STATISTICAL SOFTWARE – MS EXCEL

Dr. Bibha Verma
PG Department of Zoology
Maharaja College Ara

**PG Sem II, CC-6, Unit -IV**

INTRODUCTION

Statistics is an area that most of the people find difficult. The formulae are often complicated, the calculations tedious, and probability tables confusing. But in fact, students need no longer grapple with any of these. In real life, biologists and statisticians rarely use calculation and tables these days, but instead use statistical packages such as Minitab or SPSS. But it isn't even necessary to buy an expensive statistics package, since spreadsheet software such as Excel has most of the common statistical tests built-in. When using statistics, the first hurdle is to decide which statistical test to use.

Microsoft Excel is a spreadsheet developed by Microsoft for Windows, macOS, Android and iOS. It features calculation, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications.

BASIC OPERATION

Microsoft Excel has the basic features of all spreadsheets, using a grid of cells arranged in numbered rows and letter-named columns to organize data manipulations like arithmetic operations. It has a battery of supplied functions to answer statistical, engineering, and financial needs. In addition, it can display data as line graphs, histograms and charts, and with a very limited three-dimensional graphical display. It allows sectioning of data to view its dependencies on various factors for different perspectives.

CHARTS
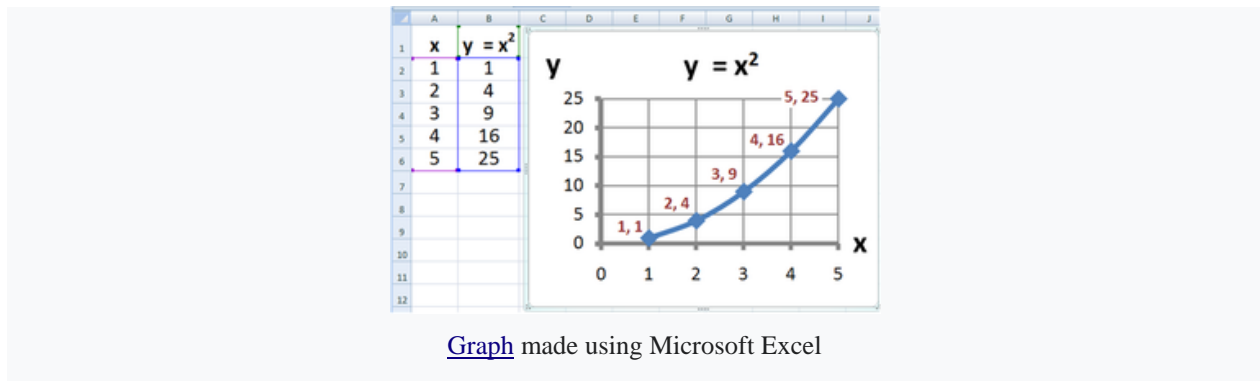
Graph made using Microsoft Excel

Excel supports charts, graphs, or histograms generated from specified groups of cells. The generated graphic component can either be embedded within the current sheet or added as a separate object.

These displays are dynamically updated if the content of cells changes. For example, suppose that the important design requirements are displayed visually; then, in response to a user's change in trial values for parameters, the curves describing the design change shape, and their points of intersection shift, assisting the selection of the best design.

BASICS

1. Ribbon: Excel selects the ribbon's Home tab when you open it. Learn how to collapse and customize the ribbon.

2.Workbook: A workbook is another word for your Excel file. When you start Excel, click Blank workbook to create an Excel workbook from scratch.

3 Worksheets: A worksheet is a collection of cells where you keep and manipulate the data. Each Excel workbook can contain multiple worksheets.

4 Format Cells: When we format cells in Excel, we change the appearance of a number without changing the number itself.

5 Find & Select: Learn how to use Excel's Find, Replace and Go To Special feature.

6 Templates: Instead of creating an Excel workbook from scratch, you can create a workbook based on a template. There are many free templates available, waiting to be used.

7 Data Validation: Use data validation in Excel to make sure that users enter certain values into a cell.

8 Keyboard Shortcuts: Keyboard shortcuts allow you to do things with your keyboard instead of your mouse to increase your speed.

9 Print: This chapter teaches you how to print a worksheet and how to change some important print settings in Excel.

10 Share: Learn how to share Excel data with Word documents and other files.

11 Protect: Encrypt an Excel file with a password so that it requires a password to open it.

FUNCTIONS

1. Count and Sum: The most used functions in Excel are the functions that count and sum. You can count and sum based on one criteria or multiple criteria.

2 Logical: Learn how to use Excel's logical functions, such as IF, AND, OR and NOT.

3 Cell References: Cell references in Excel are very important. Understand the difference between relative, absolute and mixed reference, and you are on your way to success.

4 Date & Time: To enter a date in Excel, use the "/" or "-" characters. To enter a time, use the ":" (colon). You can also enter a date and a time in one cell.

5 Text: Excel has many functions to offer when it comes to manipulating text strings.

6 Lookup & Reference: Learn all about Excel's lookup & reference functions, such as VLOOKUP, HLOOKUP, MATCH, INDEX and CHOOSE.

EXAMPLE:

	A	B	C	D	E	F	G	H	I
1		group A	group B						
2		13.2	9.3						
3		14.7	17.2						
4		10.5	25.4						
5		12.0	5.1						
6		14.6	21.2						
7		14.3	1.1						
8	mean	13.22	13.22		=AVERAGE(C2:C7)				
9	median	13.75	13.25		=MEDIAN(C2:C7)				
10	mode	#N/A	#N/A		=MODE(C2:C7)				
11	range	4.20	24.30		=MAX(C2:C7)-MIN(C2:C7)				
12	variance	2.83	91.21		=VAR(C2:C7)				
13	SD	1.68	9.55		=STDEV(C2:C7)				
14	SE	0.69	3.90		=STDEV(C2:C7) / SQRT(COUNT(C2:C7))				
15	95% CI	1.35	7.64		=CONFIDENCE(0.05, STDEV(C2:C7), COUNT(C2:C7))				

DATA ANALYSIS

1 Sort: You can sort your Excel data on one column or multiple columns. You can sort in ascending or descending order.

2 Filter: Filter your Excel data if you only want to display records that meet certain criteria.

3 Conditional Formatting: Conditional formatting in Excel enables you to highlight cells with a certain color, depending on the cell's value.

4 Charts: A simple Excel chart can say more than a sheet full of numbers. As you'll see, creating charts is very easy.

5 Pivot Tables: Pivot tables are one of Excel's most powerful features. A pivot table allows you to extract the significance from a large, detailed data set.

6 Tables: Tables allow you to analyze your data in Excel quickly and easily.

7 What-If Analysis: What-If Analysis in Excel allows you to try out different values (scenarios) for formulas.

8 Solver: Excel includes a tool called solver that uses techniques from the operations research to find optimal solutions for all kind of decision problems.

9 Analysis Tool Pak: The Analysis Tool Pak is an Excel add-in program that provides data analysis tools for financial, statistical and engineering data analysis.
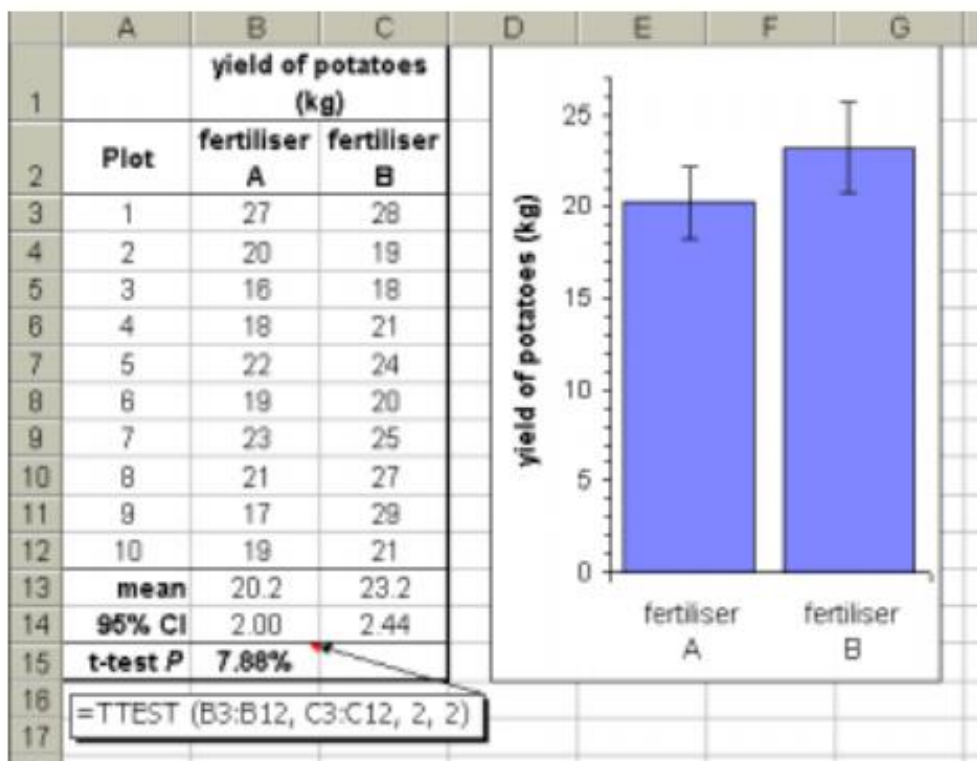
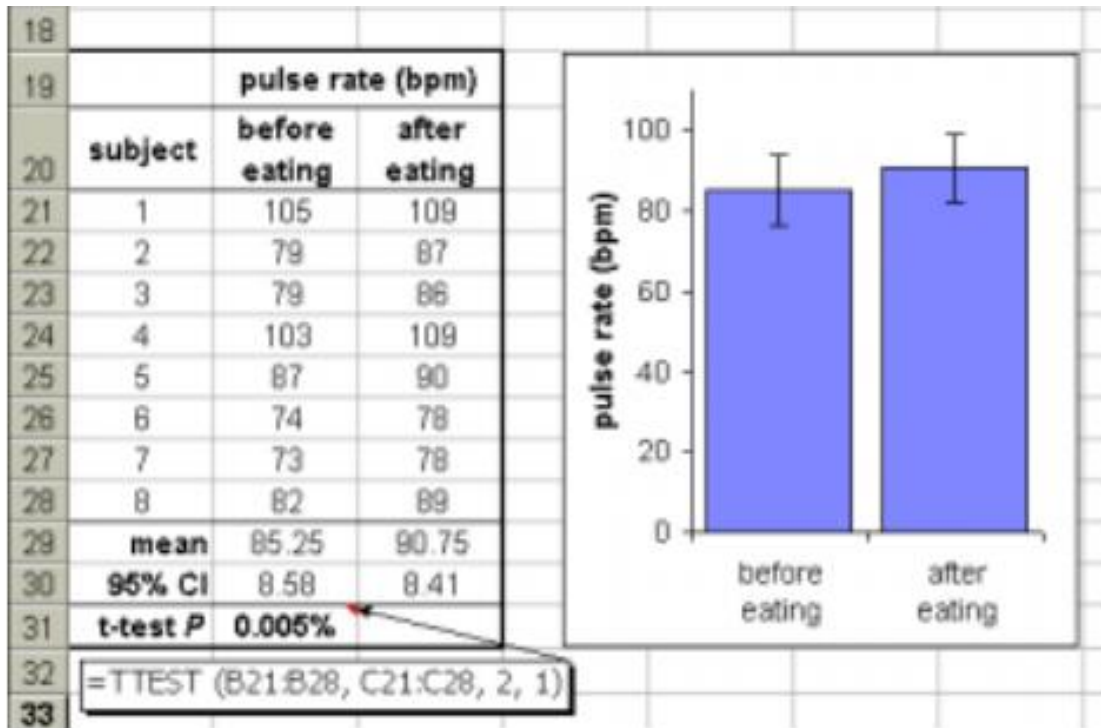8 Statistical: An overview of some very useful statistical functions in Excel.

9 Round: This chapter illustrates three functions to round numbers in Excel. ROUND, ROUNDUP and ROUNDDOWN.

10 Formula Errors: This chapter teaches you how to deal with some common formula errors in Excel.

11 Array Formulas: This chapter helps you understand array formulas in Excel. Single cell array formulas perform multiple calculations in one cell.

EXAMPLES:

	A	B	C	D	E	F	G
1		yield of potatoes (kg)					
2	Plot	fertiliser A	fertiliser B				
3	1	27	28				
4	2	20	19				
5	3	16	18				
6	4	18	21				
7	5	22	24				
8	6	19	20				
9	7	23	25				
10	8	21	27				
11	9	17	29				
12	10	19	21				
13	mean	20.2	23.2				
14	95% CI	2.00	2.44				
15	t-test P	7.88%					
16	=TTEST (B3:B12, C3:C12, 2, 2)						
17							

	subject	pulse rate (bpm) before eating	pulse rate (bpm) after eating
18			
19			
20	subject	before eating	after eating
21	1	105	109
22	2	79	87
23	3	79	86
24	4	103	109
25	5	87	90
26	6	74	78
27	7	73	78
28	8	82	89
29	mean	85.25	90.75
30	95% CI	8.58	8.41
31	t-test P	0.005%	

=TTEST (B21:B28, C21:C28, 2, 1)

CONCLUSION

Excel became the first spreadsheet to allow the user to define the appearance of spreadsheets (fonts, character attributes, and cell appearance). It also introduced intelligent cell computation, where only cells dependent on the cell being modified are updated (previous spreadsheet programs recomputed everything all the time or waited for a specific user command). Excel introduced auto-fill, the ability to drag and expand the selection box to automatically copy a cell or row contents to adjacent cells or rows, adjusting the copies intelligently by automatically incrementing cell references or contents. Excel also introduced extensive graphing capabilities.

REFERENCES:

https://www.excel-easy.com/

https://en.wikipedia.org/wiki/Microsoft_Excel

http://dpbiologia.weebly.com/uploads/2/1/5/5/21553524/biology_statistics_made_simple_using_excel.pdf