TECHSIGHTING
SOFTWARE

All's Well That Ends Well

Probably the most common cross-discipline software used in science is for reference management, and with good reason—formatting bibliographic references is no fun. Bookends Plus (version 6.0) is a Macintosh-only software program that simplifies the task immensely. The program combines two major features: it compiles and formats references for bibliographies and footnotes and it archives large amounts of information from published material for retrieval through author or keyword searches. As in other reference management software products, Bookends Plus users can insert temporary citations in the text and later replace them with publication-ready, custom-formatted references for the journal of choice. The program comes equipped with add-ins designed for Microsoft Word 6 or Word 98 and for Nisus Writer versions 5 or later. The user can choose from a large selection of journal formats, or create individual formats in minutes.

Bookends Plus
Sonny Software
Bethesda, MD
$99; $69 (student)
www.sonnysoftware.com

One of the best time-saving features is the reference import capability. In addition to importing data from one Bookends file to another or from files generated in other reference software programs, such as Endnote, Bookends Plus can download references directly from the Web. The software contains browser bookmarks for commonly used databases, such as CARL UnCover, Medline's PubMed, or the Educational Resources Information Center (ERIC). With Bookends Plus, users can access their favorite database with Netscape Communicator or Microsoft Explorer and import the desired references in seconds. Author names, titles, and even complete abstracts available through Medline's PubMed search engine may be downloaded. Any keyword in the abstract or title can later be used for searches in the Bookends Plus database, making it an ideal tool for personal reference management. Although importing online references is fast and easy, it relies on specific formatting cues that Bookends Plus receives from the external database. This can cause errors during data import when Internet sites change their formats or add new features. Two features keep this process working smoothly: first, new import templates can be downloaded from Sonny Software's Web page and dropped into a folder provided by the software. Although this is the easier way of updating Bookends Plus, it relies on continuous postings from Sonny Software. The second way to change existing formats or add new database import formats is to configure the software's user-defined import template. This can prove to be somewhat tricky for the novice. However, Sonny Software provides superb online technical support to help with the process.

Once the user's database is complete, bibliographies can be tailored to use all references, or to include only a subset ("hit list") of references needed for a particular publication. The program sorts, formats, and displays the sub-bibliography, which can then be printed, saved, or exported into a word processing document without losing the formatting.

Bookends Plus comes with a user-friendly, step-by-step online tutorial, but the manual is somewhat lengthy and repetitious. The internal help function, however, is useful and takes a confused user through the necessary steps to remedy the problem in question.

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TECHSIGHTING
SOFTWARE

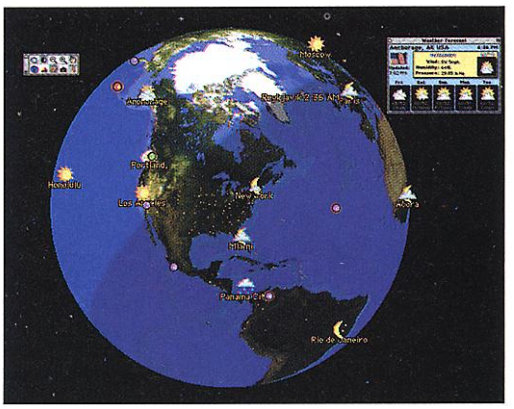
World Wide World

The Earth Browser is a unique software product that makes viewing world environmental information as easy as browsing the Web. Although it provides some of the same information as weather tracking programs (*1*), Earth Browser goes considerably beyond simple weather data by providing up-to-the-minute information about worldwide earthquakes, active volcanoes, time zones, weather conditions/forecasts, and even a few live camera shots from around the world.

Earth Browser
Lunar Software
Portland, OR
$19.95;
$29.95 (CD-ROM)
503-771-6761
www.lunarsoft.com

Not confined to either a standard browser format or terse, text-based output, Earth Browser provides a rotating view of Earth in its program window. Users can select over 450 cities worldwide and obtain their current environmental conditions. The program can access live Web camera locations or pinpoint sites of recent earthquakes and volcanoes, and it can give the latitude and longitude of the pointer's location anywhere on the world map.

A magnifying glass feature permits users to enlarge and reduce the globe's onscreen size. User-controlled specification windows for each city contain an adjustable slide bar that sets the magnification level at which the city's weather information is shown. By adjusting the slide bar for each city, weather information for that location is provided when the user views the world at the specified magnification. Weather information includes temperature, wind, humidity, barometric pressure, a 5-day forecast, local time, and time of the last weather update. Another interesting feature of the program is a cloud cover map of the entire globe that is updated four times daily with satellite data from a Web site in Wisconsin. If a user seeks information about volcano and earthquake sites, that additional data can be easily obtained by clicking on the appropriate icon. This brings up a link to the U.S. Geological Service (USGS) Web site with additional information about the quake. Earthquake information is color-coded to indicate how old it is. The program lists the 21 most recent earthquakes (over magnitude 3.0) in the world. Yet another useful aspect of the program is that when a user clicks on the flag emblem of a country, a browser link to the CIA's fact book about that country is provided.



Worldview. Image of Earth from Earth Browser.

Users can customize the program to their own tastes quite well with numerous settings in the preferences. Earth Browser can also be used as a screen saver, though, like the main program, its use requires an Internet link.

Earth Browser has a few minor shortcomings. The list of cities is not as extensive as that of competing weather tracking programs. Users can add cities to the program list, but they cannot make Earth Browser get weather information for those locations, even if such data is readily available on the Web. These are minor complaints, however, about a very well-designed program. Earth Browser operates on both Macintosh and

Tech.Sight is published in the third issue of each month. Contributing editor: Kevin Ahern, Department of Biochemistry and Biophysics, Oregon State University. Send your comments by e-mail to techsight@aaas.org

Windows computers. A useful demo version of the program can be downloaded at www.earthbrowser.com.

—KEVIN AHERN

References
1. K. Ahern, *Science* **287**, 1949 (2000).

TECHSIGHTING
SOFTWARE

Easy Data Analysis

Graphical presentation and analysis of experimental data are parts of every working scientist's life, and the ubiquitous availability of computers has generated a panoply of programs to help in these tasks. Choosing the most appropriate package for one's needs is the key to efficient and reliable analysis.

Prism
GraphPad Software, Inc.
San Diego, CA
$449; $99 (upgrade)
858-457-3909
www.graphpad.com/welcome.htm

Prism is a neat, compact, and flexible program with a "clean" interface that can be used to plot and analyze two-dimensional data sets. The software is available in Windows and Macintosh versions with very similar interfaces. The User's Guide is slightly different for the two versions, and both come with the book *Analyzing Data with GraphPad Prism*, which not only explains how to use Prism but also helps users to choose an analysis appropriate for their data and make sense of the results. A major strong point of the software is the extraordinary way in which the documentation and online help manage to provide instruction in the principles of data analysis.

The organization of Prism is based on "Projects" and within each project there are five components comprising Data, Graphs, Results, Layouts, and Notes. Data can be entered from the keyboard or by importing text files, although there is no extensive set of filters for other file formats. Once entered, the data can be plotted in a variety of styles. In addition to the normal parametric (*x*-*y*) plot, histograms and various column plot types are available. The user has considerable freedom to define the attributes of the graph (axes, symbols, legends, error bars). A button brings up a Greek or Mathematical symbols keypad.

There are a variety of options for analysis of data, including basic column operations (transformations, transpositions, baseline correction), statistical tests (t-tests, analysis of variance, survival curves), and regression (linear and nonlinear). The nonlinear regression encompasses both built-in equations and a straightforward equation editor for user-defined functions. The program's built-in functions are aimed squarely at the biological sciences with equations for one- and two-site hyperbolic binding, sigmoidal dose-response curves, and exponential growth or decay. The program's ability to fit two different equations to the same data set is very useful.

Graphs and layouts produced in Prism can be saved as PICT files (Mac) or WMF files (Windows) for easy incorporation into other programs. Prism can also export graphs or layouts in .bmp or .tiff extension formats at up to 1200 dots per inch.

Overall, Prism is an easy-to-learn and fairly flexible package. Although not as feature-laden as more heavyweight data analysis and graphing software, it does an excellent job of concentrating on ease of use, speed, and convenience. It is ideally suited to basic data plotting or analysis applications in the life sciences. The associated Web site and documentation both contain a wealth of sensible, useful advice on data analysis and curve fitting and are real bonuses.

—TONY CASS

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TECHSIGHTING
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In Silico Bio Lab

Considerable interest has focused on the potential for using computer software in interactive teaching, particularly for situations where the materials required for instruction are either difficult or expensive to obtain. Schools with limited laboratory facilities, or instructors interested in supplementing their students' lab experience, will find such software products useful. The Molecular Biology Notebook (MBN) is one such software product.

The Molecular Biology Notebook
Association of Applied Biologists
Wellesbourne, Warwick, UK
$45, £30;
$180, £120 (multiuser)
+44 (0)1789 470382
www.iacr.bbsrc.ac.uk/notebook/mbnzone/mbn.html

The Molecular Biology Notebook is organized into three modules. One, called BioLab, provides an environment for performing virtual molecular biological laboratory procedures. The second, Dr. Chromo's Laboratory, is a hypertext-based instructional module that gives background information about molecular biological principles. The third, RESource, is a browser with online instructions for using the system.

Contrary to the company's Web site claim that MBN provides comprehensive instruction in molecular biological principles, the CD-ROM does not comprehensively cover the topic, even for beginning students. The BioLab module is particularly disappointing. Two methods of "modifying DNA" [restriction mapping and polymerase chain reaction (PCR)] are illustrated in the module, as are three techniques (gel electrophoresis, Southern blotting, and hybridization). The program is awkward in illustrating these techniques and is a bit tricky itself to learn, despite the online help of RESource. Two sets of "tubes" are used in each virtual experiment. Users must "load" the reaction tubes, perform the reaction, and then load the sample tubes from the reaction tubes. It is not clear why this cumbersome design was chosen, though it does allow one to mix reaction products in sample tubes without contaminating the original tubes.

After sample tubes are loaded, aliquots from them must be "loaded" onto gels. The design of BioLab is flawed—a good deal of the student's interaction with it involves "transferring samples," rather than learning concepts or testing hypotheses. The samples transferred contain no labels, only numbers, so the student needs a key to even understand what is being transferred. Though important parameters of PCR and hybridization analysis, such as primer annealing temperature and stringency, are mentioned in the program and linked to adjustable controls, little effort is expended to make them instructionally meaningful. For example tweaking the adjustable controls has little effect because the program won't let students foul up the reactions. This is unfortunate because mistakes are important for learning.

The deficiencies of the program as a learning tool are best illustrated in the experiment unclearly labeled as "number 10." In the exercise, students do little more than add numbered samples to numbered tubes and "pour" them onto a gel. No indication is provided of what they are doing. This information is contained in the RESource module, but it contains a limited amount of theory and is not aimed at students. Thus, the BioLab module, which should ideally provide an independent, interactive learning experience for the student is instead completely dependent on instructor input. Talented instructors with limited access to resources may find this approach useful, but many will be disappointed at the lack of instruction in the BioLab module. One saving grace of the CD-ROM is the Dr. Chromos section. It provides a fairly thorough discussion of basic concepts along with simple animations and molecular structures.

Overall, the Molecular Biology Notebook is a mixed bag. The BioLab module needs considerable improvement to function as a stand-alone instructional, whereas the hypertext of Dr. Chromos is reasonably well done.

—KEVIN AHERN