PadhAI: Information Theory and Cross Entropy

One Fourth Labs

Entropy

What is Entropy

1. First, a quick recap of the concepts we've studied so far

Random Variable: X	**Probability Distribution: P(X=?)**	**Information Content: IC(X=?)**	**Expectation E(Gain)**
A	P(X=A)	$-\log_2 P(X=A)$	$\Sigma_{i \in \{A,B,C,D\}} P(X=i) * Gain(X=i)$
B	P(X=B)	$-\log_2 P(X=B)$	
C	P(X=C)	$-\log_2 P(X=C)$	
D	P(X=D)	$-\log_2 P(X=D)$	

2. Based on these four concepts, we can talk about Entropy
3. Entropy H(X) is the Expected Information Content of a Random Variable
4. $H(X) = -\Sigma_{i \in \{A,B,C,D\}} P(X=i) * log_2 P(X=i)$
5. Basically, substitute Gain for Information Content in the