CMPE 150 PROJECT #3
Honore's Game Of Life

December 22, 2003

1 Definition

In this project, you are going to simulate the living in an environment containing some primitive beings, which men call *yécúc*s. Yécúcs are lazy creatures, they eat and stay motionless all the time. When they reach a certain weight, they produce children by agamic reproduction.

The environment is an array of *Cell* structures. A Cell structure contains information about the location. The *empty* field stores whether the location contains a yécúc or not (1 or 0). If there is a yécúc in the location, its weight is stored in the *weight* field, by how many grams it gets heavier at each turn is stored in the field *weightIncreaseConstant*. The *age* field is for keeping the age of the creature, increased at each turn. When a yécúc reproduces (its weight exceeds *reproductionThreshold*), two children are born, one *rightRange* cells on the right and one *downRange* cells down.

```
struct Cell{
  int empty;
  int age;
  double weight;
  double weightIncreaseConstant;
  double reproductionThreshold;
  int rightRange;
  int downRange;
};
```

The program reads the position of a yécúc and its properties from the user. It is put in the appropriate place in a 5x5 structure array. The program also reads the number of turns for which the simulation will last. Then, the simulation begins. In one turn, each creature in the array is processed: its weight is increased by *weightIncreaseConstant* and its age is increased by 1. If its weight exceeds the threshold, it reproduces: 2 young creatures are created and placed in the appropriate locations. If the limits of the array is exceeded, the array is resized such that it contains the new locations. After the reproduction, the parent and the children have one over third of the original weight. The ages of the childrean are set to 0. The other properties of the children are calculated as follows: for each property, a random number between -2 and 2 is added to the property of the parent. If a property is to have a zero or negative value, the number is not added. If a new creature is to be created at a location where another creature dwells, a new creature is created whose properties are the averages of these two creatures. For integer fields, the result should be converted to integer.

When the simulation finishes, the program outputs the size of the environment, the number of yécúcs in it and a table which shows for each age how many yécúcs there are of that age.

2 Submission Guide

- Submission deadline is 12 January 2004.
- You will submit **ONLY** source code (.c file **NOT CPP FILE**) of your program to the FTP site
  ftp://haydut.cmpe.boun.edu.tr with the user name **cmpe150** and password **150cmpe**. You will submit the program to the **proje-teslim** directory.
- Name of your project as yournumber.c. For example, if your student number is 2002500411 then you will submit 2002500411.c file.
- Note that the FTP site will be open between the dates 9 January 2004 and 12 January 2004.
- The FTP submission directory is write-only, so you can not overwrite

existing files or can read other's projects. Therefore you can not submit your project twice (you can not upload your program twice).

- FTP site is only accessible from the computers in BU.
- Projects which are not submitted using FTP will not be accepted.

3 Final Remarks

- You will **ONLY** submit the source code using FTP. No other submission is required.
- Commenting and programming style (identifier names, indentation, **function usage**) of your program will affect your grade.
- Deadlines are sharp. There will be a %20 decrease per day for late projects.
- Please note that the computers in the PC labs may be unreliable, down on the date of submission, inadequate, slow, etc. Please try to finish your projects 48 hour before the deadline to compensate this kind of unplanned problems.
- You are also responsible for reading and understanding the course policy written on the web page of this course. Before submitting your project, read the policy of this course from http://www.cmpe.boun.edu.tr/courses/cmpe150/fall2003/policy.html
- For any further questions on this project see Volkan Ozadali (volkanoz@mail.com).