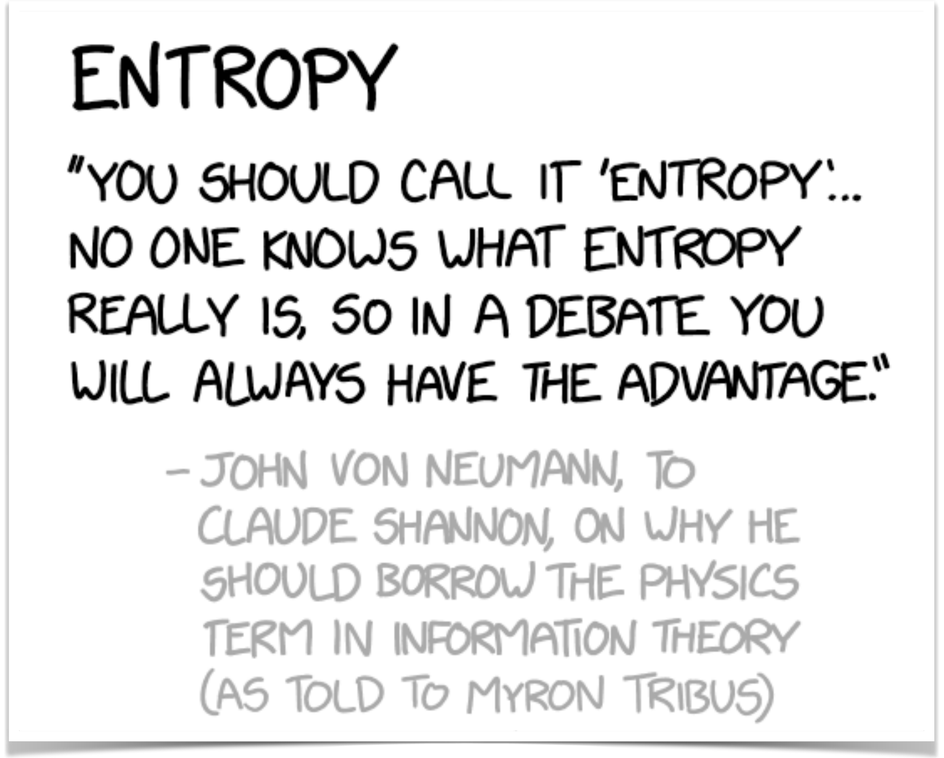
what is entropy?



univariate entropy

statistical entropy is a measure of uncertainty of random variables

for a discrete random variable X with a finite range space of size r_X

$$H(X) = \sum_x p(x) \log_2 \frac{1}{p(x)} \qquad p(x) > 0, \ \sum_x p(x) = 1$$

- ☑ minimal zero entropy has no uncertainty
- ☑ maximum entropy $\log_2(r_X)$ $\Longrightarrow$ uniform distribution

example:
entropy of a binary variable