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THE NIST STATISTICAL TEST SUITE

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1. FREQUENCY TEST

Computational information:

(a) The nth partial sum = 1664
(b) S_n/n = 0.001664

p_value = 0.096112, SUCCESS

2. BLOCK FREQUENCY TEST

Computational information:

(a) χ^2 = 125014.000000
(b) # of substrings = 125000
(c) block length = 8

p_value = 0.488300, SUCCESS

3. CUMULATIVE SUMS TEST

Cumulative sums forward test:

Computational information:

(a) The maximum partial sum =

p_value = 0.087391, SUCCESS

Cumulative sums reverse test:

Computational information:

(a) The maximum partial sum =

p_value = 0.093623, SUCCESS

4. RUNS TEST

Computational information:

(a) P_i = 0.500832
(b) V_{n_obs} (Total # of runs) = 499865

$$\frac{(c) \sqrt{n_{\text{obs}} - 2 n p_i (1-p_i)}}{2 \sqrt{2n} p_i (1-p_i)} = 0.188961$$

p_value = 0.789291, SUCCESS

5. LONGEST RUNS OF ONES TEST

Computational information:

(a) N (# of substrings) = 100
 (b) M (Substring Length) = 10000
 (c) Chi^2 = 9.581409

Frequency

<=10	11	12	13	14	15	>=16
5	20	31	14	10	7	13

p_value = 0.143423, SUCCESS

6. RANK TEST

Computational information:

(a) Probability P_32 = 0.288788
 (b) P_31 = 0.577576
 (c) P_30 = 0.133636
 (d) Frequency F_32 = 294
 (e) F_31 = 556
 (f) F_30 = 126
 (g) # of matrices = 976
 (h) Chi^2 = 0.779061
 (i) NOTE: 576 BITS WERE DISCARDED.

p_value = 0.677375, SUCCESS

7. DFT TEST

Computational information:

(a) Percentile = 95.006200
 (b) N_l = 475031.000000
 (c) N_o = 475000.000000
 (d) d = 0.201155

p_value = 0.840578, SUCCESS

8. NONOVERLAPPING TEMPLATES TEST

Computational information:
LAMBDA = 122.061523
M = 125000, N = 8, m = 10, n = 1000000

Template	W_1	W_2	W_3	W_4	W_5	W_6	W_7	W_8
1100100100	107	129	133	115	121	129	144	133

chi2_value = 9.137520
p_value = 0.330828, SUCCESS

9. OVERLAPPING TEMPLATE OF ALL ONES TEST

Computational information:
(a) n (sequence_length) = 1000000
(b) m (block length of 1s) = 10
(c) M (length of substring) = 1032
(d) N (number of substrings) = 968
(e) lambda $[(M-m+1)/2^m]$ = 0.999023
(f) eta = 0.499512

Frequency:

0	1	2	3	4	>=5	Chi^2
571	154	93	62	40	48	2.4632

p_value = 0.782027, SUCCESS

10. UNIVERSAL TEST

Computational information:
(a) L = 7
(b) Q = 1280
(c) K = 141577
(d) sum = 877100.716923
(e) sigma = 0.002768
(f) variance = 3.125000
(g) exp_value = 6.196251
(h) phi = 6.195220
(i) WARNING: 1 bits were discarded.

p_value = 0.709770, SUCCESS

11. APPROXIMATE ENTROPY TEST

Computational information:
(a) m (block length) = 5
(b) n (sequence length) = 1000000

(c) Chi² = 35.534343
(d) Phi(m) = -3.465713
(e) Phi(m+1) = -4.158843
(f) ApEn = 0.693129
(g) Log(2) = 0.693147

p_value = 0.305299, SUCCESS

12. RANDOM EXCURSIONS TEST

Computational information:

(a) Number Of Cycles (J) = 0333
(b) Sequence Length (n) = 1000000

WARNING: TEST NOT APPLICABLE. THERE ARE AN
INSUFFICIENT NUMBER OF CYCLES.

13. RANDOM EXCURSIONS VARIANT TEST

Computational information:

(a) Number Of Cycles (J) = 333
(b) Sequence Length (n) = 1000000

WARNING: TEST NOT APPLICABLE. THERE ARE AN
INSUFFICIENT NUMBER OF CYCLES.

14. SERIAL TEST

Computational information:

(a) Block length (m) = 5
(b) Sequence length (n) = 1000000
(c) Psi_m = 45.500800
(d) Psi_m-1 = 21.108192
(e) Psi_m-2 = 11.784096
(f) Del_1 = 24.392608
(g) Del_2 = 15.068512

p_value1 = 0.081273, SUCCESS

p_value2 = 0.057827, SUCCESS

15. LEMPEL-ZIV COMPRESSION TEST

Computational information:

(a) W (# of words) = 69581

p_value = 0.200019, SUCCESS