In the construction of mathematical models of physical systems it is usually assumed that all of the independent variables, such as time and space, are continuous. This assumption normally leads to a realistic and justified approximation of the real variables of the system. However, we regularly encounter systems for which this continuous variable assumption can not be made. Systems in which one or more variables are inherently discrete are in areas such as population model growth [1], [9], [33], [54], digital control [34], digital communication networks [49], and quantum mechanics [35], [40]. Due to their discrete character, these systems must be modelled by the use of difference equations. In numerical analysis [73], differential equations are converted to difference equations which in turn can be solved by the use of digital computer. This conversion can be accomplished through a wide range of discretization methods such as forward, and backward difference. In order that solutions of the difference equations approximate solutions of the differential equations, with acceptable accuracy, the step size of the discrete independent variables are usually taken to be small.

To summarize, the reason for studying nonlinear difference equations lies in the fact they are fascinating mathematical