Name(s)	Project Number
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Project Title

Bob's World

Abstract

Objectives/Goals

There are many different objectives for Bob#s World, though they are all based on evolution. The firx objective is to see how the effects of Genetic Drift change with the population size. The second objective is to see how natural selection can affect a population#s genetic information with different environments. The final objective is to see which is more effective: sexual or asexual reproduction.

Methods/Materials

The source code for Bob#s World was created using BASIC. The program is a Monte Carlo simulation of evolution using two gene creatures. These creatures can reproduce sexually, and have four different phenotypes have all different levels of move lengths. There are many different input variables which can be changed.

Results

The results for the first experiment demonstrated that when the population was large the populations for the phenotypes assumed the 9:3:3:1 ratio. When the population was small one of the phenotypes becamex dominant, killing all the others in the process. The second experiment showed that when there wet environments with the food spread out, the long-moving phenotypes would be the most successful. Whenx the food was packed together around certain areas, the short moving phenotypes would be the mostt successful. In the third experiment asexual reproduction was more successful in a normal environmentx while sexual reproduction was more efficient in a changing environment.

Conclusions/Discussion

The results for all of the experiments matched the results the way they were supposed to according to the hypothesis. The reason why the phenotype populations were not stable at a low population is because very easily, due to random luck, one of these phenotypes could die out. Just that would affect all the other phenotypes drastically. The reason why certain phenotypes survived in certain environments is obvioux Some traits are more successful than others in certain situations. Sexual reproduction was more successful than asexual reproduction in a changing environment is because of the fact that sexual reproduction allows for more genetic diversity and adaptability in different situations.

This project relates to evolution in many ways. One of them is just the simulator. It is a powerful tool tha€ can be used to model all kinds of situations. With some minor tweaks to the source code, you could even model such things as effect a sexually transmitted disease has on a population.

Summary Statement

My project is about different aspects of evolution using a Monte Carlo computer simulation.

Help Received

Father taught me how to program; Dr. Bowes and Dr. Stauffer of Humbodt State Univerisity helped me with genetic drift.

Ap2/02