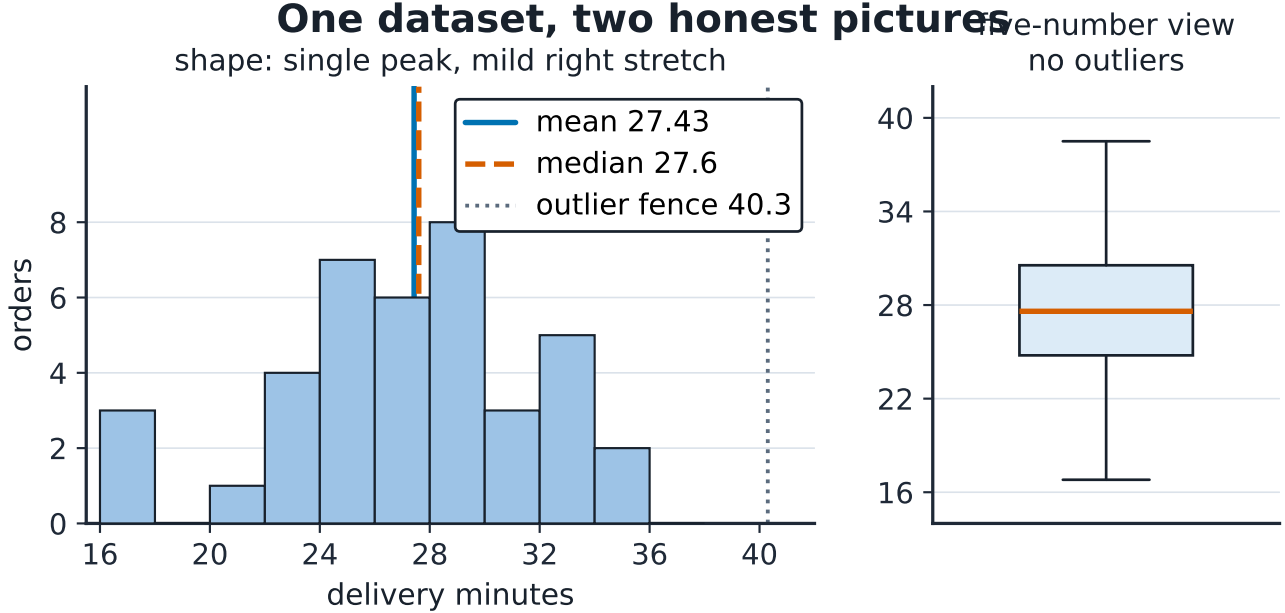
Exercise walk-through

5.2 Descriptive measures and visualisation

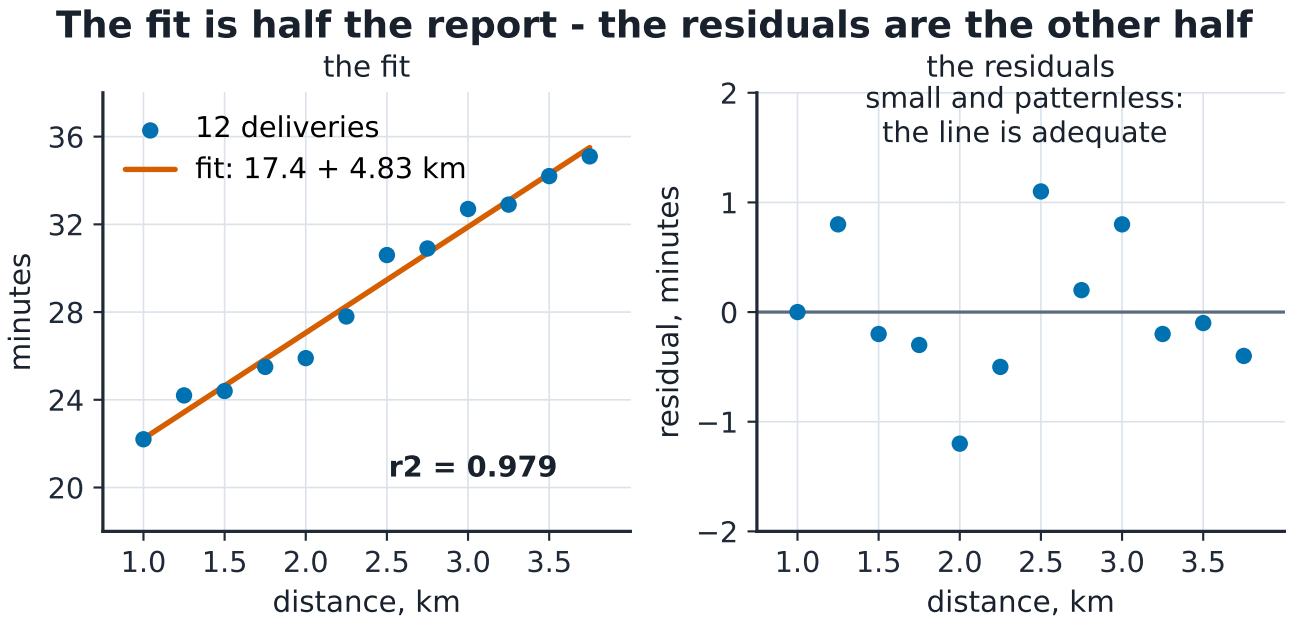
University Business

Descriptive measures and visualisation: the four questions



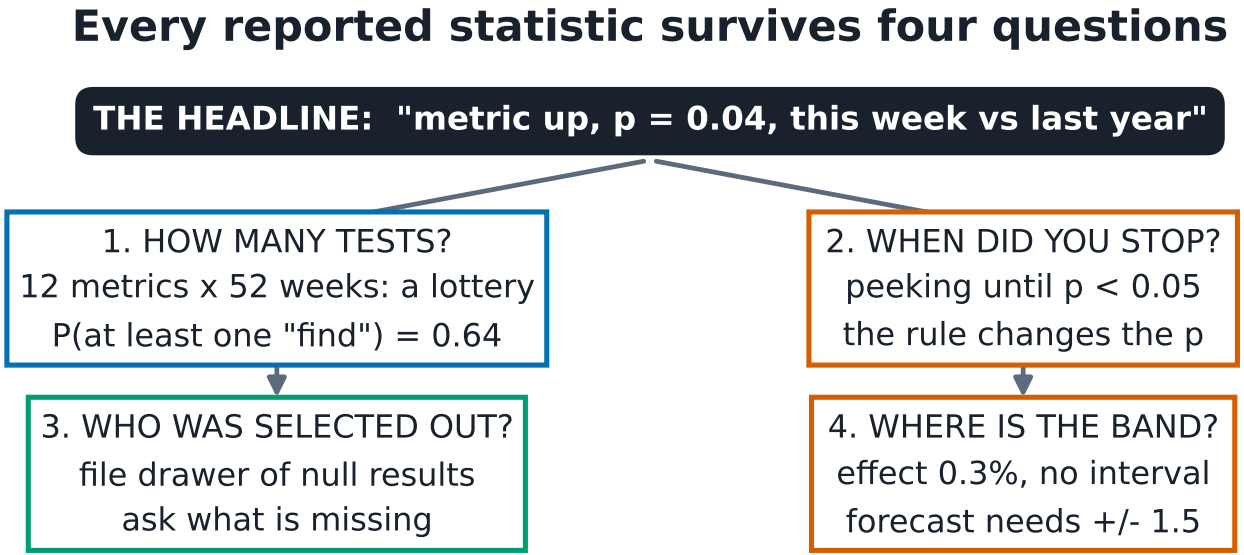
Mean 27.43, **median** 27.6, fence at 40.3: centre, spread and outliers.

Regression: the line and its police



Time = 17.4 + 4.83 km, r2 = 0.979, with patternless residuals.

Limitations: the four gates



verdict: not evidence of change - evidence of a dashboard making headlines

Challenge a headline through four gates: tests, stopping, selection, error.

Exercises 2.1·2.2

2.1 Compute the mean, median, sd and IQR. [4]

2.2 Apply the 1.5×IQR rule: is 41.2 an outlier? Show the fences. [2]

Exercises 2.1·2.2

2.1 Compute the mean, median, sd and IQR. [4]

2.1

- Mean $= 900/30 = 30.0$.
- Median $= (28.4 + 28.8)/2 = 28.6$.
- sd $= \sqrt{512/29} = \sqrt{17.66} = 4.20$.
- IQR $= 33.0 - 24.0 = 9.0$.

2.2 Apply the $1.5\times$IQR rule: is 41.2 an outlier? Show the fences. [2]

2.2

- Fences: $24.0 - 13.5 = 10.5$ and $33.0 + 13.5 = 46.5$.
- $41.2 < 46.5 \rightarrow$ not an outlier by the rule (high, but inside).

Exercises 2.3·2.4

2.3 The slowest delivery is traced to a road closure. What are the three defensible options, and which is NOT defensible? [3]

2.4 A slide shows these times on an axis starting at 24. In two lines, what is wrong and what are the two honest fixes? [2]

Exercises 2.3·2.4

2.3 The slowest delivery is traced to a road closure. What are the three defensible options, and which is NOT defensible? [3]

2.3

- Defensible: report with the cause noted; report with and without it; keep it (it is real demand).
- Each option documented in the analysis.
- NOT defensible: silent deletion – the fence is a detector, not a verdict. (stated across the marks)

2.4 A slide shows these times on an axis starting at 24. In two lines, what is wrong and what are the two honest fixes? [2]

2.4

- Truncation multiplies visual differences with true numbers.
- Fixes: axis from zero, or a clearly marked broken axis.

Exercise 2.5

2.5 The shop's mean (30.0) exceeds its median (28.6). In two lines, what does that gap say about the shape, and which average should the advert quote – with what caveat? [3]

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2.5

- Mean > median signals right skew: a slow tail pulls the mean up.
- The advert should quote the median (the typical experience).
- Caveat: say which average is quoted – the mean is honest too, for workload planning, not for promises.