Incursions on the discrete Painlevé I hierarchy

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The recurrence coefficients of an orthogonal polynomial sequence with respect to certain generalised symmetric Freud weights satisfy a coupled system of nonlinear differential equations. They are part of the discrete Painlevé I hierarchy. The behaviour of such coefficient is rather intriguing and interesting. In this talk, I will explain the motivations for such studies and explain the surprising analytical as well as asymptotic behaviour of these coefficients.