LIMITING PROBABILITY TRANSITION MATRIX
OF A CONDENSED FIBONACCI TREE

K.A. Germina

Department of Mathematics
Central University of Kerala
Kasargod, Kerala, INDIA

Abstract: This paper discusses on the construction of condensed Fibonacci trees and present the Markov chain corresponding to the condensed Fibonacci trees. An $n \times n$ finite Markov probability transition matrix for this Markov chain is presented and it is proved that the limiting steady state probabilities are proportional to the first n Fibonacci numbers.

1. Introduction

Most natural / artificial dynamic phenomena are endowed with a nondeterministic description. Stochastic processes provide appropriate mathematical models of such phenomena. Among the class of stochastic processes, Markov chains are highly utilized for many dynamic phenomena because of demonstration of equilibrium behavior. Efficient computation of equilibrium / transient probability distribution of a Discrete Time Markov Chain (DTMC) / Continuous Time Markov Chain (CTMC) is considered to be an interesting research problem. A Markov chain on Ω is a stochastic process $\{X_0, X_1 \ldots, X_t \ldots\}$ with each $X_i \in \Omega$ such that $Pr(X_{t_1} = y/X_t = x, X_{t-1} = x_{t-1}, \ldots, X_0 = x_0) =$