Why

[1]

Definition

The entropy of a distribution is the expectation of the negative logarithm of the distribution under the distribution. It is sometimes called the *discrete entropy* to distinguish it with another related topic.[2]

Notation

Let A be a finite set. Let $p : A \to \mathbf{R}$ be a distribution. The entropy of p is

$$-\sum_{a \in A} p(a) \log(p(a)).$$

We denote the entropy of p by $H(p)$.

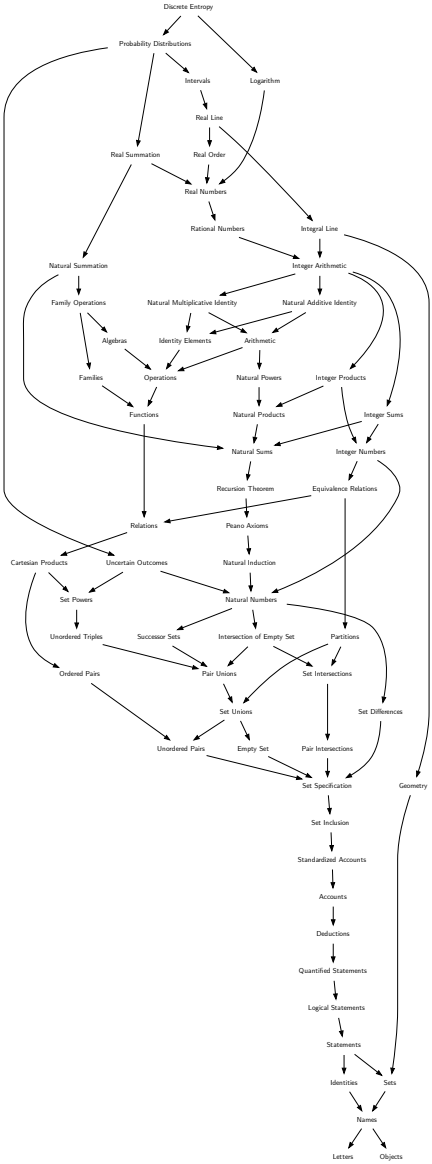
Properties

Let $x : \Omega \to V$ be a discrete random variable.

1. $H(x) \geq 0$
2. $H(f(x)) \leq H(x)$
3. Let g invertible, then $H(g(x)) \leq H(x)$

[1] This will be included in a future edition.

[2] Future editions may not forward reference differential entropy.


Discrete Entropy
Probability Distributions
Intervals
Logarithm
Real Line
Real Summation
Real Order
Real Numbers
Rational Numbers
Integral Line
Natural Summation
Integer Arithmetic
Family Operations
Natural Multiplicative Identity
Natural Additive Identity
Algebras
Identity Elements
Arithmetic
Families
Operations
Natural Powers
Integer Products
Functions
Natural Products
Integer Sums
Natural Sums
Integer Numbers
Recursion Theorem
Equivalence Relations
Relations
Peano Axioms
Cartesian Products
Uncertain Outcomes
Natural Induction
Set Powers
Natural Numbers
Unordered Triples
Successor Sets
Intersection of Empty Set
Partitions
Ordered Pairs
Pair Unions
Set Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Pair Intersections
Set Specification
Geometry
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects