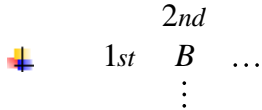
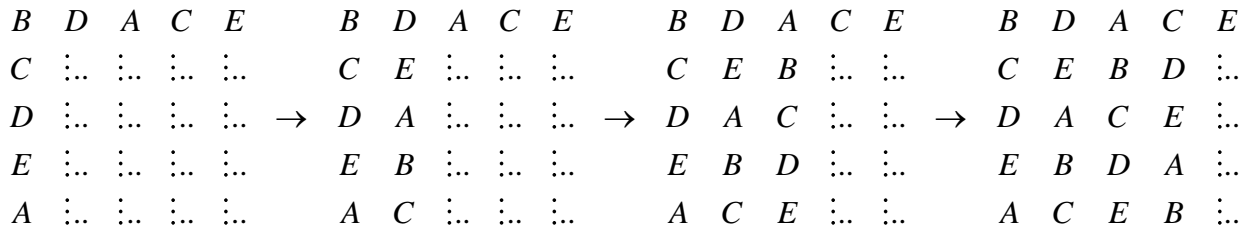


The algorithm for higher prime order of Magic Square

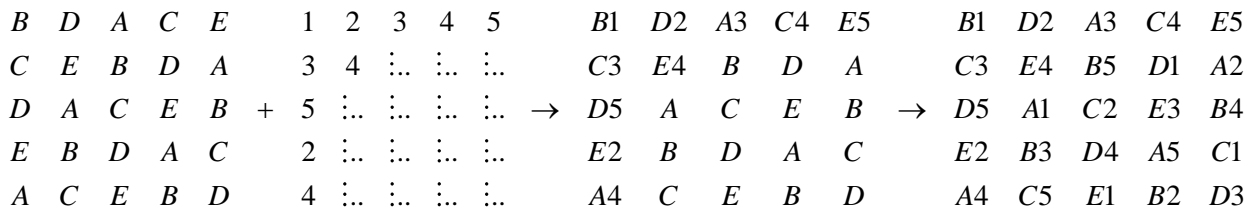
When an $m \times n$ matrix A is of order $n = 3$, there exist no panmagic square solutions or say of any order $4k + 2$, where k is an Integer. That will say no panmagic squares of order $n = 3, 6, 10, 14...$ But there exist panmagic squares when n belongs to an odd Integer that is a prime Integer, that will say order of $n = 5, 7, 11, 13, 17, 19, 23, 27, 29$ and 31 . The algorithm for these orders is of a very simple construction and I believe that the nature has approximately exact same process in the protein syntheses. The panmagic squares are then constructed with one part of letter and one part of Integer, and when overlapping both parts, we have the magic squares solved with the key.



This symbol indicates that the first letter in the left upper corner will be B . The horizontal rows will have every second letter in the alphabetic order of $A B C D E$ in a panmagic square of $n = 5$. The first vertical column will have every letter after B in alphabetic order of $A B C D E$. We have



In the second matrix first row at D we add from the first matrix column under D . In the third matrix first row at A we add the first matrix column under A . In the fourth matrix first row at C we add the first matrix column under C . Next step is to add the matrix at first row under letter E .



When adding Integer the algorithm is that the diagonals from upper right to down left the Integer must always go in a pattern of an increasing sequence of Integer or a pattern of a decreasing of Integer. This law could not be broken at any matrix in order of odd Integer in a primed sequence of order. The letter arrays are also going in alphabetic diagonal pattern sequences. If investigate the higher order of primed Magic Squares then it's possibly to see that in the nature process like in the protein synthesis or construction of *Exons* in the DNA, which are the protein coding genes and make-up of only 3% of the human genome, the main diagonal from upper left to lower right must be mathematically magic. Otherwise it will be too easy to construct the algorithm in nature process. This is possibly to see in the alphabetic letter algorithm and in some Magic Squares it's possibly to see that an Integer in a array should not arise two times in the same rows or columns. If take this nature algorithm of alphabetic letter and Integer and put it in squares, it will be magic.

The key into prime Magic Squares

Prime number p is one positive Integer having exactly one positive divisor other than 1, meaning it's an Integer that cannot be factored. It will be possibly to proof pure primed Magic Squares if the start value a is corresponding to the algorithm $5k+2$, where k belongs to an odd Integer from a sequences $k = 1, 3, 5, 7, 9, 11, \dots$. The delta difference between terms d is equal to constant with value $d = 50$. The algorithm prime starts with one start value a and sequence with adding d .

$$\begin{aligned} a &= 5k + 2 \\ &= 7 \end{aligned}$$

The lowest prime Integer of start value is $a = 7$, because the following sequence must be prime.

3 5 7 11 13 17 19 23 27 29 31 37 41 43 47 51 53 57 59 61 63 67 69 71 73 77 79 81 83 87 ...

	$\Delta d = 50$	$\Delta d = 50$
The Key		
A1 = 7		
A2 = 57		
A3 = 107		
A4 = 157	A1 B3 C4 D2	7 307 557 657
B1 = 207	D4 C2 B1 A3	757 457 207 107
B2 = 257	B2 A4 D3 C1	257 157 707 407
B3 = 307	C3 D1 A2 B4	507 607 57 357
B4 = 357		
C1 = 407		
C2 = 457	A1 B4 C2 D3	7 357 457 707
C3 = 507	C3 D2 A4 B1	507 657 157 207
C4 = 557	D4 C1 B3 A2	757 407 307 57
D1 = 607	B2 A3 D1 C4	257 107 607 557
D2 = 657		
D3 = 707		
D4 = 757		

Here are two examples of pure prime Magic Squares. However, with the algorithm of start value $a = 5k+2$ will it be possibly to find more true solutions of primed Magic Squares of order $n = 4$.

$$\Sigma(n; a, d) = \frac{1}{2} \cdot n \cdot [2 \cdot a + d \cdot (n^2 - 1)] = 1528$$

The magic sum of the primed tropic house of order $n = 4$ is $sum = 1528$. Here with start value a and increasing with the constant d . If now use $k = 3$, then the magic constant will be $sum = 1568$. This algorithm of the primed house will also be possibly to use into magic squares of order $n = 5$

Magic Square of Order 9

The Devils Square of order $n=9$ with in baked Magic Square of order $n=3$, year 2022. $S1=15$ and $S1=369$.

11	18	13	74	81	76	29	36	31
16	14	12	79	77	75	34	32	30
15	10	17	78	73	80	42	28	35
56	63	58	38	45	40	20	27	22
61	59	57	43	41	39	25	23	21
60	55	62	42	37	44	24	19	26
47	54	49	2	9	4	65	72	67
52	50	48	7	5	3	70	68	66
51	46	53	6	1	8	69	64	71

⚡

11	18	13	76	81	74	29	36	31
16	14	12	75	77	79	34	32	30
15	10	17	80	73	78	42	28	35
56	63	58	40	45	38	20	27	22
61	59	57	39	41	43	25	23	21
60	55	62	44	37	42	24	19	26
47	54	49	4	9	2	65	72	67
52	50	48	3	5	7	70	68	66
51	46	53	8	1	6	69	64	71

The square in blue is of order $n3$ and it's the only possibly magic square to get on order $n3$. Here in order $n9$. There are different main diagonal in one and two on magic square of order $n9$. That makes different.

The Magic Square of order $n9$ is composed with 9 different Magic Square of order $n3$. The blue squares in the center are an original Magic Square of order 3, with magic sum of $\Sigma 15$. The sum in each square will be like follows:

42	231	96
177	123	69
150	15	204

A2	C3	B1
C1	B2	A3
B3	A1	C2

2	9	4
7	5	3
6	1	8

All 9 squares of order $n3$ are built up according to the two formulas of magic square $n3$ above. This will make that each square also has magic main diagonals. Together they will have the magic sum $\Sigma 369$ of $n9$. To get the magic square with sum $\Sigma 15$ of order $n3$ in the blue area, A1 above must be in the center.

The formulas to get the magic sum of order n of square. Where order $n3$ will give the magic sum of $\Sigma 15$.

- $S1 = n (n^2 + 1)/2$
- $S2 = n (n^2 + 1) (2n^2 + 1)/6 = S1*(2n^2 + 1)/3$
- $S3 = n*S1^2$
- $S4 = S2*(6n*S1 - 1)/5$
- $S5 = (3n*S2^2 - S3)/2$

Here $S1$ stands for only magic, $S2$ for bimagic and $S3$ for trimagic o.s.v. Simplified it will look like follows:

- $S1 = (1/2) n^3 + (1/2) n$
- $S2 = (1/3) n^5 + (1/2) n^3 + (1/6) n$
- $S3 = (1/4) n^7 + (1/2) n^5 + (1/4) n^3$

Where order $n9$ will give the magic sum of $\Sigma 369$, bimagic sum of $\Sigma 20049$ and trimagic sum of $\Sigma 1225449$.