

Introduction to Statistics

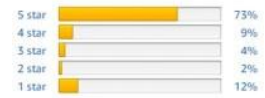
- Kendall's Correlation
 - statistical measure used for ordinal data, which are categorical variables with a meaningful order – movie ratings, education levels, customer reviews
 - non-parametric – suitable for data that does not meet parametric assumptions
 - Assesses monotonic relationships between variables (Think: $y = x$ and $y = x^2 \rightarrow$ both are monotonically increasing but both not linear)
 - Useful when a linear assumption does not hold



Customer reviews

★★★★☆ 4.3 out of 5

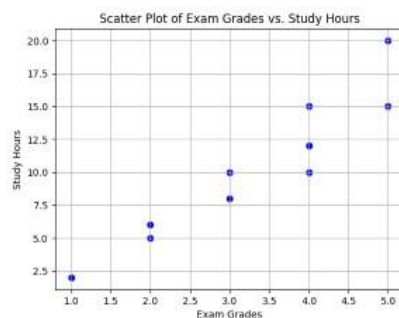
314 customer ratings



https://personal.utdallas.edu/~herve/Wel_KendallCorrelation2007-rectty.pdf
<https://www.statology.org/Kendalls-Tau-B-Test-Kendalls-Tau-B-Test-Formula/>

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- Tends to be smaller than the Pearson's correlation for ordinal data
 - Interpretation is similar to Pearson's correlation
- Example:
 - Exam Grades vs. Study Hours: Assessing if study time relates monotonically to exam grades.
 - Customer Satisfaction vs. Delivery Time: Investigating whether delivery time and customer satisfaction show a monotonic connection.



	exam_grades	study_hours
0	3	10
1	2	5
2	5	15
3	4	10
4	1	2
5	5	20
6	4	15
7	3	8
8	2	6
9	4	12

Pearson Correlation: 0.9405778815702767

Kendall Tau-b Correlation: 0.9035146374351831

$$\text{Kendall's } \tau = \frac{C - D}{C + D}$$

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where,
C is # of concordance pairs and D is # of discordance

			exam_grades	study_hours				exam_grades	study_hours	C	D
exam_grades	study_hours										
0	3	10	4	1	2	4	1	2	9	0	
1	2	5	1	2	5	1	2	5	8	0	
2	5	15	8	2	6	8	2	6	7	0	
3	4	10	0	3	10	0	3	10	5	1	
4	1	2	7	3	8	7	3	8	5	0	
5	5	20	3	4	10	3	4	10	4	0	
6	4	15	6	4	15	6	4	15	2	1	
7	3	8	9	4	12	9	4	12	2	0	
8	2	6	2	5	15	2	5	15	1	0	
9	4	12	5	5	20	5	5	20	0	0	