Statistical and Data Handling Skills in Biology

Fourth Edition

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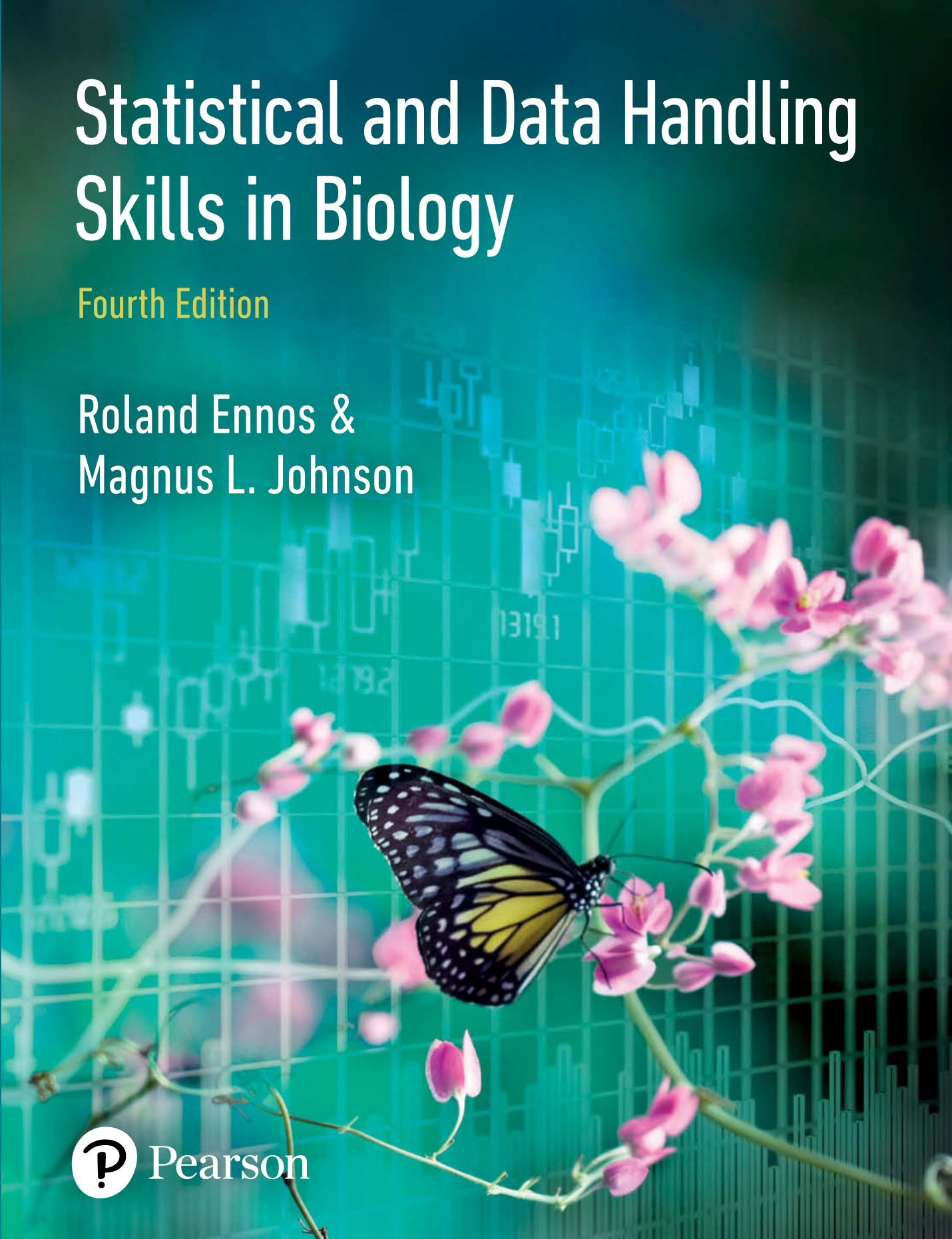
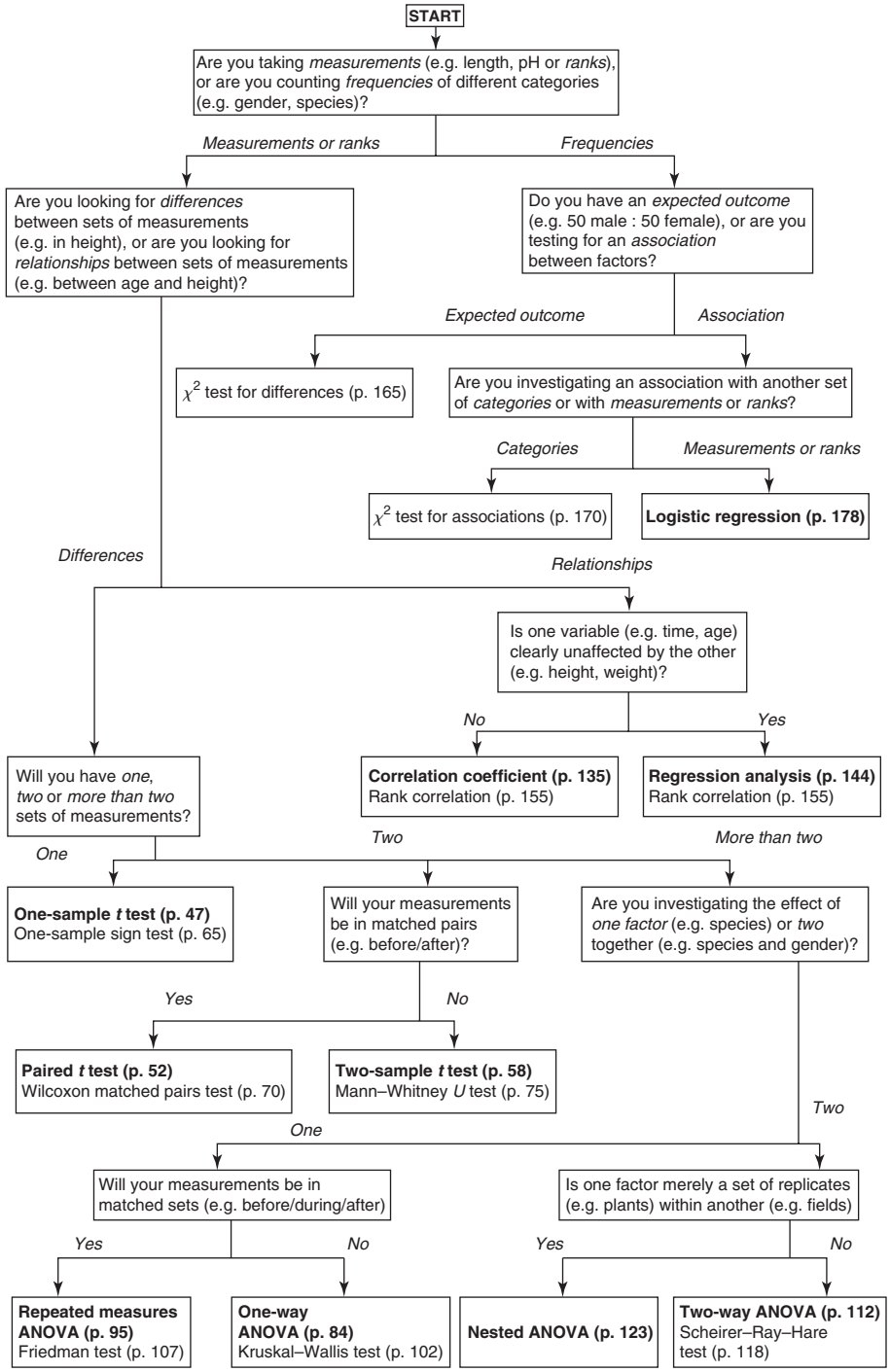


Pearson


START
Are you taking *measurements* (e.g. length, pH or *ranks*), or are you counting *frequencies* of different categories (e.g. gender, species)?
Measurements or ranks
Frequencies
Are you looking for *differences* between sets of measurements (e.g. in height), or are you looking for *relationships* between sets of measurements (e.g. between age and height)?
Do you have an *expected outcome* (e.g. 50 male : 50 female), or are you testing for an *association* between factors?
Expected outcome
Association
χ^2 test for differences (p. 165)
Are you investigating an association with another set of *categories* or with *measurements* or *ranks*?
Categories
Measurements or ranks
χ^2 test for associations (p. 170)
Logistic regression (p. 178)
Differences
Relationships
Is one variable (e.g. time, age) clearly unaffected by the other (e.g. height, weight)?
No
Yes
Will you have *one*, *two* or *more than two* sets of measurements?
Correlation coefficient (p. 135) Rank correlation (p. 155)
Regression analysis (p. 144) Rank correlation (p. 155)
One
Two
More than two
One-sample *t* test (p. 47) One-sample sign test (p. 65)
Will your measurements be in matched pairs (e.g. before/after)?
Are you investigating the effect of *one factor* (e.g. species) or *two* together (e.g. species and gender)?
Yes
No
Paired *t* test (p. 52) Wilcoxon matched pairs test (p. 70)
Two-sample *t* test (p. 58) Mann–Whitney *U* test (p. 75)
Two
One
Will your measurements be in matched sets (e.g. before/during/after)
Is one factor merely a set of replicates (e.g. plants) within another (e.g. fields)
Yes
No
Yes
No
Repeated measures ANOVA (p. 95) Friedman test (p. 107)
One-way ANOVA (p. 84) Kruskal–Wallis test (p. 102)
Nested ANOVA (p. 123)
Two-way ANOVA (p. 112) Scheirer–Ray–Hare test (p. 118)

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