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## **Predator-prey model with fuzzy initial conditions**

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Predator-prey model, an initial value problem which is found in real life describes the relationship between predators and preys in an ecosystem, consisting of two nonlinear, autonomous differential equations. As it is an initial value problem, the initial values - the number of initial populations, directly affect the accuracy of the results. Initial population size depends on many external variables such as environmental conditions and biological factors. Hence taking fixed values for initial conditions at an uncertainty environment leads inaccurate results. Therefore, initial conditions given in fuzzy intervals give solutions more accurately. Fuzziness in the initial conditions is taken as triangular fuzzy numbers. The predator-prey equations are converted into fuzzy differential equations by denoting membership functions and solved numerically using fuzzy Euler method and then using 2nd order fuzzy Taylor method. The solutions converge to crisp solutions. The sensitivity analysis of the parameters of the fuzzy Predator-Prey equations and the fuzzy initial populations are carried out. In a future work, fuzzy Taylor method can be extended to include higher orders.

**Keywords:** Fuzzy initial conditions, membership functions, predator-prey model, uncertainty