# On equivalence between Zeta and R-sequence

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This paper covers a conjecture of equivalence between a statement regarding $\Xi$ matrix and Zeta.

## 1 Definitions

**Definition 1.** For natural $n > 1$, we have: $n = \prod_{i=1}^{i=k} {p_i}^{e_i}.\mu$ function is defined as $\Omega(n) = \sum_{i=1}^{i=k} e_i$. From definition we have: $\forall x, y \in N \Omega(xy) = \Omega(x) + \Omega(y)$ and $\forall x, y \in N \Omega(x^y) = y\Omega(x)$ .

**Definition 2.** $\Xi$ matrix is the matrix where each row contains all the numbers $i \in N$-th column contains all consecutive numbers $n$ of $\Omega(n) = i$.

$$\Xi = \begin{bmatrix} 2 & 4 & 8 & 16 & ... & 2^k \\ 3 & 6 & 12 & 24 & ... & 3 * 2^{k-1} \\ 5 & 9 & 18 & 36 & ... & 5\delta(k-1) + 9 * 2^{(k-2)} \\ 7 & 10 & 20 & 40 & ... & 7\delta(k-1) + 10 * 2^{(k-2)} \\ ... & ... & ... & ... & ... & ... \\ \end{bmatrix}$$

**Definition 3.** From $\Xi$ matrix, one can find R-sequence, ie. sequence r(n)=3,9,10,27,28,30,.. such that $\forall x \in N \exists n x = r(n), m \in N : \forall z \in N \Xi[n+z, m] = 2\Xi[n+z-1, m]$

**Definition 4.** $\xi$ matrix is a created from $\Xi$ by raplacement of $i$-th column by division of $i$-th column by $i+1$-th column from $\Xi$ matrix. R-sequence in $\xi$ matrix will be referred to as $R1$-sequence.

## 2 Conjecture

$\frac{1}{2}$ appears in $R1$-sequence and all its R-sided numbers. There is exactly none of $\frac{1}{2}$ in L-sided numbers. This is also equivalent to Riemann Zeta conjecture.

## 3 References

[1] Misha Bucko, http://mishabucko.wordpress.com