Exponential distribution

Intro

According to Wiki in Ref section,

Exponential distribution is a [probability distribution](https://en.wikipedia.org/wiki/Probability_distribution) of the time between events in a [Poisson point process](https://en.wikipedia.org/wiki/Poisson_point_process), i.e., a process in which events occur continuously and independently at a constant average rate. It is a particular case of the [gamma distribution](https://en.wikipedia.org/wiki/Gamma_distribution).

PDF

if

otherwise.

CDF

if

otherwise

Expected Value

Proof:

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+

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+



(integration by parts, put in and in )

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=

Variance

Proof:

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+

= 0

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(integration by parts again.)

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Moments

Proof:

Use the definition of expected value, then integrate it with integration by parts.

Similar to above proof.

Central moments

Proof: (Wrong)

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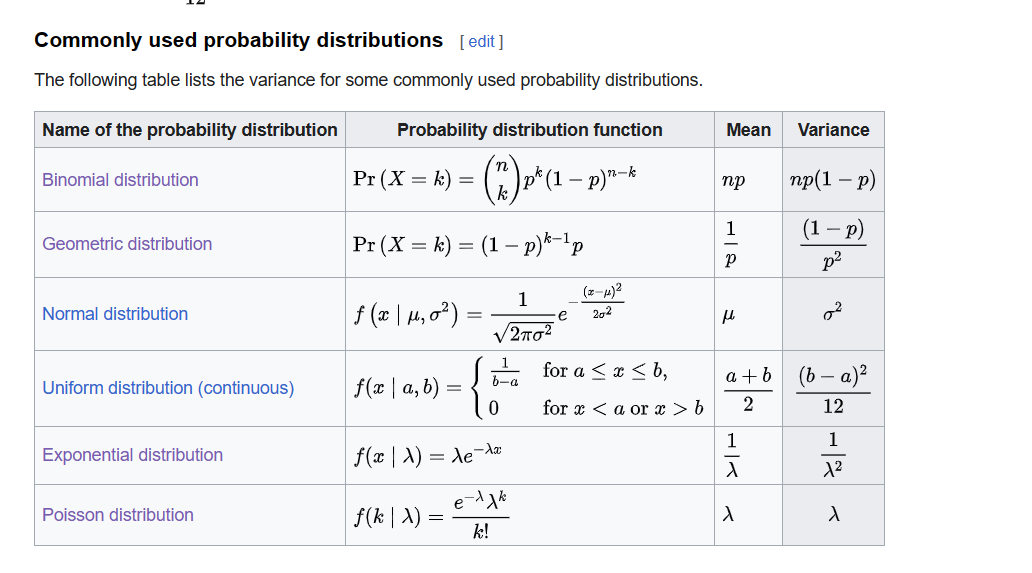
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Median

Summary



Ref

For all properties and some proof, see Wiki:

[Exponential distribution - Wikipedia](https://en.wikipedia.org/wiki/Exponential_distribution)

For more proof, see statlect:

[Geometric distribution | Properties, proofs, exercises (statlect.com)](https://www.statlect.com/probability-distributions/geometric-distribution)