POSTERIOR SAMPLES ARE EVERYTHING!

- ML methods use estimated values for parameters for everything

- $\rho = f(\hat{\theta})$

- Bayesian methods use the posterior distribution of the parameters for everything

```
> samples
# A tibble: 2,000 × 3
             a          b       sigma
     <dbl[1d]>  <dbl[1d]>   <dbl[1d]>
 1        115.      0.889        4.78
 2        109.      1.02         5.30
 3        112.      0.928        5.07
 4        111.      0.949        5.30
 5        111.      0.955        5.04
 6        115.      0.872        5.19
 7        109.      1.01         5.13
 8        117.      0.844        5.00
 9        115.      0.882        4.94
10        112.      0.939        4.95
# … with 1,990 more rows
```

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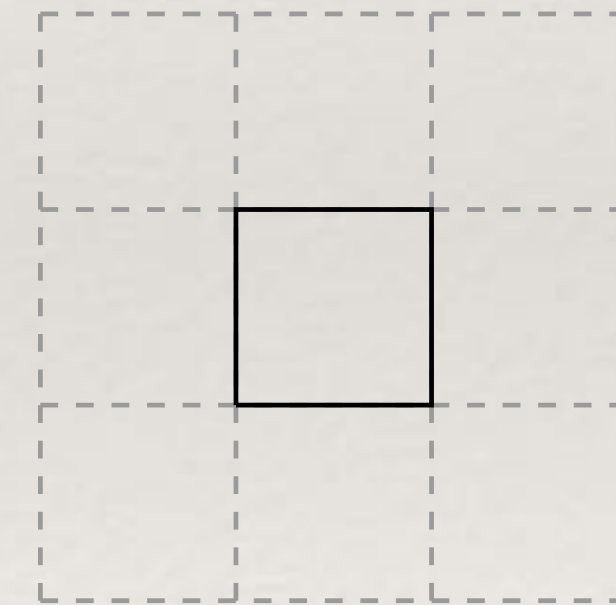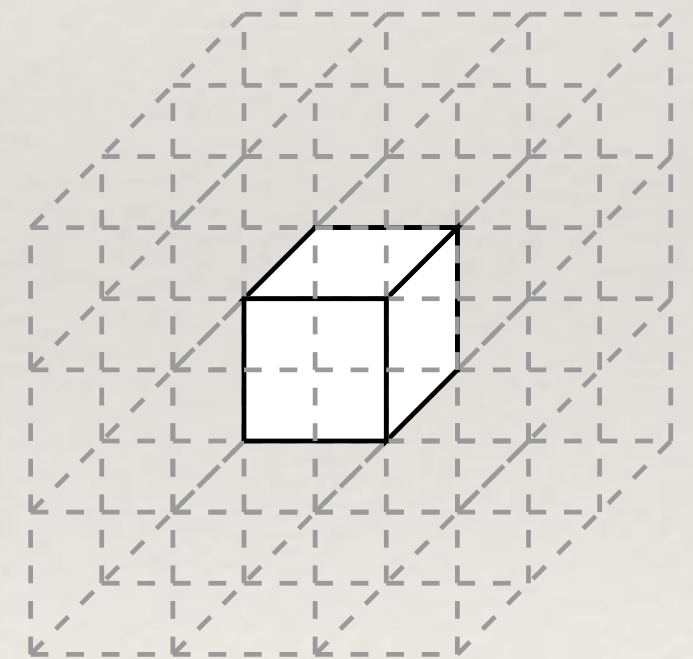
HOW TO GET POSTERIOR SAMPLES?

- There is no general method to find high probability regions in arbitrary probability distributions.

- This mean most models are fit using purely computational methods.

- For simple parameters spaces, we can do grid search or some brute force method to find high probability regions

- This breaks down quickly as the number of parameters increases

(a)   (b)   (c)