Descriptive statistics, sampling and correlation

POSTER · THE MODULE AT A GLANCE

Exam Mon, 7 Dec 2026 · 180 min

1 Three kinds of measures

Centre
Mean, median and mode: what is a typical value?

Spread
Range, variance and standard deviation: how far apart are values?

Association
Correlation: are two variables linearly related?

Descriptive statistics summarise a dataset.

2 From population to sample

1. Define the population
2. Choose a sampling method
3. Draw the sample
4. Estimate the population from the sample

- The advantage of the alternatives: less effort in data collection, often a better estimate.

A sample is only useful if it is representative.

EXAM LIKELIHOOD

Interpreting R output (no code writing)	97%
Selection bias and sample representativeness	92%
Internal and external validity	92%
Sampling methods: stratified, cluster, systematic	90%
Pearson versus Spearman correlation	90%
Spurious correlation and confounder	88%

COMMON MISTAKES

- ✖ Saying that a strong correlation proves causality.
- ✖ Thinking that the 95% is a probability for this one interval.
- ✖ Seeing a larger sample as a cure for selection bias.
- ✖ Interpreting a correlation without the scatter plot.

HOW TO WRITE THE ANSWER

1. Term
model or concept, English term

2. Definition
definition or features, precisely

3. Case fact
concrete fact from the case

4. Conclusion
judgement, advice or consequence

KEY CONCEPTS

descriptive statistics · population · validity · stratified sampling · selection bias · central limit theorem · confidence interval · covariance · Pearson · Spearman · partial correlation · statistical independence