

Java Game: Life

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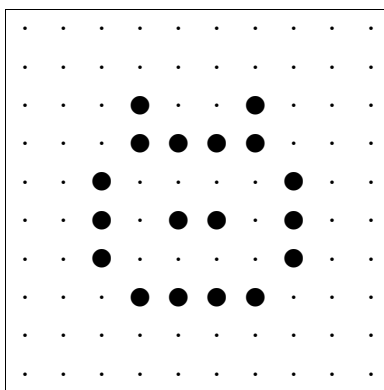
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Description

Life is a graphical Java 1.1 AWT (GUI) applet to play John Conway's Game of Life. For reference, see articles in "Scientific American" (October 1970 and February 1971) and "Time" magazine (21 January 1974). Life is not your average two-player game. You and the computer work together, with you making decisions, and the computer doing calculations. You define a board pattern and then watch as the computer projects future generations of this pattern based on rules for growth and decay. Even with some of the most trivial initial patterns, you can obtain results that are both beautiful and intriguing. You may run this program as a stand-alone application, or as an applet on the following web page:

John Conway's Game of Life - by: Keith Fenske
<http://www.psc-consulting.ca/fenske/life3a.htm>

Cells (squares) on a rectangular grid are either empty or full (occupied). The next generation is calculated by counting the number of occupied neighbors, up to a maximum of eight. Fewer than two neighbors, or more than three, results in death: the cell will be empty in the next generation. No change is made if there are exactly two neighbors. Exactly three neighbors results in a birth: the cell will be occupied. This updating is "instantaneous" and does not change squares before everybody's fate has been determined. Try the 8-generation Cheshire cat pattern ("." are empty; "●" are full):



Click the mouse to change a cell. If the cell is currently empty, then it will be filled. If the cell is currently full, then it will be emptied. Cells are shown in color. A cell with the background color is empty, and has been empty for a while. A blue cell is a death: newly empty. A green cell is a birth: newly occupied. A white cell has been occupied for a while. The number of cells in the game board is determined by how many cells fit in the current window size. There are “Bigger” and “Smaller” buttons to change the size of the cells. If the window size changes, the new game board is centered on the old game board.

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Installation

You must have the Java run-time environment (JRE) installed on your computer. Life was developed with Java 1.4 and compiled for Java 1.1, so it should run on all later versions. For Macintosh computers, the version of Java is determined by your version of MacOS. For Windows, Linux, and Solaris, you can download the JRE from Sun Microsystems:

Sun Java

JRE for end users: <http://www.java.com/getjava/>

SDK for programmers: <http://developers.sun.com/downloads/>

IDE for programmers: <http://www.netbeans.org/>

Once Java is installed, you need to put the program files for Life into a folder (directory) on your hard drive. The name of the folder and the location are your choice, except it is easier if the name does not include spaces. Assume that files will go into a C:\JAVA folder. Then create the folder and unpack the Java *.class files into this folder (if you received the program as a ZIP file). The files look something like this:

ffcccc.gif (1 KB, web page background, name must be lowercase)

GnuPublicLicense3.txt (35 KB, legal notice)

Life3.class (10 KB, executable program)

Life3.doc (37 KB, this documentation in Microsoft Word format)

Life3.gif (13 KB, sample program image)

Life3.java (40 KB, source code)

Life3.manifest (1 KB, main class manifest for archive file)
Life3.pdf (77 KB, this documentation in Adobe Acrobat format)
life3a.htm (4 KB, applet web page, external links don't work)
life3b.jar (7 KB, applet archive file, name must be lowercase)
life3c.txt (41 KB, same source code as text for web page)
Life3Window.class (1 KB, helper class for main program)
make-life3.bat (1 KB, compiles as Java 1.1 using Java 1.4 SDK)
RunJavaPrograms.pdf (60 KB, more notes about running Java)

To run the program on Windows, start a DOS command prompt, which is Start button, Programs, Accessories, Command Prompt on Windows 2000/XP. Change to the folder with the program files and run the program with a "java" command:

```
c:
cd \java
java Life3
```

The program name "Life3" must appear exactly as shown; uppercase and lowercase letters are different in Java names. Should you find this program to be popular, you can create a Start menu item or desktop shortcut on Windows 2000/XP with a target of "java Life3" starting in the "c:\java" folder. One complication may arise when trying to run this program. Java looks for an environment variable called CLASSPATH. If it finds this variable, then that is a list of folders where it looks for *.class files. It won't look anywhere else, not even in the current directory, unless the path contains "." as one of the choices. The symptom is an error message that says:

Exception in thread "main" java.lang.NoClassDefFoundError: Life3

To find out if your system has a CLASSPATH variable defined, type the following command in a DOS window:

```
set CLASSPATH
```

To temporarily change the CLASSPATH variable to the current directory, use the following command line:

```
java -cp . Life3
```

To permanently change the CLASSPATH, you must find where it is being set. This may be in an old AUTOEXEC.* file in the root directory of your system disk (usually the C:\ folder), or it may be in Control Panel, System, Advanced, Environment Variables on Windows 2000/XP.

Removal or Uninstall

To remove this program from your computer, delete the installation files listed above. If the folder that contained the files is now empty, you may also delete the folder ... if you created the folder, of course, not the system. If you created desktop shortcuts or Start menu items, then delete those too. There are no configuration or preference files, and no information is stored in the Windows system registry. You don't need an "uninstall" program.

Restrictions and Limitations

Web page applets are obsolete and may run as stand-alone applications with the help of a wrapper (included), although this becomes less likely after Java 9 (2017). Rewriting for Java Swing or newer JavaFX is not an easy job.

file: Life3.doc 2019-03-30