

Correlation for Survey Data

Standalone verified Python analysis

Method: Correlation for Survey Data

Method type: association_analysis

Design: Rank-based association between ordered study-time responses and final grade.

Variables: studytime, G3

Inference scope: H0 for the reported Spearman inference: the population rank correlation is zero.

Formula: $\rho_s = \text{cor}(\text{rank}(\text{studytime}), \text{rank}(\text{G3}))$; τ_b adjusts concordant-discordant pairs for ties.

Source rows: 649

Calculated metrics:

spearman_rho: 0.2747118483356099

spearman_p_value: 1.060624038270125e-12

kendall_tau_b: 0.22159616746694258

kendall_p_value: 2.514568793312303e-12

n_pairs: 649

Independent reference values:

spearman_rho: 0.2747118483356099

spearman_p_value: 1.060624038270125e-12

kendall_tau_b: 0.22159616746694258

kendall_p_value: 2.514568793312303e-12

n_pairs: 649

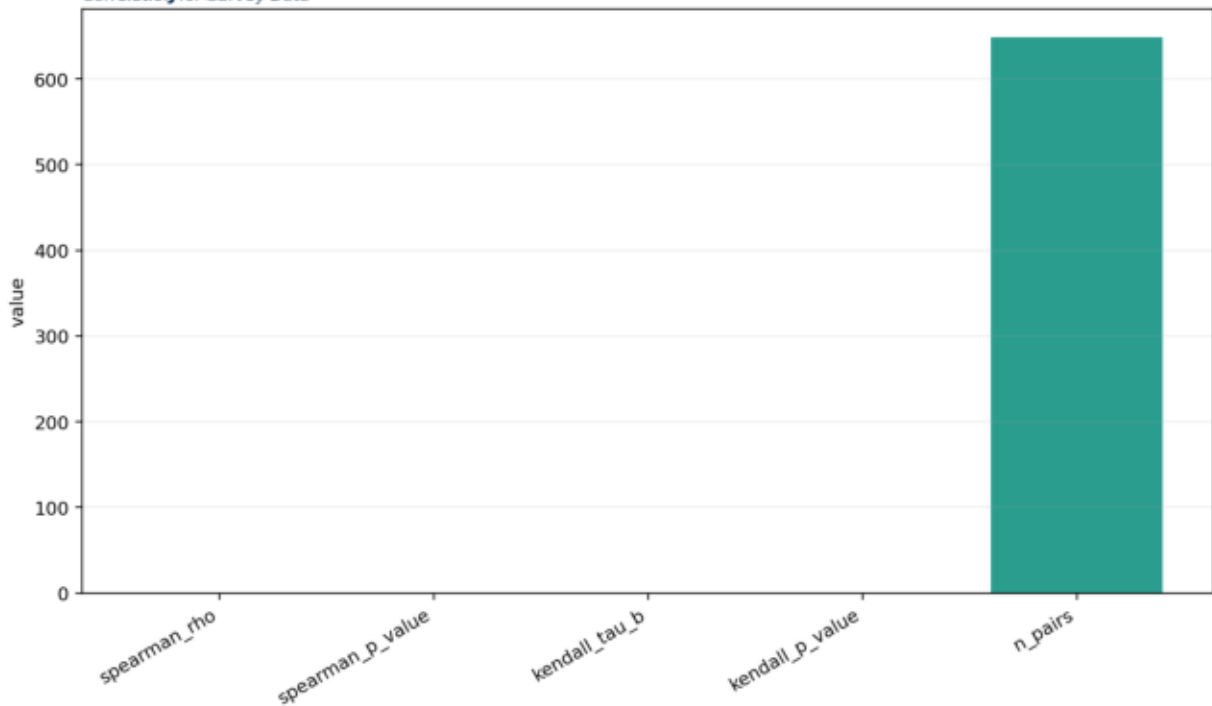
Interpretation:

Studytime is treated as ordered, so Spearman rank correlation is primary.

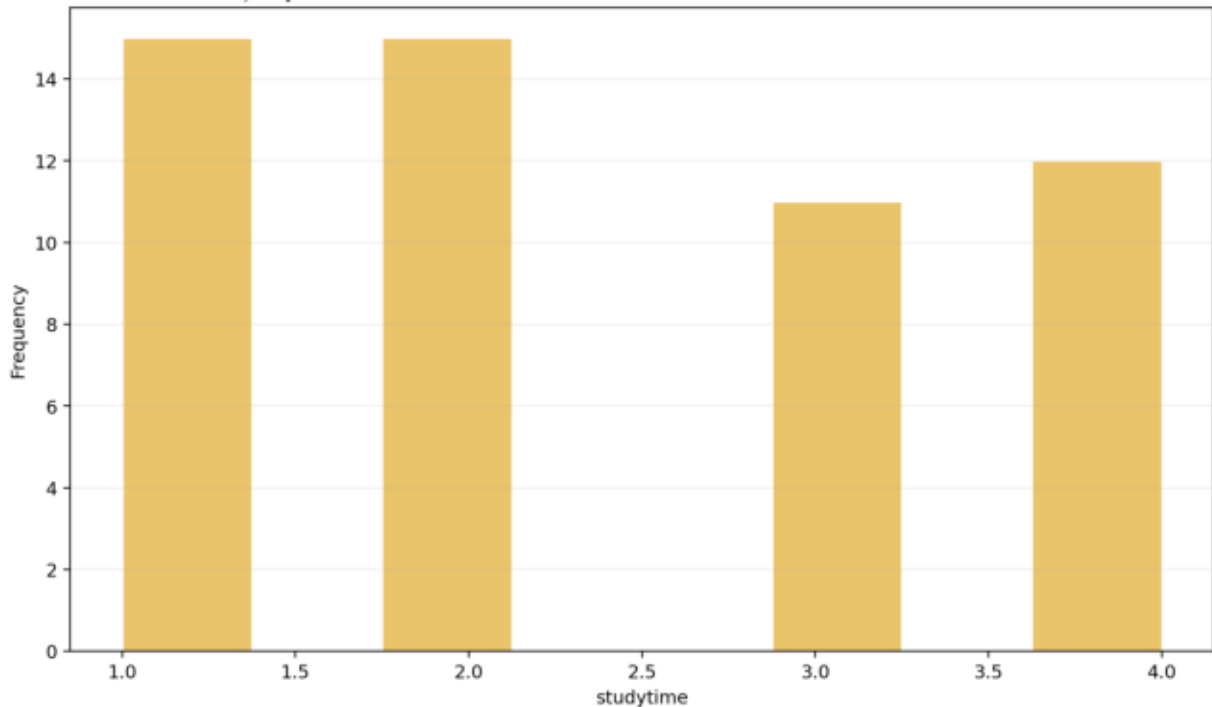
Spearman $\rho=0.274712$; Kendall $\tau_b=0.221596$.

Primary Metrics

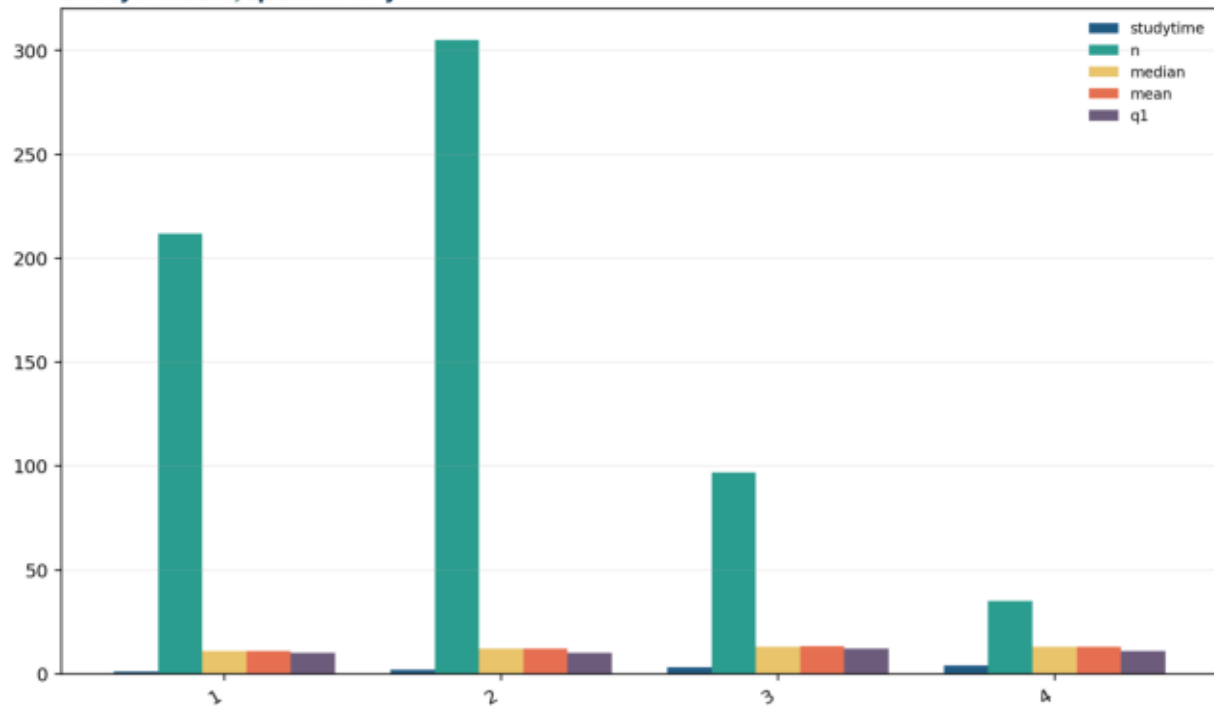
Confidence Interval Data



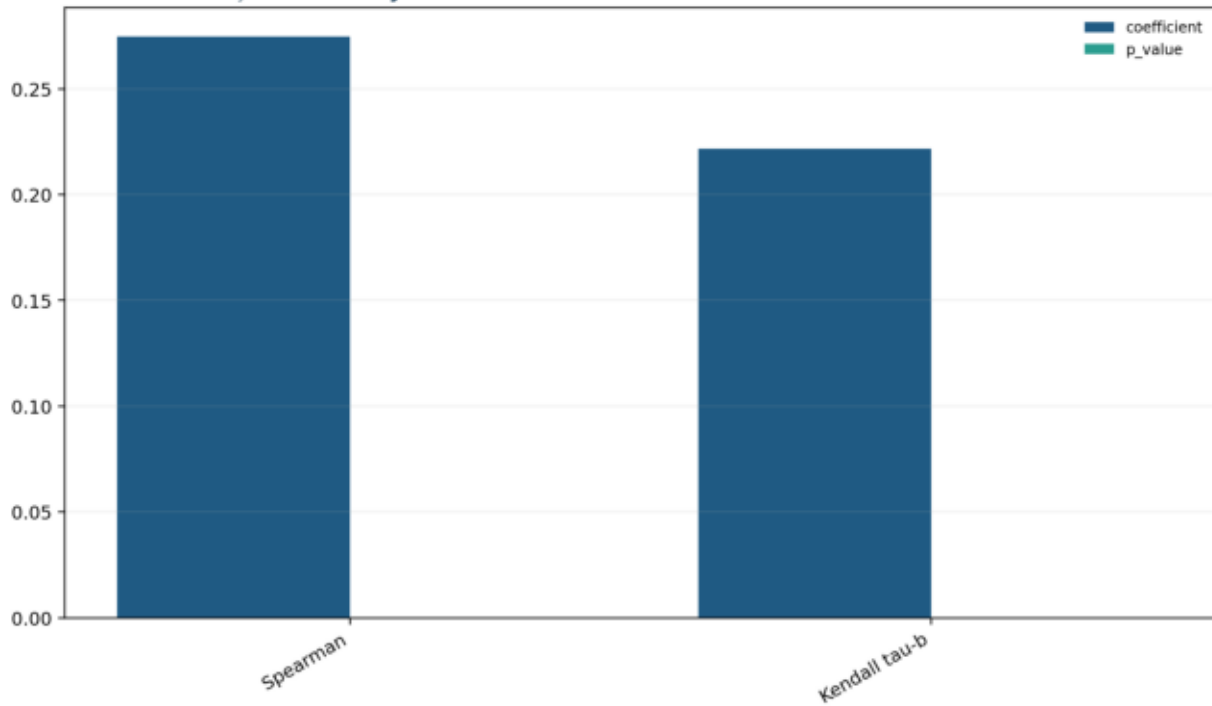
Ordered Pair Frequencies



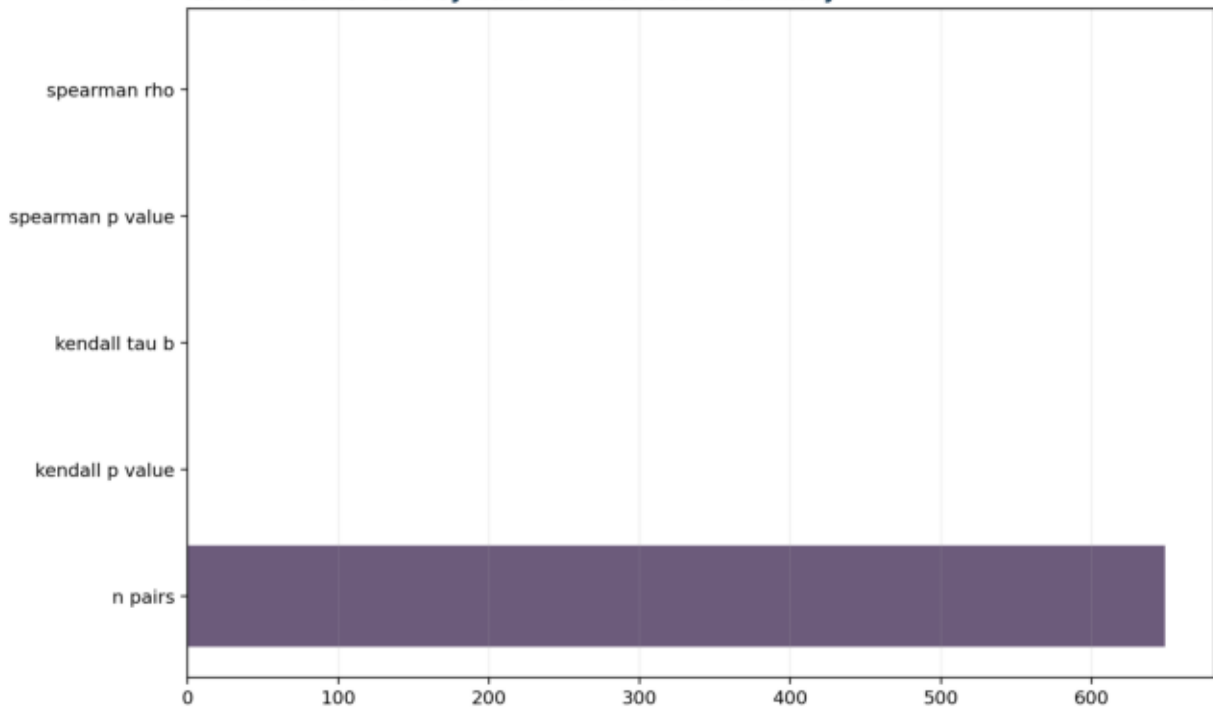
Studytime Group Summary



Rank Association Summary



Correlation for Survey Data verified result summary



Primary Metrics

metric	value
spearman_rho	0.274712
spearman_p_value	1.06062e-12
kendall_tau_b	0.221596
kendall_p_value	2.51457e-12
n_pairs	649

Ordered Pair Frequencies

studytime	G3	frequency
2	11	48
2	10	43
1	11	42
1	10	41
2	13	40
2	12	34
2	14	32
2	15	23
2	16	23
1	12	22
1	9	20
1	13	20
2	8	18
3	13	17
3	15	15
1	14	15
3	14	13
2	17	12
1	8	12
2	9	12
3	12	11
3	11	9
1	15	9
3	10	8
1	0	8
2	18	8

Studytime Group Summary

studytime	n	median	mean	q1	q3
1	212	11	10.8443	10	13
2	305	12	12.0918	10	14
3	97	13	13.2268	12	15
4	35	13	13.0571	11	15

Rank Association Summary

method	coefficient	p_value
Spearman	0.274712	1.06062e-12
Kendall tau-b	0.221596	2.51457e-12