***Prime***} numbers and couple the recently found 7 to form a new set {3, 5, 7} and consequently a *Asymmetric Universal Recursion Scheme* $3 \leftrightarrow 5 \leftrightarrow 7$. Using the same above scheme we again find a similar table for $3 \leftrightarrow 5 \leftrightarrow 7$ and can consequently find the next Prime Number to be 11.

We can keep repeating the aforementioned scheme many, many times so on, so forth and can generate the entire '*Sequence Of Prime Numbers*' up to a desired limit.

Morals

'EkoVaasiSarvaBootaanAntaraatma'

The above *Samskrutam Sloka* which means *'It Is The One That Pervades All'* is the '*Causative Reason*' of the fact that '*The pristineness and extent of the same of a person's actions decide how many Souls the person dwells in*'.

{see authors http://www.vixra.org/abs/1510.0514}

'*If you gaze too long at the abyss, the abyss gazes back at you*'. –Frederick Nietzsche (German Philospher)

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$$(x) \leftrightarrow \left(x - \frac{a}{x}\right) \leftrightarrow \left(x + \frac{b}{x}\right)$$