

Skip-free Markov Chains: Matrix Polynomial/Power Series Equations

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Skip free Markov chains of G/M/1-type, M/G/1-type found many applications in queueing, inventory and communication theories. It is well established that the equilibrium analysis of such Markov chains naturally leads to the solution of Matrix power series equation. Utilizing the Cayley-Hamilton Theorem, we reduce the matrix power series equation into a matrix polynomial equation using the companion matrix.

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