# Statistics with Spa  ows

Lecture 7

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# Outline

- Degrees of freedom

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- Soduko of statistics

| $\overline{x}$ | $x_1$ | $x_2$ | $x_3$ |
|---|---|---|---|
| 5 | 5 | 5 | ? |
| 5 | 1 | ? | ? |
| 5 | ? | ? | ? |

- How many values of $x_i$ do you need to fix to estimate the remaining?

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- How many values of $x_i$ do you need to fix to estimate the remaining?
- How many $x_i$ do you need to fix to only have ONE solution?
- 2. One parameter can be ”free”
- df =1

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- Sodoku of statistics
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- The sample size n minus the number of parameters to be estimated from the data: df = n-1
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- Reality is even more complicated. However, this is sufficient for us for now.

# Do it now!

- How do df's affect Student's t?
- Why are the df's in a dataset of 100 birds on a 2-sample t-test 98?