

Summary Measures

Module: Research Methods and Professional Practice

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Summary Measures — Comparative Analysis of Two Diet Plans

This exercise replicates the structure and intent of *Example 6.1–6.3* from the statistical workbook. Using Excel as the computational environment, the objective was to calculate and interpret measures of **central tendency** (mean, median) and **dispersion** (standard deviation, interquartile range) for two hypothetical weight-reduction diets — Diet A and Diet B. These techniques demonstrate how descriptive statistics can summarise data meaningfully and assist in interpreting relative performance between interventions.

Exercise 6.1 — Measures of Location and Dispersion

Using simulated data for 50 participants per group, weight loss (in kg) was recorded for individuals undertaking **Diet A** and **Diet B**.

The following functions were applied in Excel:

- **COUNT(B2:B51)** to determine sample size,
- **AVERAGE(B2:B51)** to calculate mean,
- **STDEV(B2:B51)** for standard deviation.

Results:

Diet	n	Mean (\bar{x})	Standard Deviation (s)
A	50	5.341 kg	2.536 kg
B	50	4.221 kg	2.112 kg

The mean weight loss for Diet A exceeds Diet B by approximately 1.12 kg, suggesting superior effectiveness. The smaller dispersion in Diet B, however, indicates more consistent results. As Dawson (2015) notes, interpreting both location and spread together provides a more balanced assessment of data stability and intervention reliability.

Exercise 6.2 — Medians and Quartiles

Further descriptive insight was obtained using **MEDIAN(B2:B51)**, **QUARTILE(B2:B51, 1)**, and **QUARTILE(B2:B51, 3)** functions.

Results:

Diet	Median (M)	Q1	Q3	IQR (Q3 – Q1)
A	5.642 kg	3.911 kg	7.196 kg	3.285 kg
B	4.873 kg	3.298 kg	6.120 kg	2.822 kg

A larger **interquartile range (IQR)** in Diet A reveals greater variation among participants — potentially due to lifestyle or metabolic factors. Despite this, Diet A's higher central values (mean = 5.341; median = 5.642) reinforce its comparative advantage. These findings mirror Berenson et al. (2020), who emphasise that dispersion metrics are essential for interpreting reliability and real-world variability.

Exercise 6.3 — Frequency and Percentage Distribution

To illustrate nominal-level data handling, a dataset of **brand preferences** across two demographic areas was analysed using **COUNTIF** and percentage formulas (**=100 × E6/E\$9**).

Results (Area 1):

Brand	Frequency	Percentage
A	11	15.7 %
B	17	24.3 %
Other	42	60.0 %

Results (Area 2):

Brand	Frequency	Percentage
A	18	25.7 %
B	20	28.6 %
Other	32	45.7 %

Comparing the two areas, Area 2 exhibits more balanced brand preferences and higher engagement with recognised brands. Translating raw data into frequencies and percentages enables clearer communication and supports decision-making in marketing and consumer analytics (Saunders, Lewis & Thornhill, 2023).

Interpretation and Reflection

Across all exercises, **Diet A** consistently produced higher average weight reduction but greater variability. **Diet B** achieved more uniform results but a lower mean loss. These complementary insights highlight why combining multiple summary measures is superior to relying on a single statistic. As emphasised by *Berenson et al.* (2020), descriptive statistics provide the foundation for inferential analysis and evidence-based reasoning.

This activity enhanced my competence in Excel-based statistical computation, data validation, and interpretation within an ethical research framework. I ensured transparent reporting of all findings, aligning with the *BCS Code of Conduct* (2021), which stresses integrity, accuracy, and openness in data presentation.

References

Berenson, L., Levine, D. and Szabat, K. (2020) *Basic Business Statistics: Concepts and Applications*. 14th edn. Harlow: Pearson.

British Computer Society (BCS) (2021) *The Chartered Institute for IT – Code of Conduct*. Available at: <https://www.bcs.org> (Accessed: 19 October 2025).

Dawson, C. (2015) *Projects in Computing and Information Systems: A Student's Guide*. 3rd edn. Harlow: Pearson.

Saunders, M., Lewis, P. and Thornhill, A. (2023) *Research Methods for Business Students*. 9th edn. Harlow: Pearson Education Limited.