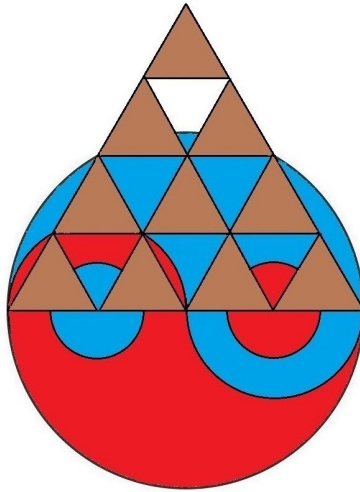


Matrix Encryption
Watson Knox Williams Jr



1 | 1

Sample User Manual



By:

Watson Williams



Combinatorial Batch Decimation

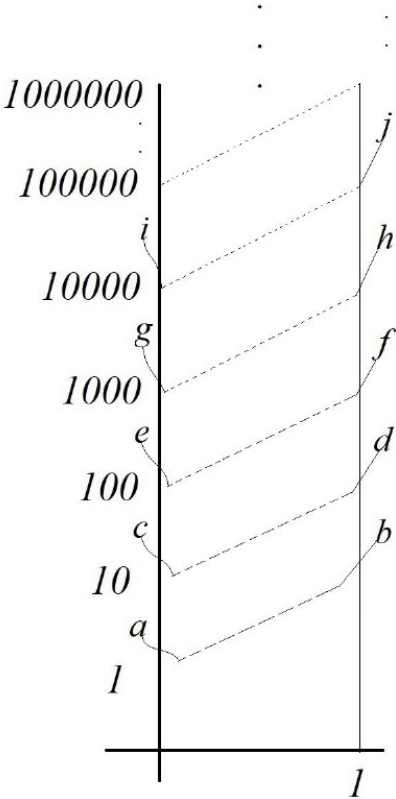
$$f(X) = x \quad : \quad f^{-1}(x) = X$$

$$X \in 0 < \mathbb{Q}^* < 1 \quad : \quad x \in \mathbb{N} \geq 3$$

$$f(X) = 10^{\text{len}(X) - 1} - \lceil X \cdot 10^{\text{len}(X) - 1} \rceil + 10^{\text{len}(X)} \cdot X + 2$$

$$f^{-1}(x) = \frac{x - \left\lfloor \frac{10^{\text{len}(x)} + 1 - x}{9} \right\rfloor - 2}{10^{\text{len}(x)}}$$

CBDD Graph - Geyser Graph



Edge Case Rule for f^{-1}

if $x = 10^n$ or $x = 10^n + 1$, with $n \in \mathbb{N}$

then, substitute $10^{\text{len}(x) - 1}$ for $10^{\text{len}(x)}$

Progression of Graph Endpoints

$$a = (0.1, 3) \quad b = (0.9, 11)$$

$$c = (0.01, 12) \quad d = (0.99, 101)$$

$$e = (0.001, 102) \quad f = (0.999, 1001)$$

$$g = (0.0001, 1002) \quad h = (0.9999, 10001)$$

$$i = (0.00001, 10002) \quad j = (0.99999, 100001)$$

⋮

+

FIG. 36

17 | 40

To Control Rounding Error in Dividing by 9:

$$\text{eq 13: } N / 9 = \text{Trimmed Sum}(N) + \text{Digit Sum}(N) / 9$$

For Example if $N = 2518022393$

$$N / 9 = 279780265.\overline{8}$$

and

Find the Trimmed Sum(N):

$$\begin{array}{r} 251802239 \\ 25180223 \\ 2518022 \\ 251802 \\ 25180 \\ 2518 \\ 251 \\ 25 \\ + 2 \\ \hline \end{array}$$

$$\text{Trimmed Sum}(N) = 279780262$$

$$\text{Digit Sum}(N) = 2 + 5 + 1 + 8 + 0 + 2 + 2 + 3 + 9 + 3 = 35$$

$$\text{Digit Sum}(N) / 9 = 35 / 9 = 3.\overline{8}$$

$$279780262 + 3.\overline{8} = 279780265.\overline{8}$$

+

+

FIG. 37

18 | 40

Technique to Implement $\left\lfloor \frac{z - x}{9} \right\rfloor$:

Create two empty Lists: $L3 = []$, $L4 = []$

$variable00 = z - x$

$variable0 = str(variable00)$

while $len(variable0) > 1$:

$variable0 = variable0[:-1]$

$L3.append(variable0)$

for i in $variable0$:

$L4.append(i)$

$variable1 = 0$

for e in $range(0, len(L3))$:

$variable1 = variable1 + int(L3[e])$

$variable2 = 0$

for f in $range(0, len(L4))$:

$variable2 = variable2 + int(L4[f])$

$g = variable2 / 9$

$h = int(math.floor(g))$

$variable3 = int(variable1 + h)$

$variable3 = \left\lfloor \frac{z - x}{9} \right\rfloor$