Ln X Graph

Ladder graph

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In the mathematical field of graph theory, the ladder graph Ln is a planar, undirected graph with 2n vertices and 3n ? 2 edges.

The ladder graph can be obtained as the Cartesian product of two path graphs, one of which has only one edge: Ln,1 = Pn × P2.

Exponential family random graph models

T = (? ln ? 2 , ln ? 3) T {\displaystyle \theta =(\theta _{1},\theta _{2})^{T}=(-\ln 2,\ln 3)^{T}} , so that the probability of every graph y ? Y {\displaystyle

Exponential family random graph models (ERGMs) are a set of statistical models used to study the structure and patterns within networks, such as those in social, organizational, or scientific contexts.They analyze how connections (edges) form between individuals or entities (nodes) by modeling the likelihood of network features, like clustering or centrality, across diverse examples including knowledge networks, organizational networks, colleague networks, social media networks, networks of scientific collaboration, and more. Part of the exponential family of distributions, ERGMs help researchers understand and predict network behavior in fields ranging from sociology to data science.

Natural logarithm

{dx}{x}} d v = d x ? v = x {\displaystyle dv=dx\Rightarrow v=x} then: ? ln ? x d x = x ln ? x ? ? x x d x = x ln ? x ? ? 1 d x = x ln ? x ? x + C {\displaystyle

The natural logarithm of a number is its logarithm to the base of the mathematical constant e, which is an irrational and transcendental number approximately equal to 2.718281828459. The natural logarithm of x is generally written as ln x, loge x, or sometimes, if the base e is implicit, simply log x. Parentheses are sometimes added for clarity, giving ln(x), loge(x), or log(x). This is done particularly when the argument to the logarithm is not a single symbol, so as to prevent ambiguity.

The natural logarithm of x is the power to which e would have to be raised to equal x. For example, ln 7.5 is 2.0149..., because e2.0149... = 7.5. The natural logarithm of e itself, ln e, is 1, because e1 = e, while the natural logarithm of 1 is 0, since e0 = 1.

The natural logarithm can be defined for any...

Random geometric graph

In graph theory, a random geometric graph (RGG) is the mathematically simplest spatial network, namely an undirected graph constructed by randomly placing

In graph theory, a random geometric graph (RGG) is the mathematically simplest spatial network, namely an undirected graph constructed by randomly placing N nodes in some metric space (according to a specified probability distribution) and connecting two nodes by a link if and only if their distance is in a given range, e.g. smaller than a certain neighborhood radius, r.

Random geometric graphs resemble real human social networks in a number of ways. For instance, they spontaneously demonstrate community structure - clusters of nodes with high modularity. Other random graph generation algorithms, such as those generated using the Erd?s–Rényi model or Barabási–Albert (BA) model do not create this type of structure. Additionally, random geometric graphs display degree assortativity according...

Conductance (graph theory)

state x ? ? {\displaystyle x\in \Omega } , 1 4 ? ? ? x (?) ? 2 ? 2 (ln ? ? (x) ? 1 + ln ? ? ? 1) {\displaystyle {\frac {1}{4\Phi }}\leq \tau _{x}(\delta

In theoretical computer science, graph theory, and mathematics, the conductance is a parameter of a Markov chain that is closely tied to its mixing time, that is, how rapidly the chain converges to its stationary distribution, should it exist. Equivalently, the conductance can be viewed as a parameter of a directed graph, in which case it can be used to analyze how quickly random walks in the graph converge.

The conductance of a graph is closely related to the Cheeger constant of the graph, which is also known as the edge expansion or the isoperimetic number. However, due to subtly different definitions, the conductance and the edge expansion do not generally coincide if the graphs are not regular. On the other hand, the notion of electrical conductance that appears in electrical networks is...

Graph traversal

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In computer science, graph traversal (also known as graph search) refers to the process of visiting (checking and/or updating) each vertex in a graph. Such traversals are classified by the order in which the vertices are visited. Tree traversal is a special case of graph traversal.

Pseudorandom graph

In graph theory, a graph is said to be a pseudorandom graph if it obeys certain properties that random graphs obey with high probability. There is no concrete

In graph theory, a graph is said to be a pseudorandom graph if it obeys certain properties that random graphs obey with high probability. There is no concrete definition of graph pseudorandomness, but there are many reasonable characterizations of pseudorandomness one can consider.

Pseudorandom properties were first formally considered by Andrew Thomason in 1987. He defined a condition called "jumbledness": a graph

G

=

(

V

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E

)

{\displaystyle G=(V,E)}

is said to be

(

p

,

?

)

{\displaystyle (p,\alpha)}

-jumbled for real

p

{\displaystyle p}

and

?...

Erd?s–Rényi model

For example, the statement that almost every graph in G (n , 2 ln ? (n) / n) {\displaystyle G(n,2\ln(n)/n)} is connected means that, as n {\displaystyle

In the mathematical field of graph theory, the Erd?s–Rényi model refers to one of two closely related models for generating random graphs or the evolution of a random network. These models are named after Hungarian mathematicians Paul Erd?s and Alfréd Rényi, who introduced one of the models in 1959. Edgar Gilbert introduced the other model contemporaneously with and independently of Erd?s and Rényi. In the model of Erd?s and Rényi, all graphs on a fixed vertex set with a fixed number of edges are equally likely. In the model introduced by Gilbert, also called the Erd?s–Rényi–Gilbert model, each edge has a fixed probability of being present or absent, independently of the other edges. These models can be used in the probabilistic method to prove the existence of graphs satisfying various properties...

Exponential function

\log } ?, converts products to sums: ? ln ? (x ? y) = ln ? x + ln ? y {\displaystyle \ln(x\cdot y)=\ln x+\ln y} ?. The exponential function is occasionally

In mathematics, the exponential function is the unique real function which maps zero to one and has a derivative everywhere equal to its value. The exponential of a variable ?

x

{\displaystyle x}

? is denoted ?

exp

?

x

{\displaystyle \exp x}

? or ?

e

x

{\displaystyle e^{x}}

?, with the two notations used interchangeably. It is called exponential because its argument can be seen as an exponent to which a constant number e ? 2.718, the base, is raised. There are several other definitions of the exponential function, which are all equivalent although being of very different nature.

The exponential function...

Bond graph

A bond graph is a graphical representation of a physical dynamic system. It allows the conversion of the system into a state-space representation. It

A bond graph is a graphical representation of a physical dynamic system. It allows the conversion of the system into a state-space representation. It is similar to a block diagram or signal-flow graph, with the major difference that the arcs in bond graphs represent bi-directional exchange of physical energy, while those in block diagrams and signal-flow graphs represent uni-directional flow of information. Bond graphs are multi-energy domain (e.g. mechanical, electrical, hydraulic, etc.) and domain neutral. This means a bond graph can incorporate multiple domains seamlessly.

The bond graph is composed of the "bonds" which link together "single-port", "double-port" and "multi-port" elements (see below for details). Each bond represents the instantaneous flow of energy (dE/dt) or power. The...

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