

Mann-Whitney U Test

Standalone verified Python analysis

Test: Mann-Whitney U Test

Design: Two independent final-grade samples defined by internet access.

Variables: G3, internet

Null hypothesis: The probability that an observation from one group exceeds the other equals 0.5.

Formula: $U_1 = R_1 - n_1(n_1+1)/2$

Source rows: 649

Calculated metrics:

u_statistic: 29581.5

p_value: 6.389702349023713e-05

probability_superiority_no_over_yes: 0.3933814729115136

Independent reference values:

u_statistic: 29581.5

p_value: 6.389702349023713e-05

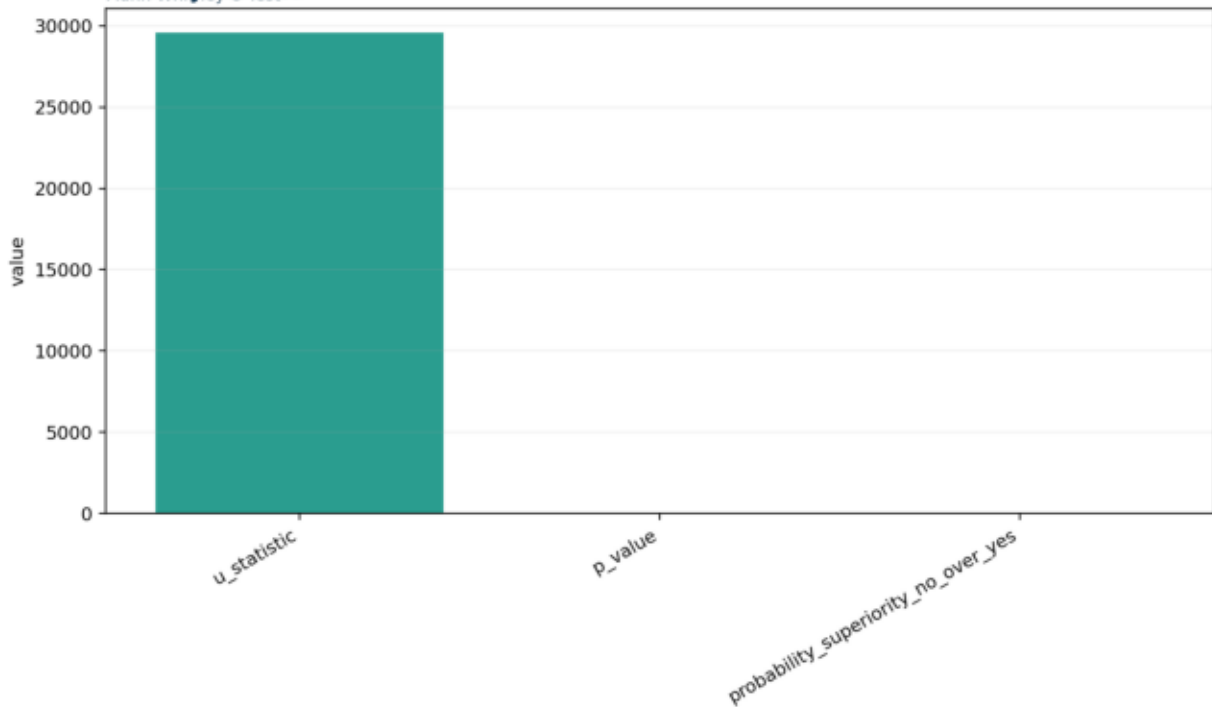
probability_superiority_no_over_yes: 0.3933814729115136

Interpretation:

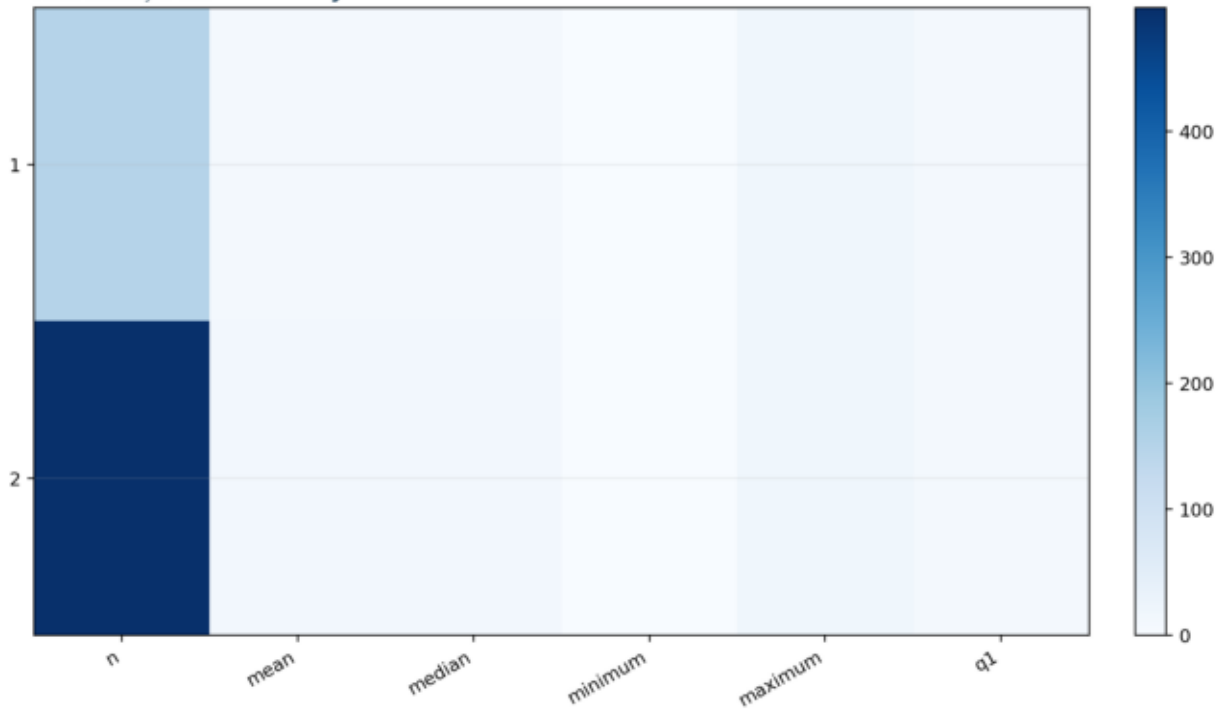
The first-group U corresponds to a probability-of-superiority estimate of 0.393381.

Ties contribute one half to pairwise superiority.

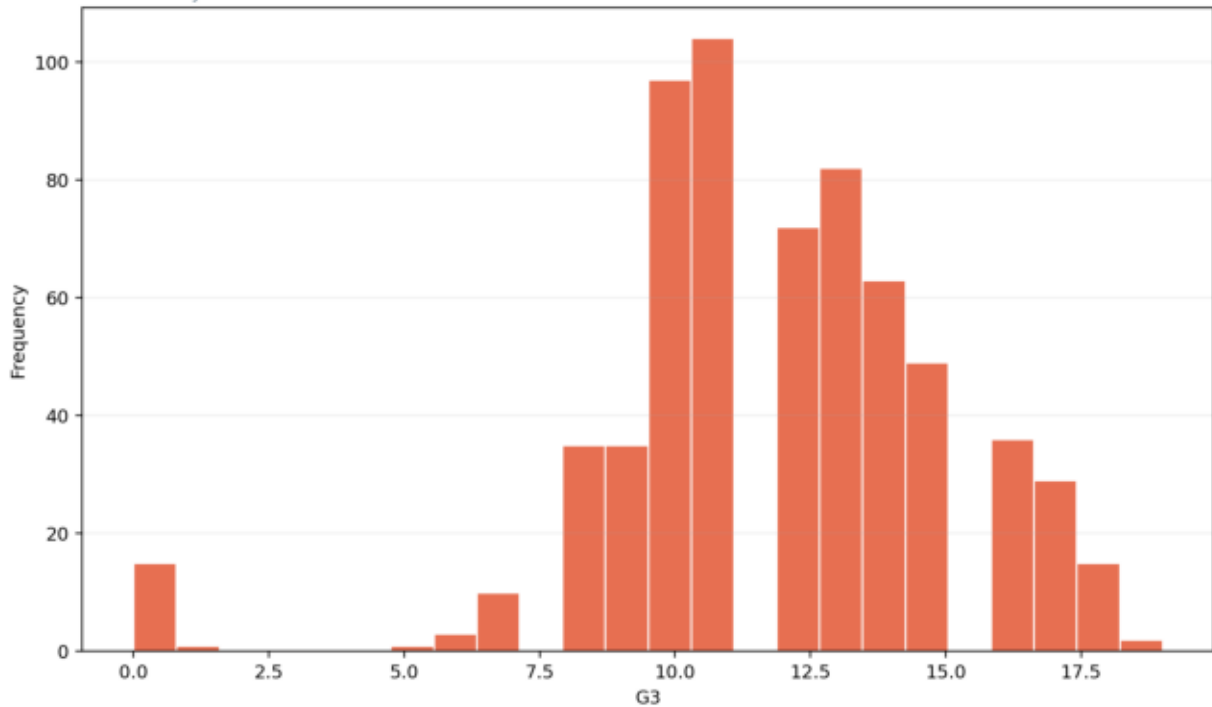
Primary Metrics



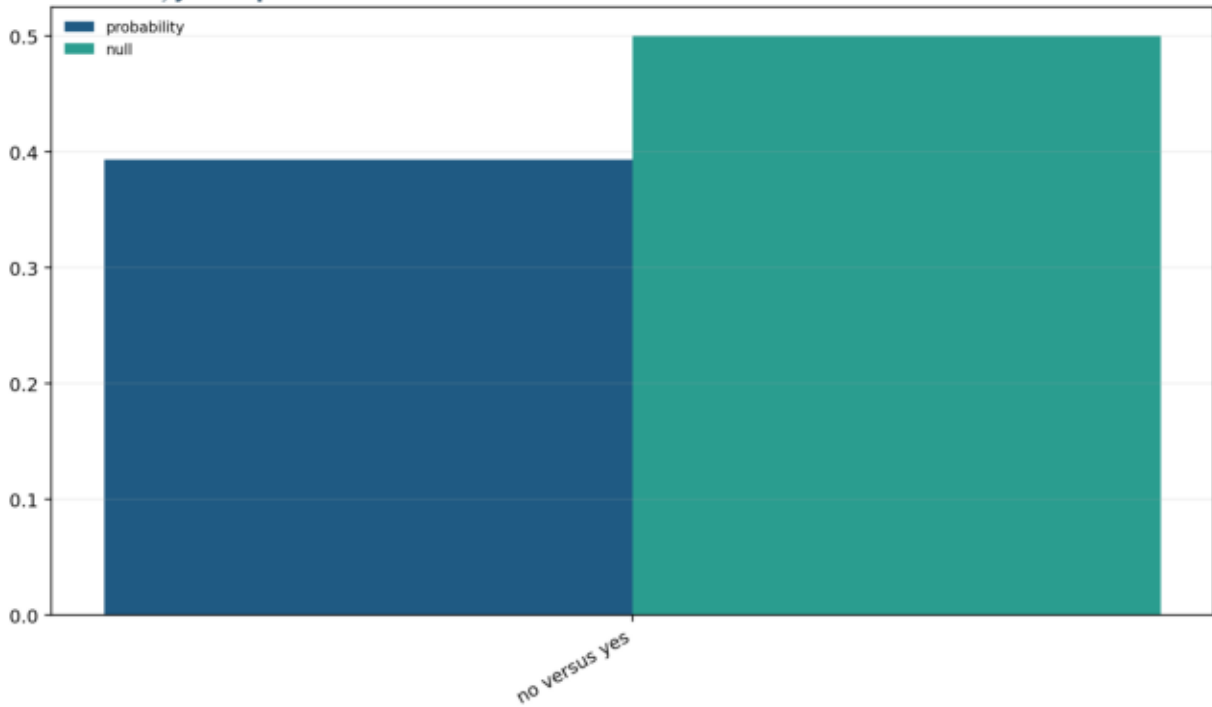
InternetGrade Summary



Ranked Observations



Probability Interpretation



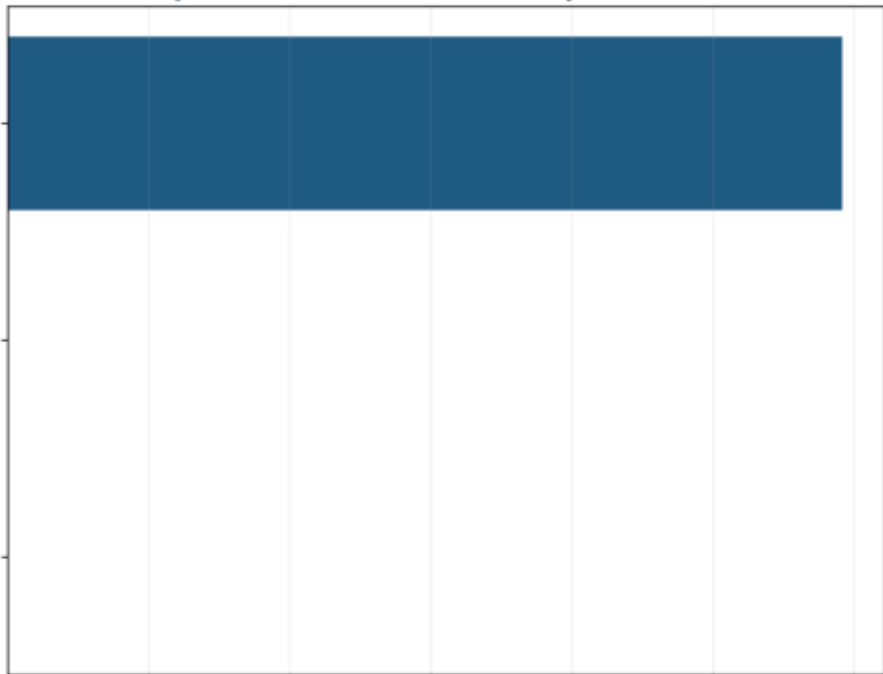
Mann-Whitney U Test verified result summary

u statistic

p value

probability superiority no over yes

0 5000 10000 15000 20000 25000 30000



Primary Metrics

metric	value
u_statistic	29581.5
p_value	6.3897e-05
probability_superiority_no_over_yes	0.393381

Internet Grade Summary

internet	n	mean	median	minimum	maximum	q1	q3
no	151	11.0265	11	0	19	10	13
yes	498	12.1727	12	0	19	10	14

Ranked Observations

internet	G3	rank
no	11	249.5
no	13	414.5
no	13	414.5
no	14	487
no	11	249.5
no	12	337.5
no	13	414.5
no	9	83
no	16	585.5
no	16	585.5
no	14	487
no	11	249.5
no	10	149
no	12	337.5
no	12	337.5
no	10	149
no	16	585.5
no	11	249.5
no	11	249.5
no	11	249.5
no	10	149
no	13	414.5
no	11	249.5
no	10	149
no	9	83

Probability Interpretation

orientation	probability	null
no versus yes	0.393381	0.5