Testing the Amount of Rainfall Affecting Animal Life

New Mexico
Supercomputing Challenge3
Final Report
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Team 53
Jackson Middle School

Team Members

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Teacher

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Project Mentors

Christopher Koch
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EXECUTIVE SUMMARY

In all our challenge is based on a real world problem. The problem describes a test of rainfall affecting animal life with different amounts of rainfall. We modeled this and tested the problem out in the model. We were common with this software so we decided to use the software for our challenge. When the kickoff began, we had help from a scientist named Dr. Edward Martinez and he helped us with our model. We changed key parts of the models frame and on the interim report, the judges told us to completely change our problem. With hard work and dedication, we completed the challenge with only a few minor errors. Both Adam and Randie were both dedicated to complete this challenge that they proposed at the start.

STATEMENT OF THE PROBLEM

Our team investigated how the rainfall affects animal life by modeling a desert in New Mexico. We worked on this problem by using various amounts of rainfall on an environment with varying amounts of rainfall on an environment with varying numbers of coyotes and jackrabbits. There will be different effects as we change the amount of rainfall. We will also see the population of the two species we are testing, the coyote and the jackrabbit. These are two common rivals in New Mexico. In our model you will see the coyote and the jackrabbit survive in our program that we used. The program we used is called StarLogo TNG, we used this program to test out and see results.

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DESCRIPTION OF METHOD

We are going to model this challenge with StarLogo TNG program. We used this because it was the most common program we were using and we knew how to program it very well. With this program we will see a slider, which changes the amount of rainfall shown on a graph that shows the population of the two species we used. WE modeled this program to represent a base plate as a desert in New Mexico. Then when the model starts the Coyotes and the Jackrabbits are in a struggle of survival with limited food and water in the area. As the model continues, the population of the species will reproduce or die and the statistics will be recorded on a graph and show the current population.

RESULTS OF THE STUDY

In our study, we had a minor problem. The problem was that the coyote's population on our graph stayed on one pace. At the end when all the jackrabbits were dead, the coyotes stayed at the population they started at when the model began. We still do not have a resolution to that problem; we have tried many different ways to find the resolution but no new results on this problem. Everything else was part of the model and everything else worked fine. The rain changer worked fine, the population chart worked besides the coyote population and the model was all around okay. We say okay because we had the problem with the coyote.

CONCLUSIONS OF THE STUDY

After we ran the model nearly 100 times we concluded that if you change the amount of rainfall, you also change the population with it. The graph shows that the animals sometimes reproduce or die in the model. The problem with the model was the coyote population. We tried many different ways and we could not figure out why this problem could not be resolved. As the model runs, we saw that everything else, except the coyotes and the graph were fine. The rainfall slider in our model worked as programmed, and the jackrabbit had a steady rate of reproduction and a rate of death. Over all, the entire model worked well. There were no major errors or problems.

SOFTWARE REFERENCE

The software we used for this problem was Starlogo TNG. We chose this program because we knew how to program it and it was common for both of us. In this software we used a slider and a graph. The slider was for the amount of rainfall on the area. The slider was one key part of the model because it shows the amount of rainfall given in the area. Another key part of the model was the population chart. With this table, it shows the population of the animals set in our model.

OUR MOST SIGNIFICANT ACHIEVEMENT

Our most original significant achievement is what we thought of as an accident. Adam's most significant achievement was that we lost our program but got farther in the newly created program after we restarted. We programmed the model in the first few weeks of the kickoff then lost the flash drive. We were able to get a programmer to help us remade our lots program.

Randie's most significant achievement is that he had the contribution to do this challenge as a partner. He did the final report and contributed by getting the report done on time.

ACKNOWLEDGEMENTS

Nick Bennett helped us understand and work through our programming

Christopher Koch helped us in the beginning to narrow down and think through the problem.

Patty Meyers pushed and encouraged us to do more, explain our program better and do better over all.

Karen Glennon gave us time after school, during class time at school, and made us stay on task.

Jackson PTA funded us with great snacks and traveling money.

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