1086-VI-1520   **Arulalan M Rajan***, perarulalan@gmail.com, and **Vittal Rao**, **Ashok Rao** and **H S Jamadagni**. *2φ + 1 and Fibonacci Sequence.*

The classical Fibonacci sequence is known to exhibit many fascinating properties and many constants are associated with it. For example, the limit of the ratio of successive elements of the Fibonacci sequence converges to the golden ratio, φ. It was proved recently that the growth rate of the random Fibonacci sequence is the number 1.1319882487943. In this paper, we look at the classical Fibonacci sequence from a different perspective and associate with it, another constant, $2\varphi + 1$. This corresponds to the limit of variance of the discrete probability distribution that one can generate with the classical Fibonacci sequence. It turns out that this value is also the upper bound on the limit variance of probability distributions induced by not only second order linear recurrence relations with positive integer coefficients, but also, any k^{th} linear recurrence relation with positive integer coefficients. We show that the largest positive real root of such recurrence relation determines the variance. In addition, we also prove that the largest positive real root influences the location of maximum in the sequence obtained from the self linear convolution of the recurrence relation. (Received September 23, 2012)

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