



One More Table of Random Two-Digit Numbers

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ABSTRACT: Due to the necessity of more than one independent table of random two-digit numbers in drawing of multi-digit random numbers, one table has here been constructed for random two-digit numbers. The table has been constructed independently of the earlier random two-digit numbers table constructed by *Chakrabarty* in 2013. However, it has been constructed by the same method which was applied in the construction of the earlier table of the same. This table consists of 10000 occurrences of the 100 two-digit numbers

00, 01, 02, 03, ,98, 99.

KEYWORDS: Two-digit numbers, table of random numbers, independent construction, drawing of random two-digit numbers.

I. INTRODUCTION

The drawing of random numbers is a scientific (more specifically statistical) method of selecting a random sample. Some random number tables, used commonly, are due to *Fisher* and *Yates* (1938), *Snedecor* and *Cochran* (1967), *Kendall* and *Smith* (1938), *Rand Corporation* (1955) etc. (*Cochran*, 1940) whose proper randomness is yet to be tested. It has been found that the random number table having 7500 two-digit number constructed by *Fisher* and *Yates* is not properly random and deviates significantly from proper randomness *Chakrabarty* (2010). For this reason, one table for two-digit random number table has been constructed by *Chakrabarty* (2013). Another table for random three-digit numbers has also been constructed by *Chakrabarty* (2013b). These two tables have been found to be almost properly random. However, these two tables are suitable only for drawing of random two-digit numbers and random three-digit numbers respectively. In practice it is required, in many situations, to draw multi-digit random number. On the other hand, construction of table multi-digit random numbers is too difficult. However, it is possible to draw multi-digit random numbers

- either from independent tables of random two-digit numbers
- or from independent tables of random three-digit numbers
- or from a combination of independent tables of random two-digit numbers and independent tables of random three-digit numbers.

For this reason, one more has been constructed for of random two-digit numbers. This table is constructed independently of the earlier random two-digit numbers table. However the same method, which was applied in the construction of the earlier random two-digit numbers, has been applied in the construction of this table also. The table consists of 10000 occurrences of the 100 two-digit numbers

00, 01, 02, 03, ,98, 99.

II. FEATURES OF THE TABLE

1. The table contains 10000 occurrences of the 100 two-digit numbers
00, 01, 02, 03, ,98, 99.
Each of them has appeared a total of 100 times in the table.
2. In the table each of the 100 two-digit numbers occurs n times out of $100n$ consecutive trials ($n = 1, 2, \dots, 100$) if we start counting from the observation at the $(100k + 1)^{\text{th}}$ position ($k = 1, 2, \dots$).
3. The number of occurrence of each of the 100 two-digit numbers out of $100n$ consecutive trials ($n = 1, 2, \dots, 100$) lies between $n \pm 1$ if we start counting from any position.
4. The method of construction of the table implies that the table is properly random with respect to the two definitions of probability namely definitions in theoretically ideal situation and definition in practically ideal situation { *Chakrabarty* (2014, 2010, 2011)}.



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5. While drawing random numbers from this table, one requires moving row wise either to the right or to the left starting from any position in the table.

III.METHOD OF DRAWING RANDOM NUMBER FROM THE TABLE

Suppose that we want to draw n random two-digit numbers from the table. In order to obtain the n random two-digit numbers, one is to proceed with the following steps:

1. Select one position from where to start. The position can be selected by any traditional random method (for example lottery method). Suppose that the i^{th} position has been selected.
2. Draw the number that occurs at the i^{th} position in the table.
3. Chose whether to move towards the left or towards the right. Of course, it is accurate to move row wise as per the method of construction of the table.

4. If it is chosen to move towards the right, draw the numbers occurred at the positions $i, i+1, i+2, \dots, i+n-1$

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

5. It may occur that some number or numbers among those drawn may be occurred twice. In that situation, retain only one

occurrences of them and draw additional consecutive numbers from the table as per requirement i.e. if k additional numbers are required, draw the numbers occurred at the positions

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

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

IV. THE CONSTRUCTED RANDOM TWO-DIGIT NUMBER TABLE

The following table shows the 10000 occurrences of the 100 two-digit numbers

$$00, 01, 02, 03, \dots, 98, 99.$$

such that each of them has appeared a total of 100 times in the table.

Table-4.1
(Random Two-Digit Numbers)

26 31 27 78 12 53 63 37 89 08 97 75 13 55 04 64 42 48 15 24 32 57 44 69 77
80 66 50 88 95 73 25 52 90 76 58 93 46 16 38 29 62 18 39 00 56 09 59 20 33
65 07 45 86 92 60 01 71 91 35 14 49 51 61 19 21 34 40 84 05 43 87 94 72 11
06 28 23 85 96 03 54 79 36 02 30 99 74 22 67 98 70 10 82 47 83 81 17 68 41
48 15 24 32 57 69 77 00 28 54 79 02 30 99 74 22 67 98 83 06 81 17 68 41 84
25 93 46 16 80 66 50 62 18 26 31 27 04 64 42 56 09 23 85 96 03 70 10 82 47
59 20 33 65 07 45 86 92 01 71 91 14 49 51 61 19 21 34 40 05 43 87 94 72 11
52 60 29 35 36 08 44 88 95 73 78 12 53 63 37 89 97 75 13 55 38 90 76 58 39
10 82 47 52 29 36 08 44 95 34 86 46 19 67 91 14 49 51 61 21 35 60 88 71 45
68 24 06 57 63 25 81 74 98 02 69 15 54 66 28 79 30 22 62 41 73 12 53 37 75
13 38 90 76 58 39 99 32 00 78 55 77 48 89 97 83 17 84 93 16 80 50 18 26 31
27 04 64 42 56 09 23 85 96 03 70 59 20 33 65 07 92 01 40 05 43 87 94 72 11
15 41 84 24 94 72 11 32 57 69 77 00 28 54 79 02 51 61 19 21 34 40 05 43 87
30 99 74 22 67 98 83 06 18 81 17 68 62 25 93 46 16 80 66 50 47 59 20 33 65
07 45 86 92 01 71 91 14 49 26 31 27 04 64 42 56 09 23 85 96 03 70 10 82 52
60 29 63 37 89 97 75 13 55 38 90 76 58 39 48 35 36 08 44 88 95 73 78 12 53
70 36 98 47 83 78 03 54 23 85 96 68 41 14 49 51 61 19 21 24 32 57 44 80 66
50 88 95 73 43 87 94 79 10 82 02 30 99 74 22 67 26 27 53 63 37 89 08 97 75
13 55 04 64 42 48 15 69 06 28 77 25 52 90 76 58 93 46 16 38 29 62 18 39 00
56 09 59 20 33 65 07 45 86 92 60 01 71 12 91 35 81 17 34 40 84 05 72 11 31
44 28 01 78 48 12 63 37 90 76 89 75 13 55 38 52 24 60 29 35 36 08 58 39 15
32 69 77 00 33 66 79 02 30 99 74 22 67 83 06 42 23 96 68 41 70 25 93 46 16
80 07 50 62 18 26 31 27 04 64 98 09 85 03 81 95 17 10 84 73 47 53 56 05 82
59 20 65 57 45 86 92 88 71 91 14 49 51 61 19 34 40 97 43 87 94 72 11 54 21



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76 58 94 39 02 60 29 33 36 08 81 17 68 41 84 15 24 32 01 73 27 04 64 42 74
09 23 98 85 03 70 10 82 47 59 20 93 65 07 45 66 92 88 71 91 79 49 51 61 25
96 48 16 80 35 50 62 18 19 56 34 40 05 90 43 87 72 11 52 44 95 86 78 12 53
14 37 89 97 75 57 69 77 00 28 54 26 31 30 99 63 22 67 13 83 06 21 55 38 46
94 52 78 53 63 37 89 97 75 13 72 91 14 27 51 61 19 34 40 05 43 82 11 55 38
90 76 58 60 29 35 81 08 44 39 92 01 71 87 48 15 88 32 57 69 77 66 00 28 54
02 30 99 64 22 56 98 23 83 06 17 36 41 84 25 93 46 24 80 07 50 62 18 26 31
79 04 49 42 74 09 21 67 85 96 03 70 10 68 47 59 20 33 65 16 45 86 95 73 12
54 26 31 30 63 22 38 00 58 94 01 73 91 04 64 42 67 13 83 06 21 55 74 09 76
98 85 03 70 10 82 47 59 20 93 65 07 99 66 92 15 88 71 27 49 96 48 23 80 35
50 62 90 43 87 72 11 52 44 95 79 86 12 53 14 37 89 16 51 61 25 75 57 69 77
28 46 97 78 39 02 60 29 33 36 08 81 17 68 41 84 45 24 32 18 19 56 34 40 05
81 17 60 29 35 73 88 12 53 63 37 97 75 13 55 38 90 76 58 39 48 52 24 32 57
69 77 28 54 79 02 30 99 74 89 22 67 98 06 25 93 15 46 80 66 86 50 62 18 26
31 78 27 04 64 42 56 09 23 85 96 70 10 82 47 59 20 33 65 16 07 92 01 91 14
00 87 19 21 34 40 36 08 44 45 95 68 41 84 05 43 03 94 72 11 71 49 51 61 83
15 75 57 69 04 64 42 67 13 83 06 21 77 48 23 80 35 50 62 90 43 87 72 11 52
44 95 79 86 12 53 99 63 22 38 00 58 94 01 76 98 03 70 10 82 47 59 20 93 65
07 73 91 55 74 09 28 46 97 78 39 02 60 29 33 36 08 81 14 37 54 26 96 31 30
17 84 45 24 32 18 19 56 34 40 05 92 85 68 41 88 71 27 49 61 66 89 16 51 25
00 68 12 53 76 57 81 79 02 30 99 74 89 22 67 98 06 25 93 15 46 80 66 75 13
17 60 29 35 86 50 58 39 48 73 88 69 77 28 54 55 08 44 45 95 41 84 05 38 90
62 18 26 31 78 27 04 64 42 56 09 23 85 96 70 10 82 47 59 20 33 65 16 07 92
01 91 14 87 19 21 34 40 36 43 63 37 97 03 94 72 11 71 49 51 61 83 52 24 32
14 99 63 22 46 36 08 81 17 68 41 84 15 24 32 01 73 27 04 64 42 74 09 23 98
85 03 38 76 58 94 39 02 60 29 33 70 10 82 47 59 20 96 48 16 80 35 50 62 18
19 93 65 07 45 66 92 88 71 91 79 49 51 61 25 56 34 40 05 90 43 87 72 11 52
44 95 86 78 12 53 37 89 97 75 57 69 77 00 28 54 26 31 30 67 13 83 06 21 55
23 47 74 17 93 15 46 63 37 97 03 62 18 26 31 85 96 70 10 82 78 27 04 64 94
56 09 59 20 33 65 16 07 92 00 68 12 53 76 57 81 79 02 30 99 60 29 35 86 50
58 39 48 73 88 69 77 28 01 91 14 87 19 21 34 40 36 43 54 89 22 67 98 06 25
80 66 75 13 55 08 44 72 11 71 49 51 61 83 52 24 32 42 45 95 41 84 05 38 90
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42 67 13 83 06 21 77 48 23 80 35 90 43 87 72 11 52 95 79 86 12 53 99 63 22
58 94 01 76 98 03 70 10 82 47 59 78 39 02 60 29 33 36 08 81 14 37 54 26 96
99 44 24 32 48 12 63 37 90 76 89 75 13 60 29 35 36 08 58 39 15 55 38 52 77
67 83 06 42 25 00 33 66 79 69 93 46 16 28 01 78 70 30 80 03 53 02 23 96 68
41 56 05 82 59 20 65 57 45 86 92 88 71 07 50 62 18 26 81 95 17 10 84 73 47
31 27 04 64 98 09 85 91 14 49 51 61 19 34 40 97 43 87 94 72 11 54 21 74 22
40 16 35 44 94 01 76 07 53 99 17 84 45 24 32 18 19 56 34 05 92 85 68 41 66
89 51 25 15 75 57 69 04 64 42 67 13 83 06 21 77 48 23 80 50 62 90 43 87 72
11 52 73 91 55 74 09 28 46 95 79 86 12 78 39 02 98 03 70 10 82 47 59 20 93
65 88 71 27 49 61 60 29 33 36 08 81 14 37 54 26 96 31 30 63 22 38 00 58 97
59 39 69 89 22 00 72 60 29 35 73 42 56 09 23 85 96 70 99 74 67 98 06 25 93
15 46 80 66 86 50 62 18 26 87 19 21 34 40 36 08 44 45 95 68 41 84 05 43 03
94 11 71 49 51 61 83 20 33 65 16 07 92 01 91 14 81 17 88 12 53 63 37 97 75
13 55 38 90 76 58 31 78 27 04 64 10 82 47 48 52 24 32 57 77 28 54 79 02 30
57 16 35 89 78 93 65 00 58 97 69 04 84 45 95 82 47 59 20 79 71 27 49 61 60
29 33 36 08 81 14 37 54 26 96 31 88 52 73 91 30 63 22 38 64 42 67 13 83 06
21 77 48 23 80 50 62 90 43 87 72 40 44 94 01 76 07 53 99 17 24 32 18 19 56
34 05 92 85 68 41 66 51 25 15 75 11 55 74 09 28 46 86 12 39 02 98 03 70 10
90 22 06 78 27 04 64 10 82 47 48 52 46 80 74 67 98 66 79 02 30 59 39 69 89
00 72 60 29 25 93 54 94 11 71 49 51 61 83 20 33 65 16 07 92 01 91 14 81 17



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68 46 99 63 22 58 39 02 84 27 64 50 73 42 87 17 45 24 32 18 19 56 34 40 05
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25 15 75 57 69 04 35 90 43 62 44 38 00 20 93 65 94 01 76 98 03 70 10 82 47
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25 15 75 57 69 04 35 90 43 62 44 38 00 20 93 65 94 01 76 98 03 70 10 82 47
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67 13 83 74 90 85 41 14 58 39 02 84 27 64 82 47 06 21 77 48 37 91 52 95 79
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96 03 80 50 18 26 31 27 04 13 38 90 76 58 39 99 32 00 78 55 77 48 89 97 83
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34 74 22 67 26 27 53 63 37 89 08 97 28 77 25 52 90 76 58 65 07 45 86 92 60
01 71 12 21 24 32 66 50 95 73 43 87 94 79 10 82 30 99 56 09 59 20 48 15 69

V. CONCLUSION

1. The table constructed here consists of 10000 occurrences of the 100 two-digit numbers
00 , 01 , 02 , 03 , ,98 , 99.
2. The table constructed here is properly random with respect to the two definitions of probability namely definitions in theoretically ideal situation and definition in practically ideal situation { *Chakrabarty* (2014, 2010, 2011)}.
3. The table constructed here is independent of the earlier random two-digit numbers table constructed by *Chakrabarty* (2013a).
4. It is necessary to construct more independent tables of random two-digit numbers
5. It is also necessary to construct more independent tables of three-digit random numbers.

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Author's Biography

Dr. Dhritikesh Chakrabarty passed B.Sc. (with Honours in Statistics) Examination from 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



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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 (in Vocal 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.

Dr. Dhritikesh Chakrabarty is also an awardee of the Post Doctoral Research Award by the University Grants Commission for the period 2002–05.

He attended five of orientation/refresher course held in Gauhati University, Indian Statistical Institute, University Calicut and Cochin University of Science & Technology sponsored/organized by University Grants Commission/Indian Academy of Science. He also attended/participated eleven workshops/training programmes of different fields at various institutes.

Dr. Dhritikesh Chakrabarty joined the Department of Statistics of Handique Girls' College, Guwahati, as a Lecturer on December 09, 1987 and currently he is an Associate Professor (Ex Head) of the same Department of the same College. He is also a Guest Faculty in the National Institute of Pharmaceutical Education & Research (NIPER), Guwahati; Research Guide (Ph. D. Guide) in the Department of Statistics of Gauhati University and Research Guide (Ph. D. Guide), in the Department of Statistics of Assam Down Town University. He has been guiding a number of Ph.D. students in the two universities. He acted as Guest Faculty in the Department of 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 sixty three research papers in various research journals mostly of international level and eight research papers in conference proceedings. Fifty four research papers based on his research works have already been presented in research conferences/seminars of national and international levels both within and outside India. He has written a book titled "Statistics for Beginners". He is also one author of the Assamese Science Dictionary titled "Vigyan Jeuti" published by Assam Science Society. He delivered invited talks/lectures in several seminars He acted as chair person in some seminars. He visited U.S.A. in 2007, Canada in 2011 and U.K. in 2014. He has already completed one post doctoral research project (2002–05) and one minor research project (2010–11). He is an active life member of each of the following academic cum research organizations:

- (1) Assam Science Society (ASS)
- (2) Assam Statistical Review (ASR)
- (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)



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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.
