

# A Numerical Logic in Decimal Number System

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**Abstract-There is a special logic noticed in DECIMAL NUMBER SYSTEM, the Numerical value obtained in this logic starting from 1 and end at 9 and then continued again from 1 to 9 and so on up to infinity numbers in DECIMAL NUMBER SYSTEM.**

## INTRODUCTION

There are so many NUMBER SYSTEMS like Binary Number System (1, 2,3,4),Octal Number System (1),Decimal Number System (1), Hexadecimal Number System (1,5). Binary Number System consists of only two numbers 0 and 1, the next number is 10, 11, 100 and then continued up to infinity. Octal Number System has 8 numbers, they are 0, 1, 2, 3, 4, 5, 6, 7, next combination of two numbers 10, 11 and so on up to infinity. Decimal Number System contains 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 numbers and then followed by two numbers 10, 11..... continued up to infinity. Hexadecimal Number System possess 16 numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F and then 10 11 so on up to infinity numbers. There is a special feature noticed in Decimal Number System from numbers 1 to 9, the same value obtained continuously by adding total numbers, resultant value is 1 to 9 is followed and then continued.

## LOGIC BEHIND NUMERICAL VALUE IN DECIMAL NUMBER SYSTEM

This logic number system contains 9 numbers only, they are 1, 2, 3, 4, 5, 6, 7, 8, 9 and then followed by same 1, 2, 3, 4, 5, 6, 7, 8, 9 numbers again and again up to infinity times. This logic is explained as follows. Number 9 followed by 10, the logic is  $1+0=1$ , for 11 the logic is  $1+1=2$ , for 12 logic is  $1+2=3$  for 13 logic is  $1+3=4$ , for 14 number logic is  $1+4=5$ , for 15 number  $1+5=6$ , for 16 number  $1+6=7$ , for 17 number  $1+7=8$ , for 18 number  $1+8=9$ , for 19 number  $1+9=10$  i.e.,  $1+0=1$  for 20 number  $2+0=2$ , and so on. For tenth number in Decimal Number System  $10-9=1$  number is remaining. For 20 numbers  $20-18=2$  numbers remaining and so on.

The logical equation for this is  $YX = 9Y + Z$  ---- (1)

For first ten numbers excess number is one, for 20 numbers excess numbers remaining are 2,.....

For first 10 numbers  $X = 10$ ,  $Y = 1$  and  $Z = 1$  substituting these values in equation (1)

$1 * 10 = (9 * 1) + 1$  for first 10 numbers remaining number is 1

For 20 numbers  $X = 10$ ,  $Y = 2$  and  $z = 2$

$2 * 10 = (9 * 2) + 2$  for 20 numbers remaining numbers are 2

For 30 numbers  $X = 10$ ,  $Y = 3$  and  $Z = 3$

$3 * 10 = (9 * 3) + 3$  for 30 numbers remaining numbers are 3

For 40 numbers  $X = 10$ ,  $Y = 4$  and  $z = 4$

$4 * 10 = (9 * 4) + 4$  for 40 numbers remaining numbers are 4

For 50 numbers  $X = 10$ ,  $Y = 5$  and  $z = 5$

$5 * 10 = (9 * 5) + 5$  for 50 numbers remaining numbers are 5

For 60 numbers  $X = 10$ ,  $Y = 6$  and  $z = 6$

$6 * 10 = (9 * 6) + 6$  for 60 numbers remaining numbers are 6

For 70 numbers  $X = 10$ ,  $Y = 7$  and  $z = 7$

$7 * 10 = (9 * 7) + 7$  for 70 numbers remaining numbers are 7

For 80 numbers  $X = 10$ ,  $Y = 8$  and  $z = 8$

$8 * 10 = (9 * 8) + 8$  for 80 numbers remaining numbers are 8

For 90 numbers  $X = 10$ ,  $Y = 9$  and  $z = 9$

$9 * 10 = (9 * 9) + 9$  for 90 numbers remaining numbers are 9

For 100 numbers  $X = 10$ ,  $Y = 10$  and  $z = 10$

$10 * 10 = (9 * 10) + 10$  for 100 numbers remaining numbers are 10

For 100 numbers the remaining is which also contains 1, 2, 3,.....,9 numbers and one number is remaining number. Similarly for 200 numbers 2 remaining numbers are left, for 300 numbers 3 numbers are left and so on. For 1000 numbers 10 numbers are left, again 1, 2,3,.....,9 remaining 1 number for 1000 and this logic continues up to infinity numbers.

The following TABLE - 1 explains the logical numbers 1 to 9 as follows. This logic explains up to 100 (3 numbers only)

X	Y	Z	XYZ	LOGICNUMBER= X+Y+Z,IF NECESSARY TWO TIMES ADDED FINALLY TO GET SINGLE DIGIT
0	0	1	001	0+0+1=1
0	0	2	002	0+0+2=2
0	0	3	003	0+0+3=3
0	0	4	004	0+0+4=4
0	0	5	005	0+0+5=5
0	0	6	006	0+0+6=6
0	0	7	007	0+0+7=7
0	0	8	008	0+0+8=8
0	0	9	009	0+0+9=9
0	1	0	010	0+1+0=1
0	1	1	011	0+1+1=2
0	1	2	012	0+1+2=3
0	1	3	013	0+1+3=4
0	1	4	014	0+1+4=5
0	1	5	015	0+1+5=6
0	1	6	016	0+1+6=7
0	1	7	017	0+1+7=8
0	1	8	018	0+1+8=9
0	1	9	019	0+1+9=1+0=1
0	2	0	020	0+2+0=2
0	2	1	021	0+2+1=3
0	2	2	022	0+2+2=4
0	2	3	023	0+2+3=5
0	2	4	024	0+2+4=6
0	2	5	025	0+2+5=7
0	2	6	026	0+2+6=8
0	2	7	027	0+2+7=9
0	2	8	028	0+2+8=1+0=1
0	2	9	029	0+2+9=1+1=2
0	3	0	030	0+3+0=3
0	3	1	031	0+3+1=4
0	3	2	032	0+3+2=5
0	3	3	033	0+3+3=6
0	3	4	034	0+3+4=7
0	3	5	035	0+3+5=8
0	3	6	036	0+3+6=9
0	3	7	037	0+3+7=1+0=1
0	3	8	038	0+3+8=1+1=2
0	3	9	039	0+3+9=1+2=3
0	4	0	040	0+4+0=4
0	4	1	041	0+4+1=5
0	4	2	042	0+4+2=6
0	4	3	043	0+4+3=7
0	4	4	044	0+4+4=8
0	4	5	045	0+4+5=9
0	4	6	046	0+4+6=1+0=1

0	4	7	047	0+4+7=1+1=2
0	4	8	048	0+4+8=1+2=3
0	4	9	049	0+4+9=1+3=4
0	5	0	050	0+5+0=5
0	5	1	051	0+5+1=6
0	5	2	052	0+5+2=7
0	5	3	053	0+5+3=8
0	5	4	054	0+5+4=9
0	5	5	055	0+5+5=1+0=1
0	5	6	056	0+5+6=1+1=2
0	5	7	057	0+5+7=1+2=3
0	5	8	058	0+5+8=1+3=4
0	5	9	059	0+5+9=1+4=5
0	6	0	060	0+6+0=6
0	6	1	061	0+6+1=7
0	6	2	062	0+6+2=8
0	6	3	063	0+6+3=9
0	6	4	064	0+6+4=1+0=1
0	6	5	065	0+6+5=1+1=2
0	6	6	066	0+6+6=1+2=3
0	6	7	067	0+6+7=1+3=4
0	6	8	068	0+6+8=1+4=5
0	6	9	069	0+6+9=1+5=6
0	7	0	070	0+7+0=7
0	7	1	071	0+7+1=8
0	7	2	072	0+7+2=9
0	7	3	073	0+7+3=1+0=1
0	7	4	074	0+7+4=1+1=2
0	7	5	075	0+7+5=1+2=3
0	7	6	076	0+7+6=1+3=4
0	7	7	077	0+7+7=1+4=5
0	7	8	078	0+7+8=1+5=6
0	7	9	079	0+7+9=1+6=7
0	8	0	080	0+8+0=8
0	8	1	081	0+8+1=9
0	8	2	082	0+8+2=1+0=1
0	8	3	083	0+8+3=1+1=2
0	8	4	084	0+8+4=1+2=3
0	8	5	085	0+8+5=1+3=4
0	8	6	086	0+8+6=1+4=5
0	8	7	087	0+8+7=1+5=6
0	8	8	088	0+8+8=1+6=7
0	8	9	089	0+8+9=1+7=8
0	9	0	090	0+9+0=9
0	9	1	091	0+9+1=1+0=1
0	9	2	092	0+9+2=1+1=2
0	9	3	093	0+9+3=1+2=3
0	9	4	094	0+9+4=1+3=4
0	9	5	095	0+9+5=1+4=5
0	9	6	096	0+9+6=1+5=6
0	9	7	097	0+9+7=1+6=7
0	9	8	098	0+9+8=1+7=8
0	9	9	099	0+9+9=1+8=9
1	0	0	100	1+0+0=1

## CONCLUSION

The result obtained from equation (1) is verified by TABLE 1. For one thousand numbers remaining number is 1 and for one lakh number the same value 1 obtained by using this equation. Similarly for one crore also the remaining value 1 is obtained from this equation. This equation is applicable to any value in decimal number system up to infinity. So finally concluded that the estimated equation  $YX = 9Y + Z$  is correct and generalized.

## REFERENCE

- [1] A Course in Electrical & Electronics Measurement and Instrumentation, by A.K.Sawhney, Dhanpat Rai & Sons pp: 1433-1442.
- [2] Practical Binary Analysis, Dennis Andriess, 2018.
- [3] Binary Arithmetic and Boolean Algebra, Angelo C. Gillie.
- [4] Binary, Octal and Hexadecimal Programming and Computer Science, Sunil Tanna 2018.
- [5] Number System and Digital Logic, Munishwar Gulati, 2016.