

**Answers: Statistical skills example sheet: Spearman's rank**

I.

Quadrat ID	Percentage cover of <i>D. flexuosa</i>	Rank 1	Percentage cover of <i>Agrostis sp</i>	Rank 2	d	d ²
JP001	30	13.5	15	21.5	-8	64
JP003	35	17	1	2.5	14.5	210.25
JP004	15	8	5	9.5	-1.5	2.25
JP005	15	8	10	15.5	-7.5	56.25
JP006	15	8	2	4	4	16
JP007	10	4	10	15.5	-11.5	132.25
JP007b	3	1	3	5	-4	16
JP008	5	2	1	2.5	-0.5	0.25
JP009	10	4	5	9.5	-5.5	30.25
JP010	25	11	0.25	1	10	100
JP011	35	17	30	25.5	-8.5	72.25
JP012	50	24.5	20	24	0.5	0.25
JP013	50	24.5	10	15.5	9	81
JP014	30	13.5	15	21.5	-8	64
JP015	40	20.5	15	21.5	-1	1
JP016	50	24.5	5	9.5	15	225
JP017	30	13.5	4	6.5	7	49
JP018	15	8	10	15.5	-7.5	56.25
JP019	40	20.5	7	12	8.5	72.25
JP020b	35	17	15	21.5	-4.5	20.25
JP021	30	13.5	30	25.5	-12	144
JP022	50	24.5	5	9.5	15	225
JP023	15	8	10	15.5	-7.5	56.25
JP024	40	20.5	10	15.5	5	25
JP025	40	20.5	12	19	1.5	2.25
JP026	10	4	4	6.5	-2.5	6.25

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The MoorLIFE project is co-funded by the European Union's Life+ programme and delivered by Moors for the Future Partnership.

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$$\sum d^2 = 1727.5$$

$$\text{Rank (R)} = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

$$R = 1 - \frac{6 \times 1727.5}{26(676-1)}$$

$$R = 0.41$$

2. Degrees of freedom = $26 - 2$
= 24

Note: this number of degrees of freedom is not on the table for significance level therefore taking the last value for degrees of freedom as 20, at the 5 % confidence level, the critical value must be greater than 0.377. For 24 degrees of freedom the critical value would be even lower.

The rank for this test is 0.41 which is greater than the confidence level of 0.377. We can therefore assume that there is a 95 % probability that the positive correlation shown by the data is due to a relationship and not chance alone. We can reject our null hypothesis.

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