John Horton Conway , 1970
The Game of Life

Background.

British mathematician from Cambridge University, where he was employed 1959 – 1986. After this he has worked at Princeton in New Jersie, USA with the theory of numbers and other mathematical topics. But to the public he is primarily known for his simulation

”The Game of Life”.

Picture from Wikipedias biography.

Conway published back in 1970 his result as a scientific paper; but it was Scientific Americas editor of mathematical puzzles, Martin Gardner, who made it popular to a still broader part of the public :

Gardner, Martin Scientific American 223 (1970) pp. 120–123. ISBN 0-89454-001-7.
"Mathematical Games
- The fantastic combinations of John Conway's new solitaire game "life"".

Previously one could read it at :

http://ddi.cs.uni-potsdam.de/HyFISCH/Produzieren/lis_projekt-/proj_gamelife/ConwayScientificAmerican.htm

but it has been removed. Scientific American still sell the article ;-) But the link gives a good throughout explanation.

It is not a game (there is a boardgame with the same name, but it has nothing to do with it) but a computer simulation. This is a good example on how a little bit of code can simulate or visualize a complex structure in life.

The international Wikipedia has a splendid article about The Game of Life :

http://en.wikipedia.org/wiki/Conway's_Game_of_Life

and YouTube has (of course) tons of examples. You can even see how to develop a Java program for this simulation. But try it out for your self (or in cooperations with others).....

TGoL1 EXERCISE: Implement "THE GAME OF LIFE"

World 2 dimensional grid of a finite size of your choice, say 100 * 100 positions.
Each position contains either nothing or a cell.

Generations The simulation consist of generations. From each generation to the next, the cells either die, survive or are born as new cells depending upon the previous generation.

Rules

1) Under-population :
   Any live cell with fewer than two live neighbors dies.

2) Surviving :
   Any live cell with two or three live neighbors lives on.

3) Overcrowding :
   Any live cell with more than three live neighbors dies.

4) Reproduction :
   Any dead cell with exactly three live neighbors becomes a live cell.

Implement your own version of The Game of Life, so you can :

- create, read or update in the initial generation
- see the development of generations
- try out different initial generations
- try out other rules
- evt. edit and save a generation

It is important to remember, that what happens between 2 generations happens simultanously, i.e. at the same time.

TGoL2 EXERCISE: Do it even better without loops

Implement "The Game of Life" where you use some of Javas more advanced features, i.e. without loops.