Frequentism & Bayesianism:
What's the big deal?

What's the big difference?

↳ Philosophical Question: What is prob. ?

Freq → n occurances of rep. events

Bayes → individual uncertanity of events
        personal

Freq ← analyzing data given our model

bayes ← "   model given our data.

Ⓕ
↳ measure norm, dist data.
    ↳ becomes a product of many
       distributions
                          same as Ⓕ
                          ↙
Ⓑ
↳ $P(F_t | D) = \dfrac{P(D|F_t) \, P(F_t)}{P(D)}$ ← prior
                                      ← norm.

Mostly answers end up being the same.
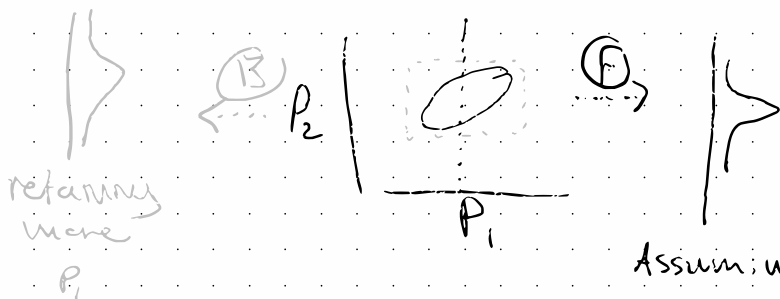   (with enough data)

complications:
- Handling parameters (non target)
- interpretation of uncertainty.
- how to incorporate priors

'nuisance parameter'
↳ parameter that effects problem
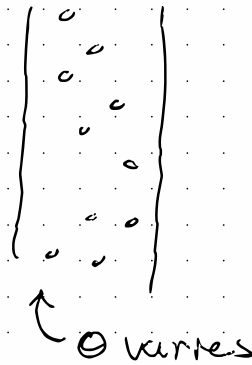& needs to be accounted for but not
of direct interest.

↳ Ⓕ ∈ estimate N.P. ← NP is fixed
Ⓑ ∈ marginalize over these values ← varying N.P.

retaining
more
P_1

P_2

P_1

Ⓕ

Assuming P_1
randomness hides
in data.

uncertainties

$\hookrightarrow$ 'confidence' vs 'credibility'

$\qquad \qquad \qquad$ $\uparrow$ θ fixed $\qquad \qquad \qquad$ $\uparrow$ θ varies

conclusion

$\rightarrow$ Bayesian values are easier to
communicate

$\rightarrow$ More natural construction on error