I will begin my experiment by stating 2 theoretically proven hypothesis:

Anyway non-prime can be built of a square, bigger than 2 but smaller than the initial number, plus a number which is a multiple of the given non-prime.

Thus, where z is a non-prime,

z=y**2+xy

In theory, this means that if it conventionally took a computer 1000000 seconds to calculate a prime, using this system it would take 1000 seconds.

This also proves, when allowing for the 1s line, that the maximum combinations of x and y is the rounded version of the square root of z. Thus the Maximilian factors of a given number is the rounded version of the square root of the given number multiplied by 2.

TRYING TO PROVE THE FIRST HYPOTHESIS

Firstly, I began by creating what I am going to call a “table of ascension”.This table holds to theories- which I am about to (hopefully) prove.

The table (other than the first line) consists completely of non-primes.

The table attains all possible non-primes.

The frequency of a given non-prime on the table ascertains its number of factors.

Basically, the table works as so:

1x1	1x2	1x3	1x4	1x5	1x6	1x7	1x8	1x9	1x10
2x2	2x3	2x4	2x5	2x6	2x7	2x8	2x9	2x10	2x11
3x3	3x4	3x5	3x6	3x7	3x8	3x9	3x10	3x11	3x12
4x4	4x5	4x6	4x7	4x8	4x9	4x10	4x11	4x12	4x13
5x5	5x6	5x7	5x8	5x9	5x10	5x11	5x12	5x13	5x14
6x6	6x7	6x8	6x9	6x10	6x11	6x12	6x13	6x14	6x15
7x7	7x8	7x9	7x10	7x11	7x12	7x13	7x14	7x15	7x16
8x8	8x9	8x10	8x11	8x12	8x13	8x14	8x15	8x16	8x17
9x9	9x10	9x11	9x12	9x13	9x14	9x15	9x16	9x17	9x18
10x10	10x11	10x12	10x13	10x14	10x15	10x16	10x17	10x18	10x19

This equates to a table as so:

1 4 9 16 25 36 49 64 81 100
2 6 12 20 30 42 56 72 90 110
3 8 15 24 35 48 63 80 99 120
4 10 18 28 40 54 70 88 108 130

5	12	21	32	45	60	77	96	117	140
6	14	24	36	50	66	84	104	126	150
7	16	27	40	55	72	91	112	135	160
8	18	30	44	60	78	98	120	144	170
9	20	33	48	65	84	105	128	153	180
10	22	36	52	70	90	112	136	162	190

(where the table is rotated for programmatic convenience)

Anyway, for the rest of this experiment I will assume that y represents going up by one (as 1x1, 2x2 and 3x3) and x as increasing the difference between the two multiples (as 1x1, 1x2 and 1x3).

Also the coordinates x and y shall start at 1 and will account for the 1s line.

The general equation for working out a number with a given X and Y coordinate is (as previously mentioned):

n (number)=y(x+y)

This works where y is the first number (which only increases by 1) and (x+y) is the second number (which only increase by 1 but holds a constant difference of x).

This can then be simplified down to:

n (number)=y**2+xy

In addition, to this- one must take one from x for the equation to correctly work, so n should really be expressed as

n (number)=y**2+(x-1)y

Amongst the first theory, that the table is completely consituted of non-primes it is obvious.A prime's criteria is that it only attains two factors- 1 and itself.This multiple can only be found on the top line (1x1,1x2 1x3) and because both factors are constantly increasing by 1 there can never be a resulting number which does not reside on the top line which is a prime. Only numbers which attain multiples which are greater than 1.

The second theory, that the theoretically infinitely ascending plain attains all possible non primes (though if primes are infinite it never quite touches counting infinity) is quite easy to calculate.

Let us begin with x- which is a non prime.

Let us say that z and y multiply together to make x- where z is greater or equal to y.

a=z-y

Thus the root of zy (where it resides in the x coordinate) is 1(a+1)

Where if you add y-1 to both numbers and we get zy- thus any non prime can be given a root.

The final theory- that the frequency of a given number on the table ascertains the factors of the given number.

Firstly, let us say that x is the given number.

My theory would say that the number of factors for x would be:

factors=2y+2

Essentially, considering all possible multiples can be expressed on the table (as shown above) then all possible multiples that equal x can be shown on the grid and thus multiply to equal x.

In addition to this, because the table only works with one as the initial root both multiples (7x6 and 6x7, for example) do not appear because the second will always be bigger than the first.

In the true plain (where we omit the ones line) after searching for the frequency of the number you would then have to add 2 to account for 1 and x

THE SECOND HYPOTHESIS

It has thus been proved that the frequency of a number on the table can be formulated to the number factors of the given number, and thus the number of combinations of the x and y coordinates on the grid in relation to the given number in the equation z=y**2+xy is the number of factors.

And understanding the limits of the equation (y cannot be larger than the square root of z because x has to cannot be smaller than zero on the table) we can therefore say that the maximum number of factors of a numhber is the square root of the given number multiplied by 2.

EXAMPLE

Using my system, I looked up the 15 digit mersenne prime and found the prime through a quick program I created using my system of squares:

```
100000000000031
This number is a prime.
That took 17.842356 seconds.
```

THE PLOT THICKENS (A SECOND TACKLE OF THE PROBLEM)

Following the concept of the non-primes it occurred to me that an equation could be created which predicts clusters of non primes which reside between ranges of counting numbers.Using this concept one could then scan through this cluster and if a given number did not occur in it it would then be prime.This would increase the speed of finding massive primes extremely against scanning the whole table especially with an additional trick:

Anyway, in order to do this it would first be obvious to test the distribution of the non primes in order to see if there was any form of patter which one could manipulate.I did this by first 255 non primes and colouring them (so that the smallest were the darkest) on 500x250 grid.This is the result I found:

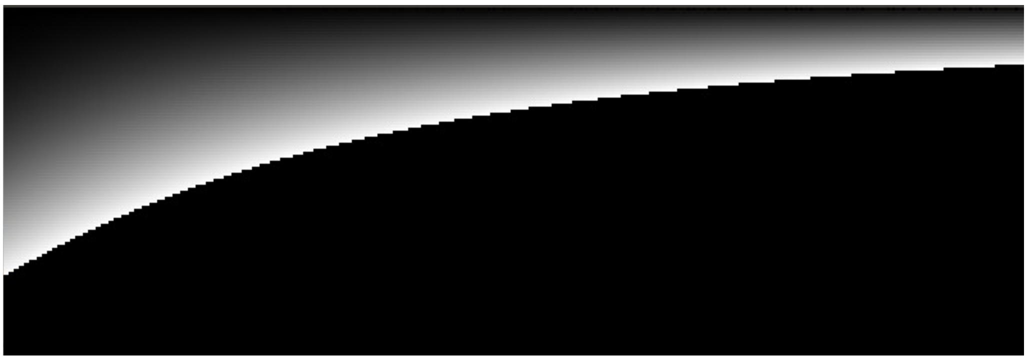
As you can see, I noticed the brightest within the range occurred in a curve. This then created two theoretical hypothesis which, if proved would extremely speed the process of finding super large primes (well, I hope so).

It is obvious that the brightest numbers remain in a curve because both x and y increase so in a given range when x increases (to some currently unknown form) y decreases in order to level the number so not to increase the range.

The first suggests that if one can create a curve equation in relation to a given range (in this case, 255) and the number of pixels (numbers on the grid) the curve passes through one could create a small range of numbers that could then be scanned for the existence of massive non primes.

In addition to this, it also appears that the equation of the curve changes in relation to the given range.

For example, here is a much larger range:



It is also important to note that the resolution of the table has a curious impact (which will be covered later)- which can be remarked by the deviation of seemingly random dots on the 255 range above.

Thus the following variables are open to the equation:

r1 and r2- the resolution of the table

x- the given range

In order to calculate-

Zx- a list containing all the deviations of the pattern and their deviations.

a- the equation of the curve

y- the number of pixels the curve passes through.

The second theory fruits the curiously complex image shown at the top of this article:

Essentialy, the second (and considerably more complex) equation covers the distribution of the brightest numbers within the given range.These, of course reside on the curve when the number of plots for the brightest number<y.

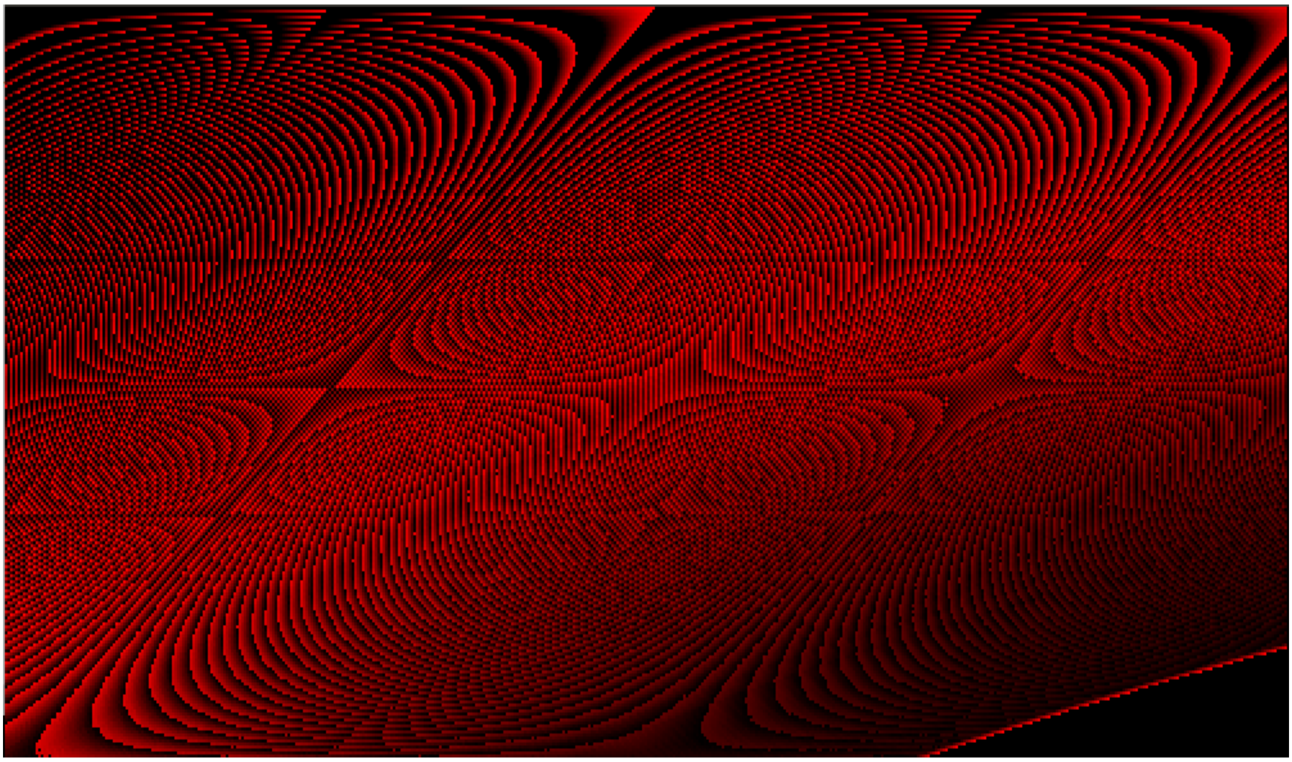
To plot the distribution, I had to consider the following factors:

p- the number of plots

r1 and r2

x

Firstly, I tried p as 200, x as 250 and kept r1 and r2 at 500x250.The following variables created a dotted curve of seemingly random distribution. In order to gain further understanding of this distribution I then tried to iterate the equation where all the variables where kept constant- but x which was increased by 250 on each iteration. In addition to this, amongst the top 200 brightest numbers in the range the smaller numbers were coloured darker and the larger numbers are coloured brighter. The following created a beautiful construction built by the distribution of the dots on an ever changing curve equation:

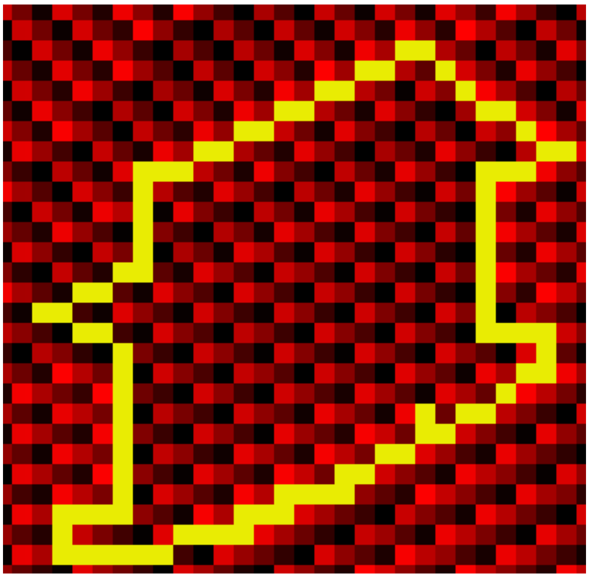


There are several notable features which can be attached to this pattern which may (or may not) help in finding a system behind this horribly complex table.

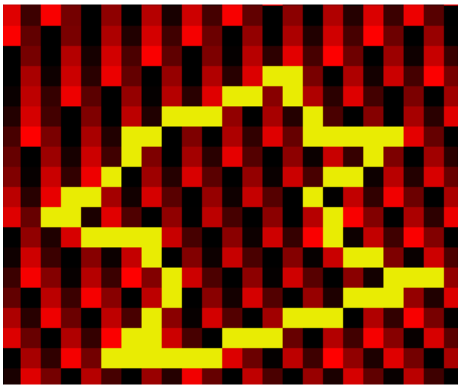
FROGS (SMALL AND LARGE)

There seems to be a pattern of "frogs" where small and large frogs seem to alternate- between two patterns amongst boxes which will be covered later.

LARGE FROG



SMALL FROG

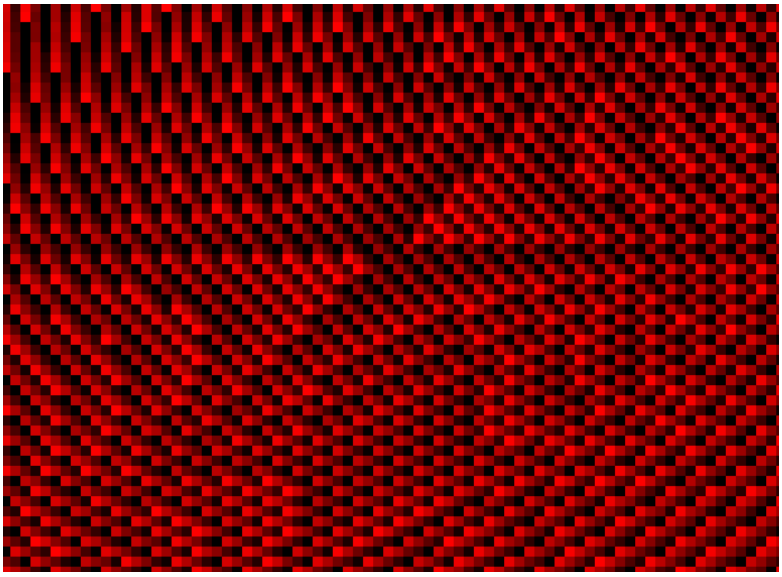


These two items (which are better seen from a distance at the edge of sight) are adjacent to each other against the lesser lesser triangles.

TRIANGLES (LESSER AND GREATER)

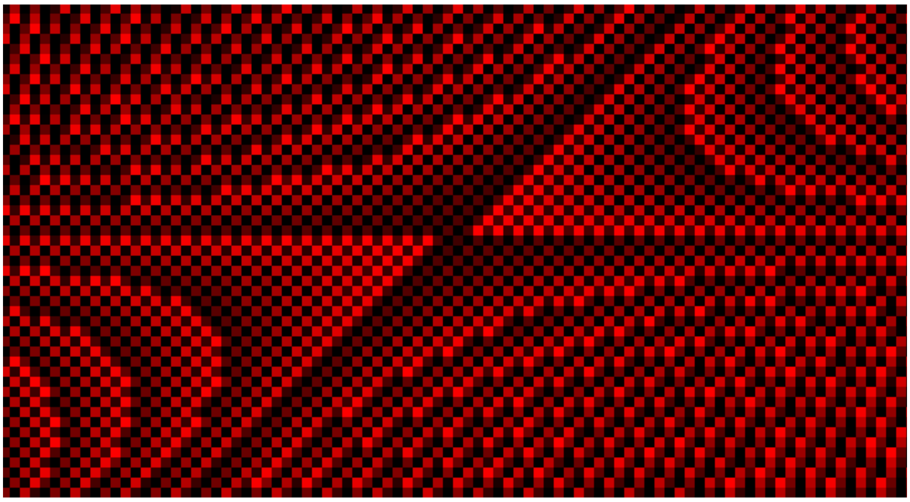
The next shapes have several connections throughout the pattern-firstly it seems that the greater triangles are formed by two diverging spiral from the lines drawn by the initial triangles at the top of the pattern and similiarly the less triangles form the spiralling boxes which can be clearly seen throughout the pattern.In addition to this, the lesser triangles appear alternately between the adjacent circles and can appear in dotted or lined patterns.In addition to this, there is also the lesser lesser triangle- which follows a consistent line that marks the pattern.The lesser lined triangles tend to appear in between the alternating greater triangles and the dotted triangles within their own alternating pattern.

LESSER LESSER TRIANGLES



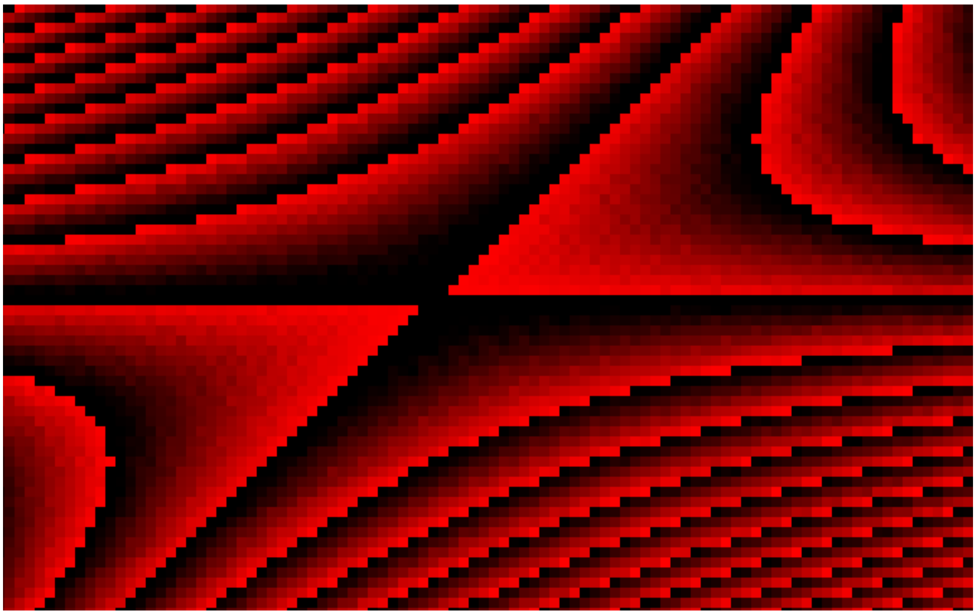
You may also notice carefully the two adjacent lesser and greater frogs.

LESSER TRIANGLE (SPOTTED)



Interestingly enough, the gradient between the two triangles mark the gradient of every possible box- as if the structure was observed on a plane from an angle.

GREATER TRIANGLES

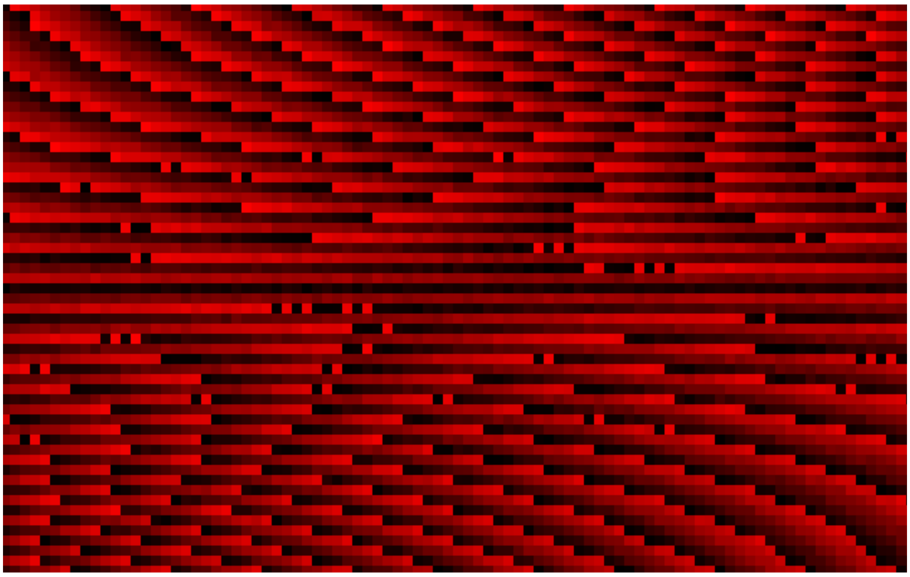


It does seem that the triangles appear to alternate (excepting the lesser lesser triangles) and it would be interesting to observe a greater field of triangles to test this supposedly consistent theory.Also it is possible that there may be greater greater triangles somewhere out there.

MEETING CIRCLES (GREATER, HORIZONTAL AND VERTICAL)

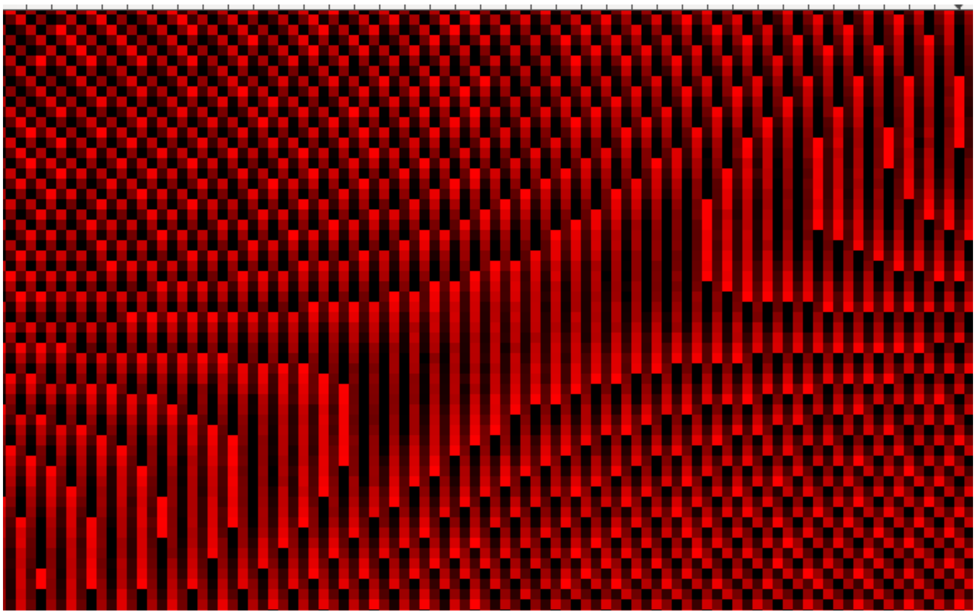
To my knowledge there only appears to be three types of meeting circles- greater, horizontal and vertical. I have found no evidence with my limited computational power of dotted circles and all seem to be applied under two lined categories- horizontal and vertical (which also applies for the triangles) and seems to be dependent on the size of the triangles- the greater triangles seemingly fruit horizontal meeting circles while the lesser triangles fruit vertical ones.

HORIZONTAL MEETING CIRCLES (DEVIATED)



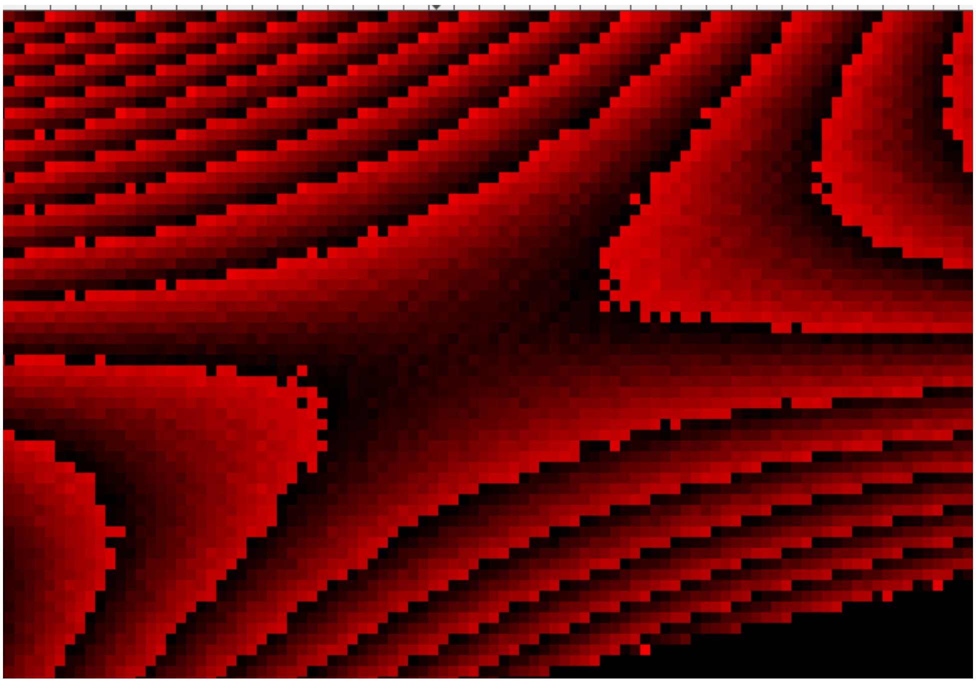
A deviated horizontal meeting circle under the influence of the “resolution effect”- which will be covered later.It is also debatable that the horizontal meeting circle is fallacy! It may well just be an extremely deviated lined lesser triangle.

VERTICAL MEETING CIRCLE



As you can see, these meeting circles seem to form a barrier between the dotted and lined dimension to this complex structure.

DEVIATED GREATER MEETING CIRCLE

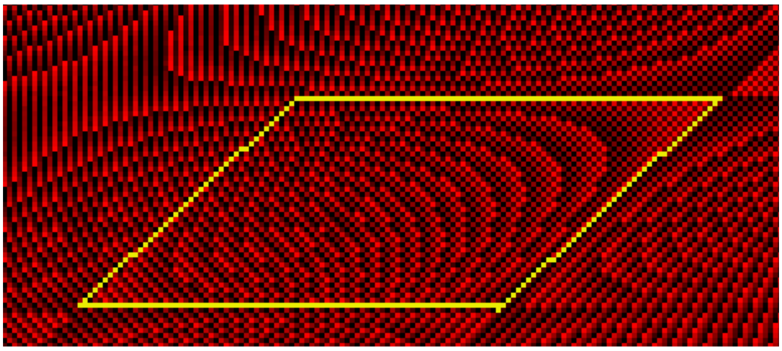


BOXES AND LINES

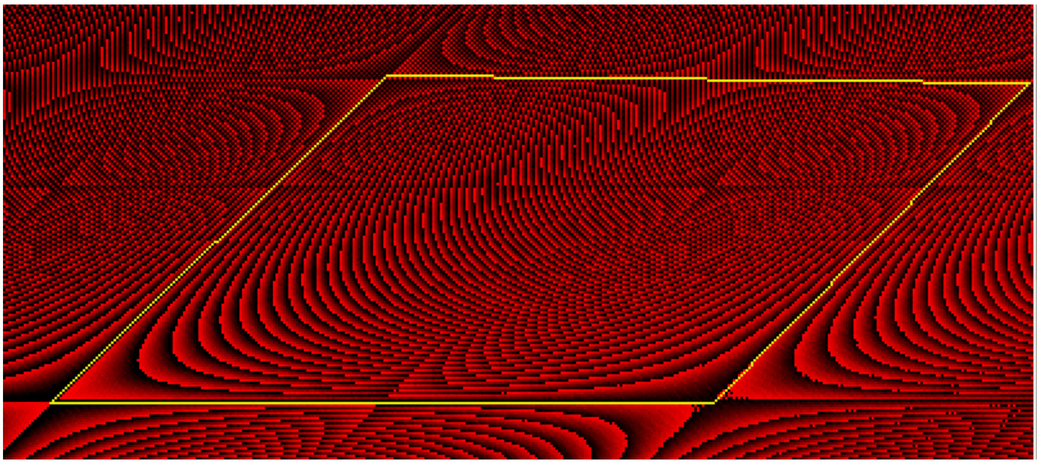
It is obvious that one can imagine “spiral boxes” within the image. These are played to my knowledge in two forms- lesser and greater- and are made up by the lesser lesser triangles to create a 3x3 grid of lesser boxes within the greater boxes- which are made up by the greater triangles and meeting circles.

In addition to this, if you look closely, you may observe “third” lines that seem to split between the lesser boxes in thirds and seem to diverge from the hearts of the greater frogs.

LESSER BOXES

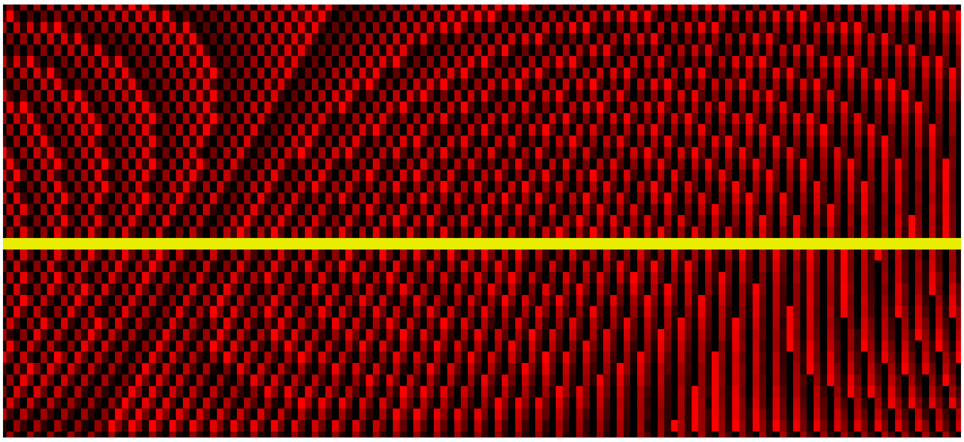


GREATER BOXES



The link between the lesser and greater triangles does begin to give the impression that greater triangles will link further into the infinite plain.

THIRD LINES



THE RESOLUTION EFFECT

Obviously, when I tested the range initially I noticed small black dots which I certified as a small bug within my program, it was only later when I ran the initial structure that I found slight deviations that seemed to cause increased chaos as one moved further along the y coordinates. I then felt that this level of chaos may be some further hidden equation, mutations that increased on each box or even just mathematical anomalies within numbers. It was then to my absolute surprise that when I ran the program at a higher resolution these problems has disappeared. But as the iteration increased I found that within the new found area new and different deviation occurred.

I set this down to 3 possibilities-

resolution- as the resolution reached infinity only then would a perfect image occur.

The curve- it is not fully represented amongst the greater curves and partly diverged off the end of the finite table.

The number of plots- is fixated and therefore could have an impact as the equation of the curve moves through more pixels and thus the density of edge pixels to the number of plots is affected (although this in itself may be part of the reason to the complex structure in itself, anyway).

CONCLUSION

Evidently, if an equation can be found for the curvature of the generating lines and the distribution of the brighter dots can be understood- then this could make finding super massive primes considerably easier.

In addition to this, if a second relationship (other than $z=y^{**}2+xy$) can be found in the table, then by the application of simultaneous equation one could easily consider whether a number is prime without brute force computation.