INSECT-O-RAMA

New Mexico Adventure in

Super Computing Challenge

Final Report

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Team 66

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Executive Summary

Do you have bugs in your house? Bugs are a major problem in many human households. People spend millions of dollars a year trying to get rid of these pests. Whether it's by calling exterminators or by using many of the harsh chemical products made today. In our project we are using Star Logo to find out how bugs in the human household interact with one another and how we could limit the bug population in an average home. To make this work we picked 6 major bugs in our area, they are: grasshoppers, mosquitoes, ants, spiders, flies, and cockroaches. We are using the bugs to see if you allow certain bugs to live in your house, they might limit the population of other bugs. We found out how they interacted with one another.

Description

We used star logo to make a model that shows a yard, house, shade, trees, and a pond. All of the places that bugs would live. We are having the bugs that are predators and pray. The predators are spiders, ants sometimes. The prey are grasshopper, flies, cockroach, and mosquitoes. Spiders can eat any one of these bugs if it can catch them. Ants all eat a lot of bigger bugs but there has to be more than one ant and can get eaten by most bugs when alone. Flies mostly eat rotten food and get eaten by spiders. Cockroaches don't get eaten by other bugs but they eat garbage. Grasshoppers can get ate by spiders when by them and they eat plants. Mosquitoes don't eat other bugs and blood and plant nectar and the people and exteraders kill all of these. The predators can make the number of the prey go down. There are lots of thing that can affect the bugs but we couldn't put all of them in our model. So we picked six bugs that are a big problem in ever day life. We found a lot of information on them. Here are some facts on them.

First, a mosquito's life takes about a month. An adult female can lay a raft of 40 to 400 tiny white eggs in standing water or very slow-moving water. They can carry disease like yellow fever, dog heartworm, and West Nile virus just to name a few. The male only sips plant nectar.

The second is the ant. The ant has four different ants in a colony the Queen, workers, soldiers, and males. An ant has four stages of life: egg, larva, pupa, and adult. Their life usually lasts from 6 to 10 weeks. But the queen can live over 15 years. Some workers can live for up to 7 years.

Grasshoppers undergo simple metamorphosis. The grasshoppers' eggs hatch into nymphs. That look like little adults without wings and reproductive organs. The Nymphs molt many times as they grow into adults.

We found similar types of information about the remaining three 'bug ' species of cockroaches, spiders, and flies. Using all of this information, we were able to construct the math model of the species interaction.

Results

Some things we intend to determine with our model are how the different insect species will interact and affect each other's numbers. If the population numbers go up or down and the best way to get ride of the unwanted species. We would like to find way to keep them down with out an exterminator. We also want to find out how the bugs population dynamics will change when one type of bug is eliminated from the mix of species.

Original Achievement

We designed and programmed a math motel of insects using parameters we decided upon ourselves with six different bugs to use. The six bugs are found in ever day life and are common to all of New Mexico. The places we used are places that the bugs would live well, and that everyone could relate to as part of their ‘personal environment’.

Acknowledgement

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