negative hypergeometric distribution

Intro

It is a special case of beta-binomial distribution with parameter

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Parameter

population size

number of success in population.

number of failure in population.

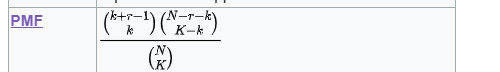
number of success in observations.

PDF

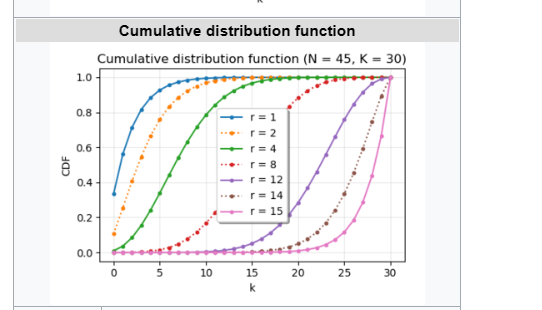
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where

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CDF



Expected Value

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Proof: (wrong proof)

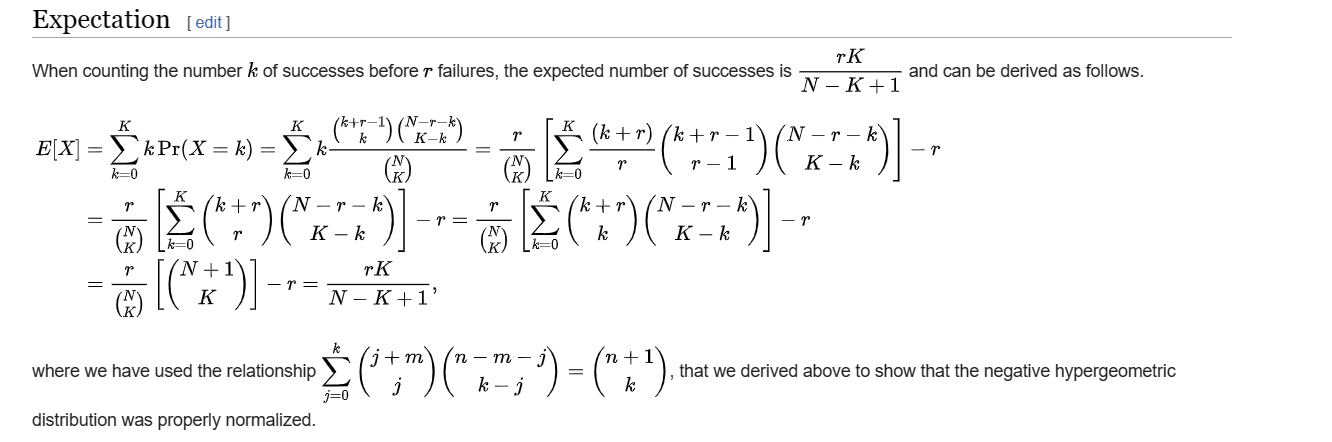
For correct proof, see the following figure.

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(since it is defined only for integer in negative hypergeometric distribution)

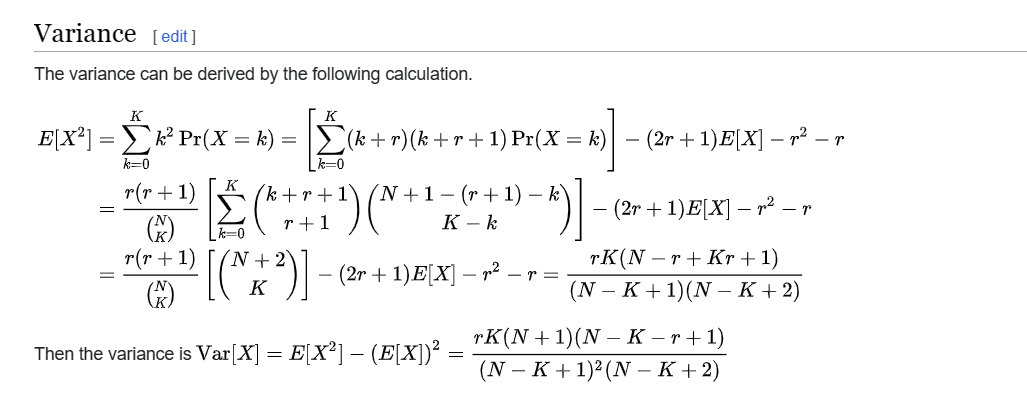


Variance

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Proof:

The proof on the following figure.



Ref

[Negative hypergeometric distribution - Wikipedia](https://en.wikipedia.org/wiki/Negative_hypergeometric_distribution)