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Drawing of Random Six-Digit Numbers from a Single Table of Random Two-Digit Numbers

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ABSTRACT: There exist methods of drawing of random six-digit numbers from three independent tables of random two-digit numbers and from two independent tables of random three-digit numbers respectively. In these two methods of drawing of random six-digit numbers, two or more tables are required. In the first method of these two, two tables are required while in the second method of these two, three tables are required. In the current study, method has been developed for drawing of random six-digit numbers from a single table of random two-digit numbers. This paper describes the derivation of the method with numerical example in order to show the application of the method.

KEYWORDS: Table of random two-digit numbers, drawing of random six-digit numbers, method of drawing.

I. INTRODUCTION

There exists lot of tables of random numbers for the purpose of drawing of random sample. These tables have been constructed by *Tippett* (1927), *Mahalanobis* (1934), *Kendall* & *Smith* (1938 , 1939), *Fisher* & *Yates* (1938), *Hald* (1952), *Royo* & *Ferrer* (1954), *RAND Corporation* (1955), *Quenouille* (1959), *Moses* & *Oakford* (1963), *Rao*, *Mitra* & *Matthai* (1966), *Snedecor* and *Cochran* (1967), *Rohlf* & *Sokal* (1969), *Manfred* (1971), *Hill* & *Hill* (1977) and others. Among these tables, the four tables namely

(1) Tippett's Random Numbers Table that consists of 10,400 four-digit numbers giving in all 41,600 single digits (*Tippett*, 1927),
(2) Fisher and Yates Random Numbers Table that comprises 15000 digits arranged in two's (*Fisher* & *Yates*, 1938),
(3) Kendall and Smith's Random Numbers that consists of 100,000 digits grouped into 25,000 sets of random four-digit numbers (*Kendall* & *Smith*, 1938)
& (4) Random Numbers Table by Rand Corporation that contains of one million digits consisting of 200,000 random numbers of 5 digits each (*Rand Corporation*, 1955).

are treated as suitable in drawing of simple random sample (with or without replacement) from a population (*Cochran*, 1940).

The proper randomness of these tables is yet to be tested. In a study made by *Chakrabarty* (2010) on the testing of randomness of the table due to *Fisher* and *Yates* (1938), it has been found that this table, consisting of the 7500 occurrences of the 100 two-digit numbers, is not properly random and deviates significantly from proper randomness. Due to this reason, one table consisting of 6000 random occurrences of the 100 two-digit numbers has been constructed as an alternative/competitor of this table (*Chakrabarty*, 2013*a*). Also, one table containing 5000 random occurrences of the 1000 three-digit numbers has been constructed by *Chakrabarty* (2013*b*) due to the unavailability of such table of three-digit numbers. Two more tables, one containing 20000 occurrences of random two-digit numbers and the other containing 20000 occurrences of random three-digit numbers, have also been constructed by the same author [*Chakrabarty*(2013*a* , 2016*b*)]. Recently, study has been made on testing the proper randomness of the random number tables due to Tippett (*Sarmah* & *Chakrabarty*, 2014), due to Kendall & Smith (*Sarmah* & *Chakrabarty*, 2014*b*), due to *Rand Corporation* (*Sarmah*, *Chakrabarty* & *Barman* (2015*b*). In the studies, each of the tables has been found to be suffered from proper randomness. This leads to think of constructing of table of random four-digit numbers. Moreover, there is or there may be necessity of drawing of random five-digit numbers, random six-digit numbers, random seven-digit numbers etc.. However, due to the increasing difficulties in the construction of tables of these types of random numbers by the method composed by *Chakrabarty* (2013*a*), it had been compelled to think of an alternative approach of drawing of these types of random numbers. As the first attempt on this approach, one method was developed for

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drawing of random five-digit numbers from the tables of random two-digit numbers and of random three-digit numbers (*Chakrabarty*, 2016*c*). Later on, in a study, one method was derived for drawing of random six-digit numbers from the two independent tables of random three-digit numbers (*Chakrabarty*, 2016*d*). In another study, one method has been developed for drawing of random six-digit numbers from three independent tables of random two-digit numbers (*Chakrabarty*, 2016*e*). In these two methods of drawing of random six-digit numbers, two or more tables are required. In the first method of these two, two tables are required while in the second method of these two, three tables are required. In the current study, method has been developed for drawing of random six-digit numbers from a single table of random two-digit numbers. This paper describes the derivation of the method with numerical example in order to show the application of the method.

II. DRAWING OF RANDOM TWO-DIGIT NUMBERS

The table of random two-digit numbers constructed by Chakrabarty (2013*a* , 2016*a*) carries the following features:

(1) In the table, each of the 100 two-digit numbers occurs n times out of $100n$ consecutive occurrences ($n = 1 , 2 ,$ …….) if we start counting from the observation at the $(100k + 1)^{th}$ position ($k = 0 , 1 , 2 ,$ …….).

(2) In the table, the frequency of occurrence of each of the 100 two-digit numbers out of $100n$ consecutive trials ($n = 1 ,$ $2 ,$ …….) may be one more or less than n if we start counting from any position.

(3) The table can be treated as random as per the logic behind the two definitions of probability namely definition in theoretically ideal situation and definition in practically ideal situation (Chakrabarty, 2011).

(4) The table is random with respect to the occurrences of the numbers row-wise but not column-wise. Thus while drawing random numbers from the table, one requires moving row-wise either to the right or to the left starting from any position in the table. The starting position and the direction of movement are to be selected at random by suitable randomized trials in order to keep their randomness intact.

Each of the two tables, constructed here, can be used in drawing of random two-digit numbers

(1) which are distinct

and (2) which are not necessarily distinct.

A. Drawing of Distinct Random Two-Digit Numbers

Suppose that we want to draw n random two-digit numbers from any one of the two tables such that the drawn numbers are distinct.

Since distinct two-digit numbers are to be drawn, one can draw a maximum of 100 such numbers since the total number of the two-digit numbers is 100.

Feature no (2), mentioned above**.** implies that if n two-digit numbers occurred consecutively from the $(100k + 1)^{th}$ position ($k = 0 , 1 , 2 ,$ …….) in the table are drawn subject to the feature no (4) then the drawn n numbers will be distinct and random.

Also, feature no (3) implies that if n two-digit numbers occurred consecutively in the table are drawn starting from any position then the drawn n numbers may not be distinct. Some of them may occur twice. Thus in order to draw distinct numbers, it is required to exclude the next occurrence of the same number and to draw the next consecutive number occurred in the table subject to the feature no (4).

Thus the drawing of random two-digit numbers consists of the two basic tasks namely

(*a*) selection of the starting position at random

and (*b*) selection of the direction (right or left) of movement at random.

Accordingly, in order to obtain the n random two-digit numbers one is to proceed with the following steps:

(1) Select the position, from where to start, at random. Since the table contains 10000 random occurrences of the 100 two-digit numbers, accordingly there are 10000 positions of the numbers namely

0000 , 0001 , 0002 , …… , 9999.

In selecting the starting position, one thus can apply some usual manual randomization technique of drawing one number from among the numbers

0000 , 0001 , 0002 , …… , 9999.

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One method of drawing of such number is as follows:

Take a set of 10 identical small balls marking them by the 10 digits

$$0 , 1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9$$

respectively and put them inside a opaque container C_1 .

Similarly, take another set of 4 identical small balls marking them by

$$L \ , \ R , \ M_1 \ \& \ M_2$$

respectively and put them inside adifferent opaque container C_2 .

Now, draw one ball at random from the container C_1 containing the 10 balls and note down digit appeared on it.

Let the digit drawn be d_1.

Next, draw another ball at random from the container C_1 containing the same 10 balls and note down digit appeared on it.

Let the digit drawn at this stage be d_2.

Then, draw one ball at random from the container C_2 putting 2 balls marked with L & R inside it.

If the drawn ball is R, put the digit d_2 at the right position of $d_1$and if the drawn ball is L, put the digit d_2 at the left position of d_1.

Thus if the ball R appears, the selected two-digit number will be d_1d_2 and if the ball L appears, the selected two-digit number will be d_2d_1.

Let the selected two-digit number be d_2d_1.

Next, draw another ball at random from the container C_1 containing all the 10 balls and note down digit appeared on it.

Let the digit drawn here be d_3.

Then, draw one ball at random from the container C_2 putting 3 balls marked with

$$L \ , \ M_1 \ \& \ M_2$$

inside it and put the digit d_3 at the

left position of d_2d_1 if the drawn ball is L ,

middle position of d_2d_1 if the drawn ball is M_1

& right position of d_2d_1 if the drawn ball is R .

Thus the selected three-digit number will be $d_3d_2d_1$ or $d_2d_3d_1$ or $d_2d_1d_3$ in accordance with the selected ball is L or M_1 or R .

Let the selected three-digit number be $d_2d_3d_1$.

Finally, draw another ball at random from the container C_1 containing all the 10 balls and note down digit appeared on it. Let the digit drawn here be d_4.

Then, draw one ball at random from the container C_2 putting 4 balls marked with

$$L \ , \ M_1 \ , \ M_2 \ \& \ R$$

inside it and put the digit d_4 at the

left position of $d_2d_3d_1$ if the drawn ball is L ,

1st middle position (from left) of $d_2d_3d_1$ if the drawn ball is M_1 ,

2nd middle position (from left) of $d_2d_3d_1$ if the drawn ball is M_2

& right position of $d_2d_3d_1$ if the drawn ball is .

Thus the selected four-digit number will be $d_4d_3d_2d_1$ or $d_2d_4d_3d_1$ or $d_2d_1d_4d_3$ or $d_2d_1d_3d_4$ in accordance with the selected ball is L or M_1 or M_2 or R .

The position of the four-digit number selected here will be the required starting position.

(2) Let the i^{th} (i is any of the four numbers $d_4d_3d_2d_1$, $d_2d_4d_3d_1$, $d_2d_1d_4d_3$, $d_2d_1d_3d_4$) position be selected in the earlier step.

In this step, draw the number that occurs at the i^{th} position in the table.

(3) Chose whether to move towards left or towards right. The choice can be made at random by a binary trial e.g. by

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tossing of an unbiased coin or by drawing a number from the container C_2 putting two identical balls, marked with L & R respectively, inside it.

(4) If it is chosen to move towards right, draw the numbers occurred at the positions

$i\ ,\ i+1\ ,\ i+2\ ,\ \ldots\ldots\ldots\ldots\ ,\ i+n-1$

in the table to obtain the *n* random two-digit numbers.

(5) If it is chosen to move towards left, draw the numbers occurred at the positions

$i\ ,\ i-1\ ,\ i-2\ ,\ \ldots\ldots\ldots\ldots\ ,\ i-n+1$

in the table to obtain the *n* random two-digit numbers.

(6) It may occur that some number or numbers among those drawn may be occurred twice. In that situation, retain only one occurrence of them and draw additional numbers appeared at the consecutive positions in the table as per the requirement.

If *k* additional numbers are required to draw, then draw the numbers occurred at the positions

$i+n\ ,\ i+n+1\ ,\ i+n+2\ ,\ \ldots\ldots\ldots\ldots\ ,\ i+n+k-1$

if it is chosen to move towards right

and draw the numbers occurred at the positions

$i-n\ ,\ i-n-1\ ,\ i-n-2\ ,\ \ldots\ldots\ldots\ldots\ ,\ i-n-k+1$

if it is chosen to move towards left.

Note 2.1: Drawing of distinct random numbers corresponds to the drawing of simple random sample without replacement.

B. Drawing of Distinct Random Two-Digit Numbers (Not Necessarily Distinct)

The features (1) and (2), mentioned in section II, imply that if two-digit numbers are picked up at a gap of *g* positions ($101 \leq g \leq 199$), the picked up numbers will not necessarily be distinct.

Thus in order to to draw *n* random two-digit numbers which need not necessarily be distinct, one is to proceed with the following steps:

(1) Select one position from where to start at random by the similar method as in the case of drawing of distinct random two-digit numbers mentioned above. Let the i^{th} position be selected.

(2) Draw the number that occurs at the i^{th} position in the table.

(3) Chose the length of jump that is to be 101 or more and 199 or less at random. It can be chosen by some usual manual randomization technique of drawing one number from among the numbers

$$101\ ,\ 102\ ,\ 103\ ,\ \ldots\ldots\ldots\ldots\ ,\ 199.$$

Let the selected length of jump be *l*.

The random selection of the length of the jump can be done by similar method as done in the selection of the starting position.

(4) Chose whether to jump towards left or towards right. The choice can be made by the same method as in the earlier case.

(5) If it is chosen to jump towards right, draw the numbers occurred at the positions

$$i\ ,\ i+l\ ,\ i+2l\ ,\ \ldots\ldots\ldots\ldots\ ,\ i+(n-1)l$$

in the table to obtain the required *n* random two-digit numbers.

(6) If it is chosen to move towards left, draw the numbers occurred at the positions

$$i\ ,\ i-l\ ,\ i-2l\ ,\ \ldots\ldots\ldots\ldots\ ,\ i-(n-1)\,l$$

in the table to obtain the required *n* random two-digit numbers.

Note 2.2: Drawing of random numbers, not necessarily, distinct corresponds to the drawing of simple random sample with replacement.

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III. DRAWING OF RANDOM SIX-DIGIT NUMBERS

Let d_1d_2 be a random two-digit number drawn from a table of random two-digit numbers.
The possible values that d_1d_2 assumes are the 100 two-digit numbers

00 , 01 , 02 , ……. , 98 , 99

and the probability that d_1d_2 assumes any of them is equal which is 0.01.
Similarly, if d_3d_4 *is another two-digit number drawn independently from the same table then* the possible values that d_3d_4 assumes are also the 100 two-digit numbers

00 , 01 , 02 , ……. , 98 , 99

and the probability that that d_3d_4 assumes any of them is equal which is 0.01.
Again, if d_5d_6 *is another two digit number drawn independently from the same table then* the possible values that d_5d_6 assumes are also the 100 two-digit numbers

00 , 01 , 02 , ……. , 98 , 99

and the probability that that d_5d_6 assumes any of them is equal which is 0.01.
Now if the three two-digit numbers namely

$$d_1d_2 \text{ , } d_3d_4 \text{ & } d_5d_6$$

are combined together to form the six-digit number $d_1d_2d_3d_4d_5d_6$
then the possible values that $d_1d_2d_3d_4d_5d_6$ will assume are the 100000 six-digit numbers

000000 , 000001 , 000002 , …… , 999999

and the probability that $d_1d_2d_3d_4d_5d_6$ assumes any one of them is equal which is 0.000001
(since the three numbers d_1d_2 , d_3d_4 and d_5d_6 have been drawn independently).
Thus the six-digit number $d_1d_2d_3d_4d_5d_6$ is a random one.
Similarly, the other five six-digit numbers

$$d_1d_2d_5d_6d_3d_4 \text{ , } d_3d_4d_1d_2d_5d_6 \text{ , } d_3d_4d_5d_6d_1d_2 \text{ , } d_5d_6d_1d_2d_3d_4 \text{ & } d_5d_6d_3d_4d_1d_2$$

are also a random ones.
If one of these six six-digit numbers is selected by performing a random trial that results in six possible equally likely outcomes, the selected number will be a random six-digit number.
If the process is repeated once, one more random six-digit number can be obtained. By further repetitions, one can obtain more random six-digit numbers.
Therefore in order to draw *n* random six-digit numbers from a single table of random two-digit numbers, it is required to draw three independent sets, each of *n* random two-digit numbers, from the table.
It is to be noted that any successive two digits of different six-digit numbers can be same. Conversely, with the same successive two digits there can be different six-digit numbers. Therefore, the random two-digit numbers in each of the three independent sets of random two-digit numbers, drawn in order to form random six-digit numbers, need not be distinct.

Thus, in order to draw *n* random six-digit numbers one can proceed with the following steps:
(1) Make a choice at random which set's two-digit numbers will be placed at the left position, which set's two-digit number will be placed at the middle position and which set's two-digit number will be placed at the right position while combining them in the formation of random six-digit numbers. This can be done by a random trial that results in six equally likely possible outcomes namely

(d_1d_2 at Left , d_3d_4 at Middle , d_5d_6 at Right) ,
(d_1d_2 at Left , d_5d_6 at Middle , d_3d_4 at Right) ,
(d_3d_4 at Left , d_1d_2 at Middle , d_5d_6 at Right) ,
(d_3d_4 at Left , d_5d_6 at Middle , d_1d_2 at Right) ,
(d_5d_6 at Left , d_1d_2 at Middle , d_3d_4 at Right) ,
(d_5d_6 at Left , d_3d_4 at Middle , d_1d_2 at Right) ,

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where d_1d_2 ∈ 1st set , d_3d_4 ∈ 2nd set & d_5d_6 ∈ 3rd set.

Throwing of a fair dice (i.e.an unbiased dice), distinguishing its six sides by the six possible outcomes, can be performed in selecting the said choice.

(2) Draw the 1st set of *n* random two-digit number from the table by the method discussed in Section II *b*.

(3) Draw the 2nd set of *n* random two-digit number from the table by the same method independently from the 1st set.

(4) Draw the 3rd set of *n* random two-digit number from the table by the same method independently from the 1st set & the 2nd set.

(4) Combine the random two-digit numbers of the 1st set with the corresponding random two-digit numbers of the 2nd set and the corresponding random two-digit numbers of the 3rd set by the choice of the positions obtained in step (1) to obtain the *n* random six-digit numbers.

In order to draw *n* random six-digit numbers one can also proceed with the following steps:

(1) Draw three random two-digit numbers independently from the table of random two-digit numbers by the same method as discussed in Section II *b*.

(2) Make a choice at random which two-digit number will be placed at the left position, which two-digit number will be placed at the middle position and which two-digit number will be placed at the right position while combining them in the formation of random six-digit numbers. This can be done by the random trial as mentioned above.

(3) Combine the three two-digit numbers, obtained in step (1), as per the selected choice of the positions to obtain one random six-digit number.

(4) Perform the above three steps more $(n-1)$ times to obtain more $(n-1)$ random six-digit numbers.

(5) The random six-digit numbers obtained in step (3) & Step (4) are the required *n* random six-digit numbers.

IV. NUMERICAL EXAMPLE

Example (4.1): Let it be wanted to draw 20 random six-digit numbers from the table of random two-digit numbers constructed by *Chakrabarty* (2016*a*).

First way of drawing

Let a trial namely the throwing of an unbiased dice be performed to make a choice which set's two-digit number will be placed at the left position, which set's two-digit number will be placed at the middle position and which set's two-digit number will be placed at the right position while combining them in the formation of random six-digit number. Suppose, the selected choice is as follows:

Two-digit number belonging to the **1st Set** will be placed at the **Left** position,
Two-digit number belonging to the **2nd Set** will be placed at the **Middle** position
& Two-digit number belonging to the **3rd Set** will be placed at the **Right** position.

Now let us draw the 1st set of 20 random two-digit numbers from the table by the method as described in Section II *b*. Let the numbers drawn be

47 , 87 , 59 , 03 , 37 , 00 , 50 , 27 , 52 , 60 , 51 , 94 , 70 , 74 , 26 , 37 , 46 , 59 , 78 , 74 .

Next, let us draw the 2nd set of 20 random two-digit numbers from the table by the same method but independently of the 1st set.

Let the numbers drawn, in this case, be

90 , 26 ,19 , 94 , 22 , 02 , 88 , 46 , 42 , 29 , 98 , 02 , 89 , 26 , 50 , 18 , 36 , 11 , 53 , 54 .

Next, let us draw the 3rd set of 20 random two-digit numbers from the table by the same method but independently of the 1st set & of the 2nd set.

Let the numbers drawn, in this case, be

40 , 57 , 52 , 83 , 36 , 37 , 39 , 23 , 10 , 03 , 33 , 98 , 96 , 26 , 32 , 33 , 72 , 12 , 32 , 22 .

Now, let us combine the corresponding numbers drawn from the three tables as per the selected choice of combination. Thus, the selected 20 random six-digit numbers are

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479040 , 872657 , 591952 , 039483 , 372236 , 000237 , 508839 , 274623 , 524210 , 602903 , 519833 , 940298 , 708996 , 742626 , 265032 , 371833 , 463672 , 591112 , 785332 , 745422 .

Second way of drawing

First, let us draw three random two-digit numbers independently to include in the three sets namely the 1st Set, the 2nd Set & the 3rd Set respectively by the method described in Section II *b*.
Let the three numbers drawn be

47 , 90 , 40 .

Next, let a trial namely the throwing of an unbiased dice be performed to choice which table's two-digit numbers will be placed at the left position, which table's two-digit numbers will be placed at the middle position and which table's two-digit numbers will be placed at the right position while combining them in the formation of random six-digit numbers.
Suppose, the selected choice is as follows:

Two-digit number belonging to the 1st Set will be placed at the Left position,
Two-digit number belonging to the 2nd Set will be placed at the Right position
& Two-digit number belonging to the 3rd Set will be placed at the Middle position.

Thus, the 1st selected six-digit random number is 474090 .
In order to obtain the remaining 19 random six-digit numbers, the two steps are to be repeated 19 times.
Let the outcomes of all the 20 trials be as follows:

Table-4-1

Serial No of Trial	Two-digit Number obtained in the 1st Set	Two-digit Number obtained in the 2nd Set	Two-digit Number obtained in the 3rd Set	Outcome of the Random Trial: Position of Two-digit Number of			Selected Six-digit Number
				1st Set	2nd Set	3rd Set	
1	47	90	40	Left	Right	Middle	474090
2	87	26	57	Right	Middle	Left	572687
3	59	19	52	Middle	Right	Left	525919
4	03	94	83	Right	Left	Middle	948303
5	37	22	36	Left	Middle	Right	372236
6	00	02	37	Left	Middle	Right	000237
7	50	88	39	Middle	Left	Right	885039
8	27	46	23	Right	Left	Middle	462327
9	52	42	10	Left	Middle	Right	524210
10	60	29	03	Right	Middle	Left	032960
11	51	98	33	Middle	Right	Left	335198
12	94	02	98	Right	Left	Middle	029894
13	70	89	96	Left	Right	Middle	709689
14	74	26	26	Right	Middle	Left	262674
15	26	50	32	Left	Middle	Right	265032
16	37	18	33	Left	Middle	Right	371833
17	46	36	72	Middle	Right	Left	724636
18	59	11	12	Right	Left	Middle	111259
19	78	53	32	Middle	Left	Right	537832
20	74	54	22	Left	Middle	Right	745422

Thus, the selected 20 random six-digit numbers to are

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474090 , 572687 , 525919 , 948303 , 372236 , 000237 , 885039 , 462327 , 524210 , 032960 , 335198 , 029894 , 709689 , 262674 , 265032 , 371833 , 724636 , 111259, 537832 , 745422 .

V. CONCLUSION

The method of drawing of random six-digit numbers, developed here, is an alternative way of drawing of random six-digit numbers in the absence of table of random six-digit numbers.

The existing methods of drawing of random six-digit numbers from three independent tables of random two-digit numbers and from two independent tables of random three-digit numbers respectively are also two alternative way of drawing of random six-digit numbers in the absence of table of random six-digit numbers.

In the method of drawing of random six-digit numbers from three independent tables of random two-digit numbers, three tables are to be used. Similarly, in the method of drawing of random six-digit numbers from two independent tables of random three-digit numbers, two tables are to be used. In the method of drawing of random six-digit numbers developed here, only single table of random two-digit numbers is quite enough.

There may exist some method of drawing of random six-digit numbers from a single table of random three-digit numbers. Thus one problem, for researcher at this stage, is to search for whether there exists such method and to find out the method if exists.

REFERENCES

[1]Dhritikesh Chakrabarty (2010): "Chakrabarty's Definition of Probability : Proper Randomness of Fisher and Yates Random Number Table ", Int. J. Agricult. Stat. Sci., 6 (2), (ISSN : 0973 – 1903), 461 – 469.

[2]Dhritikesh Chakrabarty (2011): "Probability in Ideal Situation and in Practical Situation", Arya Bhatta J. Math. & Info. , 3 (1), (ISSN : 0975 – 7139), 161 – 168.

[3]Dhritikesh Chakrabarty (2013*a*): "One Table of Random two-digit Numbers", AryaBhatta J. Math. & Info. , (ISSN : 0975 – 7139), 5 (1), 141 – 152.

[4]Dhritikesh Chakrabarty (2013*b*): "One Table of Random three-digit Numbers", AryaBhatta J. Math. & Info. , (ISSN : 0975 – 7139), 5 (2), 285 – 294.

[5]Dhritikesh Chakrabarty (2016*a*) : "One More Table of Random Two-Digit Numbers", International Journal of Advanced Research in Science, Engineering and Technology, (ISSN : 2350 – 0328), 3(3), 1667 – 1678, Also available in www.ijarset.com.

[6]Dhritikesh Chakrabarty (2016*b*) : "One More Table of Random Three-Digit Numbers", International Journal of Advanced Research in Science, Engineering and Technology, (ISSN : 2350 – 0328), 3(4), 1851 – 1869, Also available in www.ijarset.com.

[7]Dhritikesh Chakrabarty (2016*c*) : "Drawing of Random Five-Digit Numbers from Tables of Random Two-Digit and Three-Digit Numbers", *International Journal of Advanced Research in Science, Engineering and Technology*, (ISSN : 2350 – 0328), 3(7), 2385 – 2306, Also available in www.ijarset.com.

[8]Dhritikesh Chakrabarty (2016*d*) : "Drawing of Random Six-Digit Numbers from Tables of Random Three-Digit Numbers", *International Journal of Advanced Research in Science, Engineering and Technology*, (ISSN : 2350 – 0328), 3(8), 2507 – 2515, Also available in www.ijarset.com.

[9]Fisher R. A. (1938): "Statistical Tables for Biological, Agricultural and Medical Research", 6th Edition (1982), Longman Group Limited, England, 37 – 38 & 134 – 139.

[10]Dhritikesh Chakrabarty (2016*e*) : "Drawing of Random Six-Digit Numbers from Tables of Random Two-Digit Numbers", *International Journal of Advanced Research in Science, Engineering and Technology*, (ISSN : 2350 – 0328), 3(9), 2643 – 2655, Also available in www.ijarset.com.

[11]Hald A. (1952): "Table of random numbers", In: A. Hald: Statistical Tables and Formulas, Wiley.

Hill I. D. & Hill P. A. (1977): "Tables of Random Times", U.K.

[12]Kendall M. G. & Smith B. B. (1938): "Randomness and Random Sampling Numbers", Jour. Roy. Stat. Soc., 101(1), 147 – 166.

[13]Kendall M. G. & Smith B. B. (1939): "A Table of Random Sampling Numbers", Tracts for Computers no. 24, Cambridge University Press, Cambridge, England.

[14]Mahalanobis P. C. (1934): "Tables of random samples from a normal population", Sankya, 1, 289 − 328.

[15]Manfred Mohr (1971): "Le Petit Livre de Nombres au Hasar", Édition d'artiste, Paris.

[16]Moses E. L. & Oakford V. R. (1963): "Tables of Random Permutations", George Allen & Unwin.

Quenouille M. H. (1959): "Tables of Random Observations from Standard Distributions", Biometrika, 46, 178-202.

[17]Rand Corporation (1955): "A Million Random Digits with 100,000 Normal Deviates", Free Press, Glencoe, Illinois.

[18]Rao C. R. , Mitra S. K. & Matthai A. (1966): "Random Numbers and Permutations", Statistical Publishing Society, Calcutta.

[19]Rohlf F. J. & Sokal R. R. (1969): "Ten Thousand Random Digits", In: Rohlf & Sokal: Statistical Tables, Freeman.

[20]Royo J. & Ferrer S. (1954): "Tables of Random Numbers Obtained from Numbers in the Spanish National Lottery", Trabajos de Estadistica, 5, 247 − 256.

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[21]Sarmah Brajendra Kanta & Chakrabarty Dhritikesh (2014): "Examination of Proper Randomness of the Number Generated by L. H. C. Tippett ", International Journal of Engineering Sciences & Research Technology, (ISSN : 2277 - 9655), 3(12), 631 – 638.
[22]Sarmah Brajendra Kanta & Chakrabarty Dhritikesh (2015a): "Testing of Proper Randomness of the Table of Number Generated by M. G. Kendall and B. Babington Smith (1939)", International Journal of Engineering Sciences & Research Technology, (ISSN : 2277 - 9655), 4(2), 260 – 282.
[23Sarmah Brajendra Kanta, Chakrabarty Dhritikesh & Barman Nityananda (2015b) : "Testing of Proper Randomness of the Table of Number Generated by Rand Corporation (1955) ", International Journal of Engineering Sciences & Management, (ISSN : 2277 - 5528), 5(1), 97 – 119.
[24]Snedecor G. W. & Cochran W. G. (1967): "Statistical Methods", Iowa State University Press, Ames, Iowa, 6th Edition.
[25]Tippett L .H. C. (1927): "Random Sampling Numbers", Tracts for Computers no. 15, Cambridge University Press, Cambridge, England.

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Dr. Dhritikesh Chakrabarty passed B.Sc. (with Honours in Statistics) Examination from Darrang College, Gauhati University, in 1981 securing 1st class &1st position. He passed M.Sc. Examination (in Statistics) from the same university in the year 1983 securing 1st class & 1st position and successively passed M.Sc. Examination (in Mathematics) from the same university in 1987 securing 1st class (5th position). He obtained the degree of Ph.D. (in Statistics) in the year 1993 from Gauhati University. Later on, he obtained the degree of Sangeet Visharad (inVocal Music) in the year 2000 from Bhatkhande Sangeet vidyapith securing 1st class, the degree of Sangeet Visharad (in Tabla) from Pracheen Kala Kendra in 2010 securing 2nd class, the degree of Sangeet Pravakar (in Tabla) from Prayag Sangeet Samiti in 2012 securing 1st class and the degree of Sangeet Bhaskar (in Tabla) from Pracheen Kala Kendra in 2014 securing 1st class. He obtained Jawaharlal Nehru Award for securing 1st position in Degree Examination in the year 1981. He also obtained Academic Gold Medal of Gauhati University and Prof. V. D. Thawani Academic Award for securing 1st position in Post Graduate Examination in the year 1983.
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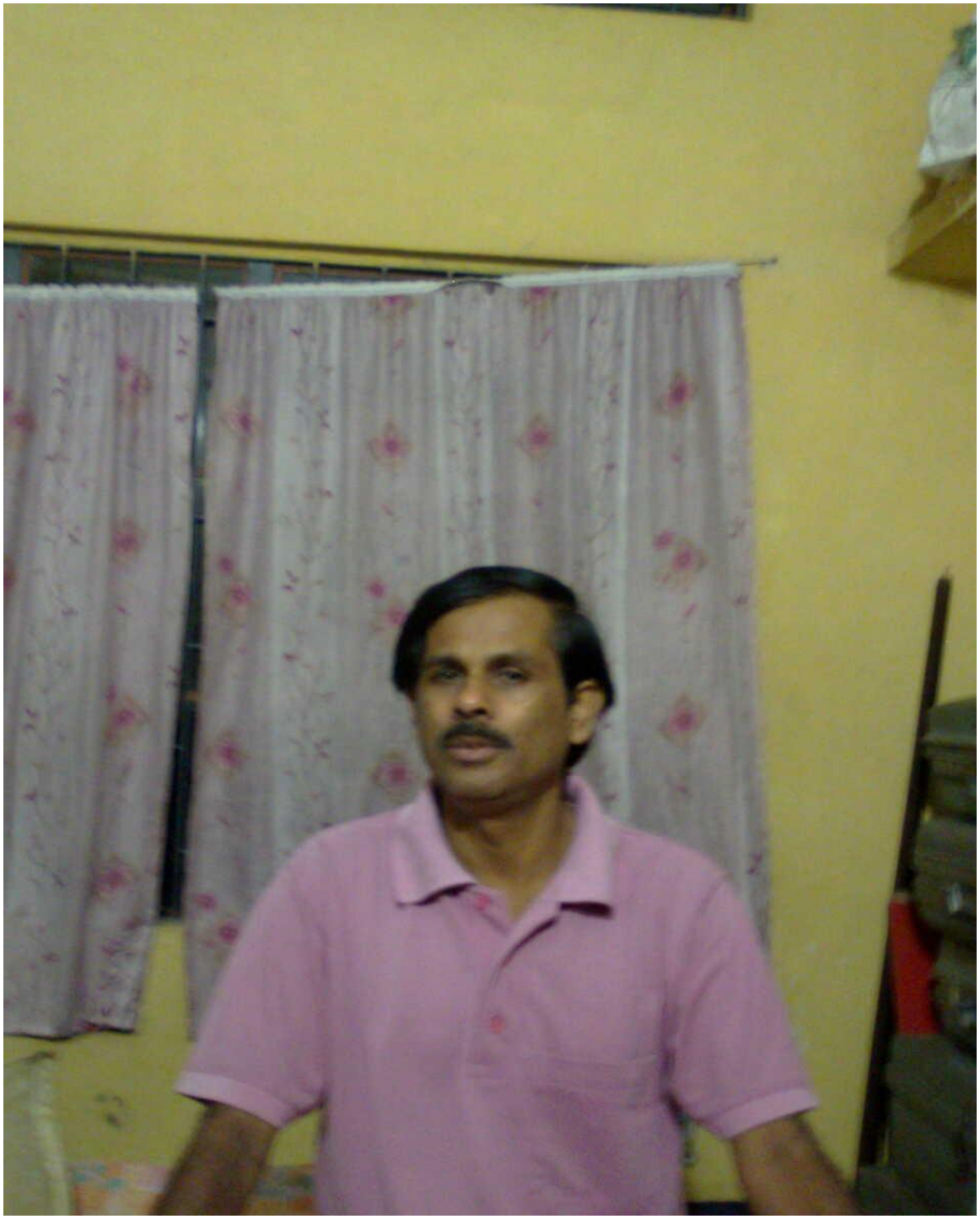

Statistics and also in the Department of Physics of Gauhati University. He also acted as Guest Faculty cum Resource Person in the Ph.D. Course work Programme in the Department of Computer Science and also in the Department of Biotechnology of the same University for the last six years. Dr. Chakrabarty has been working as an independent researcher for the last more than twenty five years. He has already published eighty research papers in various research journals mostly of international level and eight research papers in conference proceedings. Fifty four research papers

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(3) Indian Statistical Association (IAS)
(4) Indian Society for Probability & Statistics (ISPS)
(5) Forum for Interdisciplinary Mathematics (FIM)
(6) Electronics Scientists & Engineers Society (ESES)
(7) International Association of Engineers (IAENG)

Moreover, he is a Referee of the Journal of Assam Science Society (JASS) and a Member of the Editorial Board of the Journal of Environmental Science, Computer Science and Engineering & Technology (JECET).

Dr. Chakrabarty acted as members (at various capacities) of the organizing committees of a number of conferences/seminars already held.