

# AWARENESS

*Newer Horizons in Human Excellence*





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The journal Awareness is dedicated to promoting and disseminating knowledge derived from innovative research that serves humanity, all forms of life, and their environments. It aims to foster deeper understanding by integrating empirical, experimental, experiential, and spiritual dimensions of knowledge across diverse disciplines. At its core, the journal seeks to expand the horizons of collaborative and empirical research, motivated by a love for humanity, child-like curiosity, and an unwavering commitment to truth. Awareness aims to be a publicly accessible platform for fresh, creative knowledge and shared scholarly exchange, thus embracing the principle that knowledge, like light, must be shared freely and openly to dispel ignorance and inspire the pursuit of human excellence. Only through such open exchange can the journal fulfill its commitment to the ideals of the University for Human Excellence. The journal also provides a forum for exploring critical issues related to the advancement of human excellence, welcoming a wide range of perspectives across multiple fields. It publishes original research articles, reviews, perspectives, editorials, commentaries, and book reviews, all of which reflect the personal views of the authors. These contributions do not represent the official stance of the University or the institutions affiliated with the authors, editors, or reviewers, preserving the journal's commitment to intellectual independence and diversity of thought.

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Article

## IXOHOXI Magic Square in Pādukā Sahasram by Sri Vedānta Deśika

N Kannan<sup>1</sup> and K Srikanth<sup>2</sup>

<sup>1</sup> Head of the Dept. (Retd.) Department of Oriental Studies and Research SASTRA Deemed to be University Thanjavur, Tamil Nadu, India

<sup>2</sup> Founder and Chairman - Ed Gurukul Excellence Academy. Associate Professor University of Texas at Dallas. Research Scholar, Srividya International University for Vedic Science, Bangalore.

**Abstract:** Svāmī Srī Vedānta Deśika, an erudite Sri Vaiśnavite Acāryā is known for his mastery over creative formation of Sanskrit verses. He has exhibited his scholarly work in a number of verses of śrī Pādukā Sahasram. It contains verses praising the holy sandals of Srī Ranganātha. Several mathematical concepts are handled in this work. In addition, structural styles and symmetric beauty are also incorporated in ancient Sanskrit verses such as this. While these verses will flow to provide a meaning at the outset, the same verses are also arrived through certain patterns. This paper is an attempt to decode one verse from śrī Pādukā Sahasram and derive the format, structure and correlate these to known mathematical or structural style. To do that, the well-known Vedic Numerical Coding methodology is used, few mathematical concepts are analyzed and some known patterns are taken into consideration. In addition, Srinivasa Ramanujan's magic square pattern is also studied and compared to this verse.

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**Corresponding author:** K. Srikanth, Email; srikanthatwork@gmail.com



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### Introduction

Śrī Pādukā Sahasram) written by Srī Vedānta Deśika, occupies a unique place among Srī Vaiśnava Bhakti literature. He has written 1008 verses which exhibit not only his scholarly work in Sanskrit but also in mathematical concepts. This paper deals with one such verse adhering to the pattern of *ardhabhramakam*, IXOHOXI magic square and Srinivasa Ramanujan's magic square pattern.

**The Verse:**

The following verse from Śrī Pādūkā Sahasaram is taken for this study. It is verse number 933.

पापाद पापाद पापा पाद पाद दपा दपा ।  
 दपा दपा पाद पाद पाद पाद दपा दपा ॥  
 (pāpāda pāpāda pāpā pāda pāda dapā dapā  
 dapā dapā pāda pāda pāda pāda dapā dapā)

The brief meaning of the verse is as follows. The holy sandals of Śrī Ranganātha are free of sins and they store His grace as the rays in them. They bless the seekers and chase away their sins.

In the above verse only two letters are used and this can be shown in a picture and forms a geometric pattern. The verse actually is to be written along with its mirror image as shown below.

पापाद पापाद पापा पाद पाद दपा दपा ।  
 दपा दपा पाद पाद पाद पाद दपा दपा ॥  
 पाद पाद दपा दपा दपा दपा पाद पाद ।  
 पाद पाद दपा दपा पापाद पापाद पापा ॥

Following is the details about the numerical code used to decode this verse.

**Vedic Numerical Code कटपय सङ् (kaṭapaya saṅkhyā):**

In this numerical system

1. The Vyañjanam-consonants beginning with ka (क) and ta (ट) refer to digits from 1 to 9 (i.e. letters from ka (क) to jha (झ) and from ta (ट) to dha (ध) denote 1 to 9.
2. Pa (प) to ma (म) stand for 1 to 5.
3. Letters from ya (य) and ha (ह) represent the digits 1 to 8.
4. The nasal letters nya (ञ) and na (न) denote 0.
5. In the case of conjunct consonants, the number denoted only by the last consonant is taken into consideration.
6. The vowels following consonants have no value.
7. The vowels not preceded by any consonant represent 0.
8. The arrangement of the digits is from right to left as per the rule अङ्कानाम् वामतो गतिः (aṅkānām vāmato gatiḥ:)
9. The letter la (ळ) peculiar to the Dravidian languages represent 9.
10. The letter ksha (क्ष) denotes 0

## Assignment Table

1	2	3	4	5	6	7	8	9	0
क	ख	ग	घ	ङ	च	छ	ज	झ	ञ
ट	ठ	ड	ढ	ण	त	थ	द	ध	न
प	फ	ब	भ	म					
य	र	ल	व	श	ष	स	ह	ळ	&f
ka	kha	ga	gha	ṅa	ca	cha	ja	jha	jña
ta	tha	da	dha	na	ta	tha	da	dha	na
pa	pha	ba	bha	ma					
ya	ra	la	va	śa	sa	sa	ha	la	ksa

Katapaya Sankhya rule is as follows.

कादि नव टादि नव पादि पञ्च याद्यष्टौ।  
kādi nava ṭādi nava pādi pañca yādyaṣṭau |

1. कादि नव means ka and the following 8 letters ranging from digits 1 to 9.
2. टादि नव means ta and the following 8 letters ranging from digits 1 to 9.
3. पादि पञ्च means pa and the following 4 letters ranging from digits 1 to 5.
4. याद्यष्टौ means ya and the following 7 letters ranging from digits 1 to 8.
5. Ksha is equal to 0.

Using the above rule the table shown below is formed for the verse in discussion with digit “1” representing “पा” and digit “8” representing “द”.

1	1	8	1	1	8	1	1
1	8	1	8	8	1	8	1
8	1	8	1	1	8	1	8
1	8	1	8	8	1	8	1
1	8	1	8	8	1	8	1
8	1	8	1	1	8	1	8
1	8	1	8	8	1	8	1
1	1	8	1	1	8	1	1

Figure 1

**The findings:**

From the above 8 x 8 square, one can identify all combinations of digits 1 & 8 and form sixteen 4-digit numbers as follows.

1111 1811 8111 8811

1118 1818 8118 8818

1181 1881 8181 8881

1188 1888 8188 8888

By scanning the numbers horizontally in picture 1, following eight 4-digit numbers are identified.

1181, 1811, 8118, 1818, 8188, 1881, 8818 and 8181.

1	1	8	1	1	8	1	1
1	8	1	8	8	1	8	1
8	1	8	1	1	8	1	8
1	8	1	8	8	1	8	1
1	8	1	8	8	1	8	1
8	1	8	1	1	8	1	8
1	8	1	8	8	1	8	1
1	1	8	1	1	8	1	1

Figure 2

Scanning diagonally, we get the following eight 4-digit numbers.

1111, 1888, 8881, 8811, 1188, 1118, 8111 and 8888

1	1	8	1	1	8	1	1
1	8	1	8	8	1	8	1
8	1	8	1	1	8	1	8
1	8	1	8	8	1	8	1
1	8	1	8	8	1	8	1
8	1	8	1	1	8	1	8
1	8	1	8	8	1	8	1
1	1	8	1	1	8	1	1

Figure 3

By rearranging all the sixteen 4-digit numbers in a square we get the following table which reveals several mathematical facts bundled inside this beautiful verse in Śrī Pādukā Sahasram.

## Result

### a. IXOHOXI magic square

8818	1111	8188	1881
8181	1888	8811	1118
1811	8118	1181	8888
1188	8881	1818	8111

Figure 4

Picture 4 shows how these sixteen numbers form the IXOHOXI magic square. In this magic square total of all numbers in each row, column, diagonal will be 19998.

### b. Ramanujan's magic square pattern

8818	1111	8188	1881
8181	1888	8811	1118
1811	8118	1181	8888
1188	8881	1818	8111

Figure 5

Picture 5 shows just 5 combinations where same total is obtained. In addition to the summation of 4 numbers as shown above, the same total is obtained in the following combinations as well.

1. Four corner numbers.
2. 4 numbers in second and third row of first two columns and 4 numbers from right two columns of same rows
3. 4 numbers from top and bottom rows of middle two columns and 4 numbers of middle two rows of first and last column.

All these above are showing that the verse follows the pattern of Ramanujan's magic square.

c. अध मकम् (ardhabhramakam)

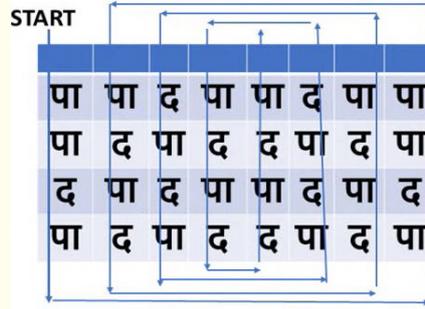


Figure 6

Svāmī Srī Vedānta Deśika, embeds this formation in many of his verses where one can start from top left and go around counter clockwise as shown above and the same verse is formed.

d. Symmetry

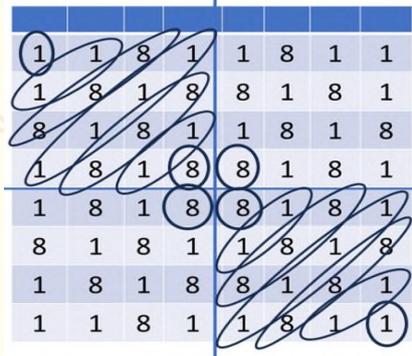


Figure 7

The verse encoded as shown in Picture 2 also forms a beautiful symmetric structure which is shown in Picture 7. The third quadrant is a mirror image of first quadrant and second quadrant is a mirror image of fourth quadrant. Picture 7 shows such a symmetry in quadrants 2 and 4 as an example.

**Conclusion**

Svāmī Srī Vedānta Deśika is a multi-faceted genius who was described as a Lion among Poets and Logicians, किव-तिका क-के सरी (Kavi-Tārkika-Kesarī) and a Sarva-Tantra- Svatantra. This paper shows only one aspect taking an example of just one verse from śrī Pādukā Sahasram.

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