

July 13, 2010

## Game of Life

- <http://turing.cs.olemiss.edu/~jcchurch/doku.php?id=code:java:conway>

```
import java.util.*;
import java.io.*;

class conway {

    final int width = 60;
    final int height = 40;
    int[][] grid = new int[height+2][width+2];

    int evaluate(int y, int x) {

        // Count neighbors to this (x,y) coordinate.
        int neighbors = 0;
        for (int i = y-1; i <= y+1; i++)
            for (int j = x-1; j <= x+1; j++)
                if (x != j || y != i)
                    neighbors += grid[i][j];

        // If exactly three neighbors, then birth (or keep living)
        if (neighbors == 3)
            return 1;

        // If a living cell has two neighbors, keep living.
        if (neighbors == 2 && grid[y][x] == 1)
            return 1;

        // Nothing happens
        return 0;
    }

    void advanceGeneration() {
        int[][] nextgrid = new int[height+2][width+2];
        for (int i = 1; i < height-1; i++)
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        for (int j = 1; j < width-1; j++)
            nextgrid[i][j] = evaluate(i,j);

    grid = nextgrid;
}

void printGrid() {
    for (int i = 1; i < height-1; i++) {
        for (int j = 1; j < width-1; j++) {
            if (grid[i][j] == 1)
                System.out.print("*");
            else
                System.out.print(" ");
        }
        System.out.println("");
    }
}

void startLife() {
    for (;;) {
        advanceGeneration();
        printGrid();
        try { Thread.sleep(2000); } catch (InterruptedException e) { break; }
    }
}

void randomize(double density) {
    Random rand = new Random();

    for (int i = 1; i < height-1; i++)
        for (int j = 1; j < width-1; j++)
            if (rand.nextDouble() < density)
                grid[i][j] = 1;
}

void readFile(String filename) {
    try {
        Scanner console = new Scanner(new File(filename));
    }
}

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        int i = 1;
        while (i < height-1 && console.hasNextLine()) {
            int j = 1;
            String line = console.nextLine();
            while (j < width-1 && (j-1) < line.length()) {
                if (line.charAt(j-1) == '*')
                    grid[i][j] = 1;

                j++;
            }
            i++;
        }
    }
    catch(FileNotFoundException e) {
        System.out.println("File not found: "+filename);
        System.exit(1);
    }
}

conway(String[] args) {
    if (args.length == 1)
        readFile(args[0]);
    else
        randomize(0.15);

    startLife();
}

public static void main(String[] args) {
    new conway(args);
}
}

```

**Test Day**