11. DISCUSSION: SOFTWARE FOR TEACHING STATISTICS

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INTRODUCTION

A considerable portion of the 1996 IASE Round Table Conference was devoted to presentation and discussion of software for teaching statistics. The section on *Developing Exemplary Software* included three presentations of software:

- *Sampling Distributions*, a computer simulation microworld (delMas, 1997).
- *Quercus*, an interactive computer based tutoring system for Biostatistics (McCloskey, 1997).
- *ConStatS*, computer based tutorials (Cohen, 1997).

Each of the presenters described the theoretical framework that directed the software design, demonstrated briefly some exemplary features, and evaluated the quality and the impact. Lively question and answer sessions followed the presentations, the essence of which I shall convey later. Each session had its own primary focus: classroom implementation, assessment and research, or developing and improving educational software.

A general discussion on the designing of statistics software, and their assessment, took place after the three presentations. The purpose of these discussions was to identify key questions that need to be addressed in the future.

A software "hands on" workshop session was spontaneously organized to let the conference participants experience how technology really works. Developers and instructors of software demonstrated computerized tools, and participants tried them out. The nine software tools that were presented include (software presenter in brackets):

1. The Authentic Statistics Stack (Susanne Lajoie)
2. ConStatS (Steve Cohen)
3. DataScope (Clifford Konold)
4. MEDASS light (Rolf Biehler)
5. Prob Sim (Clifford Konold)
6. Quercus (Moya McCloskey);
7. Sampling Distributions (Robert delMas)
8. Stats! (Dani Ben-Zvi)
9. Tabletop and Tabletop Jr. (Clifford Konold)

The objective of this chapter is to discuss topics relating to the use of computer software in teaching statistics. In the first section, I shall summarize briefly the discussions following the three papers on developing exemplary software. The second section includes a short summary of some of the questions raised in the general discussion on software. The third sections consists of an overview of the types of statistics software and its different uses in teaching. Finally, detailed descriptions of the nine specific software programs that were demonstrated at the Round Table Conference concludes the chapter.

DEVELOPING EXEMPLARY SOFTWARE

Sampling Distributions

Research

The goal of the Sampling Distribution program, as presented by its developer (delMas, 1997), is to help students develop an understanding of the Central Limit Theorem. Some of the participants pointed to the need for empirical evidence to test whether the program achieves its goal.

Classroom implementation

Many questions were raised about the implementation of the software in class. It was suggested that students might benefit more from the software if they tried to predict the characteristics of sampling distributions before they started using the computer.

The author pointed out that the teacher leads the students to do this with a classroom handout. Students then try to predict results, based on their prior knowledge. The teacher should also connect the context-free computer simulation with real data experience, by using a question session, in which the students try out the real world examples, followed by a summary discussion. Students use the program individually, but can discuss their observations and difficulties with peers. According to the author, there is some evidence, that individual work helps the students to develop an understanding of the concept. In fact, a lot of swapping of information was observed in class.

Discussants emphasized the important role of social understanding and the need to allow group learning, especially in the part of the lesson in which rules are derived. There is also a need to emphasize the difference between the Central Limit Theorem and sample mean distributions.

The author explained that when using the Sampling Distribution software, the teacher should only go into general ideas of the concept, and not into the details of formulae. Thus instruction is intended to be empirical and demonstrative, rather than technical.

Improvements suggested

Two improvements to the Sampling Distributions software were suggested:

- The addition of assessment questions at the end of the learning session.

- An explanation of the source of the square root in the theoretical formula $\sigma/\sqrt{n}$.

The software is still in the developmental stage and the author is concerned about its becoming too complex, but welcomed all comments.

Quercus

The aim of the Quercus project was to create a complete interactive tutoring courseware in basic statistics aimed specifically at bioscience students. It was designed to for students working either in a self-teaching or directed learning mode. The software was intended to be used under the direction of a course lecturer. After the paper presentation on the Quercus and STEPS projects (McCloskey, 1997), the discussion focused on developing Computer Assisted Learning (CAL) programs and classroom implementation.

Developing CAL

The author questioned whether university teachers should write CAL software. It was suggested that design teams need to consist of cognitive psychologists, multimedia specialists, computer scientists, and teachers.

Classroom implementation

The author also raised the question of the obstacles in adopting CAL materials by university teachers. She described the feedback obtained from 200 questionnaires, and indicated that university teachers expect to be able to modify or customize the software when using CAL materials. Discussants indicated that a new model of teaching statistics using CAL programs is needed. Teachers must learn the goals and use of CAL software, and how to function in a situation of "loss of control" (i.e., their lack of ability to monitor every detail of their students' actions). On the other hand, teachers should be able to modify the software for their students specific needs. However, CAL modules are often too limiting, and force the students to work through a long sequence of prescribed steps. It is often more restrictive than a textbook, which teachers can use with a sense of control and flexibility, by selecting certain passages and mixing them with material from other sources.

ConStatS

ConStatS is a computer based tutorial aimed at gaining conceptual understanding of statistics by using data. After the presentation of ConStatS by its developer (Cohen & Chechile, 1997), the discussion concentrated mainly on classroom implementation and research issues.

Classroom implementation

The author reported on different methods that were used to introduce ConStatS to the students in a statistics course. For example, some faculty introduced ConStatS during class time as a demonstration, while

other faculty handed out a written introductory assignment that students took to the computer lab and worked on independently. No driving question was offered in order to motivate the students to use ConStatS. However, students were required to attend the computer labs, and evidence suggests that they were engaged in the task while using ConStatS during lab time.

No specific support materials were designed by the development team. Some faculty produced written assignments that served as guides to using ConStatS. Other faculty just told the students to go to the lab and use it. The faculty would be in the lab, walking around and offering help.

ConStatS was used primarily as a learning tool, but some faculty had students work on selected datasets. Thus, ConStatS also allowed students to practice exploratory data analysis work. SPSS or Minitab programs were usually introduced 2/3 of the way into the course.

Discussants questioned whether the software can take a more central role in the instruction of statistics. The author explained that the development team is looking for ways to utilize what has been learned from trace data (a sophisticated trace facility was added in ConStatS to assesses individual student use), and incorporate it into the software to offer more guidance to students.

One of the discussants suggested that ConStatS is probably of most use to students with a moderate mathematics background, although it was reported that most of the students who took part in the assessment program were undergraduate students with different level of mathematics preparation.

A question was asked about the level of use of ConStatS by different faculty members, specifically by faculty on the development team who were described as being dissatisfied with the way statistics was being taught. The author responded by saying that there was no particular relationship between the level of use of ConStatS and faculty groups. However, the process of working on the development team and looking at instructional habits and materials, might have caused faculty to reflect on and improve their own teaching.

Research

In response to a few questions about the assessment of ConStatS, it was reported that the control students were selected to be all other students in statistics courses throughout Tufts University, and that there was no attempt at randomization in assigning treatment/control groups. Students were made aware that trace data was collected and had to sign a consent form.

The author mentioned that different types of feedback were received from students about the program. For example, students stated that they would prefer to use ConStatS instead of being required to do a midterm project. One of the faculty dropped one lecture section per week and required students to go to the lab to use ConStatS. This faculty member received very positive evaluations from the students.

KEY ISSUES IN TECHNOLOGY FOR TEACHING STATISTICS

A general discussion on the designing of statistics software and the assessment of that software led to an identification of the following key questions that need to be addressed in the future.

Research and assessment of software

Student learning

- What are the theories of statistics learning and teaching that underlie various types of instructional software and application?
- How can the evaluation of psychology of learning in using technology direct software construction in an effective way?

Assessment of software

- What are the results of the assessment of software packages that examine the following issues:
  critical differences in software packages that seem to be doing the same things;
  the role of software in supporting the teacher in instruction;
  the role of software in facilitating students learning of statistics;
  the integration of real data with statistics software;
  disadvantages of using computing in statistics courses; and
  a framework for classification and evaluation of software?

Communication

- How do people find out about existing software, its assessment, and availability?

Professional development

- What are the differences between traditional teaching and computer-based teaching, and how can the teacher prepare her/himself to function in the new instruction situations.
- What are the most appropriate forms of professoinal development for statistics teachers involving the use of technological environments?

Developing new software

- What makes software innovative, rather than only a little better, faster or prettier?
- What type of software is lacking: data analysis tools, CAI or CAL software, simulations, and for what age level?
- What kind of support is needed for the software being developed?
- Who should participate in software development?

TYPES OF STATISTICS SOFTWARE

The types of software that have typically been used in statistics instruction fall into one of the following three categories (Biehler, 1995; Shaughnessy et al., 1996):

Statistical packages. These include programs for computing statistics and constructing visual representations of data, often based on a spreadsheet to enter and store data. These packages create a

computing environment that is mainly used to prepare students to become professional statisticians. Professional statistical systems are very complex and are often not suitable for students. Thus, an adaptation to adjust the software to the student's cognitive ability is often required. From the list of exemplary software presented, the following software would seem to fall to some extent in this category of "educationally modified" statistical package: DataScope, MEDASS light, Stats!, and Tabletop.

Tutorials. These include programs developed to teach or tutor students on specific statistical skills, or to test their knowledge of these skills. The tutorial program is designed to take over parts of the role of the teacher and textbooks, by supplying demonstrations and explanations, setting tasks for the students, analyzing and evaluating student responses, and providing feedback. Some tutorials function as an interface with other statistical software, when a purpose of the tutorial is to demonstrate use of that software. The following software falls in this category: The Authentic Statistics Stack, ConStatS, and Quercus.

Microworlds. These consist of programs to demonstrate statistical concepts and methods, which includes interactive experiments, exploratory visualizations, and simulations, in which students can conceptualize statistics by manipulating graphs, parameters, and methods. Typical examples are microworlds that allow the investigation of the effects of changing data on its graphical representation, of manipulating the shape of a distribution on its numerical summaries, of manipulating a fitted line on the quality of the fit, and of changing sample size on the distribution of the mean. The following software are primarily microworlds: DataScope, MEDASS light, Prob Sim, Sampling Distributions, Stats!, and Tabletop.

These categories are not necessarily distinct, and in many cases a specific software can fall in more than one category. For example, Tabletop combines features of a statistics package and a microworld.

SOFTWARE DESCRIPTIONS

In this section I describe in detail each of the software packages introduced at the 1996 IASE Round Table Conference. I first categorize each software by its general type, intended users, and application: relevant sources are also provided to allow further investigation of the software and the associated research projects. This is followed by a detailed description of its main features. Technical information is also provided, including the software version, release date, operating system, system requirements, program size, suggested price, and publisher. The information was gathered from the software developers and instructors, Internet sources, and reviews.

The Authentic Statistics Stack

Type of software: Assessment standards modeling tool.
Intended users: Middle school students in introductory descriptive statistics course.
Application: Demonstration of performance criteria for the statistical investigation process.
Reference: Lajoie (1997).

Description: The Authentic Statistics Project (ASP) consists of three components, *Discovering Statistics* (a descriptive statistics HyperCard stack), *Authentic Statistics* (a library of examples developed to assist students in their learning of descriptive statistics), and *Critiquing Statistics* (students assess peer projects). The examples demonstrate student performance standards for the statistical investigation process. Thus, the abstract performance standards are made clear and open to learners. Students can see concrete examples by

watching video tapes and computer screen recordings of student performance (average and above average), accompanied by textual descriptions of the program scoring criteria. There are six assessment categories: quality of research question, data collection, data presentation, data analysis and interpretation, presentation style, and creativity. Students can access information about each category to see a textual and visual demonstration of average and above average performances. After viewing the information, they can develop their own project and align their performance to the criteria.

Technical information:

1. Version: 2.0 in progress.
2. Release date: September, 1997.
3. Operating system: Macintosh.
4. System requirements: 25 MB of hard disk space, 8-16 MBRAM.
5. Program size/Number of floppy disks: N/A.
6. Suggested price: N/A.
7. Publisher: N/A.
8. Information available from:

· Susanne Lajoie, McGill University, Applied Cognitive Science Research Group,
3700 McTavish Street, Montreal, Quebec, H3A 2T6, Canada.
E-mail: lajoie@education.mcgill.ca

ConStatS

Type of software: Computer-based tutorial.
Intended users: College students.
Application: Experimenting with statistical concepts taught in college introductory statistics courses.
Reference: Cohen & Chechile (1997)

Description: The emphasis of *ConStatS* is on gaining conceptual understanding of statistics by dealing with real and interesting data. *ConStatS* consists of 12 *Microsoft Windows* based programs, grouped into five distinct parts: representing data (displaying data, descriptive statistics, transformations, bivariate data), probability (probability measurement, probability distribution), sampling (sampling distribution, sampling error, sampling problem), inference (introductory estimation, hypothesis testing), and experiments. Each program in the package is divided into a large number of "screens," no one of which confronts the student with more than a small number of closely related decisions. The choices the student has to make on each screen lead to an active style of learning. WHY and HELP buttons are available on every screen. Students are required to perform a series of experiments on the same data, which is provided in the program. Once they have worked through the experiments and become familiar with concepts, they can use a data analysis package to explore data on their own. Datasets from different disciplines are included. New datasets can be added readily by students and teachers.

Technical information:

1. Version: 1.0.
2. Release date: September, 1996.

3. Operating system: Windows.
4. System requirements: 4 MB of hard disk space.
5. Number of floppy disks: Two floppy disks.
6. Suggested price: US $20 (Workbook available for US $12-15).
7. Publisher: Prentice Hall.
8. Information available from:

· Steve Cohen, Tufts University, Medford, MA, 02155, USA.
E-mail: scohen@emerald.tufts.edu
Web site: http://www.tufts.edu/tccs/services/css/ConStatS.html

DataScope

Type of software: Data analysis program.
Intended users: High school and college students in introductory statistics courses.
Application: Teaching statistics using exploratory data analysis techniques with real data.
References: Konold (1995); Konold, Pollatsek, Well, & Gagnon (1997).

Description: This data analysis program, which is accompanied by five datasets and suggested instructional activities, is very easy for students to learn, because it includes only a selected number of well-designed capabilities. These include bar graphs, histograms, boxplots, scatter plots, one and two-way tables of frequencies, tables of descriptive statistics, linear regression, point ID on scatterplots and box plots, combining variables to create new ones, automatic scaling of plot axes, and random resampling for testing hypotheses. A general "grouping" capability that makes *DataScope* especially powerful allows students to form graphs and tables that group values of one variable according to the levels of one or more other variables.

Technical information:

1. Version: 1.4.
2. Release date: 1994.
3. Operating system: Macintosh.
4. System requirements: System 6.0.5 or higher, 68000 processor or higher, 1 MB RAM, hard drive.
5. Program size / Number of floppy disks: 195K (not including data sets) / One floppy disk.
6. Suggested price: US $40.
7. Publisher: Intellimation Library for the Macintosh, and Australian Association of Mathematics Teachers Inc.
8. Software available from:

· Intellimation, P.O. Box 1922, Santa Barbara, CA, 93116-1922, USA.
· AAMT, GPO Box 1729, Adelaide, South Australia 5001.
· Clifford Konold: konold@srri.umass.edu

MEDASS Light

Type of software: Elementary tool for interactive data analysis.

Intended users: High school students (grade 7 and higher) and their teachers.
Application: Teaching interactive data analysis at the high school level in a first course on statistics.
Reference: Biehler (1995)

Description: *MEDASS light* is intended to be an easy to use elementary tool, and thus fill the gap between the common, too simple, and not flexible enough tools designed for high school use, and the professional tools that are too complex for high school introductory courses. It is designed to support flexible interactive data analysis with multiple analyses and results. A spreadsheet-like data table is used for data input, editing and display. The graphical methods include boxplots, histograms, bar graphs, dot plots, scatterplots, and line plots. All the plots can be used for single variables or together with a grouping variable that will produce composite or multiwindow plots. Graphs can be enriched by further statistical information, such as lines for the mean or median, regression lines or curves from fitting polynomials, and exponential functions and simple smoothers. Numerical summaries and frequency information are also available for analyses with grouping variables. Numerical results are displayed in data tables that can be further analyzed as new data with the available tools. Selection of subsets, transformation of variables and exclusion of points from an analysis are available on two levels: graphical selection "by hand," and in a more formal way, with the support of a menu system. The system supports numerical, categorical, text, and name variable types. Generic commands adapt to the variable types and the roles chosen for the variables (such as grouping variable, x or y variable).

Technical information:

1. Version: Pre-release version 1.1.
2. Release date: June, 1996.
3. Operating system: Windows 3.11 or Windows 95.
4. System requirements: N/A.
5. Number of floppy disks: Two floppy disks with automatic installation.
6. Suggested price: Not yet fixed.
7. Publisher: Demo copy will be soon available from the authors: Stefan Bauer, Rolf Biehler, and Wolfram Rach.
8. Available from:

· Rolf Biehler, Institut für Didaktik der Mathematik (IDM), Universität Bielefeld, Postfach 100131, D-33501 Bielefeld, Germany. Phone: (49) (0) 521-106-5058. Fax: (49) (0) 521-106-2991. E-mail: rolf.biehler@post.uni-bielefeld.de

Prob Sim

Type of software: Simulation tool.
Intended users: High school and introductory college courses.
Application: Teaching probability using simulations in courses where the major emphasis is on modeling real situations.
References: Konold (1994, 1995).

Description: To model a probabilistic situation with *Prob Sim*:

1. A “mixer” is constructed containing the elementary events of interest.
2. The mixer is sampled from, after specifying replacement options, sample size, and number of repetitions.
3. Events of interest in a sample are specified and counted.
4. Specified events are counted in new random samples.
5. *Prob Sim* makes the last step especially easy. Once analyses have been conducted on one sample, the user can press a button to see the results of the same analyses performed on a new sample.

Technical information:

1. Version: 1.4 or 1.5.
2. Release date: 1994.
3. Operating system: Macintosh.
4. System requirements: System 6.0.5 or higher, 68000 processor or higher, 1 MB RAM.
5. Program size / Number of floppy disks: 189K / One floppy disk.
6. Suggested price: US $40.
7. Publishers: Intellimation Library for the Macintosh, Australian Association of Mathematics Teachers Inc.
8. Available from:

· Intellimation, P.O. Box 1922, Santa Barbara, CA, 93116-1922, USA (version 1.4)
· AAMT, GPO Box 1729, Adelaide, South Australia 5001 (version 1.5)
· Clifford Konold: konold@srri.umass.edu

Quercus - Statistics for Bioscientists

Type of software: Computer-based tutorial.
Intended users: Biology, biochemistry, and medical science college students.
Application: Tutoring students in the basic techniques of data analysis and report writing.
References: McCloskey (1997). A review of the software can be found at the Internet site: http://www.stats.gla.ac.uk/cti/activities/reviews/97_08/quercus.html

Description: *Quercus* is a suite of interactive tutorial courseware. Topics covered include using MINITAB, graphs, summary statistics, sampling, testing hypotheses, investigating relationships, and ANOVA. There are supplementary modules to provide students with practice exercises and self-assessment tests. A student guidebook is to be published in 1997.

Technical information:

1. Version: 3.1.
2. Release date: September, 1996.
3. Operating system: Windows 3.1 or Windows 95.
4. System requirements: Recommend 8 MB RAM, MINITAB version 9+.
5. Program size: Requires 10 MB of hard disk space. Comes with installation program.
6. Suggested price: Free.
7. Publisher: University of Strathclyde, Glasgow, UK.

8. Available from:
   - STAMS Web page: http://www.stams.strath.ac.uk/external/quercus
   - Moya McCloskey: moya@stams.strath.ac.uk

Sampling Distributions

Type of software: Computer simulation microworld.
Intended users: Secondary students and undergraduates in introductory statistics courses.
Application: Teaching of the Central Limit Theorem and the behavior of sampling distributions.
Reference: delMas (1997).

Description: *Sampling Distributions* allows the user to create a population and then draw random samples from the population. The populations are created graphically using up and down arrows that "push" an outline of the distribution to change its shape. Populations can be simulated in one of three modes: binomial, discrete, or continuous. In drawing samples, the user determines the sample size and number of samples to be drawn. The sampling distributions of sample means and sample medians can be displayed, and summary statistics are also provided (e.g., mean of sample means, mean of sample standard deviations, standard deviation of sample means). Users can visually compare the sampling distribution to the population, and visually witness the effects on the sampling distribution caused by changing the shape of the population and sample size.

Technical information:

1. Version: 2.1.
2. Release date: 1996.
3. Operating system: Macintosh.
4. System requirements: Minimum 68030 CPU (LC III) with 13 inch color monitor.
5. Program size / Number of floppy disks: 120K / One floppy disk.
6. Suggested price: Free.
7. Publisher: None.
8. Available from:
   - Bob delMas, 333 Appleby Hall, University of Minnesota, 128 Pleasant Street SE, Minneapolis, MN, 55455-0434, USA. Phone: (612) 625-2076. FAX: (612) 626-7848. E-mail: delma001@maroon.tc.umn.edu

Stats!

Type of software: Data analysis program.
Intended users: Middle school and high school students in introductory statistics courses.
Application: Teaching statistics in courses stressing the analysis of real data using exploratory data analysis techniques.

Description: *Stats!* is an interactive environment for the study and manipulation of statistics. Students start with unordered data, typing both quantitative and qualitative data into any cell in a spreadsheet like data

table. Next, they can use the classification tool to order their data. Tally sheets display data by count, relative frequency, or percentage. Graphic representations include pie charts, pictograms, bar charts, scatterplots, and accumulated frequency graphs. The representations can be enriched by also displaying the mode, mean, median, quartile, and boxplots. Students can manipulate the data interactively directly on the graphic representations. In addition, they can compare two variables or populations on one display. The package includes a teacher's guide and accompanying datasets.

Technical information:

1. Version: 1.0.
2. Release date: November, 1995.
3. Operating system: Macintosh or Windows.
4. System requirements:

Macintosh/Power Mac: 2 MB RAM, hard drive, 13 inch color monitor or larger.

Windows: Windows 3.0 or higher, 386 or faster, 2 MB RAM, hard drive, VGA monitor.

5. Number of floppy disks: Available on CD-ROM, floppy disks, or through Internet-enabled subscriptions.
6. Suggested price: US $199 (single user). Special prices are available for a specified number of stations or for a network.
7. Publisher: LOGAL Software Inc.
8. Available from (a free demonstration CD is also obtainable):

· LOGAL Software Inc., 125 CambridgePark Drive, Cambridge, MA, 02140, USA.
Phone: (800) 564-2587, (617) 491-4440. Fax: (617) 491-5855.
Web site: http://www.logal.com/w/owa/cat.ovw?p=STA

Tabletop and Tabletop Jr.

Type of software: Data modeling tool.
Intended users: Primary, middle and high school students (Grades K-12).
Application: Teaching modeling of real data using exploratory data analysis techniques.
Reference: Hancock, Kaput, & Goldsmith (1992).

Description: *Tabletop* (Grades 4-12) provides students access to, and awareness of, the fundamental ways that data can be organized, manipulated, and presented. It includes a conventional row and column database view, which allows the student to define fields. It also features an animated iconic view, in which one icon appears for every record in the data base. The user can impose a variety of spatial constraints on the icons, and their resulting arrangements can reveal properties of the data. *Tabletop* also includes full facilities for creating and editing new databases, including the facility to design icons.

In general, the user acts by imposing structure on the screen space, after which the icons move to take up the positions dictated by the assigned structure. The icons can be assigned labels based on any field in the database, and summary computations can be generated over subsets of the data. From these representations, scatterplots, histograms, cross tabulations, Venn diagrams, and a number of other graphs, less standard but equally informative, are produced. These graphs are all open to further querying: one can change the labels on the icons, or examine an interesting one in detail by double clicking.

Tabletop Jr. (Grades K-5) is an exploratory environment supporting many games, activities, and investigations in logic and data organization. It uses many of the same spatial organizing tools as *Tabletop*, but applies them to more concrete, colorful "data" such as pizzas, hats, and cartoon characters. Together, the programs provide a developmentally appropriate introduction to data concepts, as well as a professional quality database, which enables students to gain practical experience with abstract data manipulation and analysis.

Technical information:

1. Version: 1.0 (*Tabletop* and *Tabletop Jr.* editions).
2. Release date: June, 1995.
3. Operating system: Macintosh or Windows.
4. System requirements:

Macintosh: System 6.0.8 or higher, 2 MB RAM, 4 MB hard disk space, 13 inch color monitor or larger, 256 colors.

Windows: Windows 3.1 or Windows 95, 386 or faster, 4 MB RAM, 4.5 MB hard disk space, VGA monitor/display card 640x480, 16 colors, Windows compatible sound device.

5. Number of floppy disks: One floppy disk for *Tabletop*, and one for *Tabletop Jr*.
6. Suggested price: School Edition: US $99.95. Special prices for a lab pack or for a network version.
7. Developer: TERC, Inc.
8. Available from:

Brøderbund Software Direct, P.O. Box 6125, Novato, CA, 94948-6125, USA.
Phone: (800) 474-8840.
Web site: http://www.broder.com/education/programs/math/ Tabletop/

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