Wa-Tor World

Assignment 7 - CS324e
Overview

- Visualization - Animal Populations
- Description of Wa-Tor World
- Demos
Predator – Prey Equations

- a.k.a. Lotka–Volterra equations
- \( x = \) number of animals that are prey
- \( x = \) number of predatory animals
- \( \alpha = \) prey population increase (birth rate - death rate)
- \( \beta = \) rate the predators eat the prey
- \( \gamma = \) predator mortality rate
- \( \delta = \) reproduction rate of predators per 1 prey eaten

\[
\frac{dx}{dt} = x(\alpha - \beta y) \\
\frac{dy}{dt} = -y(\gamma - \delta x)
\]
Lotka–Volterra equations

- Graphed over time

Rabbit Population in Red
Fox Population in Blue
Hudson Bay Company - Pelts

- Solid line - Rabbits, dashed line - Lynxes
Wa-tor World Population
Description of Wa-Tor World

- A.K. Dewdney
- *Computer Recreations* column in *Scientific America*
- *Sharks and Fish Wage an Ecological War on the Toroidal Planet Wa-Tor*
The World and its Inhabitants

Wa-Tor

Wa-tor World
The Assignment

- Given Simulator
- Must implement GUI and controls

Population Graphs

The World

Controls
Demos

- Basic Version
- Advanced Controls
- Simple Demo in CS324E/A4 folder

Wa-tor World
Large Worlds

Wa-tor World