

# Software reviews

**Psychology Software News** commissions both short and long reviews of software packages. Short reviews briefly describe the facilities and capabilities of the package, while long reviews include an informed critique by an expert in the field. The box at the head of the review contains summary information on the package, including a four-star rating system for quality of content (what the package does) and for quality of presentation (how well it does it). Four stars means excellent quality, one star poor quality.

<b>Introduction to Statistics</b>	
<b>Author:</b> Sandy MacRae <i>University of Birmingham</i>	<b>Hardware:</b> IBM PC & Mac
<b>Type:</b> Practicals & methodology <b>Function:</b> Statistics tutorial <b>Content:</b> **** <b>Presentation:</b> **** <b>Cost:</b> £195 + £2 per user (+ £10 per machine in use + £10 per support text), eg, 120 students using 30 machines and 30 texts: £1035	
<i>A class act</i>	
<b>Reviewed by:</b> Mike Harris <i>University of Birmingham</i>	

## Minimum Requirements:

Mac: 68020, 5Mb RAM (9Mb for PowerMac); OS 7.0.1; 2x CD-ROM drive; 256 x 640 x 480 display.

IBM (MPCII spec): 486 SX25, 4Mb RAM; Windows 3.1, for workgroups 3.11, or 95; 2x CD-ROM drive; Sound Blaster audio card; 256 colour VGA.

## Overview

I have heard the future and it lives near Inverness.

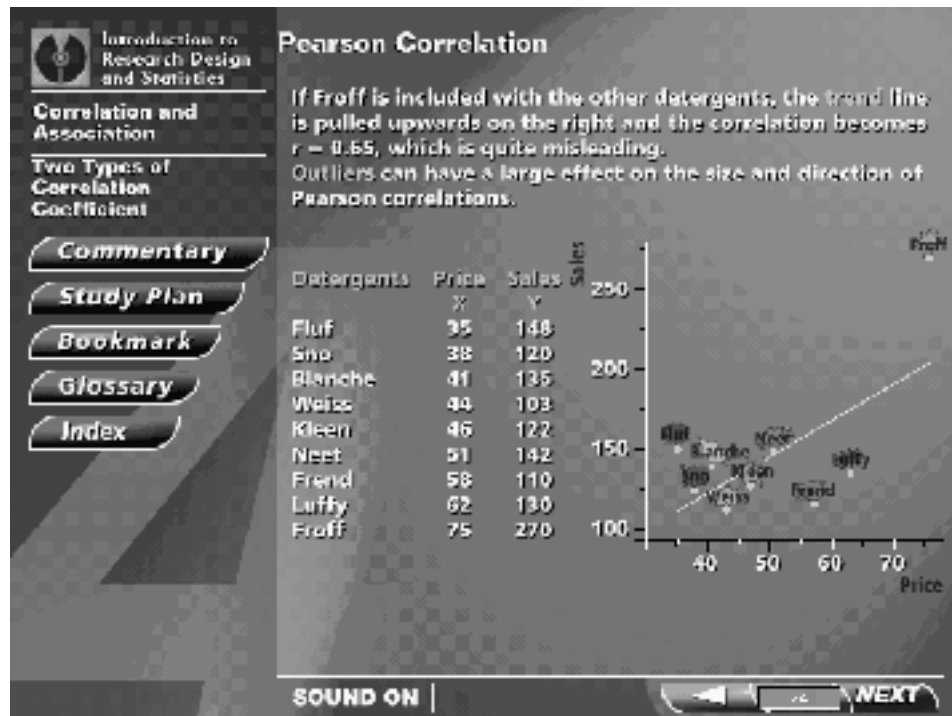
Sandy MacRae's Introduction to Statistics, produced in conjunction with the BPS, is a CD-ROM covering material suitable for a first year statistics course (e.g. correlation but not regression, t-tests but not ANOVA). Currently in pre-beta form, it will soon be available to run both as a stand-alone and a networkable package. It is designed to be used in conjunction with Sandy's three short BPS units on Research Design and Statistics and, together, the CD-ROM and written units will surely be welcomed by all the recently appointed lecturers who awake after their welcome party to find themselves committed to teaching introductory statistics, and also by the ever-swelling numbers of new psychology undergraduates.

## Structure

If used straight out of the box, the system presents a simple menu-driven interface. On logging in for the first time, the user is allocated a unique PIN and given the opportunity to watch a short demo that explains the basic features of the system and how to use them. On entering the system proper, the user sees a main menu consisting of 8 sections (see Table I). Choosing a section produces a sub-menu listing the topics in the section. Choosing a topic starts the material in the appropriate place. The user can then follow the sequence of material and, without losing this sequence, can set bookmarks or check definitions in the glossary. Alternatively, the sequence can be interrupted by returning to the main or sub-menu, following a bookmark, or by accessing the index. Each section ends with a question and answer session providing instant feedback and the opportunity to rework wrongly answered questions. The allocation of unique PINS allows the system to record individual usage and gradually to personalize itself; users can keep track of their own progress through the material, review their own performance on the tests, and maintain their own bookmarks from session to session.

Used like this, the system is very simple. The user has a certain amount of flexibility in navigation but

Figure 1: screenshot showing Pearson correlation example



the use of hypertext is largely confined to clicking highlighted terms to reveal their glossary entries. Most of the time is spent following the material in its natural sequence, which is fine because this sequence is well thought out and logical. However, the system can also be customized. Users are divided into tutors and students. Tutors can review the progress of their tutees and, most important, can create Study Plans. This is done simply by dragging the titles of individual sub-topics (typically a sequence of 5-10 screens) into the required order. Once created and named, Study Plans can be accessed easily and appear like ordinary sub-menus giving the order of topics which the user can enter in the normal way. Thus, a tutor can use the material provided to structure a course in the required way as a set of Study Plans that each student must complete. On logging in for the first time, students choose one of the available tutors and, by doing so, gain access to that particu-

lar tutor's Study Plans and allow access by that tutor to their progress records.

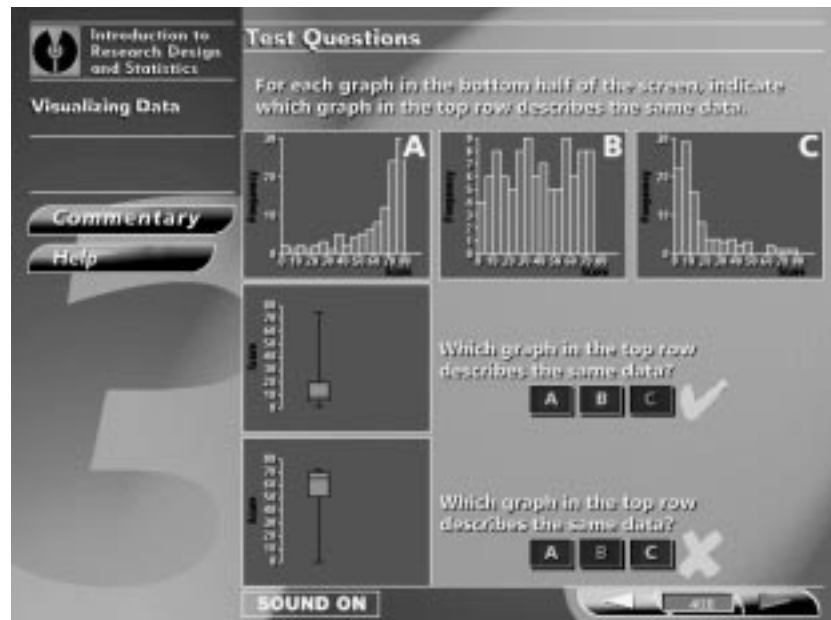
### Content

Table I shows the 8 main menu headings and an abbreviated list of associated topics, intended only to give a flavour of the types of issue dealt with rather than a comprehensive catalogue. Depth of coverage varies from typical 3 or 4 screens dealing with introductory issues, to 54 screens on how to interpret statistical equations. There is a great deal of material. Each screen typically provides a short animation, accompanied by appropriate sound ef-

TABLE I: Summary of main content

- |   |   |
|---|---|
| <p><b>1. Methods of Data Collection</b></p> <ul style="list-style-type: none"> <li>• ordinal, nominal, interval, ratio scales</li> <li>• objectivity and reactivity</li> <li>• samples and populations</li> </ul> <p><b>2. Summarizing Data</b></p> <ul style="list-style-type: none"> <li>• mean, median, mode</li> <li>• range, interquartile range, standard deviation</li> </ul> <p><b>3. Visualizing Data</b></p> <ul style="list-style-type: none"> <li>• stem-and-leaf, histograms, bar charts</li> <li>• scatter plots, line graphs</li> </ul> <p><b>4. Correlation and Association</b></p> <ul style="list-style-type: none"> <li>• Pearson, Spearman</li> <li>• prediction, relationship, causality, linearity</li> </ul> | <p><b>5. Standard Scores and the Normal Curve</b></p> <p><b>6. Statistical Inference</b></p> <ul style="list-style-type: none"> <li>• probability and chance</li> <li>• confidence, significance</li> <li>• directional and non-directional tests</li> </ul> <p><b>7. Statistical Tests</b></p> <ul style="list-style-type: none"> <li>• chi-squared</li> <li>• one sample t, Wilcoxon</li> <li>• sign, two sample t, Mann Whitney, median</li> </ul> <p><b>8. Necessary skills</b></p> <ul style="list-style-type: none"> <li>• interpreting statistical formulae</li> <li>• using statistical tables</li> </ul> |
|---|---|

Figure 2: Screenshot showing self-test questions



facts, a few sentences of text, and the option to listen to a short commentary, spoken by Sandy MacRae. The coverage is sufficient to develop a coherent theme, though many screens have references to the appropriate accompanying text units, where further explanation can be found. There is copious use of examples, each appropriately chosen to illustrate a particular concept. The emphasis throughout is clearly upon the explanation of statistical concepts rather than upon how to do statistics—although, having said that, there are some beautiful animations that move numbers around the screen to replace symbols in formulae and so demonstrate how some essential statistical calculations are performed.

I particularly liked ...

- The quantity of material and the quality of presentation. A great deal of time and effort has gone into choosing the material and into making it look and sound good, and it shows. This is a professional job rather than an academic hack.
- The use of the medium. There are a few places where the animations are purely cosmetic and one or two where they are intrusive, but in general the material has been well chosen to play to the strengths of the computer (animations, interactive demonstrations).
- The ease of use. I was only given a manual and a set of texts after I'd successfully used the system for a while so it clearly doesn't take much figuring out.
- The constrained flexibility offered to the student user. Rather than losing the student in a complex hyperspace, Study Plans allow the tutor to provide a basic structure while allowing students to browse beyond it if they wish.
- The emphasis on the teaching of concepts, rather than blind computational skills.

- The opportunity for tutors to monitor students' progress and performance on tests, which gives it the potential to become a primary teaching platform.

I didn't particularly like ...

- Some aspects of the question/answer sessions. Some of the questions seem to be testing subtle concepts that I'm not convinced the material really covers (i.e. I got them wrong). And there is no information about how many questions to expect (so at times it felt a bit like an adaptive staircase procedure that was an unknown distance from criterion).
- Though the package is designed to be usable without a sound card, each screen has a spoken commentary, which I found extremely useful (it's the first time I've really been convinced of the value of multimodal presentation). But there is no way to set the commentary on by default; each commentary has to be actively started by the user, which rapidly leads to mouse fatigue.
- The awful music that accompanies the log in procedure (but then I've got 12 copies of the same Beethoven piano sonata, so draw your own conclusions). Coupled with the unnecessarily elaborate introductory and logout sequences, it's like being stuck in a lift with an over affectionate sheepdog.
- The rather cumbersome way of establishing tutors. The first person to log in after installation is automatically a tutor, and tutors can

confer tutor status on other users, but only after those users have logged into the system at least once. There is no way for a tutor to assign a group of student names before they log in and so no way to control the names they use. In a set up with several tutors, each with many students, this seems a recipe for unnecessary tedium and chaos. (This will apparently be improved for the release version).

- The version I used was pre-Beta and I have to mention that it was very slow and rather fragile. Both aspects need to be fixed before release.

### Overall

Usually, any package this size is a mixture of good (that's the way I would have done it) and bad (that's not the way I would have done it). I think this package transcends this normal method of classification. Sure, there are things here that I wouldn't have included and some things that I think are missing, and some things that I wouldn't have done that way. But it's pervasively clear that it has been produced by someone who really understands statistics, has spent years teaching it and years working with computers, and who knows what students need to grasp and what they find difficult.

This package is exactly what it says it is—An Introduction to Statistics—and if undergraduates understand the material presented here by the end of the first year, then they will be very well equipped in-

deed. The package may not contain your favourite statistical test, it may not do it quite your way, and it almost certainly doesn't contain that wonderful demo that you once saw in Boston or thought about writing but haven't quite got round to. But I, for one, am listening, rather than complaining.

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Current release dates:  
late Spring 1998 (network version)  
Autumn 1998 (stand-alone version)

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