Cell Growth

New Mexico
Supercomputing Challenge
Final Report
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Bosque School

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Executive Summary

In our project, we modeled cell growth. We decided to model orchid cells, because they exist only in a certain temperature. This would help us to model temperature effectively. We decided to use Starlogo as our program. We made a valiant effort to model temperature effectively, but it was all for naught. We could model space effectively though. We got the cells to die if they stacked on top of each other. For us, this was just an experiment in Starlogo, to see if we could really get something to work.

Introduction

the problem we investigated was cell growth. Cell Growth can mainly help in the medical field, for organ transplants, cures, and other things. The problem was how to store and transport these cells, and what variables came with them. The biggest variable was temperature, so we decided to model that. We decided to solve this problem with starlogo, modeling the randomness of the cells and the temperature.

Results, Conclusions

The results were less than desirable. We did not model temperature successfully, which hurt us immensely. Although, we did successfully model the space constraint, that a cells dies if one is on top of the other. Conclusions are that temperature would have affected the cells, if we had modeled it correctly.

Programs, References

We mainly used Starlogo, and Unfortunatly we forgot to write down our references

Achievements, Acknowledgments

I think our biggest achievement was learning how to use Starlogo. We wern't trying to win any award or anything, we just wanted to see what Starlogo was like, and I must say, it's pretty fun, but sometimes frustrating. We would like to thank our teacher, Tom Allen, for helping us, and Dale Henderson for the same reason.

```
turtles-own [temperature]

settemperature temperature_limit
if temperature_limit < 16 [die]
if temperature_limit > 20 [die]
end

to go
 prep
 grow
 xx
 split
 dennis
end

to xx
 if breed = (hott) or (coldd) [settemperature random 33]
end

to prep
 dennis
 ifelse color = red [fd 2] [die]
 ifelse color = red [bk 1] [setc red]
end

to grow
 dennis
 hatch [setshape cellShape]
 fd 1
 rt random 45
 bk 1
end

to split
```

```
end

to dennis
 grab list-of-turtles-here
 [if (shape-of first partners) = cellShape [die]]
end

to hots
 prep
 grow
 split
 dennis
 burns
end

to colds
 prep
 grow
 split
 dennis
 freezes
end

to burns
 if color = red [setbreed hott]
 grab one-of-turtles-here [ifelse (breed-of partner) = hott [fd 1] [die]]
end

to freezes
 if color = red [setbreed coldd]
 grab one-of-turtles-here [ifelse (breed-of partner) = coldd [bk 2] [die]]
end
```

One note, the last two commands in our program were just things we used in the past, they were accidently left in there.