

# User Guide

## Introduction to Statistics

### Multi-user Version 2

#### Starting up

If you want to speed up the title sequence, tap the spacebar. You can choose a guided demonstration (**Demo**) of the program or **Login** to use it. If you choose to log in and type your 5-digit personal identification number (**PIN**) in the login box, your name appears.

#### Demo

The demonstration explains features of the program. You can go forwards and backwards quickly with the keyboard arrow keys. After each screen you can choose to see it again, view the next screen or end the demonstration.

#### Sound

A button at the bottom of the screen turns sound effects on and off but you can hear them only if your computer has a suitable sound card and speakers or earphones. The button on the left, labelled **Commentary**, plays a short, spoken commentary that sometimes gives extra information or explanation. However, the program is completely understandable without sound.

#### Main menu

The main menu displays the eight sections of the program. Each has a number of sub-sections and ends with eight interactive test questions.

The circles alongside each main section heading refer to test questions. An empty circle means that no questions have been answered correctly. A half circle means some questions have been answered correctly and a full circle means all questions in this section have been answered correctly.

In the sub-section menus, an empty circle means that the subsection has not been viewed, a half circle means that it has been viewed in part and a full circle means that it has been completed.

The list of titles on the left shows the route by which you reached the section or menu you are viewing. You can retrace your path by clicking on any of these titles.

The main section you are viewing is always indicated by its colour (different for each section) and by its number (always shown as a large digit in the background).

#### Screen Size


You can reduce the size of the display, which sometimes gives a clearer picture.

#### Arrow buttons

To move through the program, click the forward or backward arrow at the bottom right of each screen. When you reach the end of a section or sub-section, the word 'NEXT' appears. Clicking here takes you to the first screen of the next section.

You can also move backwards in this way -- the first screen of a section links directly to the last screen of the previous section; just click on NEXT. You can proceed through the whole program like this if you wish, or you may prefer to use the menu structure.

#### Animations

All animations play for a short time and then stop. Moving the mouse over the animation changes the cursor to . Clicking it repeats the animation.

#### Cross-references to Open Learning Units

Some screens contain a reference such as, 'Unit 1, p.26'. This refers to Sandy MacRae's printed Open Learning Units, published by BPS Blackwell, ISBN 1854331124, 1854331140 and 1854331167, where further explanation of the topic can be found.

#### Bookmarks

The Bookmark function allows you to mark any screen as one you later want to return to quickly

**To create a Bookmark** for the current screen:

1. Click on the **Bookmark** button.
2. Click on one of the 20 name boxes. If it is already in use you will be asked if you wish to replace the previous bookmark.
3. Enter a name for the Bookmark or use the default name (the sub-section name followed by the screen number in brackets). Use the keyboard to delete or change existing names.
4. Exit by clicking on the X in the top right corner.

**To delete a Bookmark:**

- a. Follow steps 1 & 2.
- b. Delete the name of the bookmark.

**To use a Bookmark:**

- a. Follow steps 1 & 2.
- b. Click on the arrow button alongside the name of the Bookmark whose screen you wish to move to.

#### Glossary

Words shown in yellow in the teaching screens are technical terms. If you click on one of these words, its definition appears. Click on the definition to make it disappear again.

Clicking on the **Glossary** button displays a scrollable list of all the technical words in the text. Clicking on a word brings up its definition. Above the list is an editable text box which can be used to go straight to a particular definition; just delete the existing word and enter a new word (followed by return/enter) to display its definition. If only a few letters are entered, then the definition of the first word that begins with those letters is displayed. E.g., entering MED would display the definition of MEDIAN, whilst entering MEDIAN T would display the definition of MEDIAN TEST.

#### Index

This displays a scrollable list of the main topics covered in the program. Clicking on a word will take you to the first screen where the topic is explained. Topics can also be typed in as described for the Glossary

#### Test questions

Eight question screens are shown in random order at the end of each section. Each screen is scored as a single item that may be any of the following types:

**A single multiple-choice question.** The possible answers may be text or images.

**A group of multiple-choice questions.** The possible answers will be the same for each question, e.g. True/False.

**Dragging answers to their correct positions.** If you decide to change your answer, you can replace it with a new one or drag the current answer to another position.

To see if your answer was correct, click the forward arrow.

When all the questions have been answered, a score sheet is displayed. If you have not answered all the questions correctly, you are given the opportunity to retry them.

*When the NEXT button is used to move backwards into a sub-section of Test Questions, it will not show the score screen (since the questions have not been attempted) but instead shows the 'first' (randomly selected) question. You can either to click the NEXT button again and avoid all the questions or move forward through the questions.*

**To obtain a hint** on how to tackle any of the test questions, you can click the **Help** button on that screen. It won't give you the answer but will point you in the right direction. Click on the message if you want to remove it.

# Contents of the Program

## Study plans

A Study Plan is a menu constructed by a tutor to present material from various sections in an order different from the normal menus or to focus on only part of a section.

To use a Study Plan, click the **Study plan** button on the left. This brings up a list of all the study plans (if any) that have been created for you. Click on the purple arrow next to the appropriate study plan to see its menu. Thereafter, you can either use the study plan menu to reach the relevant teaching sections or just proceed straight through it, by means of the forward arrows in the lower right-hand corner of each screen. When there is no forward arrow or 'Next' in the lower right corner, you have reached the end of the study plan.

## Ending the program

To leave the program, **go to the main menu** and click the **Exit** button in the bottom left corner. To reach the menu, click the Program Title in the top left or the cross in the top right corner.

**Important!** Exiting in any other way (by switching off, or by using the keyboard, say) will leave you unable to log in again until your records have been reset by your tutor.

Before exiting you see a summary of your scores in each set of test questions. A section score shown as 6/8 means that six of the eight questions were answered correctly and two were wrong. 6\*/8 means that six questions were answered correctly but fewer than eight were tried.

Clicking **Confirm Exit** ends the program and saves your test question results and bookmarks – you may need to wait a short time while the information is saved. If you decide to continue the program instead, click on the **Program Title** in the top left corner of the screen instead of 'Confirm Exit'.

If you want to speed up the final exit animation, tap the keyboard spacebar each time the picture changes.

## 1. METHODS OF DATA COLLECTION

- Why collect data?
- Types of variable
- Problems in data collection
- Objectivity
- Reactivity
- Sampling: Problems and methods
- Representative and unrepresentative samples
- Methods of sampling
- Measurement
- Why measure?
- Scales or levels of measurement
- Test questions

## 2. SUMMARIZING DATA

- Why summarize data?
- Typical scores
- Mode
- Median
- Mean
- Which should we use?
- Measure of spread
- Range
- Interquartile range
- Standard deviation
- Which should we use?
- Test questions

## 3. VISUALIZING DATA

- Why visualize data?
- Stem-and-leaf diagram
- Graphs of distributions
- Histogram
- Frequency polygon
- Box-and-whisker plot
- Bar chart
- Test Questions
- Graphs of relationships
- Scatter plot
- Line graph
- Information required in graphs
- Test questions

## 4. CORRELATION AND ASSOCIATION

- What is correlation?
- Two types of correlation coefficient
- Pearson correlation
- Spearman correlation
- Which type of correlation should we use?
- Interpreting correlations
- Correlation and prediction
- Relatedness not equality
- Correlation not causality
- Relationships that are not straight lines
- Range restriction
- Test questions

## 5. STANDARD SCORES AND THE NORMAL CURVE

- The Normal distribution
- Standard scores
- Test questions

## 6. STATISTICAL INFERENCE

- Why do we need statistical tests?
- Probability and chance
- Three requirements for confidence
- Statistical significance
- Directional and non-directional tests
- Test questions

## 7. STATISTICAL TESTS

- Why use statistical tests?
- Types of data
- Counted data: Chi squared
- Measured data in pairs
- An example
- One sample t-test
- Wilcoxon test
- Sign test
- Measured data not in pairs
- An example
- Two-sample t-test
- Mann-Whitney test
- Median test
- Test questions

## 8. NECESSARY SKILLS

- Interpreting statistical formulae
- Using statistical tables
- Test questions

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