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Families of Fibonacci and Lucas Sums via the Moments of a Random Variable,

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Abstract

In this paper we show how the expectation of a particular random variable gives rise to an infinite series whose coefficients are certain functions of the Fibonacci numbers. A general result follows from this which, when specialized to varying degrees, leads both to well-known and lesser-known identities. Also, by considering a different random variable, we go on to obtain corresponding results for the Lucas numbers. Finally, we look at series arising from higher moments.