

Friedman Test

Standalone verified Python analysis

Test: Friedman Test

Design: Three repeated grade occasions analyzed as a complete block design with students as blocks.

Variables: G1, G2, G3

Null hypothesis: The three repeated grade distributions have equal location.

Formula: $Q = 12/[n \cdot k(k+1)] \sum_j R_j^2 - 3n(k+1)$, with tie correction.

Source rows: 649

Calculated metrics:

statistic: 167.32827735644634

p_value: 4.625154438692089e-37

degrees_of_freedom: 2

kendalls_w: 0.12891238625304033

Independent reference values:

statistic: 167.32827735644634

p_value: 4.625154438692089e-37

df: 2

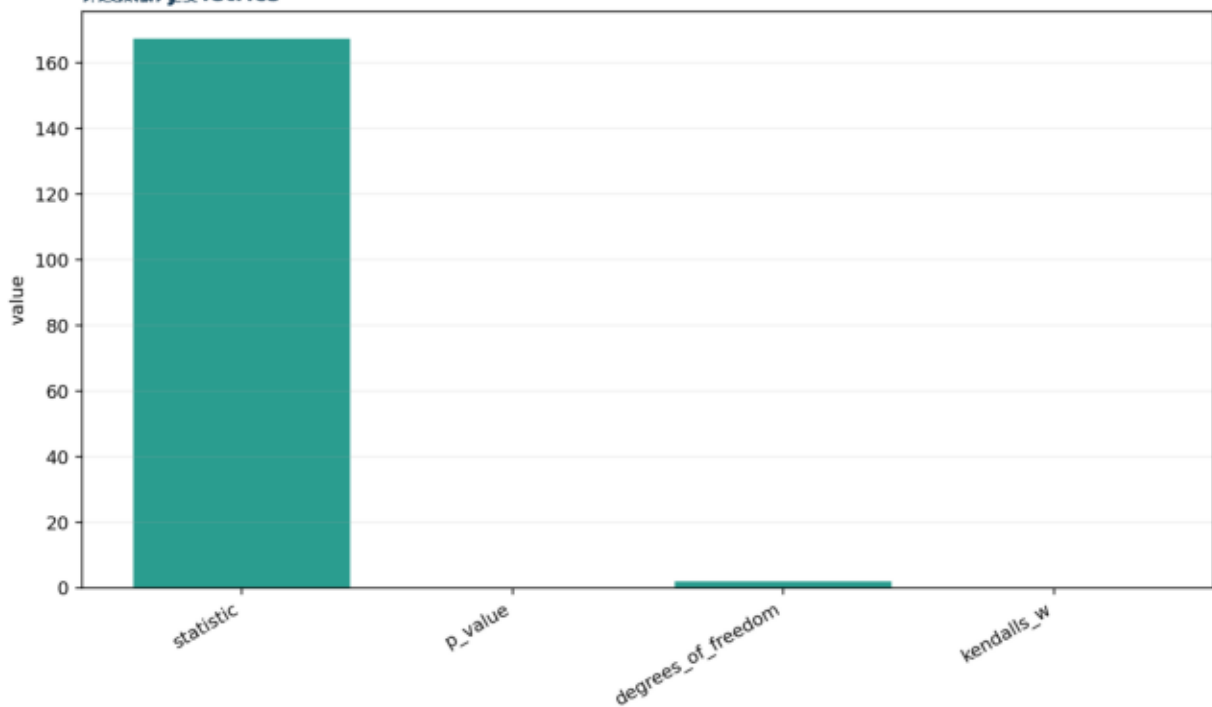
kendalls_w: 0.12891238625304033

Interpretation:

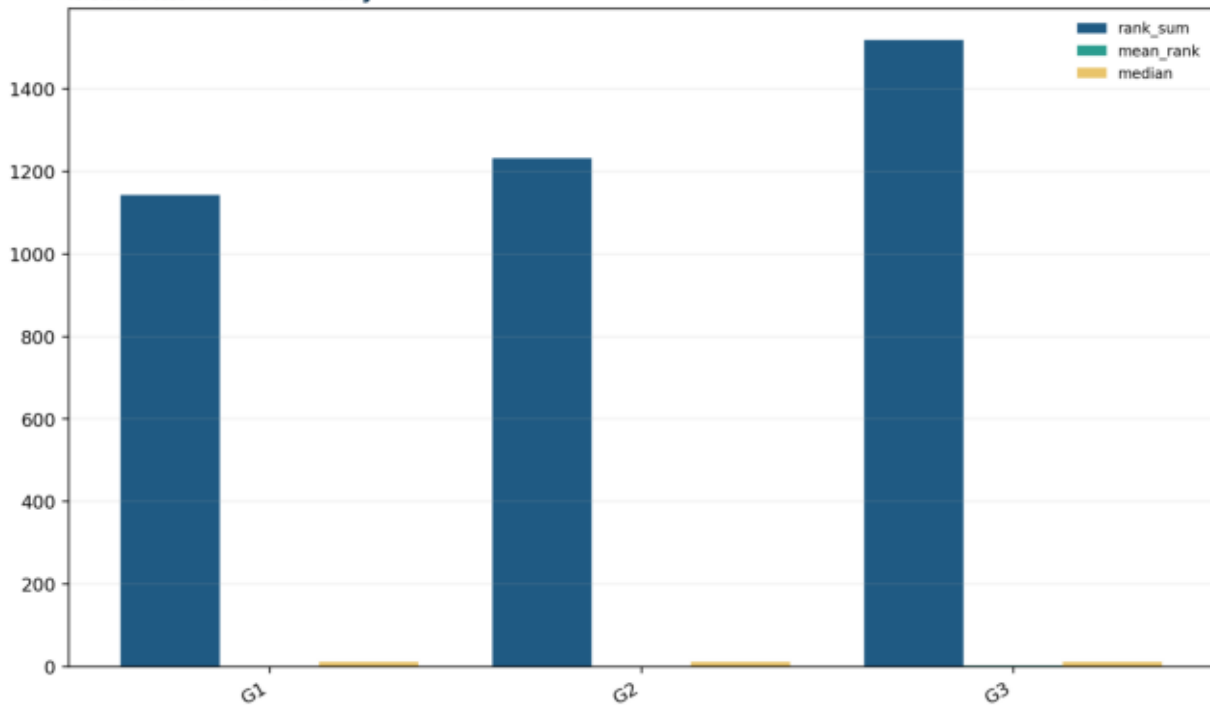
Students form complete blocks and all three grade occasions are ranked within each student.

Friedman chi-square=167.328277, p=4.62515e-37.

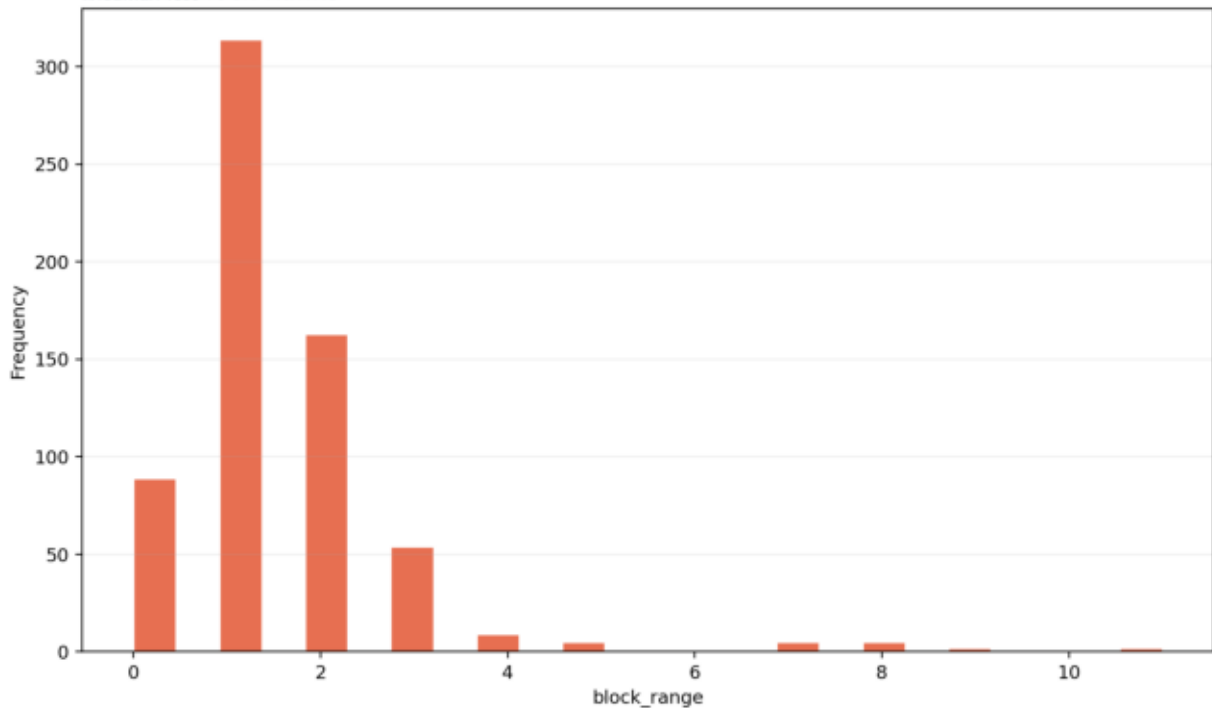
Primary Metrics



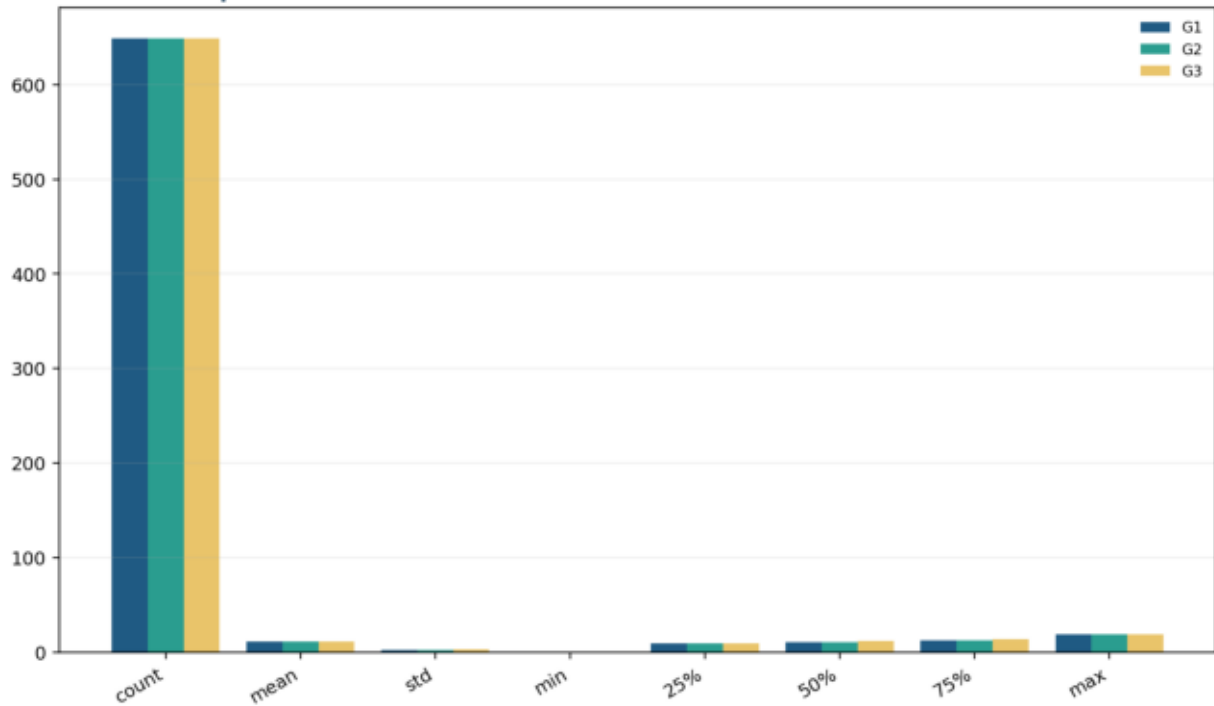
Occasion Rank Summary



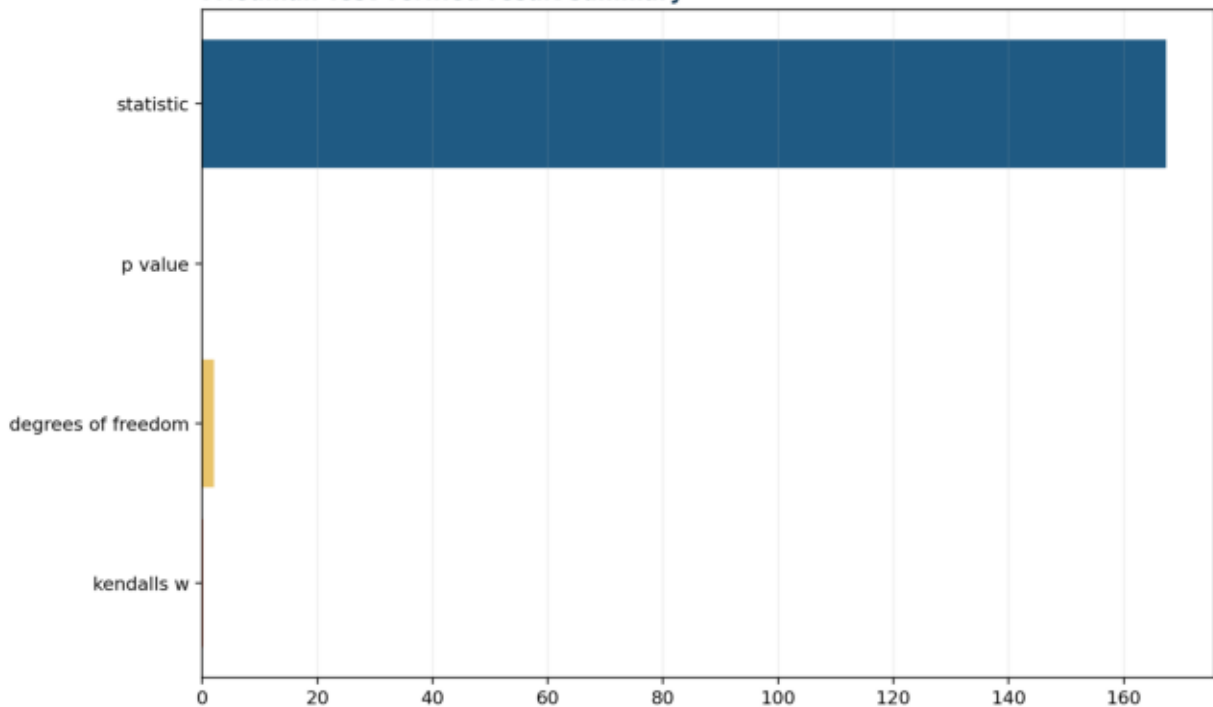
Student Block Ranks



Grade Descriptives



Friedman Test verified result summary



Primary Metrics

metric	value
statistic	167.328
p_value	4.62515e-37
degrees_of_freedom	2
kendalls_w	0.128912

Occasion Rank Summary

occasion	rank_sum	mean_rank	median
G1	1143	1.76117	11
G2	1232	1.89831	11
G3	1519	2.34052	12

Student Block Ranks

block_range	G1_rank	G2_rank	G3_rank
11	1	2.5	2.5
2	1	2.5	2.5
1	1.5	3	1.5
0	2	2	2
2	1	2.5	2.5
1	1.5	1.5	3
1	2.5	1	2.5
3	1	2.5	2.5
2	1	2	3
1	1.5	1.5	3
0	2	2	2
3	1	2	3
1	1.5	3	1.5
1	1.5	1.5	3
1	1.5	1.5	3
0	2	2	2
1	1.5	1.5	3
1	1	2.5	2.5
1	2.5	2.5	1
0	2	2	2
2	1	2	3
1	1	2.5	2.5
2	1	2	3
0	2	2	2
1	1.5	3	1.5
2	1	2	3

Grade Descriptives

index	G1	G2	G3
count	649	649	649
mean	11.3991	11.5701	11.906
std	2.74527	2.91364	3.23066
min	0	0	0
25%	10	10	10
50%	11	11	12
75%	13	13	14
max	19	19	19