

Fred Schenkelberg

Why We Use Statistics



Exploring



Understanding

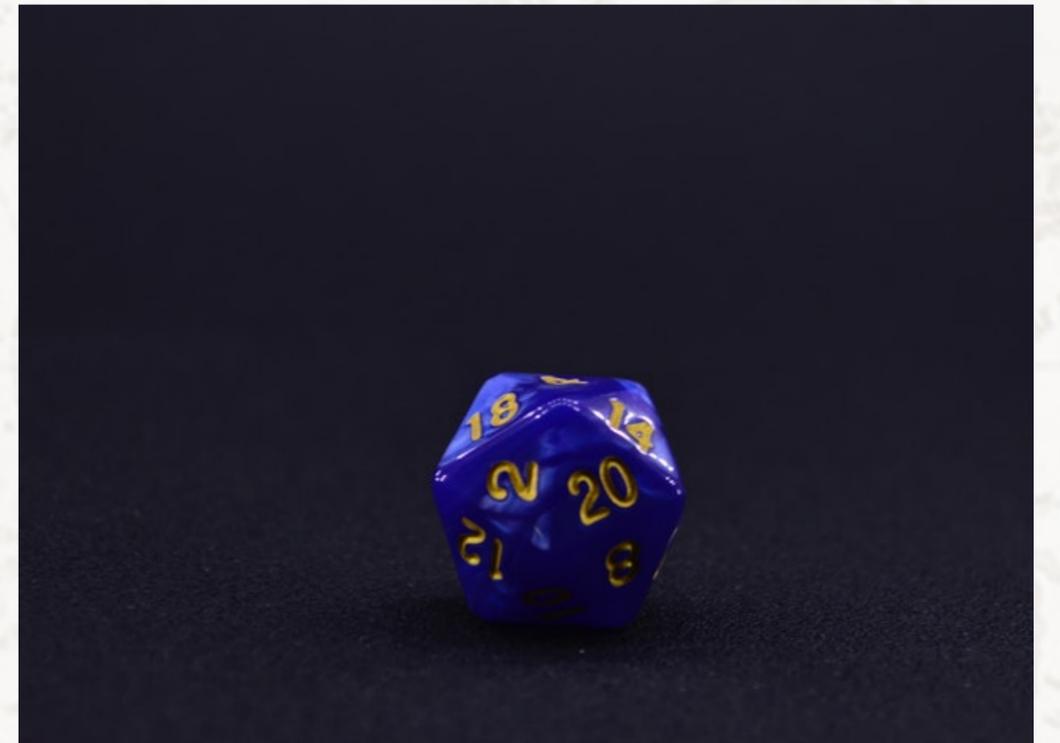


A collection of various dice is scattered on a textured, light-colored surface. The dice include a standard six-sided die, a ten-sided die, a twelve-sided die, and several other polyhedral dice with different face counts and markings. The word "Comparing" is overlaid in orange text on the right side of the image.

Comparing

What kind of stats
do you use?

Depicting Variation



Histogram

Depicting Variation

ok, let's all pick a number between 0 and 10.

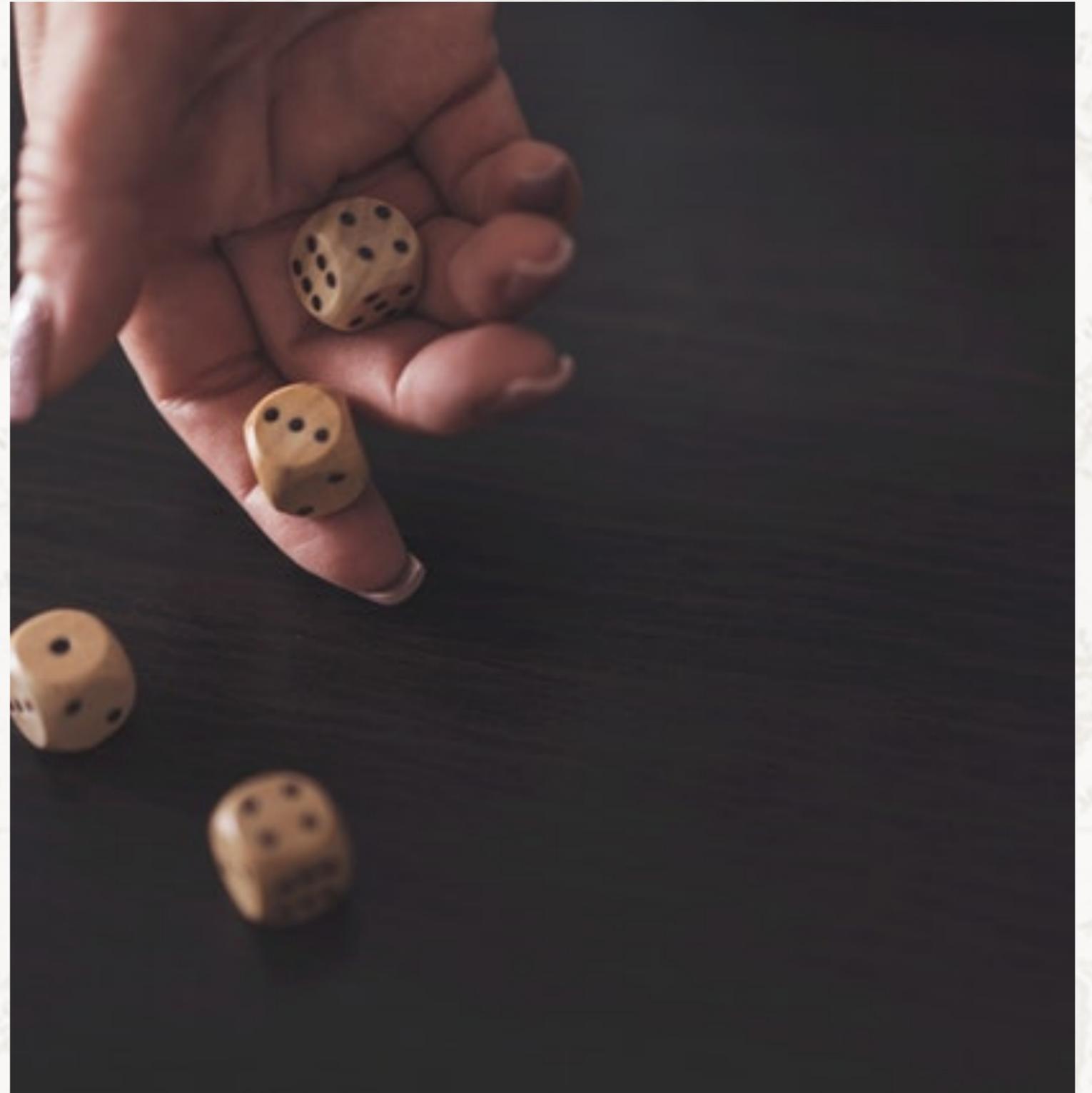
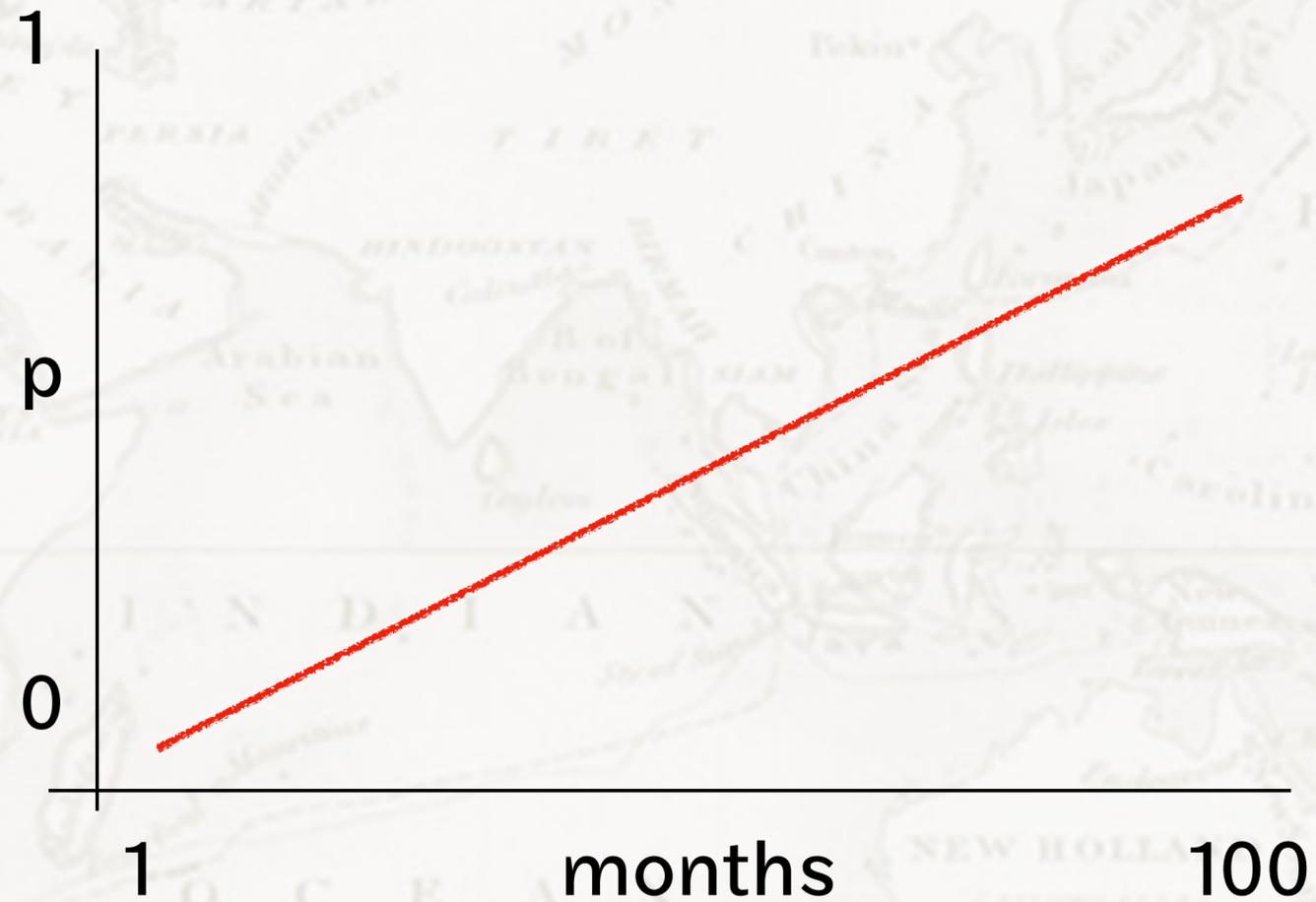
1 2 3 4 5 6 7 8 9



CDF

Depicting Variation

Time to failure varies



Variance

Depicting Variation

The second moment

Of a 20 sided die, the variance is

33.25

The mean is 10.5 and

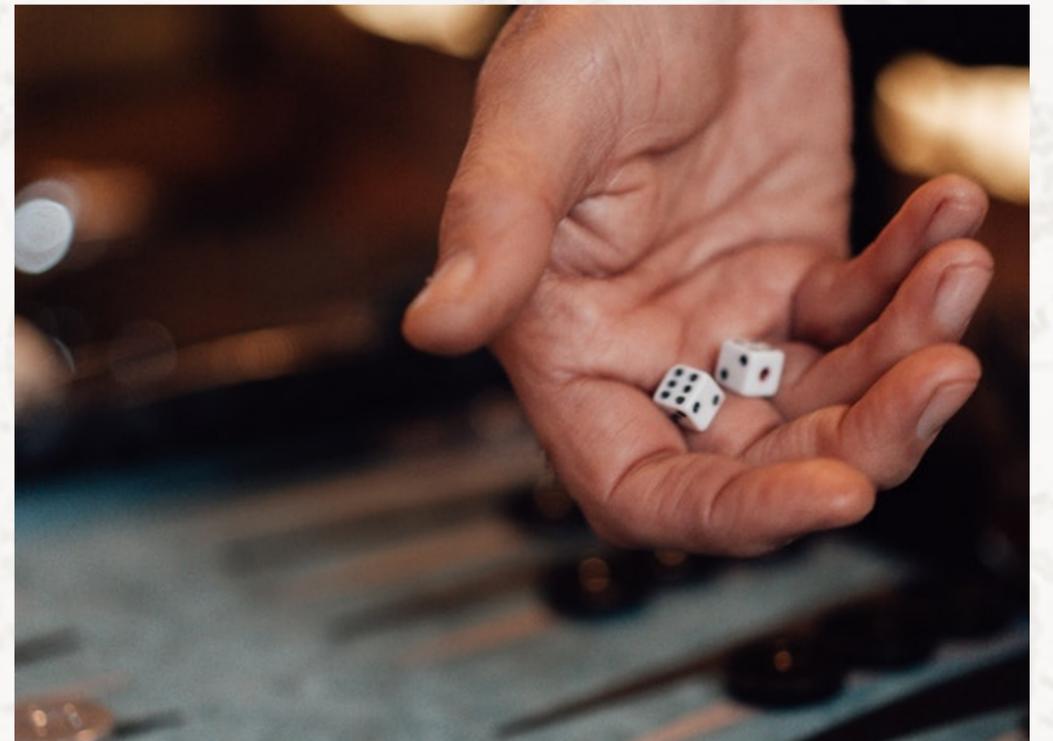
std dev is 5.77



What is your

favorite method?

Clues in Stats



Histogram

Clues in Stats

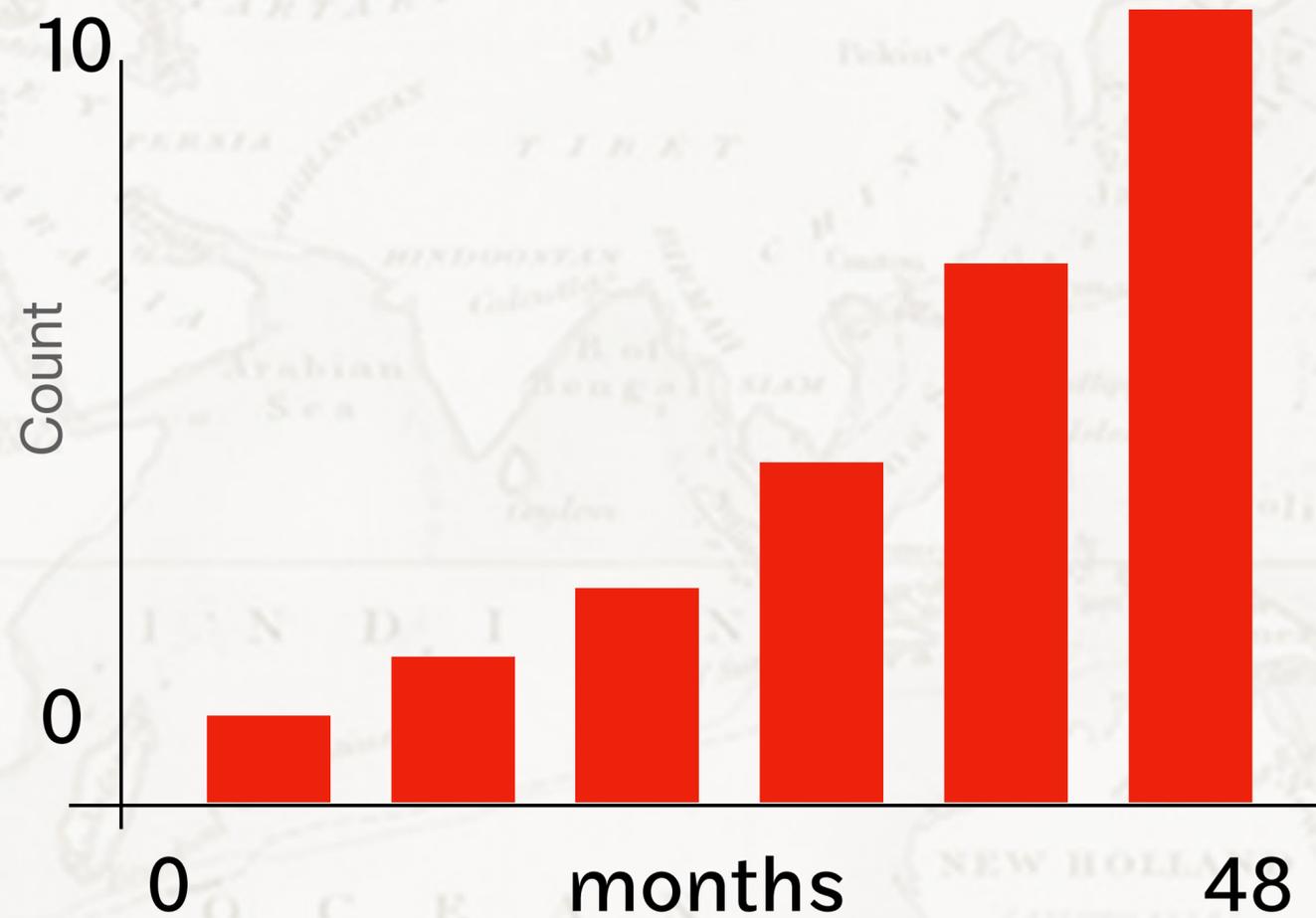
What questions should we ask with this one?



MCF

Clues in Stats

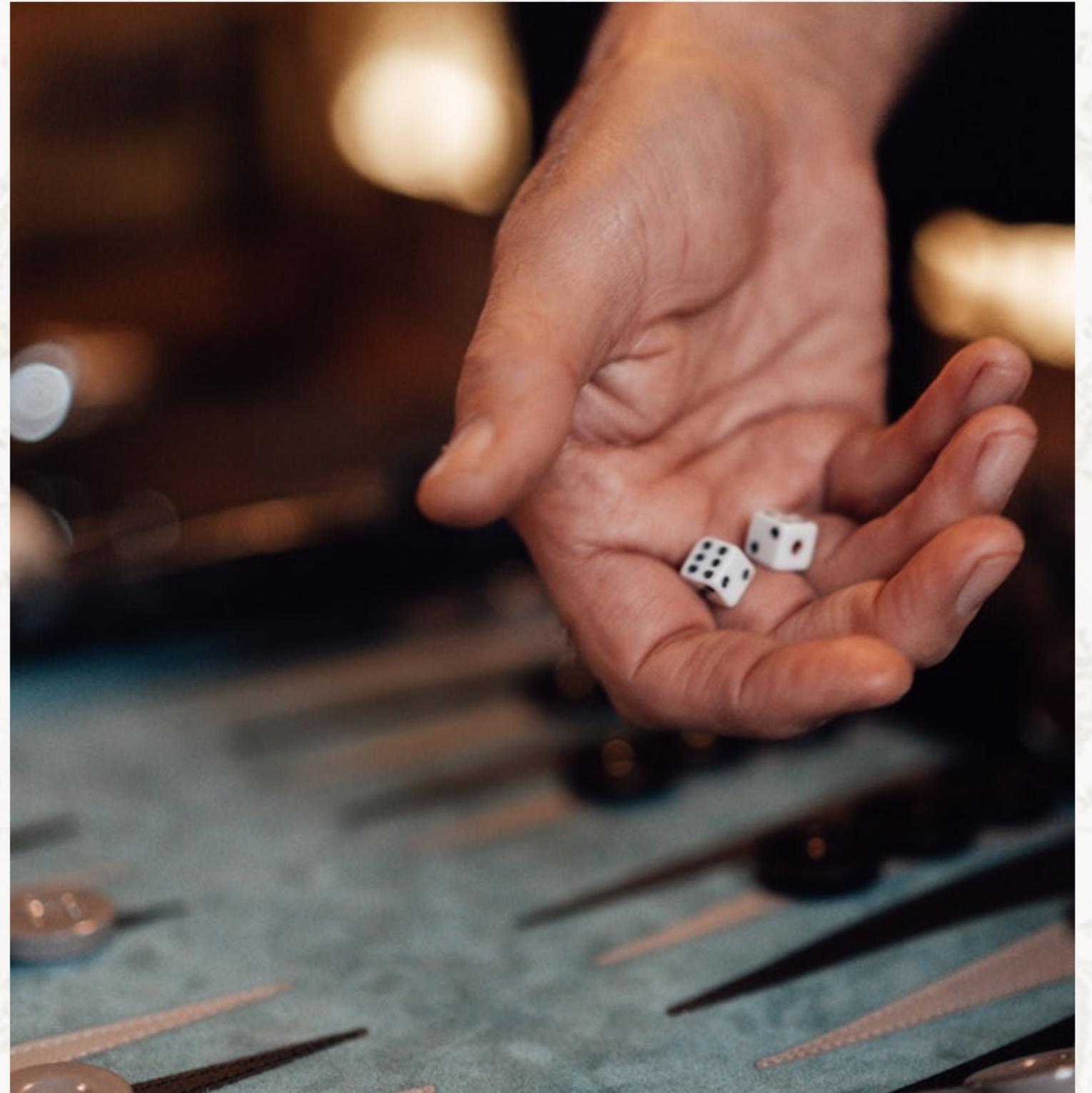
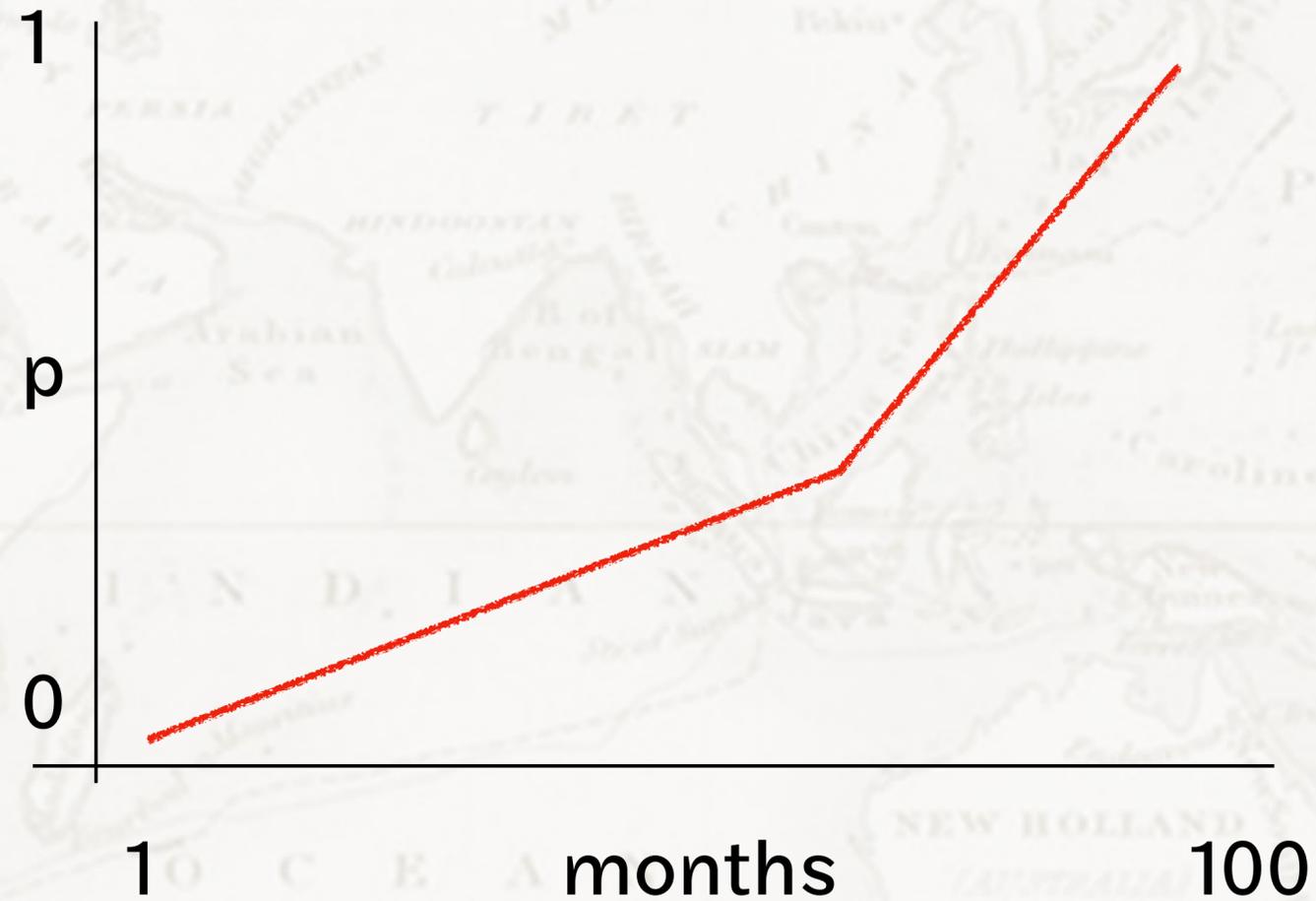
What questions come to mind?



CDF and Hockey Stick

Clues in Stats

Any next steps come to mind?



What has been

revealed for you?

Good Enough or Better



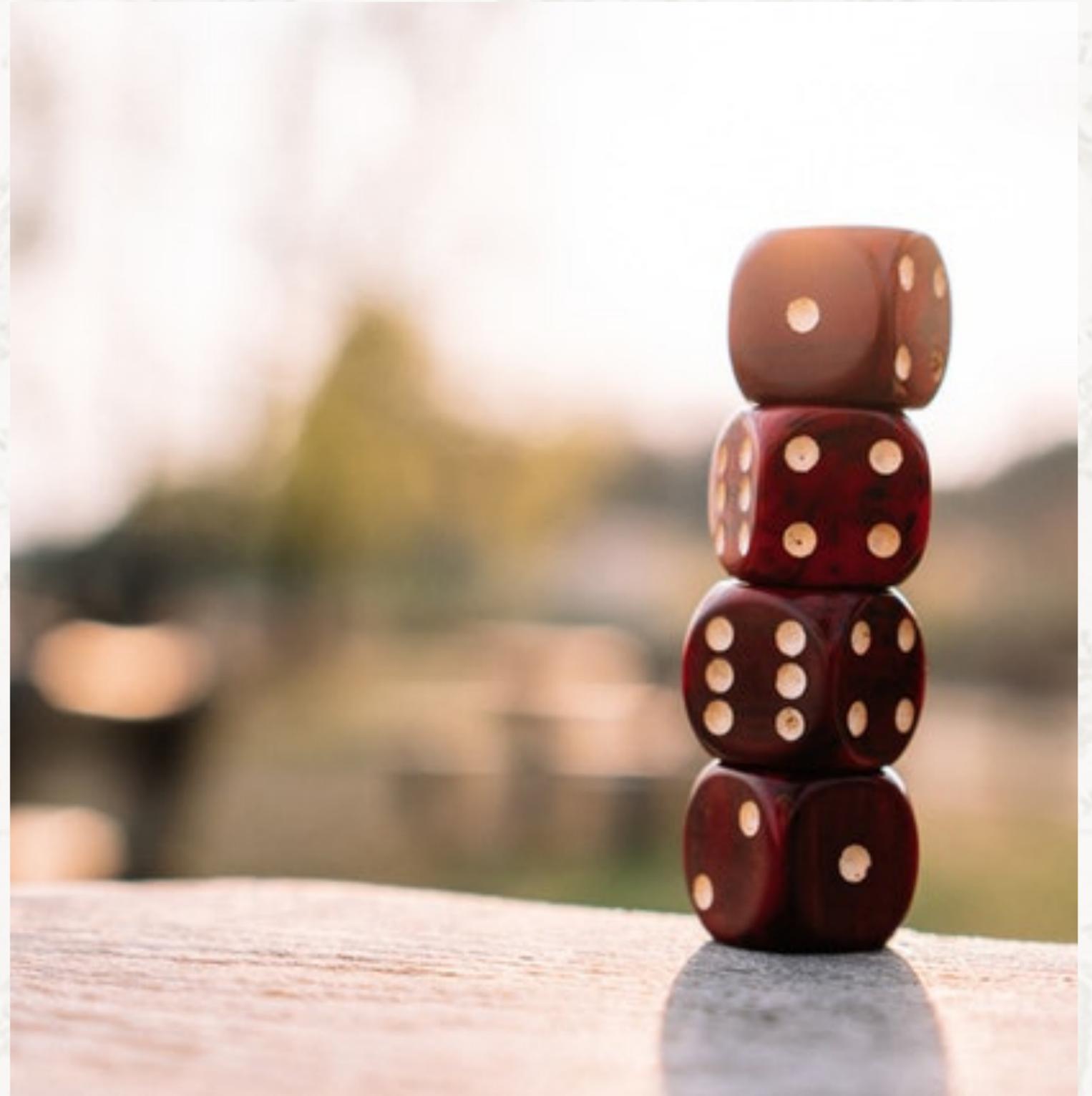
Hypothesis Testing

Good Enough or Better

Compare to a standard

or

Compare two data sets



ANOVA

Good Enough or Better

Compare three or more data sets



DOE

Good Enough or Better

Now we can have fun

exploring

understanding

optimizing



What is your

approach to comparisons?

Reliability engineering
includes statistics.

Thanks

see more at [AccendoReliability.com](https://www.AccendoReliability.com)