Lecture 1

Bit — distinction between 2 states

2 Bit — distinction between 4 states

System has N distinguishable states $\Leftrightarrow \log_2 N$ bits

3 states $\Rightarrow$ bits >1 , bits <2

Amount the information

Entropy is information $S = k \log W$ (log: ln) $\longrightarrow$ the number of microscopic states or configurations

k: Boltzmann's constant 1.38×10^{-23} J/K

W: Complexions.

$$S = k \ln W = \underbrace{k \ln 2}_{\text{constant}} \cdot \log_2 W \longrightarrow \text{information}$$

What is information? Change in entropy.

Entropy is information we don't have

get information, reduce entropy

ASCII 7 bits — 128 symbols

0000000 — NULL