

Binary Math

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Binary Math

- Base 2 numeration: Uses only zeros and ones to count. (is simply yin/yang logic applied to counting)
- German philosopher/mathematician Gottfried Wilhelm von Leibniz (1646-1716) is usually credited with the development of binary arithmetic. It is now known that he was not actually the first.
- Leibniz was co-developer of calculus, along with Isaac Newton.
- He published his treatise on dyadic counting in 1679.
- This was followed by a decade (1697–1707) of correspondence with French Jesuit missionary Father Joachim Bouvet. Sent to China by Louis XIV, Bouvet was mathematics instructor to Emperor Kang Xi.
- It was Bouvet who recognized the relationship between Leibniz's binary system and the Fu Xi / Shao Yong (1011-1077) arrangement of hexagrams, which he sent to Leibniz in November of 1701.
- Binary logic is the language of computers: on / off; something / nothing;
- its just a western version of yin-yang logic

Binary Counting

Binary Counting:

- the 'one' column is always the farthest to the **right**
- there are an infinite number of columns
- each column represents twice the number of the previous column
- if there is a '1' in the column it indicates it is 'full', and should be added to the total,
- if a zero, do not add that number.
- I will limit my example to 6 columns (i.e. the '32' column) because that will be sufficient to obtain the numbers from 0 to 63 (i.e. 64 hexagrams)

32	16	8	4	2	1
1 = add 32	1 = add 16	1 = add 8	1 = add 4	1 = add 2	1 = add 1
0 = add 0	0 = add 0	0 = add 0	0 = add 0	0 = add 0	0 = add 0

I will use examples of 3 and 6 digits to reflect trigrams and hexagrams even when the zeros on the left would be unnecessary for the calculation.

3 digit

6 digit

Thus: 1 = 1

001 also = 1

000001 still = 1

10 = 2

010 also = 2

000010 still = 2

100 = 4

1000 = 8

10000 = 16

100000 = 32

111111 = 63

R to L (1 + 2 + 4 + 8 + 16 + 32 = 63)

L to R (32 + 16 + 8 + 4 + 2 = 1 = 63)

Binary Numbers & Trigram Correlations

- 0 & 1 are just symbols and another way to depict yin & yang
- Which is which? Does not really matter.
- **Method A**
- physical resemblance suggests:
0 = yin (rou/pliable) 1 = yang (gang/firm)

Using this system:

- Hex. 1, Qian would be '63' [111111]
- Hex. 2, Kun will be '0' [000000]

See next slide:

Binary Numbers & Trigram Correlations – A

Method A: Applied to trigrams provides the better visual correspondence

FH #	Pinyin	Vertical line for line	Graph	Horizontal read L to R (bottom to top)	Binary #
1	Qian	1 1 1	☰	111	7
2	Dui	0 1 1	☱	110	6
3	Li	1 0 1	☲	101	5
4	Zhen	0 0 1	☳	100	4
5	Xun	1 1 0	☴	011	3
6	Kan	0 1 0	☵	010	2
7	Gen	1 0 0	☶	001	1
8	Kun	0 0 0	☷	000	0

Binary Numbers & Trigram Correlations – B

Method B Symbolic:

- Yang represents a more rarified state; energy, the sky, which is best depicted by '0'.
- Yin by contrast implies materialization and manifestation, something substantive, and therefore '1'.

Using this system:

- Hex. 1, Qian will be '0' [000000]
- Hex. 2, Kun will be '63' [111111]

Binary Numbers & Trigram Correlations – B

Method B: Applied to trigrams provides the better correlation with established FH numbers

FH #	Pinyin	Vertical line for line	Graph	Horizontal read L to R (bottom to top)	Binary #
1	Qian	0 0 0	— — —	000	0
2	Dui	1 0 0	— — — —	001	1
3	Li	0 1 0	— — — —	010	2
4	Zhen	1 1 0	— — — — —	011	3
5	Xun	0 0 1	— — — —	100	4
6	Kan	1 0 1	— — — — —	101	5
7	Gen	0 1 1	— — — — —	110	6
8	Kun	1 1 1	— — — — — —	111	7