

WELCOME TO DISCUS !



DISCUS

Discovering Important Statistical Concepts Using Spreadsheets

DISCUS consists of 8 Excel workbooks and a set of associated photo-copyable workcards. The workbooks were produced in Excel 4 but the version supplied is now in Excel 5/95/97 format.

The materials are designed to be used off the shelf by students working on their own, and little preparation by teaching staff is required. However, if you have particular requirements, remember that they are essentially Excel spreadsheets, which you are free to tailor to your needs. The password is given on the next page.

Each workbook consists of a series of interactive spreadsheets on a particular topic. No prior knowledge of Excel is necessary.

The accompanying workcards provide a series of thought provoking challenges which it is hoped will help the student to gain insight and understanding. Alternatively you may wish to write your own workcards.

The topics covered are:

1. Descriptive Statistics
2. Probability
3. Binomial Distributions
4. The Poisson Distribution
5. Continuous Distributions
6. Sampling
7. Regression
- and 8. Hypothesis Testing.

For the technicalities and general advice on using the disk turn over.

TECHNICALITIES AND ADVICE !

- The screen displays were designed to be used with VGA monitors. If you find the display is either too large or too small, please adjust the zoom setting on the Standard Excel toolbar.
- DISCUS appears to run without modification on an **Apple Macintosh** equipped with Excel 5 and **PC Exchange**. However, the spreadsheets have not been rigorously tested on this platform.
- You are advised to **make a back-up copy as soon as possible**.
- All worksheets have been **protected** using the password **neville**. Obviously you are advised NOT to let students know this. However, in **Excel 5** to allow students to copy work from the 'spare spreadsheet' you will need to **unprotect** each **workbook**.
- Worksheets which contain **macros** should be treated with respect. This means **you must not** change the name of the workbook or of the password! Macros are hidden but **not** protected.
- If you want to copy a workbook, use a **file** copy. **DO NOT** use 'Save As' when in Excel, as this may destroy links. You have been warned !
- Your purchase of DISCUS entitles you to make as many **copies** of the disk as you need for use within your own institution, or alternatively to use it on a network. However, if the network is accessible by other institutions, each connected institution must purchase a copy of the software.
- Similarly you may print or duplicate as many copies of the workcards as you need for use within your own institution. For your convenience the workcards are supplied as **Word 6 documents** on the disk, so that you can alter them to suit your particular requirements and obtain high quality reproduction.

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Spreadsheets are

- **Natural**

Spreadsheets provide a natural environment for calculating statistics.
Analyses can be set out according to traditional hand calculation methods.

- **Transparent**

Spreadsheets are not "black boxes". If you want to see how a cell has been calculated, simply highlight it and examine the formula. Naming cells aids transparency enormously.

- **Interactive**

Spreadsheets demand to be meddled with. You can ask those "What if ..." questions that you are afraid to voice for fear of appearing stupid.
Change something and see what happens.

- **Dynamic**

The powerful colour graphics provide dynamic illustrations and charts to illuminate various aspects of your data or method of analysis.

- **Adaptable**

Because spreadsheets are transparent they are easy to alter to fit your preferred notation, terminology or method. Having said that, the spreadsheets driven by macros are less easy to modify.

- **Real-world**

Spreadsheets are used in offices and businesses all over the world. They are considered a fundamental part of computer literacy, second only to word processing. Many people have access to a spreadsheet on a home computer.

- **Limited**

Spreadsheets are not ideal for highly complex analyses. As a general rule, once your spreadsheet ceases to be transparent you have gone too far.
Always use the right tool for the job !

- **Economical**

Your organisation almost certainly uses a spreadsheet package already.
Why buy additional software just to do elementary statistics ?

LIST OF WORKBOOKS AND ASSOCIATED WORKCARDS

DISCUS

1.	DESC.XLS	1.1	Calculating a mean and standard deviation
		1.2	Measures of location (averages)
		1.3	Measures of dispersion
		1.4	Drawing boxplots
		1.5	Drawing histograms
2.	PROB.XLS	2.1	National Lottery simulation
		2.2	Coupon collecting simulation.
		2.3	River level simulation.
		2.4	Tree Diagrams
3.	BINO.XLS	3.1	Binomial distributions with $n = 10$
		3.2	Sorting Office simulation
		3.3	Comparing Binomial distributions.
4.	POIS.XLS	4.1	Queuing simulation
		4.2	Poisson distributions for small values of λ
		4.3	Comparing Poisson distributions.
		4.4	Comparing Binomial and Poisson distributions
5.	CONT.XLS	5.1	The Normal Distribution
		5.2	Student's t-distribution
		5.3	The chi-squared distribution
		5.4	The F-distribution
		5.5	The Exponential distribution
		5.6	The Beta distribution
		5.7	The Gamma distribution
		5.8	The Weibull distribution
		5.9	Comparing distributions
6.	SAMP.XLS	6.1	Sampling from a Normal population
		6.2	Sampling from a Uniform population
		6.3	Sampling from an Exponential population
		6.4	Sampling from a Normal population with $\mu = 0$ and $\sigma = 1$
		6.5	Sampling from a Uniform Population with $\mu = 7$ and $\sigma = 4$
		6.6	Sampling from an Exponential Population with $\mu = 1$
		6.7	Calculating a confidence interval for a population mean
		6.8	Calculating a confidence interval for a population proportion
		6.9	Simulating confidence intervals for a population mean
7.	REGR.XLS	7.1	Least squares regression
		7.2	Goodness-of-fit statistics
		7.3	Guessing correlations
		7.4	Linear combinations (independent variables)
		7.5	Linear combinations (dependent variables)
		7.6	Regression calculator
8.	HYPO.XLS	8.1	Testing fair coins
		8.2	Testing unfair coins
		8.3	Testing significance of means
		8.4	Chi-squared test of association