On an Extension of Fibonacci like Sequences and Some of Their Properties.

The Fibonacci numbers are generated by using the following recursive relationship $f(n+1) = f(n) + f(n-1)$, where $n = 1, 2, 3, \ldots$ and $f(0) = f(1) = 1$. In this presentation, we analyze the recursive relationship of the form $a(n+1) = a(n) + a(n-k+1)$ for $k = 2, 3, 4, \ldots$ and $n = k-1, k, k+1, \ldots$. The starting values are $a(0) = a(1) = a(2) = \ldots = a(k-1) = 1$. The ratios of consecutive numbers satisfy similar characteristics as the golden ratio of the Fibonacci numbers. We also present (i) a way to generate the $a(n)$'s by modifying Pascal’s triangle and (ii) an extension of the identity $f(n) * f(n) - f(n-1) * f(n+1) = (-1)^n$ of the Fibonacci numbers that is satisfied by these sequences. (Received September 28, 2004)