ABSTRACT

Mathematical models of the interaction between predator and prey populations have been expressed as systems of non-linear ordinary differential equations. Solutions of such systems may be periodic or aperiodic. Periodic, oscillatory solutions may depend on the initial conditions of the system or may be limit cycles. Aperiodic solutions can, but do not necessarily, exhibit oscillatory behaviour.

This project looks mainly at the Lotka-Volterra predator prey model, its assumptions and the modifications made in order to make the model more realistic so as to model real world situations. Examples of one predator one prey models are discussed as well as more complex models such as two predator one prey models and one predator two prey models. The Kermack-McKendrick predator prey model is also briefly discussed.

This research paper can be used as a manual to show how to solve these systems of non-linear ordinary differential equations using the technical computing program Matlab. This program has numerous tools for numerically solving non-linear ordinary differential equations however this paper focuses mainly on the ode45 command.

Keywords: Lotka-Volterra model; predator prey model; Kermack-McKendrick model; Matlab.

i