

One-Sample Runs Test for Randomness

Standalone verified Python analysis

Test: One-Sample Runs Test for Randomness

Design: Randomness of the observed row-order sequence of final grades above and below the sample median.

Variables: ordered G3 sequence

Null hypothesis: Above-median and below-median observations occur in random order.

Formula: $E(R)=1+2n_{0n_1}/N$; $Var(R)=2n_{0n_1}(2n_{0n_1}-N)/[N^2(N-1)]$

Source rows: 649

Calculated metrics:

median: 12.0
below_count: 301
above_count: 276
ties_removed: 72
runs: 231
expected_runs: 288.95840554592723
variance: 143.4584807621645
z_statistic: -4.838974301928715
p_value: 1.3051091861674735e-06

Independent reference values:

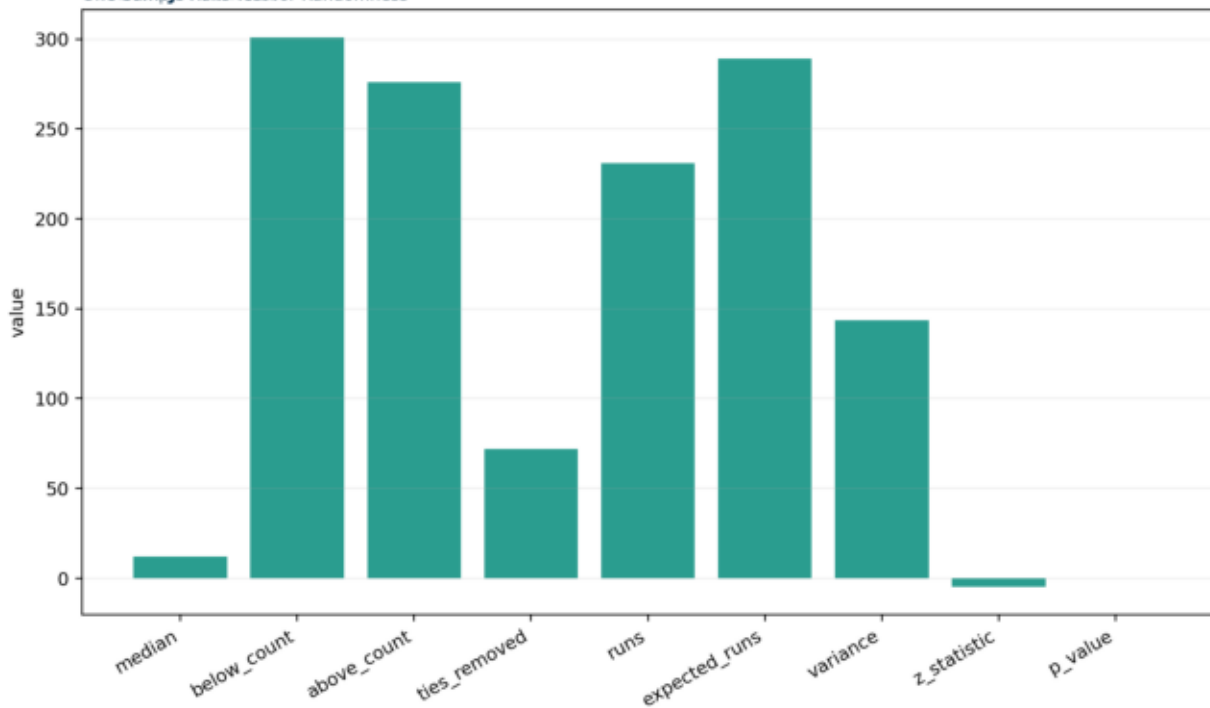
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Interpretation:

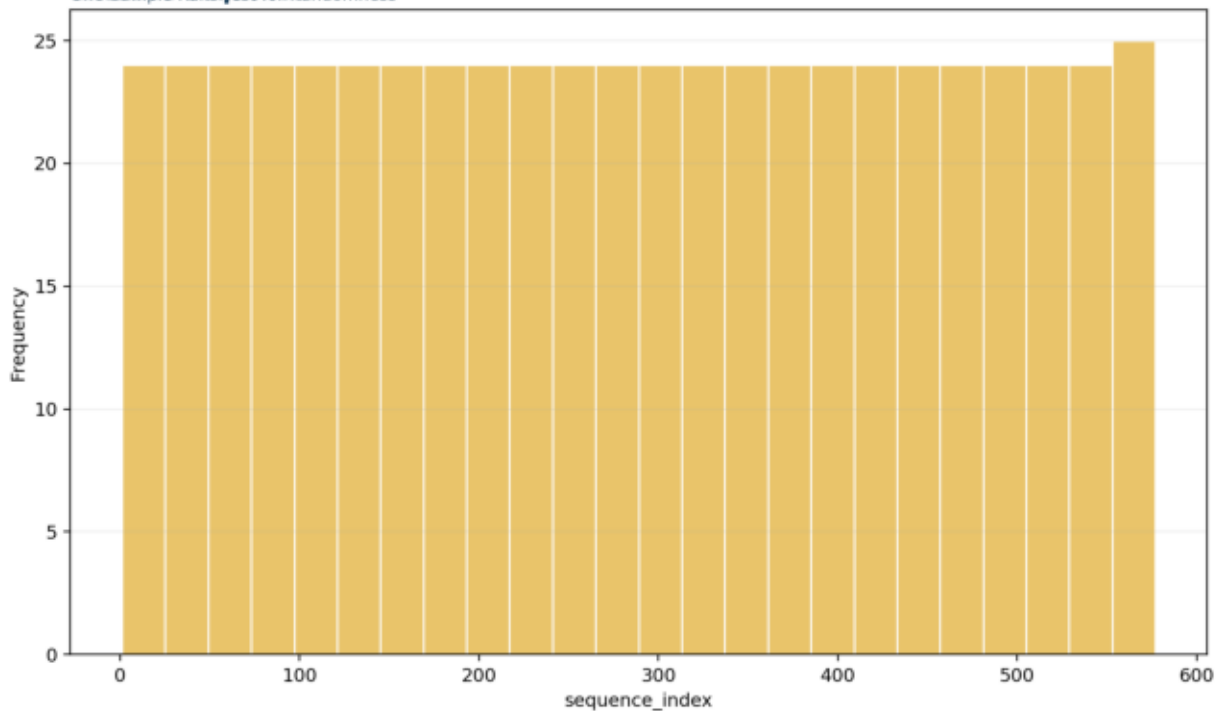
Grades equal to the sample median are removed before the binary run sequence is formed.

Observed runs=231, expected=288.958, p=1.30511e-06.

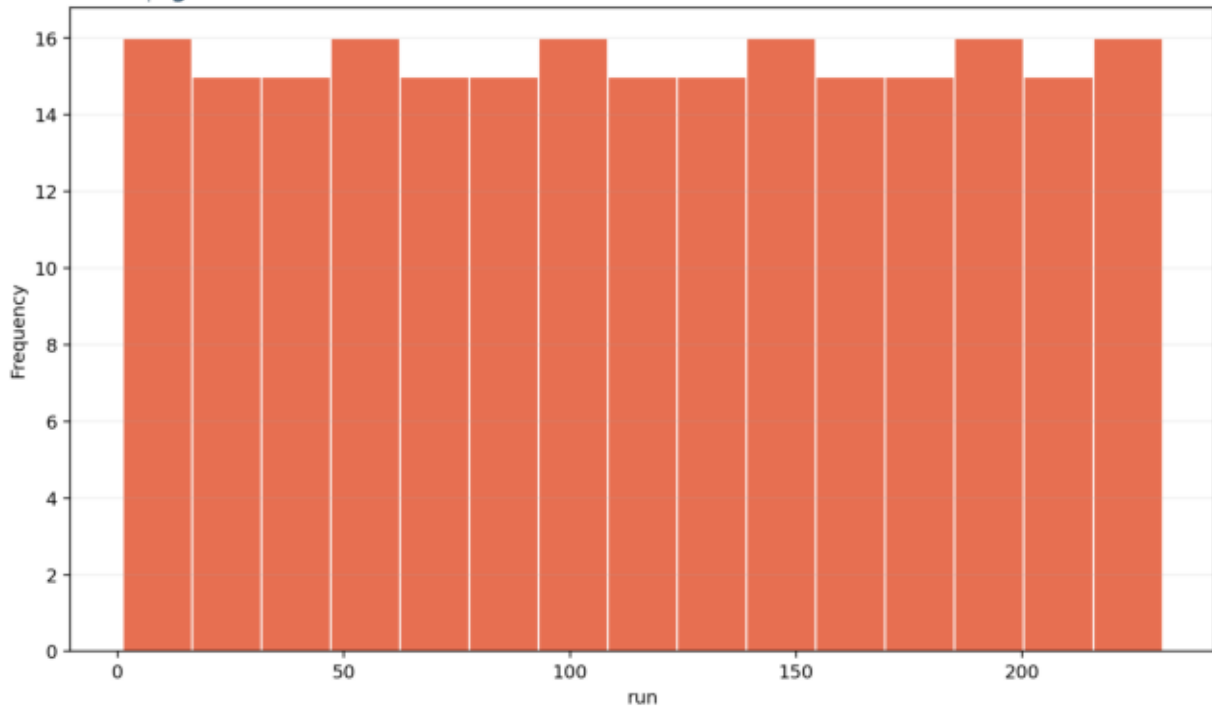
Primary Metrics



Encoded Sequence Randomness

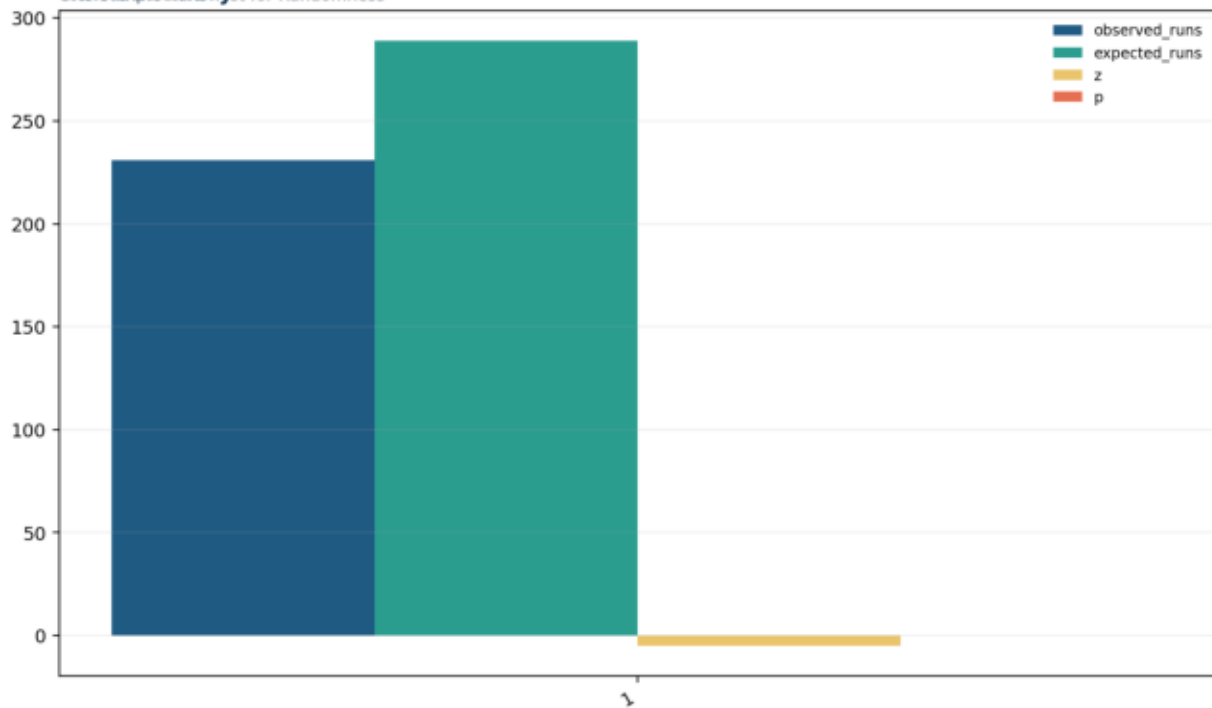


Run Lengths Test for Randomness

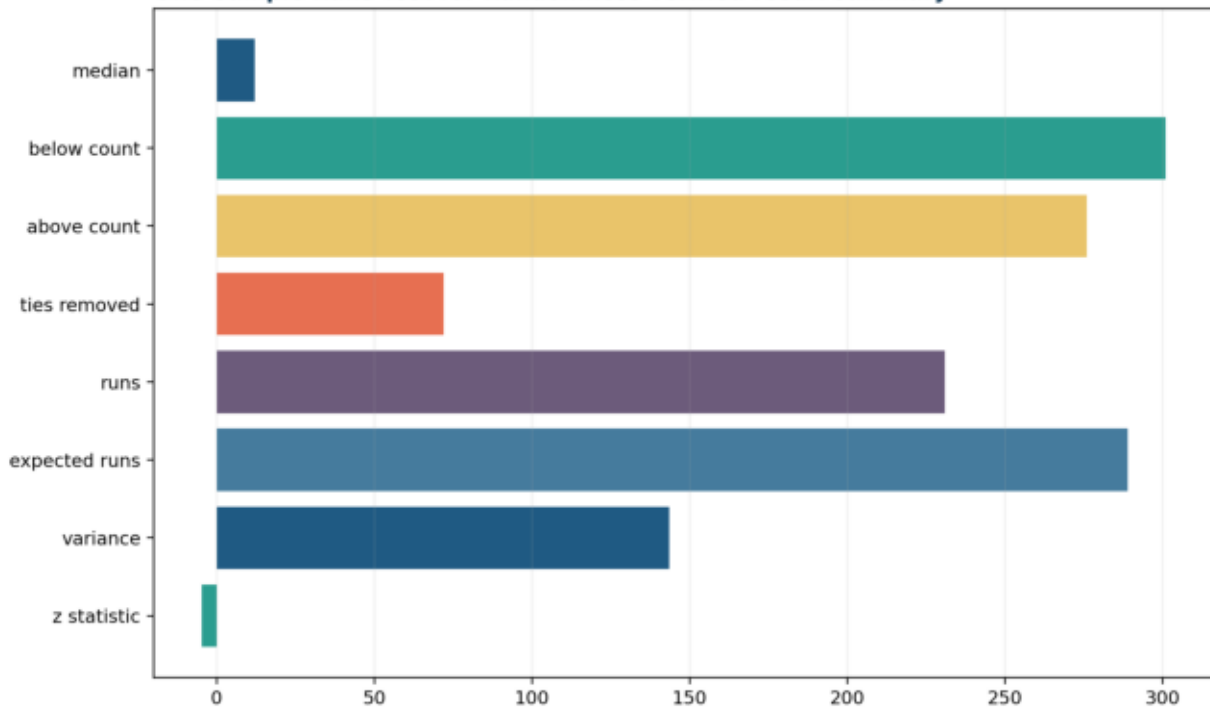


Run Summary

Test for Randomness



One-Sample Runs Test for Randomness verified result summary



Primary Metrics

metric	value
median	12
below_count	301
above_count	276
ties_removed	72
runs	231
expected_runs	288.958
variance	143.458
z_statistic	-4.83897
p_value	1.30511e-06

Encoded Sequence

sequence_index	side_of_median
1	0
2	0
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	0
18	1
19	1
20	0
21	0
22	0
23	1
24	0
25	1
26	1

Run Lengths

run	run_length
1	2
2	14
3	1
4	2
5	3
6	1
7	1
8	2
9	1
10	2
11	2
12	1
13	3
14	5
15	1
16	7
17	1
18	2
19	2
20	1
21	3
22	1
23	3
24	1
25	4
26	1

Run Summary

observed_runs	expected_runs	z	p
231	288.958	-4.83897	1.30511e-06