Text Encryption with Singular Values Decomposition Aided- level one

Mohammed Abdul-Hameed

Mathematical Department/College of Basic Education/University of Kufa

Najaf, Iraq

E-mail: mohammeda.alkufi@uokufa.edu.iq

ABSTRACT

This paper we will address the encryption process text is generally through a number of processes of dispersion of the later values in a matrix is A through remittances linear in addition to the use of svd enters, including one key, where work will begin the application process distracting initial. In a compound to generate new matrices B1 and B2 of the original text matrix and which enters the key .The second phase of the dispersion is using SVD on the last matrices and switch S matrix among the two spectral for the new matrices C1 and C2 which represents putting as correlative F = [C1 C2] the matrix of the initial of the encoded text.

For purpose of ascertaining the accuracy of the work we calculated the matrix of absolute value of the difference between the matrix of numbers for original text characters lettering before encryption and matrix of numbers for text characters after decryption to show us zero matrix, as well as the calculation of the average values of this matrix was zero.

KEYWORDS: Text, Encryption text, SVD,M.K. Text Cipher1

1 INTRODUCTION

The issue of maintaining the security and privacy of databases (Database Security And Privacy) from the important problems in database applications through networks of various communication against spambots activity of unauthorized (Unauthorized Activity) Access to the data or manipulate it and the provision of a particular method to register all activity spambots while retaining full registrations of all the processes of update the data that take place on a databases away from the hands of the beneficiaries (Users) helps the Database Administrator to improving the security situation and the privacy of her future it must include the programs used in dealing with databases emphasizing the security and confidentiality of the data and to prevent use of improper to grant the specific Permissions and by nature of and quality of the beneficiary with continuous monitoring of the activities of the use of the system

Provides most of current applications, databases and many of the means of protection for databases such as (passwords and data encryption).

Passwords:

All database applications provide a way to add passwords, in addition to the possibility of the beneficiary providing programs his own to use passwords away from passwords provided by database applications. And to choose passwords must follow the following procedures:-

Stay away from the usual choice of password, for example, the person's name, date of birth, family name, name of the director of work .... etc. (where this method provides ease of guessing.

Passwords are chosen as a combination of letters, numbers and special symbols provided by the operating systems in the calculator shows the following example, the number of letters, numbers and special symbols that can be used in the selection of passwords (depending on what the availability the English language only)

The numbers = 11.

Number of characters = 52 (lower/upper case).

Special symbols provided by the keyboard =33.

Will be the total =95. letter, number and special code is added to all the shapes of the letters provided by any language except English to become field choice is very wide.

Preferably that the length of the password at least 11 (characters, number, or special symbol) and the following table shows the time required to guess the password:

Number of characters used	Number of the attempts	The time required
4	81450625	71.6464 hour
6	7.3509e+11	116.5481 year
8	6.6342e+15	631110 year
10	5.9874e+19	1898600000 year

Possibility of choosing more than a password to the important beneficiaries for example a database manager.

Importance of the choice of passwords that its validity associated with time on the day.

Data encryption:-

Procedures for data encryption Includes a comprehensive encryption for data or partial encryption where is encrypted portion of the data so that no allow hackers through different computer networks. Possibility of knowing the nature of the data by withholding this data and data structures used them, An example of this encryption all the major and minor keys in tables of data structures used. The process of encryption using an encryption key it is possible to use more than one key to encrypt the data according to its importance. The controls of select the key subject to the same controls for selecting the password follow through regimes implemented in any institution after the transformation of the systems implemented on one computer (only one beneficiaries) to Systems adopted the principle of (the server and the beneficiary) with retaining structures, programs and data (Previous unchanged), popped the following security problems.

Each beneficiary with in the network can to review and update all system tables without notation what he had done and what is the nature of the beneficiary changed information (means that there is an opportunity to manipulate data without leaving a trace of it).

Can use the one computer linked to the network to change all this data at any time when the server in the case on.

So It rolls it is necessary that the focus is on the issue of the security of the data, documents and information and keep abreast of developments in this field, because of weakness in this subject will make the country unprotected and available to breakthrough and Information pirates, which would cause a loss of Informatics lead to a negative impact on the economic sideas shown by the histogram following which shows the amount of the economic impact on one of the joints to work in a state where only the health aspect illustrated how important information security at present where all the nations of the world are subject to the effects of globalization and the development of modern scientific

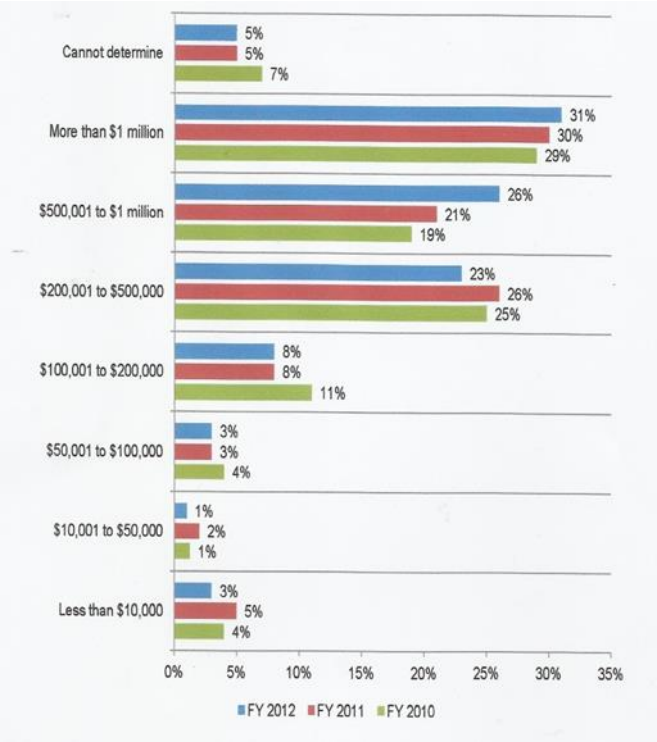

Figure 1. Economic impact of data breach incidents experienced over the three years(2010, 2011,2012)

2 SINGULAR VALUE DECOMPOSITION (SVD)

Let A be an m×n real matrix. Then there exist orthogonal matrices U of size $m \times m$ and V of size $n \times n$ such that

$$A = USV^T$$

Where S is an $m \times n$ matrix with nondiagonal entries all zero and:

$$s_{11} \geq s_{22} \geq \cdots \geq s_{pp} \geq 0 \text{ where } p = \min\{m, n\}$$

Not:

The diagonal entries of S are called the singular values of A. The columns of U are called the left singular vectors of A. The columns of V are called the right singular vectors of A.

$$A = col_1(U)s_{11}col_1(V)^T + col_2(U)s_{22}col_2(V)^T + \cdots + col_p(U)s_{pp}col_p(V)^T \ldots (6)$$

Let $V(A^TA)V^T = D$

D is diagonal matrix whose diagonal entries $\lambda_1, \lambda_2, \ldots, \lambda_n$ are the eigenvalues of A^TA .

v_j denote column j of V.

Not: each eigenvalue of A^TA is nonnegative.

let the eigenvalues of A^TA is $\lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_n$

Define $s_{jj} = \sqrt{\lambda_j}$

$\because$ V is orthonormal matrix $\Longrightarrow$ each of it's columns is a unit vector.

$\therefore \ \|v_j\| = 1$

Thus the singular values of A are the square roots of the eigenvalues of A^TA.

The matrix U is to be orthogonal, it's columns must be an orthonormal set. Hence they are linearly independent $m \times 1$ vectors.

$$\begin{bmatrix} s_{11} & 0 & \cdots & 0 & \\ 0 & s_{22} & \cdots & 0 & 0_{p,n-p} \\ \vdots & \vdots & \ddots & \vdots & \\ 0 & 0 & \cdots & s_{pp} & \\ & 0_{m-p,p} & & & 0_{m-p,n-p} \end{bmatrix}$$

$\because AV = US, so$

$$\therefore \ A[v_1 \quad v_2 \quad \cdots \quad v_n] = [u_1 \quad u_2 \quad \cdots \quad u_m] \begin{bmatrix} s_{11} & 0 & \cdots & 0 & \\ 0 & s_{22} & \cdots & 0 & 0_{p,n-p} \\ \vdots & \vdots & \ddots & \vdots & \\ 0 & 0 & \cdots & s_{pp} & \\ & 0_{m-p,p} & & & 0_{m-p,n-p} \end{bmatrix}$$

$$\Longrightarrow Av_j = s_{jj}u_j \quad \Longrightarrow \ u_j = \frac{1}{s_{jj}} Av_j$$

3 METHODOLOGY

3.1 Encryption

The full algorithm to encrypt the text in general:

Beginning we define one key to entered within the matrix of text encryption phases which real but not equal zero.

Identification the numbers corresponding to the letters of the text you want encrypted, including commasand point the bow and all that falls within the composition of the text numbers which is are stored in computer memory. Generally can specify a special table for the numbering of the characters and the signals which are used in the writing of the text.

Using the method of (DATA CUBE) we transform the numbers of text components to three-dimensional matrix. Let this matrix A.

In this step, we will use the method of distracting the matrix numbers to create a matrix B1 and B2

B1=Key*A ,B2=-Key*A

Apply SVD Distracting the numbers:

In this step, we will apply (SVD Distracting the numbers) to conduct a spectral analysis of the matrices B1,B2 and for the purpose of a switch between the singular values in the matrices analyzes.

[UB1,SB1,VB1]=SVD(B1) ,[UB2,SB2,VB2]=SVD(B2)

C1=UB1*SB2*⟦VB1⟧^T, C2=UB2*SB1*⟦VB2⟧^T

F=[C1 C2]

Text Cipher= FThe full paper has to be submitted electronically via the website of the conference) by

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3.2 Decryption

Text decryption:

The full algorithm to decrypt of the text.

Now, with phases of decode matrix of text.

We have matrix is encrypted $\mathrm{M.K.Text\ Cipher1} = F$

1- Divide the matrix F_{new} to restore matrices $C1_{new}\ and\ C2_{new}$
2- Reflect the impact of (SVD Distracting the numbers) that is in step 5 of the encryption process to restore matrices $B1_{new}\ and\ B2_{new}$.

[U$C1_{new}$,S$C1_{new}$,V$C1_{new}$]=SVD($C1_{new}$) [U$C2_{new}$,S$C2_{new}$,V$C2_{new}$]=SVD($C2_{new}$)

$B1_{new} = \mathrm{U}C1_{new} * \mathrm{S}C2_{new} * \mathrm{V}C1_{new}{}^{T}$, $B2_{new} = \mathrm{U}C2_{new} * \mathrm{S}C1_{new} * \mathrm{V}C2_{new}{}^{T}$

3- $A_{new} = \frac{B1_{new}}{key}$

The last matrix A_{new} represent the numerical values of the letters of the cipher text after decryption they include the error increase or decrease of less than 0.5 which is cannot represent the numerical values for letters. So we approximation of each value to the nearest integer, as in below:

$45.456 \cong 45$, $36.743 \cong 37$ ... etc

Bringing we produces matrix of numerical values for letters of cipher text identical to the original matrix and without any error.

From the last matrix we recover the letters and symbols corresponding to the numerical values of it to show the same original text and without any error.

4 THE RESULT

4.1

The text Before encryption:-

This paper we will address the encryption process text is generally through a number of processes of dispersion of the later values in a matrix is A through remittances linear in addition to the use of svd enters, including three keys sequentially, where work will begin the application process distracting initial we called (MK-Distracting the numbers method1)In a compound to generate new matrices A1 and A2 of the original text matrix and which enters the first key (Key1) and then using the second key (Key2) for a linear transform matrices A1 and A2 second phase in dispersing Numbers Matrices (MK-Distracting the numbers method2) to get the new matrices B1 and B2.The third phase of the dispersion is using SVD on the last matrices and switch S matrix among the two spectral for the new matrices C1 and C2 which represents putting as correlative F = [C1 C2] the matrix of the initial of the encoded text. Then conducting the process of chromaticity values in the last matrix composite F, which will be values of real non-specific range that is to say including what is less than zero, including what is bigger than the one to be ultimately values of later within the closed set [0,1] while retaining the largest value and the smallest value... In the matrix FF within the last matrix to ensure the possibility of return versa in the decryption phase in a way that we called (MK press numbers) The final matrix resulting matrix is the final encrypted text that we call (M.K. Text Cipher1).

4.2

The numbers corresponding to the components of The text

84 104 105 115 32 112 97 112 101 114 32 119 101 32 119 105 108 108 32 97 100 100 114 101 115 115
32 116 104 101 32 101 110 99 114 121 112 116 105 111 110 32 112 114 111 99 101 115 115 32 116 101 120 116
32 105 115 32 103 101 110 101 114 97 108 108 121 32 116 104 114 111 117 103 104 32 97 32 110 117 109 98
101 114 32 111 102 32 112 114 111 99 101 115 115 101 115 32 111 102 32 100 105 115 112 101 114 115 105
111 110 32 111 102 32 116 104 101 32 108 97 116 101 114 32 118 97 108 117 101 115 32 105 110 32 97 32
109 97 116 114 105 120 32 105 115 32 65 32 116 104 114 111 117 103 104 32 114 101 109 105 116 116 97 110
99 101 115 32 108 105 110 101 97 114 32 105 110 32 97 100 100 105 116 105 111 110 32 116 111 32 116 104
101 32 117 115 101 32 111 102 32 115 118 100 32 101 110 116 101 114 115 44 32 105 110 99 108 117 100 105
110 103 32 116 104 114 101 101 32 107 101 121 115 32 115 101 113 117 101 110 116 105 97 108 108 121 44 32
119 104 101 114 101 32 119 111 114 107 32 119 105 108 108 32 98 101 103 105 110 32 116 104 101 32 97 112
112 108 105 99 97 116 105 111 110 32 112 114 111 99 101 115 115 32 100 105 115 116 114 97 99 116 105 110
103 32 105 110 105 116 105 97 108 32 119 101 32 99 97 108 108 101 100 32 40 77 75 45 68 105 115 116
114 97 99 116 105 110 103 32 116 104 101 32 110 117 109 98 101 114 115 32 109 101 116 104 111 100 49 41
73 110 32 97 32 99 111 109 112 111 117 110 100 32 116 111 32 103 101 110 101 114 97 116 101 32 110 101
119 32 109 97 116 114 105 99 101 115 32 65 49 32 97 110 100 32 65 50 32 111 102 32 116 104 101 32
111 114 105 103 105 110 97 108 32 116 101 120 116 32 109 97 116 114 105 120 32 97 110 100 32 119 104 105
99 104 32 101 110 116 101 114 115 32 116 104 101 32 102 105 114 115 116 32 107 101 121 32 40 75 101 121
49 41 32 97 110 100 32 116 104 101 110 32 117 115 105 110 103 32 116 104 101 32 115 101 99 111 110 100
32 107 101 121 32 40 75 101 121 50 41 32 102 111 114 32 97 32 108 105 110 101 97 114 32 116 114 97
110 115 102 111 114 109 32 109 97 116 114 105 99 101 115 32 65 49 32 97 110 100 32 65 50 32 115 101
99 111 110 100 32 112 104 97 115 101 32 105 110 32 100 105 115 112 101 114 115 105 110 103 32 78 117 109
98 101 114 115 32 77 97 116 114 105 99 101 115 32 40 77 75 45 68 105 115 116 114 97 99 116 105 110
103 32 116 104 101 32 110 117 109 98 101 114 115 32 109 101 116 104 111 100 50 41 32 116 111 32 103 101
116 32 116 104 101 32 110 101 119 32 109 97 116 114 105 99 101 115 32 66 49 32 97 110 100 32 66 50
46 84 104 101 32 116 104 105 114 100 32 112 104 97 115 101 32 111 102 32 116 104 101 32 100 105 115 112
101 114 115 105 111 110 32 105 115 32 117 115 105 110 103 32 83 86 68 32 111 110 32 116 104 101 32 108
97 115 116 32 109 97 116 114 105 99 101 115 32 97 110 100 32 115 119 105 116 99 104 32 83 32 109 97
116 114 105 120 32 97 109 111 110 103 32 116 104 101 32 116 119 111 32 115 112 101 99 116 114 97 108 32
102 111 114 32 116 104 101 32 110 101 119 32 109 97 116 114 105 99 101 115 32 67 49 32 97 110 100 32
67 50 32 119 104 105 99 104 32 114 101 112 114 101 115 101 110 116 115 32 112 117 116 116 105 110 103 32
97 115 32 99 111 114 114 101 108 97 116 105 118 101 32 70 32 61 32 91 67 49 32 67 50 93 32 116 104
101 32 109 97 116 114 105 120 32 111 102 32 116 104 101 32 105 110 105 116 105 97 108 32 111 102 32 116
104 101 32 101 110 99 111 100 101 100 32 116 101 120 116 46 32 84 104 101 110 32 99 111 110 100 117 99
116 105 110 103 32 116 104 101 32 112 114 111 99 101 115 115 32 111 102 32 99 104 114 111 109 97 116 105
99 105 116 121 32 118 97 108 117 101 115 32 32 105 110 32 116 104 101 32 108 97 115 116 32 109 97 116
114 105 120 32 99 111 109 112 111 115 105 116 101 32 70 44 32 119 104 105 99 104 32 119 105 108 108 32
98 101 32 118 97 108 117 101 115 32 111 102 32 114 101 97 108 32 110 111 110 45 115 112 101 99 105 102
105 99 32 114 97 110 103 101 32 116 104 97 116 32 105 115 32 116 111 32 115 97 121 32 105 110 99 108
117 100 105 110 103 32 119 104 97 116 32 105 115 32 108 101 115 115 32 116 104 97 110 32 122 101 114 111
44 32 105 110 99 108 117 100 105 110 103 32 119 104 97 116 32 105 115 32 98 105 103 103 101 114 32 116
104 97 110 32 116 104 101 32 111 110 101 32 116 111 32 98 101 32 117 108 116 105 109 97 116 101 108 121
32 118 97 108 117 101 115 32 111 102 32 108 97 116 101 114 32 119 105 116 104 105 110 32 116 104 101 32
99 108 111 115 101 100 32 115 101 116 32 91 48 44 49 93 32 119 104 105 108 101 32 114 101 116 97 105
110 105 110 103 32 116 104 101 32 108 97 114 103 101 115 116 32 118 97 108 117 101 32 97 110 100 32 116
104 101 32 115 109 97 108 108 101 115 116 32 118 97 108 117 101 46 46 46 32 73 110 32 116 104 101 32

109	97	116	114	105	120	32	70	70	32	119	105	116	104	105	110	32	116	104	101	32	108	97	115	116	32	109	97
116	114	105	120	32	116	111	32	101	110	115	117	114	101	32	116	104	101	32	112	111	115	115	105	98	105	108	
105	116	121	32	111	102	32	114	101	116	117	114	110	32	118	101	114	115	97	32	105	110	32	116	104	101	32	100
101	99	114	121	112	116	105	111	110	32	112	104	97	115	101	32	105	110	32	97	32	119	97	121	32	116	104	97
116	32	119	101	32	99	97	108	108	101	100	32	40	77	75	32	112	114	101	115	115	32	110	117	109	98	101	114
115	41	32	84	104	101	32	102	105	110	97	108	32	109	97	116	114	105	120	32	114	101	115	117	108	116	105	110
103	32	109	97	116	114	105	120	32	105	115	32	116	104	101	32	102	105	110	97	108	32	101	110	99	114	121	112
116	101	100	32	116	101	120	116	32	116	104	97	116	32	119	101	32	99	97	108	108	32	40	77	46	75	46	32	84
101	120	116	32	67	105	112	104	101	114	49	41																			

Key=9

Matrix of the encryption of numbers for the text and it consist of 4000 element:

```
f(:,:,1) =
  1.0e+003 *
  Columns 1 through 10
    0.7560   1.0350   1.0440   0.2880   0.2880   1.0620   0.9360   0.2880   0.9180   0.9360
    0.9360   0.2880   0.9090   0.8730   0.9000   0.8730   1.0260   0.9450   0.2880   1.0260
    0.9450   1.0440   1.0800   0.2880   0.9450   0.9720   0.9990   0.9900   1.0350   0.9090
    1.0350   0.9360   1.0440   0.9900   1.0350   1.0530   1.0530   0.2880   1.0620   0.9090
    0.2880   0.9090   0.2880   1.0530   1.0080   0.9090   0.9270   0.8730   0.9000   0.2880
    1.0080   0.2880   0.9450   0.9810   0.9090   1.0350   0.9360   0.9000   0.2880   0.9630
    0.8730   0.9090   1.0350   0.8820   1.0260   0.2880   0.2880   0.9000   0.9090   0.9090
    1.0080   0.9900   0.2880   0.9090   1.0350   0.9450   1.0260   0.9450   0.9900   1.0890
    0.9090   0.8910   0.9270   1.0260   0.9450   0.9900   0.9090   1.0440   1.0440   1.0350
    1.0260   1.0260   0.9090   0.2880   0.9990   0.2880   0.9810   0.9450   0.9090   0.2880
    0.2880   1.0890   0.9900   0.9990   0.9900   0.8730   0.9450   0.9990   1.0260   1.0350
    1.0710   1.0080   0.9090   0.9180   0.2880   0.2880   1.0440   0.9900   1.0350   0.9090
    0.9090   1.0440   1.0260   0.2880   0.9990   0.9810   1.0440   0.2880   0.3960   1.0170
    0.2880   0.9450   0.8730   1.0080   0.9180   0.8730   0.8730   1.0440   0.2880   1.0530
    1.0710   0.9990   0.9720   1.0260   0.2880   1.0440   0.9900   0.9990   0.9450   0.9090
    0.9450   0.9900   0.9720   0.9990   1.0440   1.0260   0.8910   0.2880   0.9900   0.9900
    0.9720   0.2880   1.0890   0.8910   0.9360   0.9450   0.9090   1.0440   0.8910   1.0440
    0.9720   1.0080   0.2880   0.9090   0.9090   1.0800   1.0350   0.9360   0.9720   0.9450
    0.2880   1.0260   1.0440   1.0350   0.2880   0.2880   0.2880   0.9090   1.0530   0.8730
    0.8730   0.9990   0.9360   1.0350   0.9720   0.9450   0.9720   0.2880   0.9000   0.9720
    0.9000   0.8910   1.0260   0.9090   0.8730   1.0350   0.9450   1.0530   0.9450   0.9720
    0.9000   0.9090   0.9990   1.0350   1.0440   0.2880   0.9900   1.0350   0.9900   1.0890
    1.0260   1.0350   1.0530   0.2880   0.9090   0.5850   0.9090   0.9090   0.9270   0.3960
    0.9090   1.0350   0.9270   0.9990   1.0260   0.2880   0.8730   0.2880   0.2880   0.2880
    1.0350   0.2880   0.9360   0.9180   0.2880   1.0440   1.0260   0.9990   1.0440   1.0710
  Columns 11 through 20
    0.9360   0.8730   0.8730   0.3600   1.0260   1.0440   0.5850   0.2880   1.0440   0.2880
    0.9090   1.0080   0.8910   0.6930   1.0350   0.9990   0.4410   1.0440   0.9090   0.8730
    1.0260   1.0080   1.0440   0.6750   0.2880   0.2880   0.2880   0.9090   1.0260   0.9900
    0.9090   0.9720   0.9450   0.4050   0.9810   0.9270   0.8730   1.0800   1.0350   0.9000
    0.2880   0.9450   0.9900   0.6120   0.9090   0.9090   0.9900   1.0440   0.2880   0.2880
    1.0710   0.8910   0.9270   0.9450   1.0440   0.9900   0.9000   0.2880   1.0440   1.0440
    0.9990   0.8730   0.2880   1.0350   0.9360   0.9090   0.2880   0.9810   0.9360   0.9360
    1.0260   1.0440   0.9450   1.0440   0.9990   1.0260   0.5850   0.8730   0.9090   0.9090
    0.9630   0.9450   0.9900   1.0260   0.9000   0.8730   0.4500   1.0440   0.2880   0.9900
    0.2880   0.9990   0.9450   0.8730   0.4410   1.0440   0.2880   1.0260   0.9180   0.2880
    1.0710   0.9900   1.0440   0.8910   0.3690   0.9090   0.9990   0.9450   0.9450   1.0530
    0.9450   0.2880   0.9450   1.0440   0.6570   0.2880   0.9180   1.0800   1.0260   1.0350
    0.9720   1.0080   0.8730   0.9450   0.9900   0.9900   0.2880   0.2880   1.0350   0.9450
    0.9720   1.0260   0.9720   0.9900   0.2880   0.9090   1.0440   0.8730   1.0440   0.9900
    0.2880   0.9990   0.2880   0.9270   0.8730   1.0710   0.9360   0.9900   0.2880   0.9270
    0.8820   0.8910   1.0710   0.2880   0.2880   0.2880   0.9090   0.9000   0.9630   0.2880
    0.9090   0.9090   0.9090   1.0440   0.8910   0.9810   0.2880   0.2880   0.9090   1.0440
    0.9270   1.0350   0.2880   0.9360   0.9990   0.8730   0.9990   1.0710   1.0890   0.9360
    0.9450   1.0350   0.8910   0.9090   0.9810   1.0440   1.0260   0.9360   0.2880   0.9090
    0.9900   0.2880   0.8730   0.2880   1.0080   1.0260   0.9450   0.9450   0.3600   0.2880
    0.2880   0.9000   0.9720   0.9900   0.9990   0.9450   0.9270   0.8910   0.6750   1.0350
    1.0440   0.9450   0.9720   1.0530   1.0530   0.8910   0.9450   0.9360   0.9090   0.9090
    0.9360   1.0350   0.9090   0.9810   0.9900   0.9090   0.9900   0.2880   1.0890   0.8910
    0.9090   1.0440   0.9000   0.8820   0.9000   1.0350   0.8730   0.9090   0.4410   0.9990
    0.2880   1.0260   0.2880   0.9090   0.2880   0.2880   0.9720   0.9900   0.3690   0.9900
  Columns 21 through 30
    0.9000   0.2880   0.9000   0.9090   0.6930   1.0350   0.2880   0.9360   0.9450   0.8730
    0.2880   1.0440   0.2880   1.0260   0.6750   0.2880   0.9810   0.9450   0.9990   1.0350
    0.9630   1.0260   0.5850   1.0350   0.4050   0.9810   0.8730   1.0260   0.9900   1.0440
    0.9090   0.8730   0.4500   0.9450   0.6120   0.9090   1.0440   0.9000   0.2880   0.2880
    1.0890   0.9900   0.2880   0.9900   0.9450   1.0440   1.0260   0.2880   0.9450   0.9810
    0.2880   1.0350   1.0350   0.9270   1.0350   0.9360   0.9450   1.0080   1.0350   0.8730
    0.3600   0.9180   0.9090   0.2880   1.0440   0.9990   0.8910   0.9360   0.2880   1.0440
    0.6750   0.9990   0.8910   0.7020   1.0260   0.9000   0.9090   0.8730   1.0530   1.0260
    0.9090   1.0260   0.9990   1.0530   0.8730   0.4500   1.0350   1.0350   1.0350   0.9450
    1.0890   0.9810   0.9900   0.9810   0.8910   0.3690   0.2880   0.9090   0.9450   0.8910
    0.4500   0.2880   0.9000   0.8820   1.0440   0.2880   0.5940   0.2880   0.9900   0.9090
    0.3690   0.9810   0.2880   0.9090   0.9450   1.0440   0.4410   0.9990   0.9270   1.0350
    0.2880   0.8730   1.0080   1.0260   0.9900   0.9990   0.2880   0.9180   0.2880   0.2880
    0.9180   1.0440   0.9360   1.0350   0.9270   0.2880   0.8730   0.2880   0.7470   0.8730
    0.9990   1.0260   0.8730   0.2880   0.2880   0.9270   0.9900   1.0440   0.7740   0.9900
    1.0260   0.9450   1.0350   0.6930   1.0440   0.9090   0.9000   0.9360   0.6120   0.9000
    0.2880   0.8910   0.9090   0.8730   0.9360   1.0440   0.2880   0.9090   0.2880   0.2880
    0.8730   0.9090   0.2880   1.0440   0.9090   0.2880   0.5940   0.2880   0.9990   1.0350
    0.2880   1.0350   0.9450   1.0260   0.2880   1.0440   0.4500   0.9000   0.9900   1.0710
    0.9720   0.2880   0.9900   0.9450   0.9900   0.9360   0.4140   0.9450   0.2880   0.9450
    0.9450   0.5850   0.2880   0.8910   1.0530   0.9090   0.7560   1.0350   1.0440   1.0440
    0.9900   0.4410   0.9000   0.9090   0.9810   0.2880   0.9360   1.0080   0.9360   0.8910
    0.9090   0.2880   0.9450   1.0350   0.8820   0.9900   0.9090   0.9090   0.9090   0.9360
    0.8730   0.8730   1.0350   0.2880   0.9090   0.9090   0.2880   1.0260   0.2880   0.2880
    1.0260   0.9900   1.0080   0.3600   1.0260   1.0710   1.0440   1.0350   0.9720   0.7470
  Columns 31 through 40
    0.2880   0.8910   1.0350   0.9900   0.9090   0.9990   0.9990   0.9270   0.8910   0.9810
    0.9810   1.0440   0.2880   1.0440   0.2880   0.9180   0.9000   0.2880   0.9450   0.8730
    0.8730   1.0260   0.6030   1.0350   0.6300   0.2880   0.9090   1.0440   1.0440   1.0440
    1.0440   0.8730   0.4410   0.2880   0.2880   1.0440   0.9000   0.9360   1.0890   1.0260
    1.0260   0.9720   0.2880   1.0080   0.5490   0.9360   0.2880   0.9090   0.2880   0.9450
    0.9450   0.2880   0.8730   1.0530   0.2880   0.9090   1.0440   0.2880   1.0620   1.0800
    1.0800   0.9180   0.9900   1.0440   0.8190   0.2880   0.9090   1.0080   0.8730   0.2880
    0.2880   0.9990   0.9000   1.0440   0.6030   0.9450   1.0800   1.0260   0.9720   0.8910
    0.8730   1.0260   0.2880   0.9450   0.4410   0.9900   1.0440   0.9990   1.0530   0.9990
    0.9810   0.2880   0.6030   0.9900   0.2880   0.9450   0.4140   0.8910   0.9090   0.9810
```

```
    0.9990   1.0440   0.4500   0.9270   0.6030   1.0440   0.2880   0.9090   1.0350   1.0080
    0.9900   0.9360   0.2880   0.2880   0.4500   0.9450   0.7560   1.0350   0.2880   0.9990
    0.9270   0.9090   1.0710   0.8730   0.8370   0.8730   0.9360   1.0350   0.2880   1.0350
    0.2880   0.2880   0.9360   1.0350   0.2880   0.9720   0.9090   0.2880   0.9450   0.9450
    1.0440   0.9900   0.9450   0.2880   1.0440   0.2880   0.9900   0.9990   0.9900   1.0440
    0.9360   0.9090   0.8910   0.8910   0.9360   0.9990   0.2880   0.9180   0.2880   0.9090
    0.9090   1.0710   0.9360   0.9990   0.9090   0.9180   0.8910   0.2880   1.0440   0.2880
    0.2880   0.2880   0.2880   1.0260   0.2880   0.2880   0.9990   0.8910   0.9360   0.6300
    1.0440   0.9810   1.0260   1.0260   0.9810   1.0440   0.9900   0.9360   0.9090   0.3960
    1.0710   0.8730   0.9090   0.9090   0.8730   0.9360   0.9000   1.0260   0.2880   0.2880
    0.9990   1.0440   1.0080   0.9720   1.0440   0.9090   1.0530   0.9990   0.9720   1.0710
    0.2880   1.0260   1.0260   0.8730   1.0260   0.2880   0.8910   0.9810   0.8730   0.9360
    1.0350   0.9450   0.9090   1.0440   0.9450   0.9090   1.0440   0.8730   1.0350   0.9450
    1.0080   0.8910   1.0350   0.9450   1.0800   0.9900   0.9450   1.0440   1.0440   0.8910
    0.9090   0.9090   0.9090   1.0620   0.2880   0.8910   0.9900   0.9450   0.2880   0.9360
Columns 41 through 50
   -0.7560  -1.0350  -1.0440  -0.2880  -0.2880  -1.0620  -0.9360  -0.2880  -0.9180  -0.9360
   -0.9360  -0.2880  -0.9090  -0.8730  -0.9000  -0.8730  -1.0260  -0.9450  -0.2880  -1.0260
   -0.9450  -1.0440  -1.0800  -0.2880  -0.9450  -0.9720  -0.9990  -0.9900  -1.0350  -0.9090
   -1.0350  -0.9360  -1.0440  -0.9900  -1.0350  -1.0530  -1.0530  -0.2880  -1.0620  -0.9090
   -0.2880  -0.9090  -0.2880  -1.0530  -1.0080  -0.9090  -0.9270  -0.8730  -0.9000  -0.2880
   -1.0080  -0.2880  -0.9450  -0.9810  -0.9090  -1.0350  -0.9360  -0.9000  -0.2880  -0.9630
   -0.8730  -0.9090  -1.0350  -0.8820  -1.0260  -0.2880  -0.2880  -0.9000  -0.9090  -0.9090
   -1.0080  -0.9900  -0.2880  -0.9090  -1.0350  -0.9450  -1.0260  -0.9450  -0.9900  -1.0890
   -0.9090  -0.8910  -0.9270  -1.0260  -0.9450  -0.9900  -0.9090  -1.0440  -1.0440  -1.0350
   -1.0260  -1.0260  -0.9090  -0.2880  -0.9990  -0.2880  -0.9810  -0.9450  -0.9090  -0.2880
   -0.2880  -1.0890  -0.9900  -0.9990  -0.9900  -0.8730  -0.9450  -0.9990  -1.0260  -1.0350
   -1.0710  -1.0080  -0.9090  -0.9180  -0.2880  -0.2880  -1.0440  -0.9900  -1.0350  -0.9090
   -0.9090  -1.0440  -1.0260  -0.2880  -0.9990  -0.9810  -1.0440  -0.2880  -0.3960  -1.0170
   -0.2880  -0.9450  -0.8730  -1.0080  -0.9180  -0.8730  -0.8730  -1.0440  -0.2880  -1.0530
   -1.0710  -0.9990  -0.9720  -1.0260  -0.2880  -1.0440  -0.9900  -0.9990  -0.9450  -0.9090
   -0.9450  -0.9900  -0.9720  -0.9990  -1.0440  -1.0260  -0.8910  -0.2880  -0.9900  -0.9900
   -0.9720  -0.2880  -1.0890  -0.8910  -0.9360  -0.9450  -0.9090  -1.0440  -0.8910  -1.0440
   -0.9720  -1.0080  -0.2880  -0.9090  -0.9090  -1.0800  -1.0350  -0.9360  -0.9720  -0.9450
   -0.2880  -1.0260  -1.0440  -1.0350  -0.2880  -0.2880  -0.2880  -0.9090  -1.0530  -0.8730
   -0.8730  -0.9990  -0.9360  -1.0350  -0.9720  -0.9450  -0.9720  -0.2880  -0.9000  -0.9720
   -0.9000  -0.8910  -1.0260  -0.9090  -0.8730  -1.0350  -0.9450  -1.0530  -0.9450  -0.9720
   -0.9000  -0.9090  -0.9990  -1.0350  -1.0440  -0.2880  -0.9900  -1.0350  -0.9900  -1.0890
   -1.0260  -1.0350  -1.0530  -0.2880  -0.9090  -0.5850  -0.9090  -0.9090  -0.9270  -0.3960
   -0.9090  -1.0350  -0.9270  -0.9990  -1.0260  -0.2880  -0.8730  -0.2880  -0.2880  -0.2880
   -1.0350  -0.2880  -0.9360  -0.9180  -0.2880  -1.0440  -1.0260  -0.9990  -1.0440  -1.0710
Columns 51 through 60
   -0.9360  -0.8730  -0.8730  -0.3600  -1.0260  -1.0440  -0.5850  -0.2880  -1.0440  -0.2880
   -0.9090  -1.0080  -0.8910  -0.6930  -1.0350  -0.9990  -0.4410  -1.0440  -0.9090  -0.8730
   -1.0260  -1.0080  -1.0440  -0.6750  -0.2880  -0.2880  -0.2880  -0.9090  -1.0260  -0.9900
   -0.9090  -0.9720  -0.9450  -0.4050  -0.9810  -0.9270  -0.8730  -1.0800  -1.0350  -0.9000
   -0.2880  -0.9450  -0.9900  -0.6120  -0.9090  -0.9090  -0.9900  -1.0440  -0.2880  -0.2880
   -1.0710  -0.8910  -0.9270  -0.9450  -1.0440  -0.9900  -0.9000  -0.2880  -1.0440  -1.0440
   -0.9990  -0.8730  -0.2880  -1.0350  -0.9360  -0.9090  -0.2880  -0.9810  -0.9360  -0.9360
   -1.0260  -1.0440  -0.9450  -1.0440  -0.9990  -1.0260  -0.5850  -0.8730  -0.9090  -0.9090
   -0.9630  -0.9450  -0.9900  -1.0260  -0.9000  -0.8730  -0.4500  -1.0440  -0.2880  -0.9900
   -0.2880  -0.9990  -0.9450  -0.8730  -0.4410  -1.0440  -0.2880  -1.0260  -0.9180  -0.2880
   -1.0710  -0.9900  -1.0440  -0.8910  -0.3690  -0.9090  -0.9990  -0.9450  -0.9450  -1.0530
   -0.9450  -0.2880  -0.9450  -1.0440  -0.6570  -0.2880  -0.9180  -1.0800  -1.0260  -1.0350
   -0.9720  -1.0080  -0.8730  -0.9450  -0.9900  -0.9900  -0.2880  -0.2880  -1.0350  -0.9450
   -0.9720  -1.0260  -0.9720  -0.9900  -0.2880  -0.9090  -1.0440  -0.8730  -1.0440  -0.9900
   -0.2880  -0.9990  -0.2880  -0.9270  -0.8730  -1.0710  -0.9360  -0.9900  -0.2880  -0.9270
   -0.8820  -0.8910  -1.0710  -0.2880  -0.2880  -0.2880  -0.9090  -0.9000  -0.9630  -0.2880
   -0.9090  -0.9090  -0.9090  -1.0440  -0.8910  -0.9810  -0.2880  -0.2880  -0.9090  -1.0440
   -0.9270  -1.0350  -0.2880  -0.9360  -0.9990  -0.8730  -0.9990  -1.0710  -1.0890  -0.9360
   -0.9450  -1.0350  -0.8910  -0.9090  -0.9810  -1.0440  -1.0260  -0.9360  -0.2880  -0.9090
   -0.9900  -0.2880  -0.8730  -0.2880  -1.0080  -1.0260  -0.9450  -0.9450  -0.3600  -0.2880
   -0.2880  -0.9000  -0.9720  -0.9900  -0.9990  -0.9450  -0.9270  -0.8910  -0.6750  -1.0350
   -1.0440  -0.9450  -0.9720  -1.0530  -1.0530  -0.8910  -0.9450  -0.9360  -0.9090  -0.9090
   -0.9360  -1.0350  -0.9090  -0.9810  -0.9900  -0.9090  -0.9900  -0.2880  -1.0890  -0.8910
   -0.9090  -1.0440  -0.9000  -0.8820  -0.9000  -1.0350  -0.8730  -0.9090  -0.4410  -0.9990
   -0.2880  -1.0260  -0.2880  -0.9090  -0.2880  -0.2880  -0.9720  -0.9900  -0.3690  -0.9900
Columns 61 through 70
   -0.9000  -0.2880  -0.9000  -0.9090  -0.6930  -1.0350  -0.2880  -0.9360  -0.9450  -0.8730
   -0.2880  -1.0440  -0.2880  -1.0260  -0.6750  -0.2880  -0.9810  -0.9450  -0.9990  -1.0350
   -0.9630  -1.0260  -0.5850  -1.0350  -0.4050  -0.9810  -0.8730  -1.0260  -0.9900  -1.0440
   -0.9090  -0.8730  -0.4500  -0.9450  -0.6120  -0.9090  -1.0440  -0.9000  -0.2880  -0.2880
   -1.0890  -0.9900  -0.2880  -0.9900  -0.9450  -1.0440  -1.0260  -0.2880  -0.9450  -0.9810
   -0.2880  -1.0350  -1.0350  -0.9270  -1.0350  -0.9360  -0.9450  -1.0080  -1.0350  -0.8730
   -0.3600  -0.9180  -0.9090  -0.2880  -1.0440  -0.9990  -0.8910  -0.9360  -0.2880  -1.0440
   -0.6750  -0.9990  -0.8910  -0.7020  -1.0260  -0.9000  -0.9090  -0.8730  -1.0530  -1.0260
   -0.9090  -1.0260  -0.9990  -1.0530  -0.8730  -0.4500  -1.0350  -1.0350  -1.0350  -0.9450
   -1.0890  -0.9810  -0.9900  -0.9810  -0.8910  -0.3690  -0.2880  -0.9090  -0.9450  -0.8910
   -0.4500  -0.2880  -0.9000  -0.8820  -1.0440  -0.2880  -0.5940  -0.2880  -0.9900  -0.9090
   -0.3690  -0.9810  -0.2880  -0.9090  -0.9450  -1.0440  -0.4410  -0.9990  -0.9270  -1.0350
   -0.2880  -0.8730  -1.0080  -1.0260  -0.9900  -0.9990  -0.2880  -0.9180  -0.2880  -0.2880
   -0.9180  -1.0440  -0.9360  -1.0350  -0.9270  -0.2880  -0.8730  -0.2880  -0.7470  -0.8730
   -0.9990  -1.0260  -0.8730  -0.2880  -0.2880  -0.9270  -0.9900  -1.0440  -0.7740  -0.9900
   -1.0260  -0.9450  -1.0350  -0.6930  -1.0440  -0.9090  -0.9000  -0.9360  -0.6120  -0.9000
   -0.2880  -0.8910  -0.9090  -0.8730  -0.9360  -1.0440  -0.2880  -0.9090  -0.2880  -0.2880
   -0.8730  -0.9090  -0.2880  -1.0440  -0.9090  -0.2880  -0.5940  -0.2880  -0.9990  -1.0350
   -0.2880  -1.0350  -0.9450  -1.0260  -0.2880  -1.0440  -0.4500  -0.9000  -0.9900  -1.0710
   -0.9720  -0.2880  -0.9900  -0.9450  -0.9900  -0.9360  -0.4140  -0.9450  -0.2880  -0.9450
   -0.9450  -0.5850  -0.2880  -0.8910  -1.0530  -0.9090  -0.7560  -1.0350  -1.0440  -1.0440
   -0.9900  -0.4410  -0.9000  -0.9090  -0.9810  -0.2880  -0.9360  -1.0080  -0.9360  -0.8910
   -0.9090  -0.2880  -0.9450  -1.0350  -0.8820  -0.9900  -0.9090  -0.9090  -0.9090  -0.9360
   -0.8730  -0.8730  -1.0350  -0.2880  -0.9090  -0.9090  -0.2880  -1.0260  -0.2880  -0.2880
   -1.0260  -0.9900  -1.0080  -0.3600  -1.0260  -1.0710  -1.0440  -1.0350  -0.9720  -0.7470
Columns 71 through 80
   -0.2880  -0.8910  -1.0350  -0.9900  -0.9090  -0.9990  -0.9990  -0.9270  -0.8910  -0.9810
   -0.9810  -1.0440  -0.2880  -1.0440  -0.2880  -0.9180  -0.9000  -0.2880  -0.9450  -0.8730
   -0.8730  -1.0260  -0.6030  -1.0350  -0.6300  -0.2880  -0.9090  -1.0440  -1.0440  -1.0440
   -1.0440  -0.8730  -0.4410  -0.2880  -0.2880  -1.0440  -0.9000  -0.9360  -1.0890  -1.0260
   -1.0260  -0.9720  -0.2880  -1.0080  -0.5490  -0.9360  -0.2880  -0.9090  -0.2880  -0.9450
   -0.9450  -0.2880  -0.8730  -1.0530  -0.2880  -0.9090  -1.0440  -0.2880  -1.0620  -1.0800
   -1.0800  -0.9180  -0.9900  -1.0440  -0.8190  -0.2880  -0.9090  -1.0080  -0.8730  -0.2880
   -0.2880  -0.9990  -0.9000  -1.0440  -0.6030  -0.9450  -1.0800  -1.0260  -0.9720  -0.8910
   -0.8730  -1.0260  -0.2880  -0.9450  -0.4410  -0.9900  -1.0440  -0.9990  -1.0530  -0.9990
   -0.9810  -0.2880  -0.6030  -0.9900  -0.2880  -0.9450  -0.4140  -0.8910  -0.9090  -0.9810
   -0.9990  -1.0440  -0.4500  -0.9270  -0.6030  -1.0440  -0.2880  -0.9090  -1.0350  -1.0080
   -0.9900  -0.9360  -0.2880  -0.2880  -0.4500  -0.9450  -0.7560  -1.0350  -0.2880  -0.9990
   -0.9270  -0.9090  -1.0710  -0.8730  -0.8370  -0.8730  -0.9360  -1.0350  -0.2880  -1.0350
   -0.2880  -0.2880  -0.9360  -1.0350  -0.2880  -0.9720  -0.9090  -0.2880  -0.9450  -0.9450
   -1.0440  -0.9900  -0.9450  -0.2880  -1.0440  -0.2880  -0.9900  -0.9990  -0.9900  -1.0440
   -0.9360  -0.9090  -0.8910  -0.8910  -0.9360  -0.9990  -0.2880  -0.9180  -0.2880  -0.9090
   -0.9090  -1.0710  -0.9360  -0.9990  -0.9090  -0.9180  -0.8910  -0.2880  -1.0440  -0.2880
```

```
 -0.2880  -0.2880  -0.2880  -1.0260  -0.2880  -0.2880  -0.9990  -0.8910  -0.9360  -0.6300
 -1.0440  -0.9810  -1.0260  -1.0260  -0.9810  -1.0440  -0.9900  -0.9360  -0.9090  -0.3960
 -1.0710  -0.8730  -0.9090  -0.9090  -0.8730  -0.9360  -0.9000  -1.0260  -0.2880  -0.2880
 -0.9990  -1.0440  -1.0080  -0.9720  -1.0440  -0.9090  -1.0530  -0.9990  -0.9720  -1.0710
 -0.2880  -1.0260  -1.0260  -0.8730  -1.0260  -0.2880  -0.8910  -0.9810  -0.8730  -0.9360
 -1.0350  -0.9450  -0.9090  -1.0440  -0.9450  -0.9090  -1.0440  -0.8730  -1.0350  -0.9450
 -1.0080  -0.8910  -1.0350  -0.9450  -1.0800  -0.9900  -0.9450  -1.0440  -1.0440  -0.8910
 -0.9090  -0.9090  -0.9090  -1.0620  -0.2880  -0.8910  -0.9900  -0.9450  -0.2880  -0.9360

f(:,:,2) =
  1.0e+003 *
  Columns 1 through 10
   0.2880   0.9990   0.2880   0.2880   0.9270   0.2880   1.0530   0.9720   0.8730   0.8730
   1.0710   0.9900   1.0440   0.9720   0.2880   0.9990   0.9090   0.9990   0.9450   0.9900
   0.9450   0.4050   0.9990   0.9090   1.0710   0.9900   1.0350   1.0350   0.9900   0.9000
   0.9720   1.0350   0.2880   1.0350   0.9360   0.9090   0.2880   0.9090   0.9450   0.2880
   0.9720   1.0080   1.0350   1.0350   0.8730   0.2880   0.9990   0.9000   0.9900   1.0440
   0.2880   0.9090   0.8730   0.2880   1.0440   1.0440   0.9180   0.2880   0.9270   0.9360
   0.8820   0.8910   1.0890   1.0440   0.2880   0.9990   0.2880   1.0350   0.2880   0.9090
   0.9090   0.9450   0.2880   0.9360   0.9450   0.2880   0.9720   0.9090   1.0440   0.2880
   0.2880   0.9180   0.9450   0.8730   1.0350   0.8820   0.8730   1.0440   0.9360   1.0350
   1.0620   0.9450   0.9900   0.9900   0.2880   0.9090   1.0440   0.2880   0.9090   0.9810
   0.8730   0.8910   0.8910   0.2880   0.8820   0.2880   0.9090   0.8190   0.2880   0.8730
   0.9720   0.2880   0.9720   1.0980   0.9450   1.0530   1.0260   0.4320   0.9720   0.9720
   1.0530   1.0260   1.0530   0.9090   0.9270   0.9720   0.2880   0.3960   0.8730   0.9720
   0.9090   0.8730   0.9000   1.0260   0.9270   1.0440   1.0710   0.4410   1.0260   0.9090
   1.0350   0.9900   0.9450   0.9990   0.9090   0.9450   0.9450   0.8370   0.9270   1.0350
   0.2880   0.9270   0.9900   0.3960   1.0260   0.9810   1.0440   0.2880   0.9090   1.0440
   0.9990   0.9090   0.9270   0.2880   0.2880   0.8730   0.9360   1.0710   1.0350   0.2880
   0.9180   0.2880   0.2880   0.9450   1.0440   1.0440   0.9450   0.9360   1.0440   1.0620
   0.2880   1.0440   1.0710   0.9900   0.9360   0.9090   0.9900   0.9450   0.2880   0.8730
   1.0260   0.9360   0.9360   0.8910   0.8730   0.9720   0.2880   0.9720   1.0620   0.9720
   0.9090   0.8730   0.8730   0.9720   0.9900   1.0890   1.0440   0.9090   0.8730   1.0530
   0.8730   1.0440   1.0440   1.0530   0.2880   0.2880   0.9360   0.2880   0.9720   0.9090
   0.9720   0.2880   0.2880   0.9000   1.0440   1.0620   0.9090   1.0260   1.0530   0.4140
   0.2880   0.9450   0.9450   0.9450   0.9360   0.8730   0.2880   0.9090   0.9090   0.4140
   0.9900   1.0350   1.0350   0.9900   0.9090   0.9720   0.8910   1.0440   0.2880   0.4140
  Columns 11 through 20
   0.2880   1.0440   0.2880   0.9900   0.2880   0.8730   0.7560   0.9270   1.0260   0.3600
   0.6570   0.9360   1.0440   0.2880   1.0080   0.9720   0.9360   0.2880   1.0890   0.6930
   0.9900   0.9090   0.9360   1.0620   0.9360   0.9720   0.9090   0.9810   1.0080   0.4140
   0.2880   0.2880   0.9090   0.9090   0.8730   0.9090   0.2880   0.8730   1.0440   0.6750
   1.0440   0.9720   0.2880   1.0260   1.0350   0.9000   0.9180   1.0440   0.9090   0.4140
   0.9360   0.8730   1.0080   1.0350   0.9090   0.2880   0.9450   1.0260   0.9000   0.2880
   0.9090   1.0350   0.9990   0.8730   0.2880   0.3600   0.9900   0.9450   0.2880   0.7560
   0.2880   1.0440   1.0350   0.2880   0.9450   0.6930   0.8730   1.0800   1.0440   0.9090
   0.9810   0.2880   1.0350   0.9450   0.9900   0.6750   0.9720   0.2880   0.9090   1.0800
   0.8730   0.9810   0.9450   0.9900   0.2880   0.2880   0.2880   0.9450   1.0800   1.0440
   1.0440   0.8730   0.8820   0.2880   0.8730   1.0080   0.9810   1.0350   1.0440   0.2880
   1.0260   1.0440   0.9450   1.0440   0.2880   1.0260   0.8730   0.2880   0.2880   0.6030
   0.9450   1.0260   0.9720   0.9360   1.0710   0.9090   1.0440   1.0440   1.0440   0.9450
   1.0800   0.9450   0.9450   0.9090   0.8730   1.0350   1.0260   0.9360   0.9360   1.0080
   0.2880   1.0800   1.0440   0.2880   1.0890   1.0350   0.9450   0.9090   0.8730   0.9360
   0.6300   0.2880   1.0890   0.9000   0.2880   0.2880   1.0800   0.2880   1.0440   0.9090
   0.6300   1.0440   0.2880   0.9090   1.0440   0.9900   0.2880   0.9180   0.2880   1.0260
   0.2880   0.9990   0.9990   0.8910   0.9360   1.0530   1.0260   0.9450   1.0710   0.4410
   1.0710   0.2880   0.9180   1.0260   0.8730   0.9810   0.9090   0.9900   0.9090   0.3690
   0.9450   0.9090   0.2880   1.0890   1.0440   0.8820   1.0350   0.8730   0.2880   0.4140
   1.0440   0.9900   1.0260   1.0080   0.2880   0.9090   1.0530   0.9720   0.8910  -0.0000
   0.9360   1.0350   0.9090   1.0440   1.0710   1.0260   0.9720   0.2880   0.8730  -0.0000
   0.9450   1.0530   1.0440   0.9450   0.9090   1.0350   1.0440   0.9090   0.9720  -0.0000
   0.9900   1.0260   1.0530   0.9990   0.2880   0.3690   0.9450   0.9900   0.9720  -0.0000
   0.2880   0.9090   1.0260   0.9900   0.8910   0.2880   0.9900   0.8910   0.2880  -0.0000
  Columns 21 through 30
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
  Columns 31 through 40
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
       0        0        0        0        0        0        0        0        0        0
```

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Columns 41 through 50

-0.2880	-0.9990	-0.2880	-0.2880	-0.9270	-0.2880	-1.0530	-0.9720	-0.8730	-0.8730
-1.0710	-0.9900	-1.0440	-0.9720	-0.2880	-0.9990	-0.9090	-0.9990	-0.9450	-0.9900
-0.9450	-0.4050	-0.9990	-0.9090	-1.0710	-0.9900	-1.0350	-1.0350	-0.9900	-0.9000
-0.9720	-1.0350	-0.2880	-1.0350	-0.9360	-0.9090	-0.2880	-0.9090	-0.9450	-0.2880
-0.9720	-1.0080	-1.0350	-1.0350	-0.8730	-0.2880	-0.9990	-0.9000	-0.9900	-1.0440
-0.2880	-0.9090	-0.8730	-0.2880	-1.0440	-1.0440	-0.9180	-0.2880	-0.9270	-0.9360
-0.8820	-0.8910	-1.0890	-1.0440	-0.2880	-0.9990	-0.2880	-1.0350	-0.2880	-0.9090
-0.9090	-0.9450	-0.2880	-0.9360	-0.9450	-0.2880	-0.9720	-0.9090	-1.0440	-0.2880
-0.2880	-0.9180	-0.9450	-0.8730	-1.0350	-0.8820	-0.8730	-1.0440	-0.9360	-1.0350
-1.0620	-0.9450	-0.9900	-0.9900	-0.2880	-0.9090	-1.0440	-0.2880	-0.9090	-0.9810
-0.8730	-0.8910	-0.8910	-0.2880	-0.8820	-0.2880	-0.9090	-0.8190	-0.2880	-0.8730
-0.9720	-0.2880	-0.9720	-1.0980	-0.9450	-1.0530	-1.0260	-0.4320	-0.9720	-0.9720
-1.0530	-1.0260	-1.0530	-0.9090	-0.9270	-0.9720	-0.2880	-0.3960	-0.8730	-0.9720
-0.9090	-0.8730	-0.9000	-1.0260	-0.9270	-1.0440	-1.0710	-0.4410	-1.0260	-0.9090
-1.0350	-0.9900	-0.9450	-0.9990	-0.9090	-0.9450	-0.9450	-0.8370	-0.9270	-1.0350
-0.2880	-0.9270	-0.9900	-0.3960	-1.0260	-0.9810	-1.0440	-0.2880	-0.9090	-1.0440
-0.9990	-0.9090	-0.9270	-0.2880	-0.2880	-0.8730	-0.9360	-1.0710	-1.0350	-0.2880
-0.9180	-0.2880	-0.2880	-0.9450	-1.0440	-1.0440	-0.9450	-0.9360	-1.0440	-1.0620
-0.2880	-1.0440	-1.0710	-0.9900	-0.9360	-0.9090	-0.9900	-0.9450	-0.2880	-0.8730
-1.0260	-0.9360	-0.9360	-0.8910	-0.8730	-0.9720	-0.2880	-0.9720	-1.0620	-0.9720
-0.9090	-0.8730	-0.8730	-0.9720	-0.9900	-1.0890	-1.0440	-0.9090	-0.8730	-1.0530
-0.8730	-1.0440	-1.0440	-1.0530	-0.2880	-0.2880	-0.9360	-0.2880	-0.9720	-0.9090
-0.9720	-0.2880	-0.2880	-0.9000	-1.0440	-1.0620	-0.9090	-1.0260	-1.0530	-0.4140
-0.2880	-0.9450	-0.9450	-0.9450	-0.9360	-0.8730	-0.2880	-0.9090	-0.9090	-0.4140
-0.9900	-1.0350	-1.0350	-0.9900	-0.9090	-0.9720	-0.8910	-1.0440	-0.2880	-0.4140

Columns 51 through 60

-0.2880	-1.0440	-0.2880	-0.9900	-0.2880	-0.8730	-0.7560	-0.9270	-1.0260	-0.3600
-0.6570	-0.9360	-1.0440	-0.2880	-1.0080	-0.9720	-0.9360	-0.2880	-1.0890	-0.6930
-0.9900	-0.9090	-0.9360	-1.0620	-0.9360	-0.9720	-0.9090	-0.9810	-1.0080	-0.4140
-0.2880	-0.2880	-0.9090	-0.9090	-0.8730	-0.9090	-0.2880	-0.8730	-1.0440	-0.6750
-1.0440	-0.9720	-0.2880	-1.0260	-1.0350	-0.9000	-0.9180	-1.0440	-0.9090	-0.4140
-0.9360	-0.8730	-1.0080	-1.0350	-0.9090	-0.2880	-0.9450	-1.0260	-0.9000	-0.2880
-0.9090	-1.0350	-0.9990	-0.8730	-0.2880	-0.3600	-0.9900	-0.9450	-0.2880	-0.7560
-0.2880	-1.0440	-1.0350	-0.2880	-0.9450	-0.6930	-0.8730	-1.0800	-1.0440	-0.9090
-0.9810	-0.2880	-1.0350	-0.9450	-0.9900	-0.6750	-0.9720	-0.2880	-0.9090	-1.0800
-0.8730	-0.9810	-0.9450	-0.9900	-0.2880	-0.2880	-0.2880	-0.9450	-1.0800	-1.0440
-1.0440	-0.8730	-0.8820	-0.2880	-0.8730	-1.0080	-0.9810	-1.0350	-1.0440	-0.2880
-1.0260	-1.0440	-0.9450	-1.0440	-0.2880	-1.0260	-0.8730	-0.2880	-0.2880	-0.6030
-0.9450	-1.0260	-0.9720	-0.9360	-1.0710	-0.9090	-1.0440	-1.0440	-1.0440	-0.9450
-1.0800	-0.9450	-0.9450	-0.9090	-0.8730	-1.0350	-1.0260	-0.9360	-0.9360	-1.0080
-0.2880	-1.0800	-1.0440	-0.2880	-1.0890	-1.0350	-0.9450	-0.9090	-0.8730	-0.9360
-0.6300	-0.2880	-1.0890	-0.9000	-0.2880	-0.2880	-1.0800	-0.2880	-1.0440	-0.9090
-0.6300	-1.0440	-0.2880	-0.9090	-1.0440	-0.9900	-0.2880	-0.9180	-0.2880	-1.0260
-0.2880	-0.9990	-0.9990	-0.8910	-0.9360	-1.0530	-1.0260	-0.9450	-1.0710	-0.4410
-1.0710	-0.2880	-0.9180	-1.0260	-0.8730	-0.9810	-0.9090	-0.9900	-0.9090	-0.3690
-0.9450	-0.9090	-0.2880	-1.0890	-1.0440	-0.8820	-1.0350	-0.8730	-0.2880	-0.4140
-1.0440	-0.9900	-1.0260	-1.0080	-0.2880	-0.9090	-1.0530	-0.9720	-0.8910	0.0000
-0.9360	-1.0350	-0.9090	-1.0440	-1.0710	-1.0260	-0.9720	-0.2880	-0.8730	0.0000
-0.9450	-1.0530	-1.0440	-0.9450	-0.9090	-1.0350	-1.0440	-0.9090	-0.9720	0.0000
-0.9900	-1.0260	-1.0530	-0.9990	-0.2880	-0.3690	-0.9450	-0.9900	-0.9720	0.0000
-0.2880	-0.9090	-1.0260	-0.9900	-0.8910	-0.2880	-0.9900	-0.8910	-0.2880	0.0000

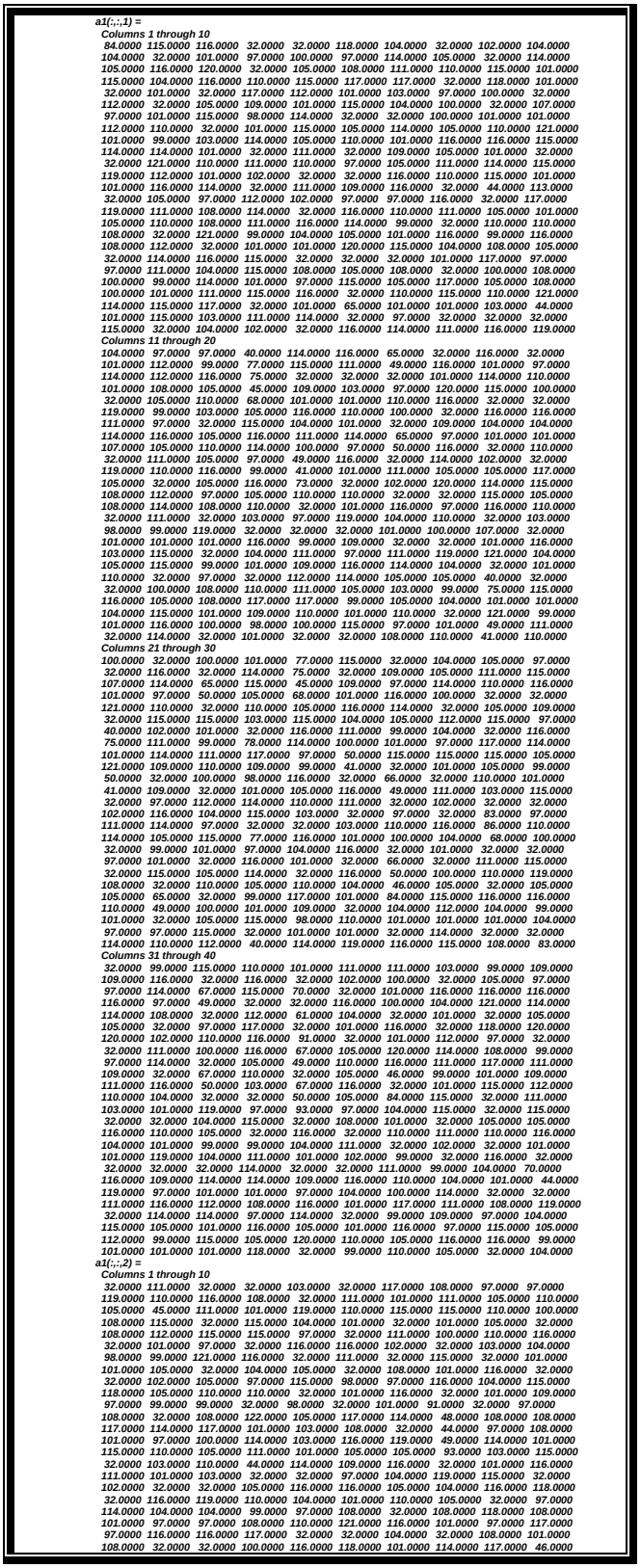
Columns 61 through 70

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Columns 71 through 80

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

The Numbers of the text after decoding It contain 2000 element and all of it is include error does not resemble the original numbers.



```
a1(:,:,1) =
  Columns 1 through 10
   84.0000  115.0000  116.0000   32.0000   32.0000  118.0000  104.0000   32.0000  102.0000  104.0000
  104.0000   32.0000  101.0000   97.0000  100.0000   97.0000  114.0000  105.0000   32.0000  114.0000
  105.0000  116.0000  120.0000   32.0000  105.0000  108.0000  111.0000  110.0000  115.0000  101.0000
  115.0000  104.0000  116.0000  110.0000  115.0000  117.0000  117.0000   32.0000  118.0000  101.0000
   32.0000  101.0000   32.0000  117.0000  112.0000  101.0000  103.0000   97.0000  100.0000   32.0000
  112.0000   32.0000  105.0000  109.0000  101.0000  115.0000  104.0000  100.0000   32.0000  107.0000
   97.0000  101.0000  115.0000   98.0000  114.0000   32.0000   32.0000  100.0000  101.0000  101.0000
  112.0000  110.0000   32.0000  101.0000  115.0000  105.0000  114.0000  105.0000  110.0000  121.0000
  101.0000   99.0000  103.0000  114.0000  105.0000  110.0000  101.0000  116.0000  116.0000  115.0000
  114.0000  114.0000  101.0000   32.0000  111.0000   32.0000  109.0000  105.0000  101.0000   32.0000
   32.0000  121.0000  110.0000  111.0000  110.0000   97.0000  105.0000  111.0000  114.0000  115.0000
  119.0000  112.0000  101.0000  102.0000   32.0000   32.0000  116.0000  110.0000  115.0000  101.0000
  101.0000  116.0000  114.0000   32.0000  111.0000  109.0000  116.0000   32.0000   44.0000  113.0000
   32.0000  105.0000   97.0000  112.0000  102.0000   97.0000   97.0000  116.0000   32.0000  117.0000
  119.0000  111.0000  108.0000  114.0000   32.0000  116.0000  110.0000  111.0000  105.0000  101.0000
  105.0000  110.0000  108.0000  111.0000  116.0000  114.0000   99.0000   32.0000  110.0000  110.0000
  108.0000   32.0000  121.0000   99.0000  104.0000  105.0000  101.0000  116.0000   99.0000  116.0000
  108.0000  112.0000   32.0000  101.0000  101.0000  120.0000  115.0000  104.0000  108.0000  105.0000
   32.0000  114.0000  116.0000  115.0000   32.0000   32.0000   32.0000  101.0000  117.0000   97.0000
   97.0000  111.0000  104.0000  115.0000  108.0000  105.0000  108.0000   32.0000  100.0000  108.0000
  100.0000   99.0000  114.0000  101.0000   97.0000  115.0000  105.0000  117.0000  105.0000  108.0000
  100.0000  101.0000  111.0000  115.0000  116.0000   32.0000  110.0000  115.0000  110.0000  121.0000
  114.0000  115.0000  117.0000   32.0000  101.0000   65.0000  101.0000  101.0000  103.0000   44.0000
  101.0000  115.0000  103.0000  111.0000  114.0000   32.0000   97.0000   32.0000   32.0000   32.0000
  115.0000   32.0000  104.0000  102.0000   32.0000  116.0000  114.0000  111.0000  116.0000  119.0000
  Columns 11 through 20
  104.0000   97.0000   97.0000   40.0000  114.0000  116.0000   65.0000   32.0000  116.0000   32.0000
  101.0000  112.0000   99.0000   77.0000  115.0000  111.0000   49.0000  116.0000  101.0000   97.0000
  114.0000  112.0000  116.0000   75.0000   32.0000   32.0000   32.0000  101.0000  114.0000  110.0000
  101.0000  108.0000  105.0000   45.0000  109.0000  103.0000   97.0000  120.0000  115.0000  100.0000
   32.0000  105.0000  110.0000   68.0000  101.0000  101.0000  110.0000  116.0000   32.0000   32.0000
  119.0000   99.0000  103.0000  105.0000  116.0000  110.0000  100.0000   32.0000  116.0000  116.0000
  111.0000   97.0000   32.0000  115.0000  104.0000  101.0000   32.0000  109.0000  104.0000  104.0000
  114.0000  116.0000  105.0000  116.0000  111.0000  114.0000   65.0000   97.0000  101.0000  101.0000
  107.0000  105.0000  110.0000  114.0000  100.0000   97.0000   50.0000  116.0000   32.0000  110.0000
   32.0000  111.0000  105.0000   97.0000   49.0000  116.0000   32.0000  114.0000  102.0000   32.0000
  119.0000  110.0000  116.0000   99.0000   41.0000  101.0000  111.0000  105.0000  105.0000  117.0000
  105.0000   32.0000  105.0000  116.0000   73.0000   32.0000  102.0000  120.0000  114.0000  115.0000
  108.0000  112.0000   97.0000  105.0000  110.0000  110.0000   32.0000   32.0000  115.0000  105.0000
  108.0000  114.0000  108.0000  110.0000   32.0000  101.0000  116.0000   97.0000  116.0000  110.0000
   32.0000  111.0000   32.0000  103.0000   97.0000  119.0000  104.0000  110.0000   32.0000  103.0000
   98.0000   99.0000  119.0000   32.0000   32.0000   32.0000  101.0000  100.0000  107.0000   32.0000
  101.0000  101.0000  101.0000  116.0000   99.0000  109.0000   32.0000   32.0000  101.0000  116.0000
  103.0000  115.0000   32.0000  104.0000  111.0000   97.0000  111.0000  119.0000  121.0000  104.0000
  105.0000  115.0000   99.0000  101.0000  109.0000  116.0000  114.0000  104.0000   32.0000  101.0000
  110.0000   32.0000   97.0000   32.0000  112.0000  114.0000  105.0000  105.0000   40.0000   32.0000
   32.0000  100.0000  108.0000  110.0000  111.0000  105.0000  103.0000   99.0000   75.0000  115.0000
  116.0000  105.0000  108.0000  117.0000  117.0000   99.0000  105.0000  104.0000  101.0000  101.0000
  104.0000  115.0000  101.0000  109.0000  110.0000  101.0000  110.0000   32.0000  121.0000   99.0000
  101.0000  116.0000  100.0000   98.0000  100.0000  115.0000   97.0000  101.0000   49.0000  111.0000
   32.0000  114.0000   32.0000  101.0000   32.0000   32.0000  108.0000  110.0000   41.0000  110.0000
  Columns 21 through 30
  100.0000   32.0000  100.0000  101.0000   77.0000  115.0000   32.0000  104.0000  105.0000   97.0000
   32.0000  116.0000   32.0000  114.0000   75.0000   32.0000  109.0000  105.0000  111.0000  115.0000
  107.0000  114.0000   65.0000  115.0000   45.0000  109.0000   97.0000  114.0000  110.0000  116.0000
  101.0000   97.0000   50.0000  105.0000   68.0000  101.0000  116.0000  100.0000   32.0000   32.0000
  121.0000  110.0000   32.0000  110.0000  105.0000  116.0000  114.0000   32.0000  105.0000  109.0000
   32.0000  115.0000  115.0000  103.0000  115.0000  104.0000  105.0000  112.0000  115.0000   97.0000
   40.0000  102.0000  101.0000   32.0000  116.0000  111.0000   99.0000  104.0000   32.0000  116.0000
   75.0000  111.0000   99.0000   78.0000  114.0000  100.0000  101.0000   97.0000  117.0000  114.0000
  101.0000  114.0000  111.0000  117.0000   97.0000   50.0000  115.0000  115.0000  115.0000  105.0000
  121.0000  109.0000  110.0000  109.0000   99.0000   41.0000   32.0000  101.0000  105.0000   99.0000
   50.0000   32.0000  100.0000   98.0000  116.0000   32.0000   66.0000   32.0000  110.0000  101.0000
   41.0000  109.0000   32.0000  101.0000  105.0000  116.0000   49.0000  111.0000  103.0000  115.0000
   32.0000   97.0000  112.0000  114.0000  110.0000  111.0000   32.0000  102.0000   32.0000   32.0000
  102.0000  116.0000  104.0000  115.0000  103.0000   32.0000   97.0000   32.0000   83.0000   97.0000
  111.0000  114.0000   97.0000   32.0000   32.0000  103.0000  110.0000  116.0000   86.0000  110.0000
  114.0000  105.0000  115.0000   77.0000  116.0000  101.0000  100.0000  104.0000   68.0000  100.0000
   32.0000   99.0000  101.0000   97.0000  104.0000  116.0000   32.0000  101.0000   32.0000   32.0000
   97.0000  101.0000   32.0000  116.0000  101.0000   32.0000   66.0000   32.0000  111.0000  115.0000
   32.0000  115.0000  105.0000  114.0000   32.0000  116.0000   50.0000  100.0000  110.0000  119.0000
  108.0000   32.0000  110.0000  105.0000  110.0000  104.0000   46.0000  105.0000   32.0000  105.0000
  105.0000   65.0000   32.0000   99.0000  117.0000  101.0000   84.0000  115.0000  116.0000  116.0000
  110.0000   49.0000  100.0000  101.0000  109.0000   32.0000  104.0000  112.0000  104.0000   99.0000
  101.0000   32.0000  105.0000  115.0000   98.0000  110.0000  101.0000  101.0000  101.0000  104.0000
   97.0000   97.0000  115.0000   32.0000  101.0000  101.0000   32.0000  114.0000   32.0000   32.0000
  114.0000  110.0000  112.0000   40.0000  114.0000  119.0000  116.0000  115.0000  108.0000   83.0000
  Columns 31 through 40
   32.0000   99.0000  115.0000  110.0000  101.0000  111.0000  111.0000  103.0000   99.0000  109.0000
  109.0000  116.0000   32.0000  116.0000   32.0000  102.0000  100.0000   32.0000  105.0000   97.0000
   97.0000  114.0000   67.0000  115.0000   70.0000   32.0000  101.0000  116.0000  116.0000  116.0000
  116.0000   97.0000   49.0000   32.0000   32.0000  116.0000  100.0000  104.0000  121.0000  114.0000
  114.0000  108.0000   32.0000  112.0000   61.0000  104.0000   32.0000  101.0000   32.0000  105.0000
  105.0000   32.0000   97.0000  117.0000   32.0000  101.0000  116.0000   32.0000  118.0000  120.0000
  120.0000  102.0000  110.0000  116.0000   91.0000   32.0000  101.0000  112.0000   97.0000   32.0000
   32.0000  111.0000  100.0000  116.0000   67.0000  105.0000  120.0000  114.0000  108.0000   99.0000
   97.0000  114.0000   32.0000  105.0000   49.0000  110.0000  116.0000  111.0000  117.0000  111.0000
  109.0000   32.0000   67.0000  110.0000   32.0000  105.0000   46.0000   99.0000  101.0000  109.0000
  111.0000  116.0000   50.0000  103.0000   67.0000  116.0000   32.0000  101.0000  115.0000  112.0000
  110.0000  104.0000   32.0000   32.0000   50.0000  105.0000   84.0000  115.0000   32.0000  111.0000
  103.0000  101.0000  119.0000   97.0000   93.0000   97.0000  104.0000  115.0000   32.0000  115.0000
   32.0000   32.0000  104.0000  115.0000   32.0000  108.0000  101.0000   32.0000  105.0000  105.0000
  116.0000  110.0000  105.0000   32.0000  116.0000   32.0000  110.0000  111.0000  110.0000  116.0000
  104.0000  101.0000   99.0000   99.0000  104.0000  111.0000   32.0000  102.0000   32.0000  101.0000
  101.0000  119.0000  104.0000  111.0000  101.0000  102.0000   99.0000   32.0000  116.0000   32.0000
   32.0000   32.0000   32.0000  114.0000   32.0000   32.0000  111.0000   99.0000  104.0000   70.0000
  116.0000  109.0000  114.0000  114.0000  109.0000  116.0000  110.0000  104.0000  101.0000   44.0000
  119.0000   97.0000  101.0000  101.0000   97.0000  104.0000  100.0000  114.0000   32.0000   32.0000
  111.0000  116.0000  112.0000  108.0000  116.0000  101.0000  117.0000  111.0000  108.0000  119.0000
   32.0000  114.0000  114.0000   97.0000  114.0000   32.0000   99.0000  109.0000   97.0000  104.0000
  115.0000  105.0000  101.0000  116.0000  105.0000  101.0000  116.0000   97.0000  115.0000  105.0000
  112.0000   99.0000  115.0000  105.0000  120.0000  110.0000  105.0000  116.0000  116.0000   99.0000
  101.0000  101.0000  101.0000  118.0000   32.0000   99.0000  110.0000  105.0000   32.0000  104.0000
a1(:,:,2) =
  Columns 1 through 10
   32.0000  111.0000   32.0000   32.0000  103.0000   32.0000  117.0000  108.0000   97.0000   97.0000
  119.0000  110.0000  116.0000  108.0000   32.0000  111.0000  101.0000  111.0000  105.0000  110.0000
  105.0000   45.0000  111.0000  101.0000  119.0000  110.0000  115.0000  115.0000  110.0000  100.0000
  108.0000  115.0000   32.0000  115.0000  104.0000  101.0000   32.0000  101.0000  105.0000   32.0000
  108.0000  112.0000  115.0000  115.0000   97.0000   32.0000  111.0000  100.0000  110.0000  116.0000
   32.0000  101.0000   97.0000   32.0000  116.0000  116.0000  102.0000   32.0000  103.0000  104.0000
   98.0000   99.0000  121.0000  116.0000   32.0000  111.0000   32.0000  115.0000   32.0000  101.0000
  101.0000  105.0000   32.0000  104.0000  105.0000   32.0000  108.0000  101.0000  116.0000   32.0000
   32.0000  102.0000  105.0000   97.0000  115.0000   98.0000   97.0000  116.0000  104.0000  115.0000
  118.0000  105.0000  110.0000  110.0000   32.0000  101.0000  116.0000   32.0000  101.0000  109.0000
   97.0000   99.0000   99.0000   32.0000   98.0000   32.0000  101.0000   91.0000   32.0000   97.0000
  108.0000   32.0000  108.0000  122.0000  105.0000  117.0000  114.0000   48.0000  108.0000  108.0000
  117.0000  114.0000  117.0000  101.0000  103.0000  108.0000   32.0000   44.0000   97.0000  108.0000
  101.0000   97.0000  100.0000  114.0000  103.0000  116.0000  119.0000   49.0000  114.0000  101.0000
  115.0000  110.0000  105.0000  111.0000  101.0000  105.0000  105.0000   93.0000  103.0000  115.0000
   32.0000  103.0000  110.0000   44.0000  114.0000  109.0000  116.0000   32.0000  101.0000  116.0000
  111.0000  101.0000  103.0000   32.0000   32.0000   97.0000  104.0000  119.0000  115.0000   32.0000
  102.0000   32.0000   32.0000  105.0000  116.0000  116.0000  105.0000  104.0000  116.0000  118.0000
   32.0000  116.0000  119.0000  110.0000  104.0000  101.0000  110.0000  105.0000   32.0000   97.0000
  114.0000  104.0000  104.0000   99.0000   97.0000  108.0000   32.0000  108.0000  118.0000  108.0000
  101.0000   97.0000   97.0000  108.0000  110.0000  121.0000  116.0000  101.0000   97.0000  117.0000
   97.0000  116.0000  116.0000  117.0000   32.0000   32.0000  104.0000   32.0000  108.0000  101.0000
  108.0000   32.0000   32.0000  100.0000  116.0000  118.0000  101.0000  114.0000  117.0000   46.0000
```

```
  32.0000  105.0000  105.0000  105.0000  104.0000   97.0000   32.0000  101.0000  101.0000   46.0000
 110.0000  115.0000  115.0000  110.0000  101.0000  108.0000   99.0000  116.0000   32.0000   46.0000
Columns 11 through 20
  32.0000  116.0000   32.0000  110.0000   32.0000   97.0000   84.0000  103.0000  114.0000   40.0000
  73.0000  104.0000  116.0000   32.0000  112.0000  108.0000  104.0000   32.0000  121.0000   77.0000
 110.0000  101.0000  104.0000  118.0000  104.0000  108.0000  101.0000  109.0000  112.0000   46.0000
  32.0000   32.0000  101.0000  101.0000   97.0000  101.0000   32.0000   97.0000  116.0000   75.0000
 116.0000  108.0000   32.0000  114.0000  115.0000  100.0000  102.0000  116.0000  101.0000   46.0000
 104.0000   97.0000  112.0000  115.0000  101.0000   32.0000  105.0000  114.0000  100.0000   32.0000
 101.0000  115.0000  111.0000   97.0000   32.0000   40.0000  110.0000  105.0000   32.0000   84.0000
  32.0000  116.0000  115.0000   32.0000  105.0000   77.0000   97.0000  120.0000  116.0000  101.0000
 109.0000   32.0000  115.0000  105.0000  110.0000   75.0000  108.0000   32.0000  101.0000  120.0000
  97.0000  109.0000  105.0000  110.0000   32.0000   32.0000   32.0000  105.0000  120.0000  116.0000
 116.0000   97.0000   98.0000   32.0000   97.0000  112.0000  109.0000  115.0000  116.0000   32.0000
 114.0000  116.0000  105.0000  116.0000   32.0000  114.0000   97.0000   32.0000   32.0000   67.0000
 105.0000  114.0000  108.0000  104.0000  119.0000  101.0000  116.0000  116.0000  116.0000  105.0000
 120.0000  105.0000  105.0000  101.0000   97.0000  115.0000  114.0000  104.0000  104.0000  112.0000
  32.0000  120.0000  116.0000   32.0000  121.0000  115.0000  105.0000  101.0000   97.0000  104.0000
  70.0000   32.0000  121.0000  100.0000   32.0000   32.0000  120.0000   32.0000  116.0000  101.0000
  70.0000  116.0000   32.0000  101.0000  116.0000  110.0000   32.0000  102.0000   32.0000  114.0000
  32.0000  111.0000  111.0000   99.0000  104.0000  117.0000  114.0000  105.0000  119.0000   49.0000
 119.0000   32.0000  102.0000  114.0000   97.0000  109.0000  101.0000  110.0000  101.0000   41.0000
 105.0000  101.0000   32.0000  121.0000  116.0000   98.0000  115.0000   97.0000   32.0000   46.0000
 116.0000  110.0000  114.0000  112.0000   32.0000  101.0000  117.0000  108.0000   99.0000   -0.0000
 104.0000  115.0000  101.0000  116.0000  119.0000  114.0000  108.0000   32.0000   97.0000   -0.0000
 105.0000  117.0000  116.0000  105.0000  101.0000  115.0000  116.0000  101.0000  108.0000   -0.0000
 110.0000  114.0000  117.0000  111.0000   32.0000   41.0000  105.0000  110.0000  108.0000   -0.0000
  32.0000  101.0000  114.0000  110.0000   99.0000   32.0000  110.0000   99.0000   32.0000   -0.0000
Columns 21 through 30
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
Columns 31 through 40
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0
```

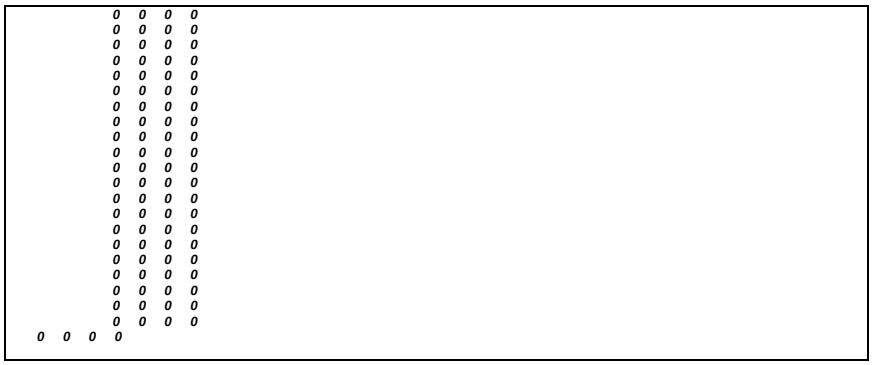
4.3

Average the absolute value of the difference between the elements of Matrix of The numbers after decoding and Matrix of The numbers before the encryption is equal = 8.7869e-012.

The Numbers of the text after decoding and its treatment mathematically to approximated to the nearest integer it contain 2000 element and its quite similar to the original matrix and the zeros at its end which representing spaces been added at the beginning of the encryption need for programming and do not affect the content of the text.

```
aba(:,:,1) =
 Columns 1 through 18
  84  115  116   32   32  118  104   32  102  104  104   97   97   40  114  116   65   32
 104   32  101   97  100   97  114  105   32  114  101  112   99   77  115  111   49  116
 105  116  120   32  105  108  111  110  115  101  114  112  116   75   32   32   32  101
 115  104  116  110  115  117  117   32  118  101  101  108  105   45  109  103   97  120
  32  101   32  117  112  101  103   97  100   32   32  105  110   68  101  101  110  116
 112   32  105  109  101  115  104  100   32  107  119   99  103  105  116  110  100   32
  97  101  115   98  114   32   32  100  101  101  111   97   32  115  104  101   32  109
 112  110   32  101  115  105  114  105  110  121  114  116  105  116  111  114   65   97
 101   99  103  114  105  110  101  116  116  115  107  105  110  114  100   97   50  116
 114  114  101   32  111   32  109  105  101   32   32  111  105   97   49  116   32  114
  32  121  110  111  110   97  105  111  114  115  119  110  116   99   41  101  111  105
 119  112  101  102   32   32  116  110  115  101  105   32  105  116   73   32  102  120
 101  116  114   32  111  109  116   32   44  113  108  112   97  105  110  110   32   32
  32  105   97  112  102   97   97  116   32  117  108  114  108  110   32  101  116   97
 119  111  108  114   32  116  110  111  105  101   32  111   32  103   97  119  104  110
 105  110  108  111  116  114   99   32  110  110   98   99  119   32   32   32  101  100
 108   32  121   99  104  105  101  116   99  116  101  101  101  116   99  109   32   32
 108  112   32  101  101  120  115  104  108  105  103  115   32  104  111   97  111  119
  32  114  116  115   32   32   32  101  117   97  105  115   99  101  109  116  114  104
  97  111  104  115  108  105  108   32  100  108  110   32   97   32  112  114  105  105
 100   99  114  101   97  115  105  117  105  108   32  100  108  110  111  105  103   99
 100  101  111  115  116   32  110  115  110  121  116  105  108  117  117   99  105  104
```

```
  114  115  117   32  101   65  101  101  103   44  104  115  101  109  110  101  110   32
  101  115  103  111  114   32   97   32   32   32  101  116  100   98  100  115   97  101
  115   32  104  102   32  116  114  111  116  119   32  114   32  101   32   32  108  110
Columns 19 through 36
  116   32  100   32  100  101   77  115   32  104  105   97   32   99  115  110  101  111
  101   97   32  116   32  114   75   32  109  105  111  115  109  116   32  116   32  102
  114  110  107  114   65  115   45  109   97  114  110  116   97  114   67  115   70   32
  115  100  101   97   50  105   68  101  116  100   32   32  116   97   49   32   32  116
   32   32  121  110   32  110  105  116  114   32  105  109  114  108   32  112   61  104
  116  116   32  115  115  103  115  104  105  112  115   97  105   32   97  117   32  101
  104  104   40  102  101   32  116  111   99  104   32  116  120  102  110  116   91   32
  101  101   75  111   99   78  114  100  101   97  117  114   32  111  100  116   67  105
   32  110  101  114  111  117   97   50  115  115  115  105   97  114   32  105   49  110
  102   32  121  109  110  109   99   41   32  101  105   99  109   32   67  110   32  105
  105  117   50   32  100   98  116   32   66   32  110  101  111  116   50  103   67  116
  114  115   41  109   32  101  105  116   49  111  103  115  110  104   32   32   50  105
  115  105   32   97  112  114  110  111   32  102   32   32  103  101  119   97   93   97
  116  110  102  116  104  115  103   32   97   32   83   97   32   32  104  115   32  108
   32  103  111  114   97   32   32  103  110  116   86  110  116  110  105   32  116   32
  107   32  114  105  115   77  116  101  100  104   68  100  104  101   99   99  104  111
  101  116   32   99  101   97  104  116   32  101   32   32  101  119  104  111  101  102
  121  104   97  101   32  116  101   32   66   32  111  115   32   32   32  114   32   32
   32  101   32  115  105  114   32  116   50  100  110  119  116  109  114  114  109  116
   40   32  108   32  110  105  110  104   46  105   32  105  119   97  101  101   97  104
   75  115  105   65   32   99  117  101   84  115  116  116  111  116  112  108  116  101
  101  101  110   49  100  101  109   32  104  112  104   99   32  114  114   97  114   32
  121   99  101   32  105  115   98  110  101  101  101  104  115  105  101  116  105  101
   49  111   97   97  115   32  101  101   32  114   32   32  112   99  115  105  120  110
   41  110  114  110  112   40  114  119  116  115  108   83  101  101  101  118   32   99
Columns 37 through 40
  111  103   99  109
  100   32  105   97
  101  116  116  116
  100  104  121  114
   32  101   32  105
  116   32  118  120
  101  112   97   32
  120  114  108   99
  116  111  117  111
   46   99  101  109
   32  101  115  112
   84  115   32  111
  104  115   32  115
  101   32  105  105
  110  111  110  116
   32  102   32  101
   99   32  116   32
  111   99  104   70
  110  104  101   44
  100  114   32   32
  117  111  108  119
   99  109   97  104
  116   97  115  105
  105  116  116   99
  110  105   32  104
aba(:,:,2) =
Columns 1 through 18
   32  111   32   32  103   32  117  108   97   97   32  116   32  110   32   97   84  103
  119  110  116  108   32  111  101  111  105  110   73  104  116   32  112  108  104   32
  105   45  111  101  119  110  115  115  110  100  110  101  104  118  104  108  101  109
  108  115   32  115  104  101   32  101  105   32   32   32  101  101   97  101   32   97
  108  112  115  115   97   32  111  100  110  116  116  108   32  114  115  100  102  116
   32  101   97   32  116  116  102   32  103  104  104   97  112  115  101   32  105  114
   98   99  121  116   32  111   32  115   32  101  101  115  111   97   32   40  110  105
  101  105   32  104  105   32  108  101  116   32   32  116  115   32  105   77   97  120
   32  102  105   97  115   98   97  116  104  115  109   32  115  105  110   75  108   32
  118  105  110  110   32  101  116   32  101  109   97  109  105  110   32   32   32  105
   97   99   99   32   98   32  101   91   32   97  116   97   98   32   97  112  109  115
  108   32  108  122  105  117  114   48  108  108  114  116  105  116   32  114   97   32
  117  114  117  101  103  108   32   44   97  108  105  114  108  104  119  101  116  116
  101   97  100  114  103  116  119   49  114  101  120  105  105  101   97  115  114  104
  115  110  105  111  101  105  105   93  103  115   32  120  116   32  121  115  105  101
   32  103  110   44  114  109  116   32  101  116   70   32  121  100   32   32  120   32
  111  101  103   32   32   97  104  119  115   32   70  116   32  101  116  110   32  102
  102   32   32  105  116  116  105  104  116  118   32  111  111   99  104  117  114  105
   32  116  119  110  104  101  110  105   32   97  119   32  102  114   97  109  101  110
  114  104  104   99   97  108   32  108  118  108  105  101   32  121  116   98  115   97
  101   97   97  108  110  121  116  101   97  117  116  110  114  112   32  101  117  108
   97  116  116  117   32   32  104   32  108  101  104  115  101  116  119  114  108   32
  108   32   32  100  116  118  101  114  117   46  105  117  116  105  101  115  116  101
   32  105  105  105  104   97   32  101  101   46  110  114  117  111   32   41  105  110
  110  115  115  110  101  108   99  116   32   46   32  101  114  110   99   32  110   99
Columns 19 through 36
  114   40    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  121   77    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  112   46    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  116   75    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  101   46    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  100   32    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
   32   84    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  116  101    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  101  120    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  120  116    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  116   32    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
   32   67    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  116  105    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  104  112    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
   97  104    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  116  101    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
   32  114    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  119   49    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  101   41    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
   32   46    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
   99    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
   97    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  108    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
  108    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
   32    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
Columns 37 through 40
    0    0    0    0
    0    0    0    0
    0    0    0    0
```



Average the absolute value of the difference between the elements of Matrix of The numbers after decoding and its treatment mathematically to approximated to the nearest integer and Matrix of The numbers before the encryption is equal =0.

4.4 The text after decryption

This paper we will address the encryption process text is generally through a number of processes ofdispersion of the later values in a matrix is A through remittances linearin addition to the use o f svd enters, including three keys sequentially, where work will begin the application process distracting initial we called (MK-Distracting the numbers method1)In a compound to generate new matrices A1 and A2 of the original text matrix and which enters the first key (Key1)and then using the second key (Key2) for a lineartransform matrices A1 and A2 second phase in dispersing Numbers Matrices (MK-Distracting the numbers method2) to get the newmatrices B1 and B2.The third phase of the dispersion is using SVD on the last matrices and switch S	matrix among the two spectral for the new matrices C1 and C2 which represents putting as correlative F = [C1 C2] the matrix of the initial of the encoded text. Then conducting the process of chromaticity values in the last matrix composite F, whichwill be values of real non-specific range that is to say including what is less than zero, includin g what is bigger than theone to be ultimately values of later within the closed set [0,1] while retaining the largest value and the smallest value...In the matrix FF within the last matrix to ensurethe possibility of return versa in the decryption phase in a way that we called (MK press numbers) . The final matrix resulting matrix is the final encrypted text that we call (M.K. Text Cipher1).

4.5

Encryption time = 0.003 second.
Decryption time = 0.006 second.

5 CONCLUSION

1. The encryption algorithm is a composition of 2 dispersal operations and substituted one confidential key which makes it impossible strong disassemble code the means and decoding programs currently available.
2. The level of encryption algorithm is characterized by high precision and so under standards of accuracy results used the mean of error.

3. enters the algorithm one key to entered within the matrix of text encryption phases which is a real number but not equal zero.
4. was characterized this algorithm their implementation quickly by computer compared to other encryption algorithms concerning the taxt.
5. alone in this algorithm is the introduction the technique of SVD within the two stages of dispersion.
6. Brought together the algorithm between three scientific fields within two specialists are: the competence of two fields in mathematics that matrix algebra and numerical analysis in addition to the competence of computers and programming language MATLAB.

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