Bagadi, R. (2017). One Step Evolution Of Any Positive Real Number. ISSN 1751-3030. *PHILICA.COM Article number 1106.*
http://philica.com/display_article.php?article_id=1106

One Step Evolution of A Given Positive Real Number

Author: Ramesh Chandra Bagadi

Affiliation: Data Scientist,
International School of Engineering
(INSOFE), Hyderabad (Gachibowli)
India.

Email: rameshcbagadi@uwalumni.com
rameshcbagadi@yahoo.com

Phone: +91-9440032711

Abstract:

In this research investigation, the author has detailed One Step Evolution of A Given Positive Real Number.

Bagadi, R. (2017). One Step Evolution Of Any Positive Real Number. ISSN 1751-3030. *PHILICA.COM Article number 1106.*
http://philica.com/display_article.php?article_id=1106

One Step Evolution of A Given Natural Number

One can note that any Natural number 's' can be written as

$$s = (p_1)^{a_1} \cdot (p_2)^{a_2} \cdot (p_3)^{a_3} \cdots\cdots (p_{k-1})^{a_{k-1}} (p_k)^{a_k}$$

where $p_1, p_2, p_3, \ldots, p_{k-1}, p_k$ are some primes and $a_1, a_2, a_3, \ldots a_{k-1}, a_k$ are some positive integers.

We can write it further as

$$s = \underbrace{(p_1 \cdot p_1 \cdots p_1)}_{a_1 \text{ number of times}} \underbrace{(p_2 \cdot p_2 \cdots p_2)}_{a_2 \text{ number of times}} \underbrace{(p_3 \cdot p_3 \cdots p_3)}_{a_3 \text{ number of times}} \cdots\cdots \underbrace{(p_{k-1} \cdot p_{k-1} \cdots p_{k-1})}_{a_{k-1} \text{ number of times}} \underbrace{(p_k \cdot p_k \cdots p_k)}_{a_k \text{ number of times}}$$

We now consider one step evolution of any one p_1 or p_2 or p_3 or ..... or p_{k-1} or p_k (among their groups of $a_1, a_2, a_3, \ldots, a_{k-1}, a_k$ respectively) such that the increase in s is minimal. By one step evolution of p_j we mean, if p_j is l^{th} prime number then we consider $(l+1)^{th}$ prime number as the one step evolved version of p_j.

Eg: $s = 2^2 \cdot 3^4 \cdot 5^3 = 40,500$

which can be written as

$s = (2 \cdot 2) \cdot (3.3.3.3) \cdot (5.5.5) = 40,500$

$\therefore$ considering one step evolution of 2 (of one among the two occurrences)

$(3.2)(3.3.3.3) \cdot (5.5.5)$ ~~or~~ $= 60,750$

Considering one step evolution of 3 (of one among the four occurrences)

$(2 \cdot 2)(5.3.3.3)(5.5.5)$ ~~or~~ $= 67500$

Considering one step evolution of 5 (of one among the three occurrences)

$(2 \cdot 2)(3.3.3.3)(7.5.5) = 56,700$

Therefore, one step evolution of 40,500 is 56,700 which is gotten by evolving 5 once.

One step Evolution of a Given Fractional Number

One can note that any Fraction $\left(\frac{l}{m}\right)$ can be written as

$$\frac{l}{m} = \frac{(q_1)^{b_1}(q_2)^{b_2}\cdot(q_3)^{b_3}\cdots\cdots(q_{u-1})^{b_{u-1}}(q_u)^{b_u}}{(r_1)^{c_1}(r_2)^{c_2}(r_3)^{c_3}\cdots\cdots(r_{v-1})^{c_{v-1}}(r_v)^{c_v}}$$

where $q_1, q_2, q_3, \ldots, q_{u-1}, q_u$ and $r_1, r_2, r_3, \ldots, r_{v-1}, r_v$ are some primes and $b_1, b_2, b_3, \ldots, b_{u-1}, b_u$ and $c_1, c_2, c_3, \ldots, c_{v-1}, c_v$ are some positive integers

We can write it further as

$$f = \frac{l}{m} = \frac{\underbrace{(q_1\cdot q_1\cdots q_1)}_{b_1 \text{ number of times}}\underbrace{(q_2\cdot q_2\cdots q_2)}_{b_2 \text{ number of times}}\underbrace{(q_3\cdot q_3\cdots q_3)}_{b_3 \text{ number of times}}\cdots\cdots\underbrace{(q_{u-1}\cdot q_{u-1}\cdots q_{u-1})}_{b_{u-1} \text{ number of times}}\underbrace{(q_u\cdot q_u\cdots q_u)}_{b_u \text{ number of times}}}{\underbrace{(r_1\cdot r_1\cdots\cdots r_1)}_{c_1 \text{ number of times}}\underbrace{(r_2\cdot r_2\cdots\cdots r_2)}_{c_2 \text{ number of times}}\underbrace{(r_3\cdot r_3\cdots\cdots r_3)}_{c_3 \text{ number of times}}\cdots\cdots\underbrace{(r_{v-1}\cdot r_{v-1}\cdots r_{v-1})}_{c_{v-1} \text{ number of times}}\underbrace{(r_v\cdot r_v\cdots r_v)}_{c_v \text{ number of times}}}$$

We now consider one step evolution of any one q_1 or q_2 or q_3 or $\ldots$ or q_{u-1} or q_u or r_1 or r_2 or r_3 or $\ldots$ or r_{v-1} or r_v (among their groups of $b_1, b_2, b_3, \ldots, b_{u-1}, b_u$ and $c_1, c_2, c_3, \ldots, c_{v-1}$ and c_v respectively such that the increase in the value of f is minimal.

Bagadi, R. (2017). One Step Evolution Of Any Positive Real Number. ISSN 1751-3030. *PHILICA.COM Article number 1106*.
http://philica.com/display_article.php?article_id=1106

Bagadi, R. (2017). One Step Evolution Of Any Positive Real Number. ISSN 1751-3030. *PHILICA.COM Article number 1106.*
http://philica.com/display_article.php?article_id=1106

Ex:

$$f = \frac{2^2 \cdot 3^2}{7^2} = \frac{4 \times 9}{49} = 0.7346$$

$$f = \frac{(2\cdot 2)(3\cdot 3)}{(7\cdot 7)}$$

Possible alternatives

Case 1:

$$e'f = \frac{(2\cdot 3)(3\cdot 3)}{(7\cdot 7)} = \frac{6 \times 9}{49} = 1.1020$$

where e' represents the one step evolution operator.

Case 2:

$$e'f = \frac{(2\cdot 2)(5\cdot 3)}{(7\cdot 7)} = \frac{4 \times 15}{49} = 1.2244$$

Case 3:

$$e'f = \frac{(2\cdot 2)(3\cdot 3)}{(11\cdot 7)} = \frac{4 \times 9}{77} = 0.4675$$

Therefore, Case 1 is the one step evolution of $f = \frac{2^2 \cdot 3^2}{7^2}$.

ie. $$e'f = \frac{(2\cdot 3)\,(3\cdot 3)}{7\cdot 7}$$