Why

Where does entropy come from?[1]

Result

$$H(x) \leq \min_{c:\text{prefix free}} \mathbf{E}[\text{len}(c(x)] \leq H(x) + 1$$

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[1] Futre editions will expand

Optimal Average Codeword Length
Prefix-Free Codes
Codes
Dot-Dash Code
Flash Code

Expectation
Random Variables
Outcome Variable Expectation

Topological Sigma Algebra
Measurable Functions
Probability Measures
Induced Probability Distributions

Measures
Topologies

Sigma Algebra
Metrics

Discrete Entropy
Real Series
Extended Real Numbers
Distance
Outcome Variable Events

Logarithm
Real Limits
Space Distance

Exponential Function
Absolute Value
Plane Distance
Event Probabilities

Real Functions
Interval Length
Probability Distributions

Intervals
Real Space

Alphabets
Real Line
Real Plane

Real Sequences
Real Summation
Real Order
Integral Line
Geometry

Subset Algebra
Sequences
Real Numbers
Rational Order
Uncertain Outcomes

Cardinality
Lists
Rational Numbers

Set Numbers
Direct Products
Integer Arithmetic

Finite Sets
Natural Multiplicative Identity
Natural Additive Identity
Integer Products

Equivalent Sets
Natural Summation
Identity Elements
Arithmetic

Function Inverses
Family Unions and Intersections
Family Operations
Natural Powers
Integer Sums
Integer Order
Comparisons

Function Images
Function Composites
Families
Operations
Natural Products
Integer Numbers
Orders

Functions
Equivalence Relations
Natural Sums
Converse Relations

Relations
Natural Order

Subset Systems
Set Products
Recursion Theorem

Ordered Pairs
Set Powers
Peano Axioms

Generalized Set Dualities
Unordered Triples
Natural Induction

Set Dualities
Set Symmetric Differences
Set Unions and Intersections
Successor Sets
Intersection of Empty Set
Partitions
Natural Numbers

Set Complements
Pair Unions
Set Intersections

Set Unions
Pair Intersections
Set Differences

Unordered Pairs
Empty Set

Set Specification

Set Equality

Set Inclusion

Deductions

Quantified Statements

Logical Statements

Statements

Identities
Sets

Names

Letters
Objects