

9 Inference for a regression slope — Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
slope	斜率	_____

Recall

Earlier you fitted a line of best fit to a scatterplot:

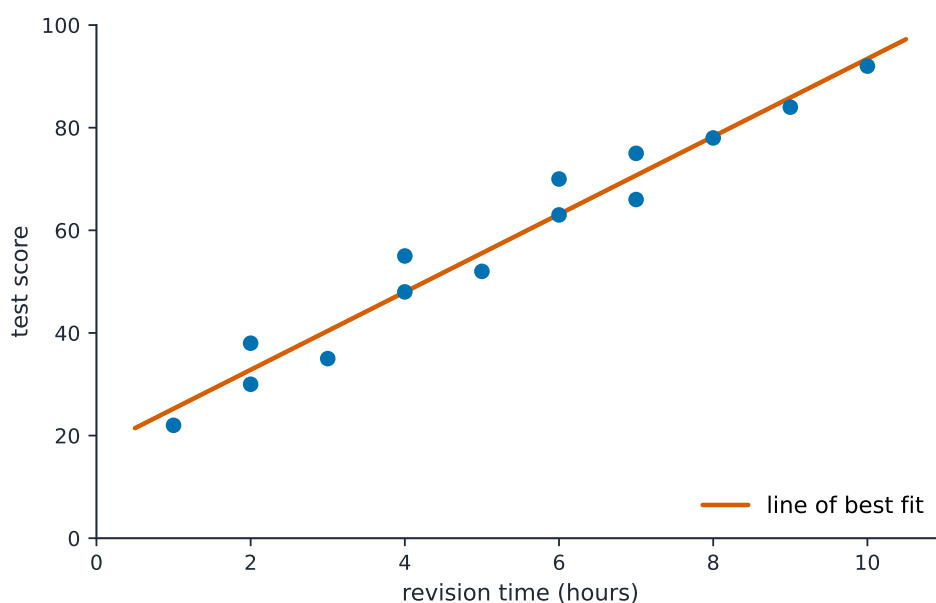
- The line's slope describes the relationship.
- But is that slope real, or could it just be chance in the sample?

This sheet lines up inference about a regression line. Each idea has a worked example.

New ideas

■ 1 The sample slope estimates the true slope

The **slope** 斜率 of the line of best fit, found from a sample, is only an **estimate** of the true relationship in the whole population.



■ 2 Is there a real relationship?

If the true slope is 0, there is **no** linear relationship. So we test whether the slope is really different from 0.

■ 3 A confidence interval for the slope

We can also give a confidence interval for the slope – a range likely to contain the true slope.

Worked example. If a sample slope is 5 with a margin of error of ± 2 , the interval is 3 to 7. Since this does not include 0, there is evidence of a real positive relationship.

■ 4 The idea reused

This is the same inference idea as before: a sample estimate, plus uncertainty, used to judge a claim (here, "the slope is 0").

Watch out: if a slope's confidence interval **includes** 0, you cannot conclude there is a real relationship – the true slope might be 0 (no link at all).

Practice

Try these in order. The methods are all above.

2.1 State what the sample slope is an estimate of. [2]

2.2 State what a true slope of 0 would mean. [2]

2.3 A sample slope is 8 with a margin of error of ± 3 . State the confidence interval. [2]

2.4 For that interval, state whether there is evidence of a real relationship, and why. [2]

2.5 State what it means if a slope's interval includes 0. [1]
