

```
{ realDomain t ;  
  t.min=0;t.delta=0.1;t.max=20;  
  
      real x(t), y(t);  
  
  when (t=t.min){x=2; y=1;}  
      // ODEs  
  x:t = x-x*y;  
      y:t = x*y-y;  
}
```

Introduction to JSim

Tools for numerical simulation of ODEs

Write your own program: Fortran, C, Python, MATLAB

Simulation software with GUI:

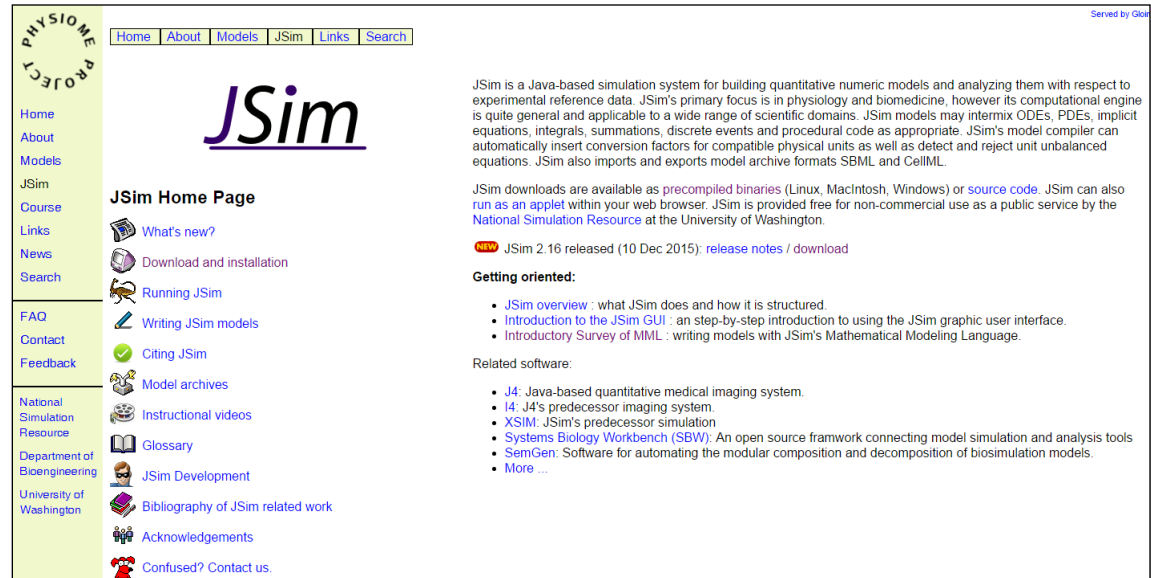
- Allows numerical integration using different in-built algorithms
- Allows other analysis like parameter sensitivity test
- Plot graphs

Define the model (ODEs, parameters) using:

- Reaction schemes and GUI tools (eg. COPASI)
- Markup language (eg. JSim)

JSim

- Own language (Mathematical Modeling Language) and GUI
- Handle ODE, PDE and discrete events
- Graphical interface for plots
- Options to export data
- Import SBML model
- Can connect with MATLAB
- Well documented and versatile instructions provided at the website




The screenshot shows the JSim Home Page. At the top, there is a navigation bar with links: Home, About, Models, JSim, Links, and Search. The JSim logo is prominently displayed in the center. To the left, a vertical sidebar contains links for Home, About, Models, JSim, Course, Links, News, Search, FAQ, Contact, and Feedback. Below these are links for National Simulation Resource, Department of Bioengineering, and University of Washington. The main content area is titled 'JSim Home Page' and lists various resources: What's new?, Download and installation, Running JSim, Writing JSim models, Citing JSim, Model archives, Instructional videos, Glossary, JSim Development, Bibliography of JSim related work, Acknowledgements, and Confused? Contact us. On the right, there is a paragraph describing JSim as a Java-based simulation system for building quantitative numeric models and analyzing them. It mentions that JSim models may intermix ODEs, PDEs, implicit equations, integrals, summations, discrete events and procedural code as appropriate. JSim's model compiler can automatically insert conversion factors for compatible physical units as well as detect and reject unit unbalanced equations. JSim also imports and exports model archive formats SBML and CellML. Below this, it states that JSim downloads are available as precompiled binaries (Linux, Macintosh, Windows) or source code. JSim can also run as an applet within your web browser. JSim is provided free for non-commercial use as a public service by the National Simulation Resource at the University of Washington. A release note for JSim 2.16 (released 10 Dec 2015) is provided with links to release notes and download. A 'Getting oriented' section lists links for JSim overview, Introduction to the JSim GUI, and Introductory Survey of MML. A 'Related software' section lists links for J4, J4's predecessor imaging system, XSIM, JSim's predecessor simulation, Systems Biology Workbench (SBW), SemGen, and More ...

~~<http://www.physiome.org/jsim/>~~

Updated link for JSim:

<https://www.imagwiki.nibib.nih.gov/physiome/jsim>

Download JSim



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Installing JSim under Microsoft Windows

JSim's Windows distribution runs on Windows XP and Windows 7. JSim is not tested on Windows Vista but has run successfully on it in the past.

- Download the appropriate JSim zip archive. Providing the following information will help us demonstrate JSim's continued utility to the funding agencies upon which we rely. Filling out this form will not result in your addition to any mailing lists other than a JSim usage survey that is sent once a year. Your response to that survey will help us to retain our funding. If you wish to receive news about JSim on a more frequent basis, please [contact us](#).

Name: 
Email: 
Institution: 

JSim is free for non-commercial use. [View complete license terms](#)

[Download the current public release: 2.15](#) [Download the latest beta release: 2.16](#)

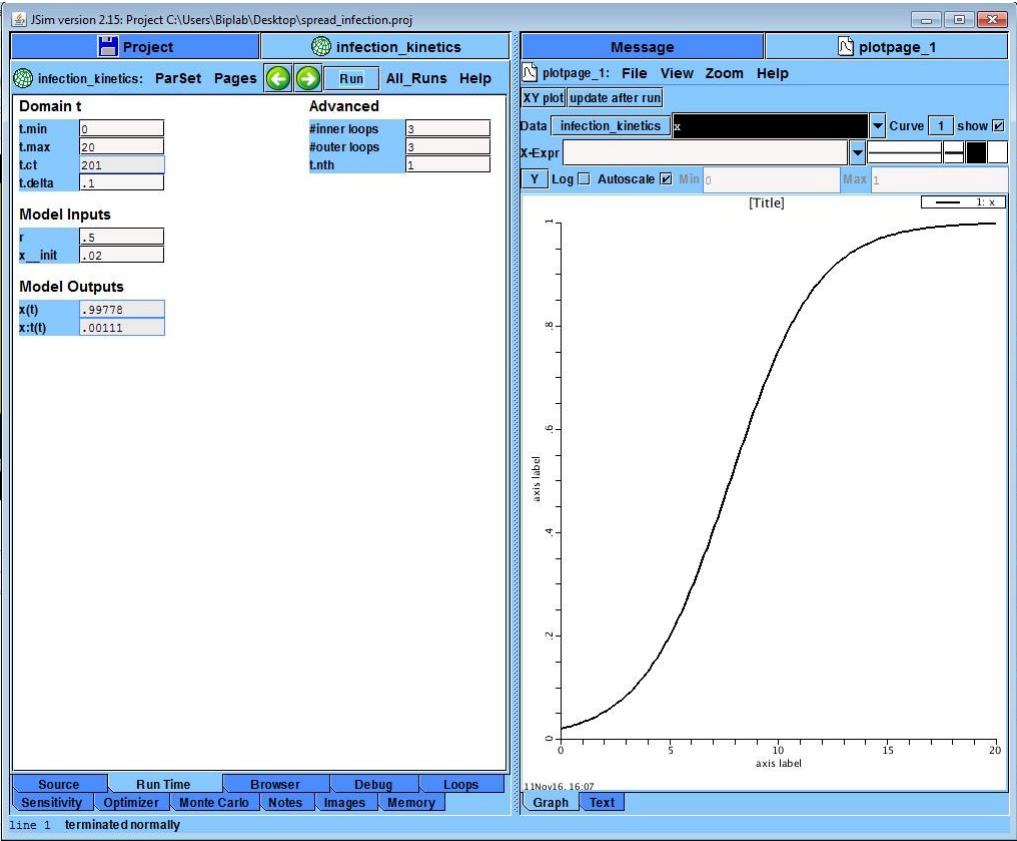
- Note: Internet Explorer(IE) users have sometimes noted that JSim download hang for several minutes at 99% complete. This appears to be a bug in IE. Our experience is that, if the user is patient, the download completes successfully after about five minutes.
- Unpack the .zip file using your system's ZIP utility in a folder of your choice.
 - Note:** You may need administrator privileges to install JSim into certain system directories such as 'Program Files'
- Inside your installation folder, you will find a sub-folder win32\bin containing the following executable files:
 - jsim.bat : the JSim GUI application (First-time users use this one).
 - jsbatch.bat : the JSim text-based batch application.
 - jsfim.bat : the JSim functional imaging application.
 - jsserver.bat : the JSim remote server application.
 - jsreg.bat : adds JSim settings to the Windows registry
 - reg.exe : general purpose Windows registry tool used by jsreg.bat

You may wish to make a short-cut to jsim.bat on your Desktop, or other convenient location. Other executables are useful only from the Windows command prompt.
- JSim 2.07 and above requests 1500MB of heap memory by default. If your system has less than 2GB of memory, you will probably need to [reconfigure JSim to use less memory](#) before JSim can launch properly.
- The optional jsreg utility sets your Windows registry so that certain JSim files (e.g. .proj) are loaded into JSim when double-clicked. See [here](#) for more information.

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Using JSim



Key points:

1. There are many tools for numerical analysis of ODEs in your computer: write your own program or use ready-made one.
2. Ready-made software differ in capabilities and level of difficulties in use.
3. Some commonly used software for ODE-based modeling in biology are: COPASI, XPPAUT, JSim