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Random Simulations
Equations in Excel
Using Formulas, Statistical Formulas: Standard Error, Standard Score

Random Simulations
We've talked about probability in terms of calculating it, and using probability-related properties and formulas on data we've already collected.

There are two random number generators in Excel are
RAND()
RANDBETWEEN()

RAND() generates a uniform random number between 0 and 1.
Every value (or range of values of the same size) has equal probability.
One really good for this is to simulate percentiles.
Can be used also for situations with only 2-3 outcomes (beyond that the formulas start becoming nasty), or where the probabilities in each category are unequal.

RANDBETWEEN() function produces integers, in a given range. Each outcome in the range is equally likely.
This is a good function to simulate the results of rolling a fair die.

1. Tossing a fair coin using RAND()
2. Toss an unfair coin using RAND()
3. Roll a fair die using RANDBETWEEN()
4. Bonus: using RAND() to simulate in another distribution (normal distribution).

Go to Excel.

Formulas in Excel/Statistical Formulas

Formulas we'll look at:

Quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Statistical formulas:

Standard Score formula: $z = \frac{x - \mu}{\sigma}$

Standard error for means: $SE = \frac{\sigma}{\sqrt{n}}$

Standard error for proportions: $SE = \sqrt{\frac{p(1-p)}{n}}$

Go back to Excel