Mini-Project I

(due: Thursday, February 23, 9:30 am)
paper due at beginning of class, presentations in class

Goal of this Mini-Project I is to give you a free hand for your creativity and to get more practice with scientific paper writing and scientific talks.

1. Use your program of the game of life or the solution programs to the in-class work (see below). Do some variation on the game of life. For example you might change the rules of the game of life, or you might change the boundary conditions, or you might add or take out cells from time to time, or you might try more complicated initial configurations than we used in class, or any other change of your choice.

2. Watch carefully the patterns how they evolve over time and/or measure for example $N(t)$, the number of life cells N of the lattice at time t. What do you observe? (periodic behavior? dying out?...) Another variation might be that you are not changing the model but instead work on a more elaborate analysis, e.g. how would you measure if a pattern does no longer change after a certain number of steps, and if so, how would you measure how many steps it took to get to the no longer changing pattern.

3. Write a **paper** about 1. and 2. The paper (figures included about one latex-page) should contain a short **introduction** which explains clearly which task you tried to do (e.g. change of boundary conditions from periodic boundary conditions to absorbing boundary conditions). This can be a section of only one or two sentences. The next section should explain what exactly your new model is, such that everybody in class could write a program, which does exactly the same as what your program does. View this section as the **Model/Simulation** section. For completeness include the rules of game of life (even if you did not change them) and a reference (e.g. the book of Gaylord and Wellin of which I gave you copies). Include a description of all parameters you used (e.g. what is your initial condition and the lattice size you used). Then continue with a mini-**results** section, in which you show a figure or two and a description/interpretation of your results. [5] End with a short **conclusions** section and possibly some ideas for future work. Since you will have only two days for this project each section can be relatively short.

4. Prepare a mini **talk** (6 min each student) which has the same content as your paper (model, variation(s), results). Prepare what you will say and two or three slides (In next class, Tue, Feb.21, you will learn how to prepare scientific talks and the necessary tools: latex beamer and xmgrace.) Use your notes from the Feb.21 class to prepare your talk. You will find on our webpage links to the "How To Give Talks", examplatory talks, and the inclass-work for `latex beamer` and `xmgrace`. Make sure that you can get to your presentation/slides on the computer on the front desk in BERT012. If you plan to use DynamicLattice, then have a file prepared with the commands for compiling, running the program and using DynamicLattice. This file of commands has the purpose to safe you time for typing in commands (instead you will just copy the commands) and therefore will allow you more time for explanations.

5. Put the sourcecode (file.cc) into your ~/share.dir/ and make it readable. Please send to me an email in which you tell me the name of your sourcecode.

Solutions: `~kvollmay/classes.dir/capstone_s2012.dir/game_of_life.dir/game2.cc` etc.

[5] To make a figure for $N(t)$ use `xmgrace` as introduced in our Feb. 21 (Tue) class (see also in-class work 7a.). To make a figure from part of your screen (e.g. a DynamicLattice picture) you may use in the command-line: "`import filename.eps`" and then select the desired area with the middle mouse button.