NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF EDUCATION

COURSE CODE: EDU804

COURSE TITLE: Data Processing

COURSE GUIDE

EDU804
DATA PROCESSING

Course Team Dr. G.C. Obodo (Writer/Developer) - ESUT
Prof. Anthony Afemigke (Editor) - UNIBEN

NATIONAL OPEN UNIVERSITY OF NIGERIA

National Open University of Nigeria
Headquarters
14/16 Ahmadu Bello Way
Victoria Island
Lagos

Abuja Office
No. 5 Dar es Salaam Street
Off Aminu Kano Crescent
Wuse II, Abuja
Nigeria

e-mail: centralinfo@nou.edu.ng
URL: www.nou.edu.ng

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Introduction

Welcome to EDU804: Data Processing in Education which is a three-credit course offered in the first year to students of the doctorate degree programme in Education. There are 22 units in this course. The only pre- requisite for studying this course is that you have your own personal computer (PC) or hire one for practical use. You cannot study this course effectively without a PC before you. In addition, it is expected that you have a good knowledge of Advanced Statistics and Research.

Your PC must have the following software loaded into it - Ms Word, Ms Excel, and SPSS. The latest version of each of these will be of immense benefit to you. This course is for distance learners who are enrolled in the doctorate education programme of the National Open University of Nigeria. You should note that this Course Guide is just one out of many sources or tools available to help you successfully complete this course and ultimately your programme.

In this Course Guide, note that you will find very useful information about the course with regards to aims and objectives, what the course is about, what course materials you will be using, available services to support your learning, information on assignments and examinations. This Guide will also suggest to you a guideline on how you can plan your time for study, the amount of time you are likely to spend on each study unit, and the Tutor- Marked Assignment.

In view of the above, I recommend very strongly that you go through the Course Guide very thoroughly and carefully. Then complete feedback form at the end before you start your study of the course. Please note that you must submit your feedback form to your Tutorial Facilitator along with your first assignment. This Guide also provides answers to many of the questions that bother you. Nevertheless, do not fail to consult your Study Centre when you have more questions to be answered.

I wish you the best in your learning experience and successful completion of this course.

Course Aims

The course is aimed at enabling the students do data entry, processing and analysis in education.

Course Objectives

On completion of this course, you should be able to:

- enter data, process data and analyse data through the use of computers using Ms Word;
- enter data, process data, and analyse data with computers using Ms Excel;
- enter data, process data and analyse data using SPSS;
- use the Ms Word, Ms Excel and SPSS to represent data graphically; and
- compare and contrast data entry, processing and analysis using Ms Word, Ms Excel and SPSS.

Study Units

There are 22 units in this course that are divided into three modules.

Module 1 Data Entry, Processing and Analysis using Word Processing

Unit 1 Word Processing
Unit 2 Some Features of Word Processing
Unit 3 Editing, Deleting and Inserting Features of Word Processing
Unit 4 Copy, Cut and Paste Editing Features of Word Processing
Unit 5 Search and Replace, Spelling and Grammar Checking Editing Features
Unit 6 Formatting a Text
Unit 7 Other Formatting Features
Unit 8 Graphical Data Representations using Ms Word
Unit 9 Retrieving/Opening a saved Document and Printing

Module 2 Data Entry, Processing and Analysis using Ms Excel

Unit 1 The Spreadsheet
Unit 2 Microsoft Excel
Unit 3 Special Features of Ms Excel
Unit 4 Spreadsheet Editing
Unit 5 Spreadsheet Formatting
Unit 6 Data Entry, Processing and Analysis using Ms Excel
Unit 7 Using the Formula Bar for Data Processing and Analysis
Unit 8 Graphical Data Representations using Ms Excel

Module 3 Data Entry, Processing and Analysis using SPSS

Unit 1 Data Editor and Data Entry
Unit 2 Editing Data in SPSS, Reports and Descriptive Statistics
Unit 3 The t Test and One Way ANOVA
Unit 4 General and Linear Model Analysis
Unit 5 Correlation, Regression, Data Reduction and Non Parametric Tests

Textbooks and References

Your course material is the main text for this course. You can also consult other sources as provided for you in the list of references/further reading below.

Ekemezie, N.J and Ngene, N.J (2004). *Computers and Information Technology*. Enugu: Kinsman Publishers Ltd.

Obodo, G.C. *Computer Education Practices*. Enugu: Fidgine Global Books.

Obodo, G.C. *Computer/Mathematical Education Innovations: Issues and Applications*. Enugu: Floxtone Press.

Okafor, E.C. (2001). *Starting with Computers*. Enugu: Immaculate Publications Ltd.

Okechuwu, Oliver O. (2006). *Introduction to Computer Application, Programming and Internet Awareness*. Enugu: Our Saviour Press Ltd.

Hutchinson, S.E and Sawyer, S.C. (2000). *Computer Communications and Information. A User's Introduction*. U.S.A: McGraw- Hills.

Kurshan, B.L, November, A.C, Stone, J.D. (1986). *Computer Literacy Through Application*. Boston: Houghton Mifflin Co.

Meyer, M et.al (1999). *Computers in Your Future*. Indianapolis: QUE Education and Training.

O' Leary, T.J and O' leary, L.I. (1996). *Computing Essentials*. U.S.A: McGraw- Hills.

Assessment

There are three kinds of assessment for this course. They are self assessment exercises and assignments at the end of each study unit, the

tutor-marked assignment and a written examination. Please use the information you have gathered during your study of the course in doing the assignments.

Self Assessment Exercises (SAEs)

Throughout your course materials, there are self assessment exercises. Attempt each exercise immediately after reading the section preceding it. These exercises help you to evaluate your learning. For the questions at the end of each study unit, attempt to answer them after you have read the study unit. They help you to assess your knowledge of the content of the unit. You will not submit your SAEs.

Tutor-Marked Assignment

There are three tutor-marked assignments for this course. The assignments are designed to cover all areas treated in the course. You will be given your assignments and the dates for submitting them at your study centre. You are expected to attempt all the three tutor-marked assignments. You will be assessed on all three tutor-marked assignments. They will be used for your continuous assessment.

Each assessment carries 10%. This will give 30% for all the three. You must submit your assignment to your tutorial facilitator for formal assessment on or before the stipulated dates for submission. Note that the work which you submit for assessment counts for 30% of your total course score.

Course Overview

There are three Modules in this course with a total of 22 units. Module 1 introduces you to data entry, processing and analysis using Word Processing. Module 2 examines data entry, processing and analysis using Ms Excel. Module 3 deals with data entry, processing and analysis using SPSS. Each study consists of one week's work and should take you not less than three hours to complete. Some units may take you up to six hours especially in Module 3. It includes specific objectives, guidance for study, reading materials and self assessment exercises, together with tutor- marked assignment. These exercises will help you in achieving the stated learning objectives of the individual study units and of the whole course.

Below is a presentation of the course and how long it should take you to complete each study unit and the accompanying assignment.

Now use this overview to plan your personal time table.

Unit	Title of Study Unit	Weeks/ Activity	Assignment
	Course Guide	1	Course Guide form
Module 1	**Data Entry, Processing and Analysis using Word Processing**		
1	Word Processing	2	Assignment
2	Some Features of Word Processing	2	Assignment
3	Editing, Deleting and Inserting Features of Word Processing	3	Assignment
4	Copy, Cut and Paste Editing Features of Word Processing	3	Assignment
5	Search and Replace, Spelling and Grammar Checking Editing Features	4	Assignment
6	Formatting a Text	4	Assignment
7	Other Formatting Features	5	Assignment
8	Graphical Data Representations using Ms Word	5	Assignment
9	Retrieving/Opening a saved Document and Printing	5	TMA 1 to be submitted
Module 2	**Data Entry, Processing and Analysis using Ms Excel**		
1	The Spreadsheet	6	TMA 1 to be submitted
2	Microsoft Excel	6	TMA 1 to be submitted
3	Special Features of Ms Excel	7	TMA1 to be submitted
4	Spreadsheet Editing	7	TMA 1 to be submitted
5	Spreadsheet Formatting	8	TMA 1 to be submitted
6	Data Entry, Processing and Analysis using Ms Excel	8	TMA 1 to be submitted
7	Using the Formula Bar for Data Processing and Analysis	9	TMA 1 to be submitted
8	Graphical Data Representations using Ms Excel	10	TMA 2 to be submitted
Module 3	**Data Entry, Processing and Analysis using SPSS**		
1	Data Editor and Data Entry	11	Assignment
2	Editing Data in SPSS, Reports	12	Assignment

	and Descriptive Statistics		
3	The t Test and One Way ANOVA	13	Assignment
4	General and Linear Model Analysis	14	Assignment
5	Correlation, Regression, Data Reduction and Non Parametric Tests	15	TMA 3 to be submitted
	Revision	16	
	Examination	17	
	Total	**17**	

How to Get the Most from this Course

In distance learning, the study units replace the university lectures. The advantage is that you can read and work through the course materials at your pace and at a time and place that suits you best. Very detailed step by step instructions have been given to help you in your studies. While reading this material, please you are advised to think of it as reading the lecturer notes rather than listening to a lecturer. Just as a lecturer gives exercises in class, your study units provide exercises for you to do at appropriate times.

It is important that you note that each study unit has common features that are designed to help your learning. The first feature is an Introduction to the subject matter of the unit and how a given unit is integrated with the other units and the course as a whole. This is followed by a set of learning objectives. The objectives help you to appreciate what you ought to be able to do by the time you complete the unit. Use these objectives to guide your learning.

Having finished learning the unit, always go back and check whether you have achieved the objectives. Note that self assessment exercises are interspersed throughout each study unit. These exercises help you to remember what you have studied and to evaluate your learning by yourself. Please ensure you do each self assessment exercise as you come to it in the study unit. Do not go to the next section until you have done the self assessment exercise preceding it.

The summary at the end of every unit helps you to recall all the major topics in the main content of each unit. There are also Tutor-Marked Assignments at the end of each unit. When you answer these questions, they will help you to achieve the objectives of the unit and prepare you for the assignment that you will submit at the final examination.

It should take you three to six hours to complete a study unit, the exercises and the assignment. Some study units will take you three hours, some four, five, or six hours. In Module 5 (SPSS), each unit is likely to take you five to six hours. When you have completed studying the first study unit, please take note of how long it took you and use this information to draw up a time table to guide your study for the rest of your course.

The wide margins on the left and right side of the pages of your course book are meant for you to make notes of main ideas or key points. You can use them when you are revising the course. Where you make use of all these features, you must likely and significantly increase your chances of passing the course with a good grade.

Course Delivery

There are three kinds of course delivery methods for this course to support your academic study. They are tutorial sessions, facilitation and counseling support services.

Tutorial Sessions

In this course, there will be not less than 10 tutorial hours. The tutorial hours will be scheduled between you and your facilitator i.e. the dates and times for each session. Make sure you have your tutorial facilitator's phone number and e- mail address.

You have a lot to gain from the tutorial sessions.

1. You have the opportunity to ask the facilitator questions about what you do not understand in your study.
2. It will enable you to consult your facilitator personally for some peculiar issues.
3. You will hear the opinion of others on your questions.
4. You will also learn from the questions that others ask the facilitator and a lot more.

   Tutorial sessions are optional. Nevertheless, learners are encouraged to participate in the sessions so as to minimise the effects of isolation.

Facilitation

The language of instruction is in English language. The major medium of instruction is the print (course material) and your personal computer. Your computer should be loaded with Ms Word, Ms Excel, and SPSS in the least.

You should expect the following from facilitation

1. The facilitator will answer your questions.
2. The facilitator will provide and coordinate discussions on the major course themes.
3. The facilitator will provide feedback on tutor- marked assignments.
4. He/ she will pose questions to you to confirm learning outcomes.
5. He/ she will coordinate, mark and record assignments/ examinations scores.
6. He/ she will monitor learner's progress.
7. Learners can seek for clarifications from tutorial facilitators on phone or by e- mail
   Facilitation will take place at the study centre nearest to the learner. Time of facilitation is a flexible arrangement between learners and facilitator.

Counseling

Counseling is a part of your learning. This is because it is provided to make your learning experience easier. There are two levels of counseling that are provided- academic and personal counseling. Student counselors provide guidance on personal issues that may affect your studies. They are available at your study centre. Your study centre manager and tutorial facilitator serve as academic counselors. They can help you with questions on academic matters like course materials, facilitation; grades etc; ensure that you have the phone number and e-mail address of your study centre and the various individuals that may be of assistance to you. Do not be shy in consulting any of them. They may be of immense help to you.

Conclusion

It is important to note that this Course Guide has been designed to facilitate your learning so that you achieve the aims and objectives of this course. The course summary, course overview, self assessment exercises and the study questions are to assist you to achieve maximum/ best results in your studies.

Summary

In this unit, we have discussed the Course Guide for EDU 804 (data processing in education). The essence of this Course Guide is to help you navigate effectively through the course. You have learnt all the components of the Course Guide and the purpose for each one of them- introduction, a guide through the course, course material and structure,

course delivery, assessment, summary, conclusion and a Course Guide form for learners to complete and submit.

Tutor-Marked Assignment

State five reasons why a Course Guide is an important component in learning by distance.

References/ Further Reading

NOUN (no date). Course material development in Open and Distance Learning: Training Manual. Lagos: NOUN.

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NATIONAL OPEN UNIVERSITY OF NIGERIA

National Open University of Nigeria
Headquarters
14/16 Ahmadu Bello Way
Victoria Island
Lagos

Abuja Office
No. 5 Dar es Salaam Street
Off Aminu Kano Crescent
Wuse II, Abuja
Nigeria

e-mail: centralinfo@nou.edu.ng
URL: www.nou.edu.ng

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MODULE 1 DATA ENTRY PROCESSING AND ANALYSIS USING WORD PROCESSING

UNIT 1 WORD PROCESSING

CONTENTS

1.0 INTRODUCTION

You can use a computer to carry out various activities in different fields of endeavour. For instance, you can use it in word processing in different areas, e.g. offices, homes, schools and churches. According to Onyewuenyi (1994), word processing accounts for at least half of the total uses of micro computers. This represents a very significant proportion of micro computer usage. You need to be familiar with word processing because it will facilitate your processing of assignments and other important documents.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- define word processing in your own words
- define a word processor and give some examples
- mention the merits of using a word processor
- state the relationship between word processing and desktop publishing
- compare and contrast word processor and typewriter
- write down types of word processors and their versions.

3.0 MAIN CONTENT

3.1 Word Processing

Word processing is the application of software to write, format, revise, save and print text for documents such as letters, reports, manuscripts, books, etc. It can also be defined as the writing, editing and production of documents, as letters, reports, manuscripts and books through the use of a computer progamme (software) or a computer system that is specially designed to enhance rapid and efficient manipulation of text. Word processing is designed in such a way as to automate many actions carried out manually by typewriters. For example, in word processing, you will not insert carriage return at the end of each line of text or insert a new sheet of paper at the end of each page. In word processing you can format every element of your written document. With these formatting features which we will discuss in the next session, you can change your presentations the way you like with ease. Word processing has popularised the computer because it is not only currently used by secretaries alone but has found wide usage among managers and professionals in different fields.

SELF-ASSESSMENT EXERCISE 1

Define word processing in your own words

3.2 Typewriter and Word Processor

The typewriter is a machine used in typing documents manually before the invention of computers. It has the same alphabet and numeric keys as the word processor. It has a carriage bar that enables it to word wrap. The major difference between a typewriter and a word processor is that while the typewriter is manually operated, the word processor is electrically operated. Word processor is defined as software which helps

the computer to behave like the office typewriter. It is also a computer programme (software) or computer system designed for word processing. A word processor converts the personal computer into a computerised typewriter so as to use it to create, edit and print documents. Word processors play a very significant part in offices and many other systems to process documents in ways that are more efficient than the use of hand or typewriter.

Word processing is the use of the word processor to produce documents, designs, diagrams etc in an electronic manner. Word processing has almost taken over the place of typewriting in our homes and offices. It makes production of documents easy, faster, neater and presentable. The formatting features of word processing distinguish it from typewriting.

SELF-ASSESSMENT EXERCISE 2

1. Define word processor in your own words.
2. Distinguish between word processing and word processor.

3.3 Merits of Word Processor

Word processor has several advantages. Some of them are as follows:

- It enables you to edit with ease i.e. changing the text.
- It gives you the ability to see a document on the computer screen before it is printed out.
- It helps you to create, edit, save and print documents such as memos, reports, term paper, letters etc.

3.4 Word Processing and Desktop Publishing

Desktop publishing is the use of desktop computer and other publishing components to produce documents or reports that are to be printed. It is an extension of word processing. It involves using a microcomputer to mix text and graphics so as to produce high quality output for commercial printing. When you create a report using word processing software, you are basically concerned with the content of your text and not the appearance of the text. However, desktop publishing considers both content and appearance of your document. It should be noted that ordinary word processors do not give documents the desired professional appearance. For instance, the professional appearance of an academic doctoral thesis will not be the same as that of a lawyer writing a law document or that of a medical doctor preparing a medical document/report. This shows that document/report designed with desktop publishing software will usually have an outstanding desired look. In recent times, desktop publishing has enormously

changed the way schools, offices, companies, organisations and individuals handle their printing jobs.

SELF-ASSESSMENT EXERCISE 3

1. Can desktop publishing do without word processing? Why?
2. What is the main advantage of desktop publishing over ordinary word processing?

3.5 The Computer Word Processor and the Typewriter

Have you ever used a typewriter to produce documents? Are you familiar with the use of computer to produce reports, or any other text? If you have used a typewriter before this time, and you are probably using a computer currently, you may have appreciated the usefulness of the word processor more than the typewriter. The computer presents many facilities that help you in simplifying the process of preparing your document. Consider this example, when you are using a typewriter, the characters and words that you are typing are typed straight into a paper. When you make a mistake or when you want to change a letter, word, phrase, clause, spelling or a sentence, you use the correction fluid to cover the text. Alternatively, you may start typing all over again with a new paper. The use of correction fluid makes the final document of your work untidy.

On the other hand, when you use the computer word processor, you are in a position to view the word/ text you are typing on the computer screen before printing on paper. Hence, the word processor allows you to correct all errors or make all amendments the way you like and when and how you want it. It is only when you are satisfied with what you have on the computer screen that you can give a command for the text to be printed on the paper. This is not so in typewriting.

One advantage of computer word processing that makes it very beautiful is that even when you have already produced your document(printed it out) you can still save your document on a disk. You can also easily retrieve (recall) the saved document for further changes whenever you want. Typewriting does not offer this kind of opportunity.

In computer word processing, you can change from double line spacing to single line spacing and vice versa. You can change (increase/decrease) the width of the margins on either the right or left. You can also delete or add some other paragraph to your existing document. You can transfer a paragraph from another document to your present document. These features are not possible in a typewriter. In a typewriter, you have

only one way of dealing with letters and numbers since it has only one typeface. However, word processors have a variety of fonts (typeface or style of character) from which you can choose so as to beautify your document or emphasise a given word, phrase or sentence in your document.

It is also possible to increase or decrease the size of your chosen character. You can spell check your document, add picture to it and lay pages the way you want. While the typewriter limits you to the number of pages you can produce through the use of carbon paper, you are not restricted to the number of pages you can produce in word processing.

Another method through which the typewriter can produce several copies is to cut the documents to stencils and it is then cyclostyled. Whether typed by direct typing or encyclostyled, there is a limit to the number of duplicates a typewriter can make at a time. Also remember that duplicates become faint as the number of copies increase. In addition, duplicate copies are never used for any official correspondence. You should remember vividly that cutting documents to stencils and cyclostyling them are rigorous exercises that are tiresome. They do not also give rise to very high quality documents. Sometimes, some of the copies are dirty and painted with ink.

On the other hand, the computer word processor enables you to produce any number of copies you desire with all of them being original. The word processor helps you to produce your documents with ease. The keys of the keyboard and the mouse help you a lot. Let us see a keyboard and possibly explain how to use it at least briefly (The facilitator should bring a keyboard or a set of computer for demonstrations in the class).

SELF-ASSESSMENT EXERCISE 4

Compare and contrast the word processor and the typewriter.

3.6 Types of Word Processor

There are many kinds of word processor. However, the popular ones are Microsoft word (MS-word), Word perfect for windows, Corel word perfect, AmiPro, and Lotus word pro. Each of these has varied versions. For instance, MS word has various versions. Some of them are popularly known as Windows 95, Windows 97, Windows 98, Windows 2000 (part of integrated software Microsoft Office 2000), Windows xp, Microsoft Office 2003 and 2007. Microsoft Office 2007 is the latest version of Ms Word. Word Perfect has versions 5.1, and 6.0(July 1993).

SELF-ASSESSMENT EXERCISE 5

1. Write down other versions of MS Word that you know that have not been listed in this sub-section
2. Write down all the versions of Word Perfect, Corel Word Perfect and Ami pro
3. Go to the internet and write down other word processors and state their versions from the first version to the latest version.

4.0 CONCLUSION

Word processing is very important in your studies, homes, offices, and businesses. You cannot do without it or else you will waste a lot of time and effort in producing documents or in processing your data. Computerized word processing makes typewriting look old fashioned because of its numerous merits. Hence, you need to own a personal computer today to process your documents. You would need to choose word processor software of your choice to prepare your documents.

5.0 SUMMARY

In this unit, you have learnt about the definitions of word processing and word processor. You also learnt about the advantages of word processor, the relationship between word processing and desktop publishing. You learnt also the similarities and differences between the computer word processor and the typewriter, and different types of word processor software and their versions.

6.0 TUTOR - MARKED ASSIGNMENT

1. What new thing have you learnt in word processing that you did not know before you studied this unit?
2. Why do you prefer the computerized word processing to the typewriting of documents?
3. The word processing is more costly to own and produce documents by an individual than the typewriter. Justify or refute this statement. (Please change the structure of the statement here. See the change as amended).

7.0 REFERENCES/FURTHER READING

Ekemezie, W.N & Ngene, N.J. (2004). *Computers and Information Technology*. Enugu: Kinsmann Publishers Ltd.

Okafor, E.C. (2001). *Starting with Computers*. Enugu: Immaculate Publications Ltd.

Onyewuenyi. R. N. (1994). *Micro Computer Studies for Beginners*. Onitsha: Spiritan Publications.

UNIT 2 SOME FEATURES OF WORD PROCESSING

CONTENTS

1.0 INTRODUCTION

Word processors perform many functions. Can you remember some of them? What are those important, interesting and/ or typical things that one can find in word processing? These are what we refer to as features of word processing. In this unit, we are interested in an overview of some of the major functions (features) of word processing. Recall from the last unit that there are many word processors with different versions. Some of them are: Microsoft Word, Word perfect, Corel word perfect, Ami pro. Nevertheless, most of them have common features but we shall use Microsoft word (windows XP) in our illustrations in this unit.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- create a document and save it
- use the num lock and the caps lock key in your system
- scroll through your documents in your system
- read the status bar information
- use the word wrap feature while keying in information in the system.

3.0 MAIN CONTENT

3.1 Cursor Movement

The cursor is that symbol that blinks in the work area showing where the next character is to appear. If you are ready to create (type) a new document in your system, the cursor appears on the top left corner of the work area. You can move the cursor up and down, left and right, using the four arrow keys- up, down, left, and right keys. Now boot your system and access the Ms word. i.e. put on the computer and allow it to undergo settings. Do not shut your system yet. Click the start button. Then click the required software you want to use, say Ms Word. Wait a little until the system displays Ms Word environment.

Can you see the cursor blinking in the work area? Press the right arrow key five times. Press the down arrow key five times. Press the left arrow key five times. Press the up arrow key five times. What do you observe? Do not shut down your computer so that you can continue the next session.

3.2 Creating a Document

A document is anything that is written using the word processing software. A document may be a newspaper, a magazine, a book, a journal, or an article, a letter, a line or few lines of information or data. A document is also called a file.

When you use your computer to create a document or file of your choice, you should give it a file name. A filename is referred to as a short title or caption that assists the computer to keep track of the document (file). Some software (programmes) limits the length of filename to eight characters, with a possible extension name of three characters. For instance, STATE, YETUNDE, DOCTOR, LETTER, UNIVERSE, MASTER, ABUJA, are filenames with 8 or less characters. OKEKENTA. ABA, MOHAMMED.JOE, DOCUMENT.SED are examples of filenames with an extension name. The filename extensions are: .ABA, .JOE and. SED respectively. You should note specifically that without a filename, your computer cannot track your document.

Now create document by doing the following:

1. Boot your computer system before normal operations take place.
2. Click the start button. Then click the required software you want to use, say Ms Word. Wait a little until the system displays Ms Word environment.

3. Now, type (key in) the following:

He came here yesterday

4. Scroll the cursor to file on top of your screen and click it. Among the things that are displayed click Save As. In the box, filename, type in the filename you want to save your document with, say, SCHOOL. Then, click save to save your document. Now your document has been saved. You can retrieve it at any time you want using the saved name, SCHOOL.

SELF-ASSESSMENT EXERCISE 1

1. Type on the screen a paragraph of your choice not less than five lines. Save it with a filename of your choice.
2. Press the right arrow key (→) ten times. Press the down arrow key (↓) ten times. Press the left arrow (↑), and the up arrow (↑) ten times each. What do you notice?

3.3 Num Lock Toggle Key

In word processing, you have available in your computer system the Num lock toggle key. You can press it ON or OFF. When it is ON, the Num lock lamp is lit and the numeric keypad keys now represent 2, 4, 6, and 8. When the toggle key is OFF, the num lock lamp is off and you can use them as arrow keys.

SELF-ASSESSMENT EXERCISE 2

1. Locate the num lock in your computer
2. Press it down. What do you notice? Press it again, what do you notice?
3. Press the numeric key, 2, five times. What do you notice? press the following numeric keys similarly and write down your observations: 4, 6, and 8.

3.4 Caps Lock Key

The caps lock key is another feature in word processing. It works with caps lock lamp. When you press down the caps lock key, the lamp is lit. Therefore, all the alphabets you key (type) in will appear as upper case ( ) capital ( ) letter).

SELF-ASSESSMENT EXERCISE 3

1. With your system still on, locate the position of the caps lock key on your keyboard. Locate the lamp also
2. Press down the caps lock key. What do you observe?
3. Now key in the following:

I am a post graduate student in NOUN, Lagos Centre. I am offering the course EDU 804. It is an interesting course that is related to what I am studying. The course is making me more computer literate than I was before I joined the university; I hope to get the best out of this course for the future.

What do you observe?

Type in another paragraph of 10 lines of your choice with the caps lock still pressed down.

3.5 Scrolling Feature

The ability of your data on the screen to move vertically down or up is referred to as scrolling. This is known as scrolling down or up respectively. A scroll is defined as a long roll of paper attached to round cylinders at the end. You may wish to recall that the term scroll was borrowed from ancient times when ancient persons wrote on scroll as you can find in the Bible. There are five ways you can use to scroll up and down. They are using up and down keys, the page up key, and the page down keys. The fifth method is to use the mouse pointer on the vertical right hand side of the screen.

SELF-ASSESSMENT EXERCISE 4

1. With your computer still on and the above document in the last section, still on your screen, identify/locate the keys for scrolling down, scrolling up, page down, page up
2. Press down the down arrow key for some seconds. What do you notice?
3. Press down the up arrow key for some seconds. Do you notice anything?
4. Press down the page down key three times and record your observations
5. Press down the page up key five times. Do you notice anything?

3.6 Status Bar Feature

The status bar is a very popular feature in word processors. In some computers you can locate it on the top of the screen. In other computers, you can locate it at the bottom of the screen. In the computer you are using now, where is the status bar located? The function of the status bar is to display the status information of your document. Examples of such status information are: names of files, current page number, total number of pages, current row and column, etc.

SELF-ASSESSMENT EXERCISE 5

1. In your computer which you are using right now, where is the status bar located?
2. Write down all the status information displayed in your system now.

3.7 Word Wrap Feature

Word wrap is available both in typewriter and word processing. In a typewriter, when you start typing and you have completed typing the first line, there is need to go to the second line. To go to the second line, you press the carriage return key at the end of each line of text. You also press the carriage return key when you want to start a new paragraph.

In a word processor, you hit only the ENTER KEY when you want to start a new paragraph. When the cursor gets to the end of a line while you are typing (keying in), it jumps automatically to the next line. This is what is known as word wrapping. From the above descriptions, you can see that word wrapping is automatic in word processor while it is mechanical in typewriters.

SELF-ASSESSMENT EXERCISE 6

Using your word processor (Ms Word of your choice, preferably the latest version), type a document of your choice to fill your computer screen. Insert three paragraphs in the document you have typed on the screen. What do you notice about the cursor?

4.0 CONCLUSION

The seven features of word processing described in this unit show the preliminary computer activities you must undertake to familiarize yourself with the use of the computer. In creating a document, these features are very necessary and so that you have to master them.

Consistent practice on the computer on these features among others will go a long way to assist you become computer literate.

5.0 SUMMARY

In this unit you have learnt how to create a document and save it. You have also learnt about cursor movement and how we can use the Num lock and Caps lock keys. We have also discussed how to scroll down and up using the down and up arrow keys, the page down and page up keys, and the mouse. You learnt how to use the status bar and the word wrap feature. You can equally type your document inserting paragraphs.

6.0 TUTOR-MARKED ASSIGNMENT

1. Create a document of two pages on your screen (type it). Choose a document of your choice or you can be given a document. Save the document with a file name of:

a. 8 characters
b. more than 8 characters.

2. What is the difference between the word wrap in typewriter and a word processor?
3. Write down all the status information of your document in no. 1.

7.0 REFERENCES/FURTHER READING

Ekemezie, W. N. & Ngene, N.J. (2004). *Computers and Information Technology*. Enugu: Kinsmann Publishers Ltd.

Obodo, G.C. (2008). *Computers Education Practices*. Enugu: Fidgina Globel Books.

Onyewuenyi, R.N. (1994). *Micro Computer Studies for Beginners*. Onitsha: Spiritan Publications.

UNIT 3 EDITING, DELETING AND INSERTING FEATURES OF WORD PROCESSING

CONTENTS

1.0 INTRODUCTION

In unit 2, you learnt how to create and save a document and some other features of word processing. In this unit, we are focusing on the editing features/ functions of word processing. You cannot edit unless you first create the document and save it as you have previously learnt. For you to be perfect in editing your document, you ought to have your own computer and practice regularly how to edit.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- delete and insert characters in your document using insert and overtype modes
- use the backspace and delete key methods to delete text
- delete large data/ using four different methods
- use the mouse to block a text and delete it
- use the cut/scissors method to delete large texts.

3.0 MAIN CONTENT

3.1 Deleting and Inserting Characters in Your Documents

After entering your draft document into your computer then, the next step is to edit the document. The document is called a draft because it has not yet been edited. Editing is the process of deleting unwanted characters/texts and/or inserting the correct or preferred ones. There are two kinds of editing.

3.1.1 The Insert Mode Editing

This method of editing (insert mode) inserts texts/characters between existing words without cleaning/ erasing/ deleting what was typed previously.

3.1.2 The Overtype Mode Editing

This kind of editing erases/wipes out what you have previously typed while at the same time typing new characters/ texts. In other words, you can replace previously typed texts with new ones without deleting the previously typed text.

3.2 Two Keyboard Methods of Deleting Text

With the keyboard, two main methods of deleting unwanted texts or characters are available. They are the backspace key method and the Del (delete) key method.

3.2.1 The Backspace Key Method

The backspace method is used in deleting unwanted texts or characters by moving the cursor, using the arrow keys, to the right of the unwanted character/ text. Can you do what has been said? Do it. Then, press the backspace key. What do you notice? Press the backspace key again. What is your observation? You will observe that pressing the backspace key once deletes one character to the left.

SELF-ASSESSMENT EXERCISE 1

Boot your system and access any Ms-Word version of your choice.

1. Type the words “family life”. Using the backspace key, delete the two words .
2. Type “family feature” and delete it similarly.

3. Type in a sentence of two lines and delete the lines using backspace key.
4. Which of the three took a longer time to delete? Why?

3.2.2 The Del (Delete) Key Method

Using the delete {DEL} key method is the second method of deleting unwanted texts or characters. It is done by moving the cursor to the left of the unwanted text/character, press the del key once to have one character deleted. This means that pressing the DEL key once deletes a character immediately to the right of the cursor. For a word of say, five characters (e.g saxot), you have to press the delete key five times to delete the five characters making up the word, saxot.

SELF-ASSESSMENT EXERCISE 2

1. With your system still on, type the word, Alabasca. Use the Del key to delete it. Type another phrase “word wrapping”, delete this using the del key.
2. Type a statement of two lines of your choice on the screen. Delete them using the Del key. What do you notice? Which of the three took a longer time to delete? Why?
3. What is the difference between the backspace and del methods for deleting texts?

3.3 How to Delete Large Texts

Using the two methods (backspace and delete key) in sections 3.2.1 and 3.2.2 to delete texts, you will have noticed that you require a reasonable time to delete large texts. This is because the characters are deleted one after another. For example in the last section, it took you longer time to delete two lines than it took you to delete one or two words.

How do you delete large texts, say a paragraph, a page or more? There are two methods of deleting large texts. They are: the selecting (blocking) text method and cutting (scissors) method.

3.3.1 Selecting (or Blocking) the Text Method

To delete texts that are large which will take time to delete using backspace or arrow key, you have to block or select the unwanted text. You select or block a text to enable your computer know the part of the document that you are working on or you want to delete. How can you select or block a text? There are two methods: the keyboard method and the mouse method.

3.3.1.1 The Keyboard Method of Deleting Large Text Using the Right Arrow Key

(a) To block, select or highlight a text using the keyboard, move your cursor to the left of the text you want to delete. Press down the shift key. While holding or pressing down the shift key, keep pressing the right arrow key until all the text is highlighted or selected from left to right. Then, press the del (delete) key.

SELF-ASSESSMENT EXERCISE 3

Type a paragraph of 10 lines with your computer. Select/ highlight your text using the right arrow key method of your keyboard. Delete the text.

(b) Alternatively, move the cursor to the end of the document you want to delete i.e immediately after the last character you want to delete. Hold down the shift key and continue pressing the left arrow key until you highlight/ select all you desire from right to left. Now press the delete key.

SELF-ASSESSMENT EXERCISE 4

Type a text of 8 lines in your computer. Select the text using the left arrow key method of your keyboard. Delete the text.

In the above two methods of deleting large texts using the left and right arrow keys to highlight a text, you would have noticed that it takes a longer time to highlight the given text. There are two faster methods of highlighting a text and thus deleting if fast. They are:

a) Using the up arrow key and
b) Using the down arrow key to highlight while holding down the shift key.

(c) **Using the Down Arrow Key to Highlight and Delete**

It is faster to highlight a text using the down arrow key. Recall that you had typed a 10 or 8 line text above. Move the cursor to the beginning of the text you want to select. Press down the shift key and at the same time keep pressing the down arrow key continuously until all the desired text is highlighted. What do you notice? You observe that this selects or highlights line by line instead of character by character as in the case of using left or right arrow key.

SELF-ASSESSMENT EXERCISE 5

Key in a document of 10 lines into your system. Choose your own text. Move your cursor to the start of your text. Hold down the shift key and press the down arrow key. What do you observe as you continue pressing the down arrow key? The text is highlighted faster line by line instead of character by character. How do you remove the highlight? To remove the highlighting, move the cursor to any area outside the blocked/highlighted/selected area. Click your mouse (right side). The highlighting disappears. Now, highlight the document again and delete by pressing the delete key.

(d) **Using the Up Arrow Key to Highlight and Delete**

To use the up arrow key to highlight and later delete, move the cursor to the end of the document you want to delete. Press the shift key and at the same time keep pressing the up arrow key continuously until the text you want to delete is selected or blocked. To remove the highlight, move the cursor to any area outside the text you have blocked and click the right button of the mouse. The blocking will be removed. Now highlight the text again and press the delete key. The document is deleted.

SELF-ASSESSMENT EXERCISE 6

Type a text of 6 lines in your computer. Move your cursor to the end of the last character of the text you want to delete. Press down the shift key and press down the up arrow key at the same time. Remove the highlight. Highlight the document again and delete it.

3.3.1.2 Using the Mouse to Block a Text and Delete

What do you do to use the mouse to highlight or select a text? This is what you have to do. Move the cursor using the mouse to the left of the character that starts the text you want to delete. Click and hold the left mouse button. Then, drag the mouse to the right and down through the entire text you want to block. Then press delete. Recall that a text is highlighted/blocked/ selected when the desired text is turned into black text on the white background.

SELF-ASSESSMENT EXERCISE 7

Key in a text of your choice of about 5 lines into your system. Use the mouse to highlight the text and then delete it.

3.3.2 Cut (Scissors) Method of Deleting Large Texts

You can delete a large document using the cut(scissors) method. Below, the menu bar on top of your screen is the tools bar. The menu bar contains list of names in word processing such as file, edit, view, insert, format, etc. the tools bar below the menu bar contains diagrams/ symbols. One of the symbols on the tools bar is a cut scissors.

In case you do not know what the symbols on the tolls bar mean, point your cursor to each and what each symbol represents will appear. Now point your cursor to (x) what do you see? You will see “cut” displayed. Do the same for other symbols now.

Scissors

To use the cut (scissor) method, select the document you want to delete. Move your cursor to the cut(X) on the tools bar. Click your mouse and the text is deleted.

SELF-ASSESSMENT EXERCISE 8

1. Type a text of 10 lines using your system.
2. Highlight lines 6, 7 and 8 and delete them using the cut method.
3. Block lines 1, 2, and 3 and cut it.
4. Select the remaining document and scissors it.

4.0 CONCLUSION

Deleting and inserting characters in your document/text is an important aspect of editing. Remember that one important difference between word processing and typewriting is in deleting and inserting characters. In typewriting, deletion and insertion of character leaves a dirty mark but it is not so in word processing. Each method of deleting is important and you should master all of them. You will save plenty of time if you master the different kinds of deleting and inserting of characters.

5.0 SUMMARY

In this unit, you have learnt how to delete and insert characters into your document. You learnt about two types of editing- insert and overtype modes. There are two methods- blocking the text and cut(scissors) methods for deleting texts.

6.0 TUTOR- MARKED ASSIGNMENT

1. Type a document of one page on your screen.
2. Edit this document using the insert mode.
3. What is the fastest method of deleting a text of 10 lines in your document?
4. How can you use the up and down arrow keys to delete a large document?

7.0 REFERENCES/FURTHER READING

Ekemezie, W.N. & Ngene, N.J. (2004). *Computers and Information* Technology Enugu: Kinsmann Publishers Ltd.

Obodo, G.C. (2008). *Computer Education Practices*. Enugu: Fidgina Global books.

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UNIT 4 COPY, CUT AND PASTE EDITING FEATURES OF WORD PROCESSING

CONTENTS

1.0 INTRODUCTION

In unit 3, you learnt about various ways of deleting a text with few characters or words and a large text. The various methods of deleting are important aspects of editing. In this unit we are focusing more on editing with regards to copying, cutting and pasting a text or part of it as the case may be. For you to gain maximum benefit in this section, you ought to learn this unit practically using your computer. Remember that practice makes perfect.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- copy a text using the command in the tools bar, edit menu and the keyboard
- cut (remove) a text using the tools bar, edit menu and the keyboard.

3.0 MAIN CONTENT

3.1 Copying and Pasting a Text

The copy command of your computer helps you to make a copy or duplicate of your text. The paste command permits you to move a text

into a document from another place in the document or another document. When you copy or cut a text using the copy or cut command, the text (or word) that is copied is placed on the clipboard. The clipboard is a temporal location in the memory that holds data for a very short time. There are three ways you can use to copy a text using your system. They are:

1. Using the copy and paste command in the tools bar
2. Using the copy and paste commanded in the edit menu.
3. Using the keyboard command to copy and paste.

3.1.2 Using the Copy Command to Cut and Paste

Remember that the tools bar is on top of your screen- below the menu bar. Now, move your cursor to the first icon on the tool bar. What do you see? If you are using Ms-word windows XP, you will see new blank document. If you place your cursor on the second icon, you will see open. Continue to move your cursor to the third, fourth, fifth, up to the 10^{th} icon. What do you see displayed for each icon. When you place your cursor on the 10^{th} icon after the scissors icon you will see "copy" displayed. This is the copy command.

I want you to now key in the following statement.
He came to the campus yesterday and cried bitterly.

You can copy this statement and paste it anywhere you want in your document. How do you do it? Now highlight or select the statement. Recall you learnt how to highlight a text in the last unit. Move the cursor to copy command on the tools bar of the MS word screen. Click on the copy command icon. Then move the cursor to the location you want to paste the item. Now move your cursor to the paste command icon immediately after the copy command icon. Click the paste command icon and the icon is copied wherever your cursor is placed. You can copy the text into any number of places you want by clicking the paste command the corresponding number of times.

SELF-ASSESSMENT EXERCISE 1

i. Key in the following text into your system

You can specify the number of newspapers you want. Buy them on daily basis and read them. You can find interesting national and international issues on these pages of various newspapers. Form the habit of reading them. You will be enlightened the more.

ii. Save this document

iii. Copy and paste this text
iv. Paste this text 10 more times below the first text.

SELF-ASSESSMENT EXERCISE 2

Type a text of three lines on your screen. Copy and paste it five times using the command in the edit menu.

3.1.3 Copying and Pasting a Text using the Keyboard

The keyboard contains the copy and paste command keys. So you can also use the keyboard to copy and paste your text. The copy command on the keyboard is Ctrl + C. This is pronounced control C. It means that you press down the control (ctrl) key and then press down the C key at the same time. The keyboard paste command is Ctrl + V (control V). This means that you press down the control (ctrl) key at the same time with the V key.

Now type the above paragraph beginning with "The keyboard contains …" Have you finished typing it?

To copy and paste the text:

1. Highlight the text
2. Hold (press) down the ctrl key on the keyboard and press the C key i.e press down the `ctrl + C or give the command ctrl + C.
3. Now give the paste command ctrl + V ie press down ctrl key and V key at the same time. The text is copied.
4. To paste the text 5 times, give the command ctrl + V 5 times and the text is pasted 5 times on your screen. Delete all.

SELF-ASSESSMENT EXERCISE 3

i. Key in the following into your system

One way to start your Ms word is by double clicking on your MS word icon (W) on the windows desktop. When you have done this, you are presented immediately with the Ms word screen, user interface or environment.

ii. Copy and paste this text
iii. Copy and paste it 6 more times. Delete all.

3.2 Cutting and Pasting a Text

The cut command permits you to remove (cut) a text word or section of your text. You may or may not paste the text you have cut. Remember that in the last unit, you learnt how to delete large texts using the cut or scissors method. When you do not want to paste a text (ie when you want to delete the text) you can cut it.

When you want to paste the text, after cutting the text, you can have to paste it. Can you guess how to cut and paste a text?

There are three methods of cutting and pasting a text or document. They are as follows:

1. Using the cut and paste command in the tools bar.
2. Using the cut and paste command in the edit menu.
3. Using keyboard command to cut and paste.

Using the Cut and Paste Commands in the Tools Bar

Just like in copying and pasting, cutting and pasting commands are available in the tools bar. You can cut and paste as follows. Type the following:

Information utilities is a third type of on- line services that combines the other two services - the information services and interactive services. A very good example of this third utility is CompuServe. The CompuServe helps users to access news and a lot more. This service is applicable in school activities.

Have you finished typing it? Now do the following:

1. Edit the text deleting all that is to be deleted and corrected.
2. Select the whole text.
3. Move your cursor to the cut command on the tools bar and click it. What do you observe?
4. Move the cursor to another place using either the enter key or mouse. Press the enter key or click the mouse.
5. Move the cursor to the paste command on the tools bar and click it? What is your observation?
6. Paste the document five more times by clicking the paste command five times. Do you notice anything? What is it you noticed?
7. Repeat actions 1 to 6 above.

SELF-ASSESSMENT EXERCISE 4

Key in the following text: Multimedia is an area in computer that has witnessed many and varied innovations in computer science technology. It is one of the fastest growing and most exciting specialties of computer science information technology. Multimedia is the ability to present information to readers by combining text, animation, pictures and video. Examples are software, reference materials and games.

1. Cut and paste this document
2. Cut and paste it three more times
3. Cut the second pasted text (NB: do not paste)
4. Cut the last pasted text.

Do not erase or delete the text. Save it. You will use it in the next section.

3.2.2 Using the Cut and Paste Command in the Edit Menu

Cut and paste commands are also available in the Edit menu. Now if you have switched off your computer, retrieve the data you keyed in section 3.2.1 in SELF-ASSESSMENT EXERCISE 4. Have you done so? Do the following:

Block the text. Move your cursor to the edit menu and click it. Move the cursor to the cut command and click it. What is your observation? Move the cursor to a different location of your choice and click it. Move the cursor again to the paste command on the edit menu and click it. The text is pasted. Click the paste command three more times to copy the text in three different locations.

SELF-ASSESSMENT EXERCISE 5

Type a text of 10 lines in your computer. Cut and paste the first five lines of your text six times. Save this text.

3.2.3 Using the Keyboard Command to Cut and Paste

You can equally use the keys of the keyboard to execute the command of cutting and pasting. This is how you do it.

The keyboard cut command is ctrl + X (control X) ie press down the control key and the X key at the same time. Recall that the paste command on the keyboard is ctrl +V. Now, do the following:

1. ( ) Retrieve the text you typed in SELF-ASSESSMENT EXERCISE 5 above
2. ( ) Block lines 1 to 5 of the text.

3. ( ) Execute ctrl + X command (press ctrl key and X key together). What do you notice? Lines 1 to 5 are cut.
4. ( ) Move your cursor to where you want to paste the text.
5. ( ) Execute the ctrl + V command. Did you observe anything?
6. repeat the paste command three more times in three different locations.

SELF-ASSESSMENT EXERCISE 6

Write down five sentences about what you have studied in this course so far. Edit it. Cut and paste the text using the keyboard command. Paste the text seven more times.

4.0 CONCLUSION

Word processing editing using cut, copy and paste commands make editing of documents very easy. It distinguishes word processors clearly and positively from typewriting. Copy, cut and paste edit using the edit menu, tools bar and keyboard should be mastered by you. Remember that you can cut a document without pasting it and in this case, it serves as a method of deleting document.

5.0 SUMMARY

In this unit, you learnt how to copy and paste a text using the tools bar, edit menu and keyboard. You also studied how to cut and paste a document using the tools bar, edit menu and keyboard.

6.0 TUTOR- MARKED ASSIGNMENT

Describe to a beginner in computer studies how he or she can copy, cut and paste using the tools bar, edit menu and keyboard.

7.0 REFERENCES/ FURTHER READING

Obodo, G.C. (2008). *Computer Education Practices*, Enugu: Fidgina Global Books.

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Onyewuenyi, R. N. (1994). *Micro Computer Studies for Beginners*. Onitsha: Spiritan Publications.

UNIT 5 SEARCH AND REPLACE, SPELLING AND GRAMMAR CHECKING EDITING FEATURES

CONTENTS

1.0 INTRODUCTION

In the last unit, you studied how to copy, cut and paste documents using various methods such as the tools bar, edit menu and the keyboard. This unit introduces you to how to search and replace a text (or part of it), how you can spell-check and grammar-check your document. It is important that you practice very often with your personal computer. The assistance of one who is more proficient than you in the use of the computer may be necessary. Do not fail to use this facility as much as possible.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- search a text using the edit menu and keyboard
- replace a text using the edit menu and keyboard
- spell-check your document
- check your document for grammatical errors.

3.0 MAIN CONTENT

3.1 Search (Find) and Replace Editing Commands

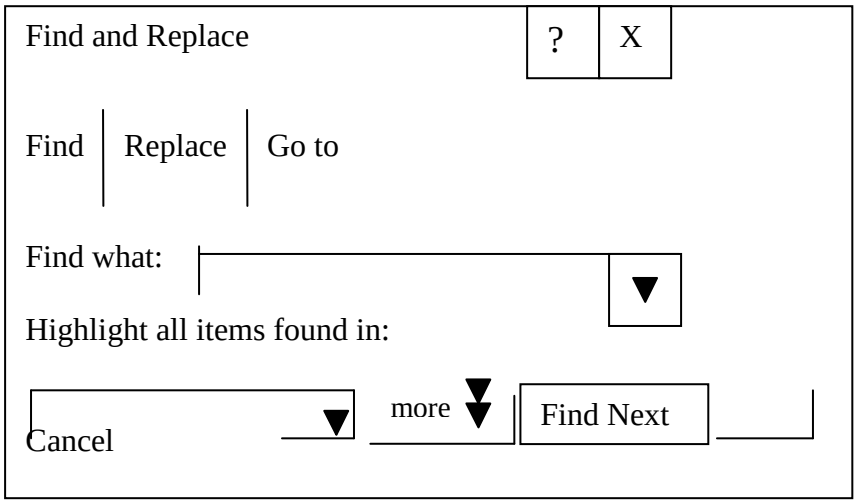
There are two methods of search and replace commands- the edit menu and the keyboard methods.

3.1.1 Search Using Edit Menu

To search means to find a specific portion of text that you have already typed in your computer. This search can range from searching for characters, to words, to phrases/clauses and to sentences. The search or find command is found in the edit menu and permits you to find a character, word, phrase/clause, sentence, etc. When you select the find (search) command, the dialogue box shown below is displayed, using Ms word windows XP.

Fig. 1

Fig 1



Insert figure number here and title.

Now, scroll your cursor to the edit menu and click it. Scroll your cursor to the find command and click it. Fig 1 above is displayed. Type in the word “praised.” You want to search beside the box “find what”. Click the button. Highlight all items found in the click “find all”. You will see all the words, praise, blocked where ever it is in the main document. To remove the dialogue box, click the close button at the top right corner of the dialogue box.

SELF-ASSESSMENT EXERCISE 1

Now type the following:

A laboratory technique is a particular skilful method of doing scientific investigations, experiments, tests, demonstrations, researches. It is a kind of technique that is applicable in mathematics, biochemistry, physics, biology, chemistry, geography etc laboratory.

i. Search for the words: technique, geography, physics
ii. Search for skillful method, kind of technique that is applicable

3.1.2 Search using the Keyboard

You can also use the keyboard to search- to find a specific portion of text that you have already typed into your computer. The keyboard command for search is ctrl + F. This command expects you to press down the control key and the F key at the same time. If you do so, the system will display fig 1 above. You can search the text you want using the keyboard command.

Now type the following:

A word processing package is a computer software that enables you to type, edit, create, arrange words into your desired format and consequently produce different kinds of documents. As a computer software, a word processing package /software will enhance your speed, accuracy, and productivity because many of the tasks are carried out automatically for you.

Search or find the following: computer software, word processing, productivity, using the keyboard command. Save this text.

To remove the dialogue box, click the close button on the top right corner of dialogue box.

SELF-ASSESSMENT EXERCISE 2

Retrieve an existing data in your computer ie a document/text you have already typed and saved in your computer. Choose any 3 words and 3 phrases you like. Search for them.

3.2 Replace Editing Command

Note that the replace command works hand in hand with the find / search command. After search for the text, you can then replace it. You

can replace a text in two ways- using the replace command in the edit menu and on the keyboard.

You can find the replace command in the edit menu. Now retrieve the text you had typed in Section 3.3.2 on word processing package. Have you done so? Search for "processing package". I want you to replace "processing package" with application software". Scroll your cursor to the edit menu and click replace.

Observe the box that is displayed.

Now study the 'find' and 'replace' boxes. What are their differences and similarities? Remember you want to replace "processing package" with "processing application software". You have already searched for "processing package". Is this phrase blocked? If it is blocked, then you are ready to replace it. If not, search for it and make sure it is blocked / highlighted / selected. Having done this, type the words, processing application package, in the box besides "Replace with". Now click "Replace all" below the dialogue box. What do you notice? All the phrases that are blocked (processing package) have been replaced with processing application package. If you have only one text to replace, you click Replace. If you want to find and replace another text, then click "find Next"

Now, I want you to find "software" and replace it with programme. What would you do? Click "Find Next" to find and replace software with programme. What do you observe?

SELF-ASSESSMENT EXERCISE 3

Key in the following:

The best manner to comprehend windows is by practically running a windows application. One of the popular word processing packages is Microsoft word. There are many versions of Microsoft word. Some of them are Microsoft word 3.1, Microsoft Word 95, Microsoft Word 97, Microsoft Word 98, Microsoft Word Office2000, Micorosoft Word Office 2003 and Microsoft Word Office 2007.- the latest version of Microsoft Word.

Save this text.

Find 'Microsoft word' and replace it with "MS word" in the text. Find 'application' and replace it with 'package'. Find 'version' and replace it with 'edition'.

3.2.2 How to use Replace Command on the Keyboard

The replace command on the keyboard is ctrl+H i.e press down the control key and the H key simultaneously. When you do this, the replace command box will be displayed. Then you can find and replace your text the way you desire.

SELF-ASSESSMENT EXERCISE 4

Retrieve the file on Microsoft word in SELF-ASSESSMENT EXERCISE 3 above. Do the exercise using the keyboard command-ctrl+H.

3.3 Spelling and Grammar Checking Editing

Your word processor has a built–in-dictionary. Hence, the word processor matches every word you type with the words in its own dictionary. When the spelling of the word you have keyed in is contradictory to what is available in the computer dictionary, your typed word is flagged (underline with a wavy red ink). If the grammar in a sentence or phrase is also contradictory, the system underlines such a sentence or phrase with a wavy green blue ink. Let us look at the two checkers separately.

3.3.1 Spell Check Editing

The spell checker detects spelling errors by matching the word in your text against an already existing built- in –dictionary in your word processor. As stated above, when you have typed a word which is wrongly spelled or not available in the word processor dictionary, MS word underlines this word with a red wavy line. Words that are repeated eg resting, resting, ms word ms word, correct, are also identified by a red wavy line.

Note that a word is flagged (underlined) as a possible error. You can correct it in four ways. You can correct it by replacing the word with possible options provided by the word processor, or by deleting the word, or by ignoring the word (i.e retaining the word), or by adding the word to the dictionary.

For you to spell check, rest the mouse pointer on the red wavy underlined word. Click the right button of your mouse. What do you see? You will see a list of possibly/suggested correct words. Select the correct word from the list of options displayed before you. Rest the mouse pointer on the selected correct word and click the right button of the mouse. The incorrect word will be replaced automatically.

Now type the following:

Man was creted with a need for a helper sutable for him from God. Man who is desireous to be self- sufficient is lacking in two directons. The two directions are vertical and horizental directions. Hence, man needs the Almight to direct and guide him. He ned a wife to be a helper to him.

What do you notice? You observe that the following words are underlined with red wavy ink- creted, sutable, desireous, directons, horizental, Almight, ned. You can correct these spelling errors with ease. Rest your mouse pointer on creted and click the right button. What do you see? A list of suggested correctly spelled words is displayed. Select the correct one (created) by resting your cursor there. Click the mouse right button and the correct word is inserted. Do the same for other words in the passage.

SELF-ASSESSMENT EXERCISE 5

1. Key in the following document

Below are the practical exercises or ms wor. Follow the steps one after the other. Ensure that you cary out one steb before you go to the other. Where you find it very dificult to exzecute a comand in any step, you are adviced not to hesitate to ask questions for your clarificatioin. You may equaly show that you canot continue that step.

Spell check this document.

2. Type your own choice of document for one full page of the computer screen. Spell checks the document properly. Save it.

Grammar Checker Editing

The grammar checker detects grammatical errors in your document. Note specially that grammatical errors, punctuations and usage errors in a document are usually identified with green wavy lines. You correct grammatical errors as you correct spelling errors using the mouse. In other words, to grammar check a document, move the cursor to the phrase/ sentence that has the wavy line. Right click the mouse button. You may see possible alternative suggestions. Right click on the correct option and the correction is automatically effected.

Now, type the following exactly the way it is:

Below is the practical exercises for ms word. Follow the step one after the other. Ensure that you carries out one step before you goes to the other. where you may finds it difficults to execute a command in any step, you is advise not to hesitate to ask questions for your clarification. You may equallyshow that you cannot continue that step.

What do you notice on your screen? You will notice the following are underlined with green wavy line: " is the practical exercises", " carries", " where you".

Now place your cursor on any location within the phrase, " is the practical exercises" right click the mouse button. What do you see? You will see the following in a box.

Are the practical exercises
Is the practical exercises
Ignore once
Grammar
About this sentence
Cut
Copy
Paste

The above are possible options. You can choose any of the two corrected phrases. If you choose the first, click on it and the correction is effected immediately.

Now right click on "carries". The correct verb is carry. Right click on carry and the correction is effected. The problem with "where you is that there is a double space between where and you. This is a punctuation problem. Right click your mouse on "where you" you will see "where you". Right click on it and the correction is effected.

The words are underlined because they are not found in the dictionary of the computer. Nevertheless, they are correctly spelt. Right click on each of the two words and then right click on ignore all. The green wavy lines will disappear if you want Igala and Tiv to be added in the computer dictionary, then you right click on "add to dictionary".

Examine the grammar check dialogue box. Below it, you find that you can cut, copy and paste documents within the text. Note that for you to cut, copy and paste, you must highlight the text first. If you do not highlight the text, the cut, copy and paste command in the grammar

check dialogue box will not be activated for use. As soon as you block the text, these three commands will be activated for use.

Notice that there are grammatical errors which the grammar checker did not correct. The second sentence reads:

Follow the step one after the other.

The correct statement is: follow the steps one after the other.
The fourth sentence reads: where you may finds it…the correct statement is: where you may find it… the grammar checker may not be able to detect serious grammatical errors and usage problems. This is one of its limitations.

On the other hand, the spell checker cannot detect correctly spelled word which is in the wrong position. Consider this sentence: He is performing wail. The word, wail, though with a correct spelling is wrongly used in the sentence. So the spell checker cannot detect it as wrong spelling. The correct sentence is: He is performing well. This means that while you are proofreading your document, do not only look for underlined wavy words/expressions but also the correctly spelt words in wrong positions.

SELF-ASSESSMENT EXERCISE 6

Type the following:

The word processor are designed to produce documents, letters and numbers. The procesing of such texts can be do in all the way in which you arranges them and prints them in every manners syou desire them to be printed. It are design to meet the uncoutable special need of today modern ofice. Word processor can copy, paginates, indexes, file, recovered documents. It can prints, spells, do statistics, do multi-page documents, etc. Word processaor can move lines, paragraph, pages, etc.

Use the grammar and spell-checkers to edit the above text.

4.0 CONCLUSION

The use of Search and Replace editing commands to edit texts is another important facility in word processing. You can search for a text or a portion of it using the Search command in the Edit menu and on the keyboard (without replacing the text you have searched for). You can also search and replace the text using the Replace commands in Edit menu and on the keyboard. Your word processor can enable you to spell check and grammar check your document.

5.0 SUMMARY

In this unit, you have studied how to use search commands in the Edit menu and on the keyboard. You also learnt how to use the Replace commands in the Edit menu and on the keyboard. Part of what you studied in this unit is how to use the spelling checker and the grammar checker in editing documents.

6.0 TUTOR-MARKED ASSIGNMENT

1. Describe in details how you can use the Search and Replace commands on the Edit menu and on the keyboard.
2. Distinguish between the functions of the spell checker and the grammar checker. In what areas are they related?

7.0 REFERENCES/FURTHER READING

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UNIT 6 FORMATTING A TEXT

CONTENTS

1.0. INTRODUCTION

In the last unit, you learnt how to search and replace a word or part of your text and how to check for spelling and grammatical errors. These are important features in editing. The present unit deals with how you can format your documents- typefaces and fonts, paragraph, bullets and numbering your text, etc. You are advised to use your PC to learn this unit. Press the computer keys with care while formatting.

2.0. OBJECTIVES

At the end of this unit, you should be able to:

- define a typeface, state its merits and mention the two kinds of typefaces we have
- define a font, state its characteristics and give some examples
- paragraph a document
- use Bullets and numbering in your document
- use outline numbering on your documents
- apply borders and shading on your text.

3.0 MAIN CONTENT

3.1 Typefaces and Font

In word processing, formatting is defined as the reorganisation of your documents to conform to a desired appearance when it is printed. To format a document means to arrange it for a computer output. You should note that formatting is the major feature which differentiates an electronic word processing from typewriting word processing.

3.1.1 Typefaces

Typefaces are collections of characteristics and symbols which have a unique look or design. There are two kinds of typefaces. One is designed with serifs and the other is without serifs. Serif typefaces contain details on the characters. Non serif typefaces do not have details on the characters. They give an entirely different appearance.

It is worthy that you note that typefaces can be scalable. This means that they can be enlarged or shrunk (reduced) to meet a given need. Scalable typefaces have the opportunities of creating virtually limitless (uncountable) fonts that have sizes up to 999.75 points in quarter-point increments.

3.1.1.1 Advantages of Typefaces

Typefaces have the following advantages:

- They improve readability
- They focus the reader's attention
- They create mood and add impact.

Note that some computer printers come with a number of scalable typefaces. You can also obtain or acquire or purchase scalable typefaces. They are available in the market, on floppy diskettes, in cartridges and in discs.

3.1.1.2 Fonts

Fonts are defined as collections of characters and symbols that have a unique design and a specific size. At this point, note the relationship and difference between a font and typeface. A typeface becomes a font when it is associated with a given/specific defined size.

3.1.1.3 Characteristics of Fonts

Fonts have seven characteristics. They are as follows:

Spacing

Every font has either a fixed spacing or proportional spacing. In fixed spacing, the effective width of every character is the same. For instances. A “b”, a “t”, and a “v” have equal width.

Nevertheless, in proportional spacing, the width of each character differs from the other. For instance, a “u” has a much larger width than an “I”. Examples of typefaces are CG Times, Times New Roman and universe. They are publication typefaces which are usually proportionately spaced.

Point size

Points measure the height of a font. A font that has a point size of 36 measures half an inch approximately. A font with a point size of 72 is approximately one inch. Similarly, a point size of 18 measures approximately one quarter of an inch.

Style

Style refers to the shape of a character. Examples of such shapes are upright shapes, condensed shape, italic shape.

Symbol Set

Symbol set refers to the specific punctuation, alphabetic, numeric and special symbols available in a font. You should note that a typeface has hundreds of varied symbols.

Stroke Weight

The thickness of print is referred to as stroke weight. Examples of such thickness are light, medium, bold and black.

Treatment

Treatment is a term used in describing a combination of stroke, weight and style.

Now move your cursor to the format menu on the top of your screen. Click it. What do you see? You will see a font dialogue box. The box

will help you to do three things- To select your desired font, character spacing, and text effects.

If you are using MS word Windows XP, you will observe that there are two kinds of fonts in the font dialogue box. They are the Latin text font and the Asian text font. Examples of Latin text font are Times New Roman, Sylfaen, Symbol, Tahoma, Tempus Sans ITC, Times New Roman Special G1, Times New Roman G2, Tiranti solid LET. Examples of Asian text font are Simsun, Nsimsun, PMingLiU, Sinittei, SimSun-ExtB. On the same font dialogue box, click on font style to see the different styles eg. Regular, italic, bold, bold italic.

Now, click on size. You will see different point sizes. Choose any of your choice point size. Alternatively, you can choose any of your choice by typing it.

This time, move the cursor to the top of your font dialogue box and click on character spacing. Click on scale, spacing and position one after another. What do you observe? You can select the scale of your choice (100%, 50%, 150%, 200%, etc). You can also select the spacing of your choice (normal, expended, and condensed), similarly, select the position of your choice eg normal, raised, lowered.

Move your cursor to Text effects on top of the dialogue box. You will see different kinds of animations – none, blinking background, Las Vegas Lights, Marching Black Ants, Marching red Ants, etc. Click on each and watch the preview box below the dialogue box. What do you observe?

SELF-ASSESSMENT EXERCISE 1

What is the difference and similarity between a typeface and font? Of what use are typefaces and fonts?

3.2 Paragraph Formatting

Another aspect of formatting is paragraph formatting. You can use your word processor to arrange paragraphs in your text the way you want. Now do the following with your computer.
Click on format button. Then click .paragraph button to display the paragraph dialogue box. You can use this box to indent and space your text, do line breaks and page breaks and to select specific kind of Asian typelogy.

To align your document, click on the Alignment button, you will see different alignments:-left, centre, right, justified, distributed, justify low,

etc. Click on any of your choice and your text will be aligned as you have chosen. Now click on cancel to remove the dialogue box.

Type the following on your screen.

MS word has many default settings for margins. They are top, bottom, right and left margins. It also has tabs, line spacing, and other formatting features. Hence, some kinds of formatting takes place by default. It is possible for you to change the default setting if you so wish.

Now do the following:

Save this text.

Highlight this text you have typed.

Click on format and then on paragraph button in the format dialogue box. On the paragraph dialogue box, click on the Alignment button and on direction (Right-to-Left). What do you see? You will see the following- Left, centre, Right, Justified, etc.
Notice that the text you have typed appeared in the preview box below the paragraph dialogue box. Click on left and watch your text in the preview box. It will move to the left. If you click on centre, the text will be centre. If you click on Right, the text will move to the right. Click on each of them and watch the movement of your text in the preview box.

SELF-ASSESSMENT EXERCISE 2

With the above document still on your screen, click on Direction (left-to-right), click on each Alignment and watch the movement of your text? What difference do you notice with the text movement when you clicked on right-to-left and left-to-right directions?

Information on the paragraph box can help you to indent your paragraphs.

There are two methods of indentation- before text and after text. Remember that windows XP is used in this illustration. Click on the "before text" up arrow and watch your text on the preview box. Keep clicking on the button and watch, what do you notice? The text is justified to the left (in a vertical line before the text) and the paragraphing moves towards the right. Notice the paragraph space in inches is indicated in the "Before text" box.

△

Now keep clicking on the "Before text" down button. What is your observation? The text moves towards the left, thus reducing the

paragraph space. This enables you to choose your desired indentation space before your text. We are through with "Before text" buttons. Let us go to 'after text' buttons.

Click the "After text" indentation up arrow button. Continue clicking it gradually and keep your eyes on the preview box. What are your observations? You will notice that the text moves to the left.

Click now on the 'After text' indentation down arrow button. Keep clicking it gradually. The text moves to the right.

The above shows that indentation can be done to the left or right of the text. You can also do it both to the left and right. This means you will centre your document. To do this, set the left and right margins indentation to your choice, say 1" to the left and I" to the right. Watch your document on the preview box. It will be centre equally on both sides.

SELF-ASSESSMENT EXERCISE 3

Key in the following:

If you do not save your document before you switch off your PC, or before there is power failure, you will loose your document. So, you must save your document from time to time. Do not wait until you finish typing before you save it. You can also space your paragraph in two ways before and after. Spacing your paragraph before, means giving space before you start typing your text. Spacing after, means giving space after you have finished typing your document.

Now retrieve the document you had earlier typed above. Click on spacing. Before up arrow button, continue clicking for 5 more times. You will see that the document moves down in spaces of 6 points, 12 points, 18 points, etc.

Click on spacing "Before" down arrow. Click on it 5 more times. You will notice that the document moves up in steps of 6 points.

SELF-ASSESSMENT EXERCISE 4

Click on spacing after up and down arrow keys in any passage .of your choice.

Write down your observations. Highlight this text. Align this text

1. To the Left, centre and right.

2. From right –to-left, to the left, right and centre.
3. From left-to-right direction, to the left, right and centre.
4. Indent this document before the text using 1", 1.5", 0.7".
5. Indent this document after the text using 12 points spacing.

Repeat this using 6 points and 18 points.

3.3 Bullets and Numbering

Bulleting Your Document

There are different kinds of bullets and numbering styles you can use to beautify your documents. It is better to demonstrate this practically using your PC (personal computer). Remember we are using MS Word windows XP in all our illustrations in this course.

1. Now click on format. Scroll your cursor to Bullets and Numbering in the Format dialogue box. Click on that button.

   There are four activities you can do using this Bullets and Numbering dialogue box. Can you see them on top of the dialogue box? They are Bulleted/Numbered/Outline Numbered /List Style.

2. Here, you will learn how to bullet your documents. There are eight ways you can bullet your documents as you can see. They are: None, ., o, !, .:., >, and √ . if you do not want your document to be bulleted, click on None.

Click on box, and click Ok. What do you see?

You will see a bullet on your screen. Type one word, press the Enter key. Is there any other observation? You will see another bullet. Type another word. Press Enter key and you will see another bullet. Your documents will be bullet until you decide to stop the bulleting. To stop the bulleting, click on format and on Bullets and Numbering.

Then click None and click Ok. The document will not be bulleted again.

SELF-ASSESSMENT EXERCISE 5

Use each of the other bullets to bullet your document eg.
o, , >, , , ● etc.√

3.4 Numbering your Documents

Let us go to Numbering aspect of bullets and numbering. If you have closed the Bullets and Numbering dialogue box, activate it now. Click on format and then on Bullet and Numbering. On Bullets and Numbering dialogue box, click on "Numbered". What do you see? You will notice eight kinds of Numbering – None, 123, I, II, III, A,B,C, a) b) c), a b c, i, ii, iii. You can now learn to number your text as you like.

Have you clicked on "Numbered" button? Click on the first numbering style ie 1, 2, 3 and click Ok. What do you see? The number 1 appears on your screen. Type QWERTY and press Enter key. Type COME and press Enter key. Type CAMPUS and press Enter key. Describe your observation.

SELF-ASSESSMENT EXERCISE 6

Use each of the remaining numbering systems to number your document of choice. Type only one word for each number.

3.5 How to use Outline Numbering

The third function of bullets and numbering dialogue box is to carryout numbering for an outline. Example of outlined number is:

1 _____ or I _____
a) _____ 1.1 _____
b) _____ 1.1.1_____
I _____

At this time, click on "outline Numbered" in the Bullets and Numbering dialogue box. Click on None and click on Ok. No numbering will be shown. Now click on the second.

Option: I, a, I, … and click Ok the number 1) appears. Type "Abuja" and press Enter key. The number 2 appears. Type Lagos. Press Enter key and the Number 3 appears. As you continue typing, line after line and you get to number 4, press Enter key and the number 4 appears. If you want to change the numbering style, you can do so by blocking the text you have just typed above numbered 1 to 4. click format window and then click "Bullets and Numbering" in format dialogue box. In the Bullets and Numbering box, click .:. button and click Ok. The numbering of your document change to .:., .:., .:., .:.,

SELF-ASSESSMENT EXERCISE 7

Type the following.

i. I am offering the course EDU 804
ii. I am a doctoral candidate in the School of education
iii. I like the open university academic programme.

I will encourage my friends to apply for admission into National Open University of Nigeria (NOUN) for Diploma, undergraduate, masters and doctoral programmes in the various schools of the university.

Practice the following.

Change the numbering style to .:., chapters, article.

Explore the use of other outline numbering methods in your computer.

3.6 Borders and Shading Formatting

In formatting, there are various kinds of Borders and shading. They are: none (where you do not want any kind of shading and borders), box, shadow, 3-D and Custom.
You can choose any of these. There are also various styles you can choose for borders and shading.

Your borders and shading can be in different colours. You can choose a colour of your choice. You can equally choose the width of your Borders and shading. Now, let us learn how to apply Borders and shading to your document. Click on format and then on Borders and Shading on the format dialogue. There are three things you can do with Borders and Shading formatting. You can apply borders to your document. You can apply page border and also do some shading.

To practice this, type the following text:

A port is a connecting socket or jack at the rear of the system unit. It is a place where you plug different types of cables. These connected sockets are called connectors where external devices are plugged.

Save this document and block the document. Click on format, and then on Borders and shading. Click on Box or any border of your choice. Click ok. Watch and see that the text is boxed. Again go back to the Border and shading dialogue box by clicking on Format and then on borders and shading for the Borders and shading dialogue box to appear. Notice that the box Border which you selected earlier is still highlighted.

Choose style of Border by clicking the choice of Border you want eg……..choose the colour of border you want by clicking Automatic button under colour. Now click on any colour of your choice from the several colours displayed say, red. Click. Ok button. What do see? The Borders appear in red colour. You can do many more things on the Borders you have chosen. You can increase the width.

Click on button. Various sizes of width appears e.g ½ point, 1 point, 2 ½ point , 3 points, etc click on 3 point. Watch the dialogue box: what do you notice? The width of the Borders increase. Right now, click the ok button. The Borders are increased.

To remove the Borders and shading, click on "None" button and click ok button. The Borders and shading will disappear. Now remove the Borders and shading.

SELF-ASSESSMENT EXERCISE 8

Retrieve the above document which you have just typed above if you have switched off your computer. Apply a Border and a shade of your choice. Choose a style of Border you like. Let the width of the Border by 2 points.

4.0 CONCLUSION

Formatting is very important in word processing. The beauty of your document lies on the formatting. The selection of typeface /fonts, borders and shading, bullets, numbering style etc all go to enhance the quality of the final document when it is printed. When two persons are given the same document to type and print, the difference in the quality and beauty of the printed document is in formatting. Therefore there is need for you to learn how to format very well using different style – for variety and variation, they say, is the spice of life.

5.0 SUMMARY

In this unit, you have learnt about typefaces and its merits, fonts and its characteristics, paragraph formatting and borders and numberings. You also studied how to apply outline numbering, borders and shading. These are essential aspects of formatting which must be at your finger tips.

6.0 TUTOR-MARKED ASSIGNMENT

Describe fully how you can use spacing, point size and style to beautify your document. Describe to a computer novice how you can effectively use paragraph formatting.

7.0 REFERENCES/FURTHER READING

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UNIT 7 OTHER FORMATTING FEATURES

CONTENTS

1.0 INTRODUCTION

In the last unit you studied, you learnt about typeface and text fonts. You also studied how to do paragraph formatting, use bullets and numbering, and how to number your document. You learnt about borders and shading formatting. In this unit, you will learn more about other formatting features. Ensure that you use your PC to learn these concepts practically.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- make bold, italicize and underline your document using the tools bar and keyboard
- set space between lines and align your document
- apply headers and footers, columns and rows
- enter data into tables.

3.0 MAIN CONTENT

3.1 Bold, Italics and Underlines (B,I,U)

You can use your word processor to bold, underline and italicize a word or sentence in your text for purposes of emphasis or drawing attention. There are two methods you can use to bold, underline and italicize your document. They are, using the B I **U** on the tools bar and using the keyboard.

3.1.1 Using the Tools Bar to Bold, Italicise and Underline

Let us learn how to use the tool bar **B I U**. Type the word: Format. Highlight the word. Click your mouse on bold **B** on the tools bar. Click your mouse anywhere outside the highlighted text. What do you notice? The word is now in bold and the highlighting is no longer there. Highlight the word again and click on **I** (Italicize). The word is italicized. Click outside the blocked text and the word Format is italicized and the highlighting disappears. Highlight the word again and click on U (underline). The word is underlined. Click outside the blocked word and the blocking disappears.

Note that you may bold, italicize and underline a word or sentence at the same time. Now type the word: default. Select this word. Click on B. The word is bolded. Click on I. The word is italicized. Click on U and the word is underlined.

SELF-ASSESSMENT EXERCISE 1

Type the following:
Education 804

This course is compulsory for all students offering a Ph.D programme in the Faculty of Education. It gives one thriving on data processing and analysis must do very well in the course. Save this text.

Bold, italicize and underline the heading. Bold the word compulsory. Italicize and underline faculty of Education. Bold and Italicize: Processing and analysis. Remove all the bolds, italics and underlines.

3.1.2 Using the Keyboard to Bold, Italisise and Underline

The keyboard commands can also be used to bold, italicise and underline words or sentence. The keyboard command for bold is Ctrl B ie press control key (Ctrl) and B key at the same time. For italicising, it is Ctrl+ I (press control key and I key at a time). The keyboard

command for underlining is Ctrl + U. this means hold down the control and U keys simultaneous.

Retrieve the text you saved above on EDUCATION 804.
Highlight EDUCATION 804. Bold and underline this by clicking on B and then on U. What do you see? The heading is bolded and underlined. Remove the underline by clicking I again. Remove the bold by clicking on B again. Move the cursor to the beginning of the text. Highlight the entire text by pressing Ctrl + A (This means control All) Do you observe anything? The whole text is highlighted. New bold the entire text by pressing Ctrl +B on keyboard. Underline the entire text by pressing Ctrl + U. Italicize the text by pressing Ctrl + I on the keyboard.

SELF-ASSESSMENT EXERCISE 2

Retrieve the above text on EDUCATION 804. Bold and italicize the heading. Italicize and underline the second sentence. Bold and underline the third sentence. Remove all the bolds, italics and underlines.

3.2 Setting the Spacing between Text Lines

You can set the spacing between text lines. This is referred to as line spacing. The different line spaces you can give to your document are single line, double line, 1.5 lines. You can now do the following.

Type a paragraph of your choice of about 5 lines. Block the text you have typed. Using MS Word XP, click on format. The format dialogue box is displayed. Move your cursor to paragraph button and click on it. The paragraph dialogue box is displayed. Move your cursor to line spacing and click on it. You will see different line spacing types as mentioned above. Click on double and click OK button. The text appears in double spacing. To place the line on 1.5 line spacing, select 1.5 and click Ok button of the paragraph dialogue box. The text appears on 1.5 lines spacing. To remove the blocking, click anywhere on the screen outside the blocked text.

SELF-ASSESSMENT EXERCISE 3

Type the following document.

Computers provide many persons with a means of livelihood. Many students, for example on graduation, become computer scientists or educators that can work as computer operators, hardware experts, software experts, repairers, engineers, whole sellers, retailers, and teachers/lecturers of computer science.

Space this document in double spacing and save it. Space this document in 1.5 line spacing and save it. Use the multiple spacing to space your text.

3.3 Text Alignment

You can align your text to the centre, right, left or justify. Centre alignment means centreing the lines, leaving both margins ragged. Left alignment aligns the text on the left and leaves the right margin ragged. Right alignment aligns the right margin but leaves the left margin ragged. Justified alignment aligns both the left and right margins.

Now practice on the following

Type 5 lines on the computer screen and do the following. Highlight your document and save it. Search the tools bars in your system to find out the tools for centre, left, right or justify alignment. Have you done that? If you have successfully done so, click on centre button what do you notice? Click on align left. Do you notice any change from the centre alignment? Click on right alignment. What do you observe? Click on justify. You will notice that the document aligns centre, left and justified respectivefully.

SELF-ASSESSMENT EXERCISE 4

Key in a document that will fill up your computer screen. Justify this document. Align the document left, centre and right.

3.4 Header and Footers

Header is used to specify number of line or lines of text that can appear within the top margin of your document. On the other hand, footer is utilized in spacing line or lines of text appearing within the bottom margin of your document. Within the header and footer, it is possible to insert page number, dates, number of pages, time, page set up, etc.

Using MS Word XP, you can find header and footer in the view menu. Go right now and click on the view menu on top of your screen. Scroll to header and Footer button and click on it. What do you see? You will see the Header and Footer dialogue box.

You can now type the following.

Line 1: I like this course
Line 2: I am getting interested in computer
Line 3: Processing my documents using word processor is good
Line 4: Word processing is very interesting.

To create a header for the above, do not highlight the text, click on the view menu and then click on Header and Footer button. What is your observation? The header box will appear. Now type the heading of your wish e.g. TYPING IN LINES or typing in lines. Note: the way you type your header is the way it will appear- either in capital or small letters. Click the close button on the header box. Your document is given a heading.

To remove the heading, click the view menu and click on header and footer button. Highlight the header and press the delete key. The heading is deleted. Click the close button and the header box disappears. Similarly, create a footer for this document.

SELF-ASSESSMENT EXERCISE 5

Type the following:

Style sheets assist you, the computer user, to assign formatting characteristics like font, font size, line spacing and alignment to an already named definition, such as body text or Heading. You can choose the name style from a list. As soon as you choose it, all the formats you have selected are automatically applied.

Give the heading or footer “STYLE SHEETS” to your document. Insert page number, date and time.

3.5 Inserting Columns and Rows

You can use your computer to create two or more independent columns on the page of your document. This is one aspect of formatting your document. Type the word QWERTY. Give a space and continue typing the word and giving one space until one line is full on your screen. Do not allow the word or any letter to spill to the second line. Have you done so successfully? Now copy and paste the word QWERTY to fill the whole page of your screen. Highlight your document. Scroll your cursor to format menu and click on it. Scroll to columns and click on it. The columns dialogue box appears. On this box, you will see one, two, three, left, and right. Column choices click on Two (to show you want two columns).

Click on the width and spacing buttons of your choice for the document, say width 2.75”, spacing 0.5”. Click on Ok button. What do you notice? The document is divided into two columns.

SELF-ASSESSMENT EXERCISE 6

Type, copy and paste the following statement to fill a page of your screen as you did above. I am a post graduate student of NOUN. Present this document in 2 and 3 columns.

3.6 Tables and Data Entry

Another feature of formatting is the use of tables to type data that are entered in rows and columns. You have to start by choosing the number of rows and columns which you want. Note that as you enter text in the table cell, it expands automatically. This makes room for your text which you are keying in. Using MS Windows XP, you will find table on the menu list on top of your screen. Click on table icon, you will see the table submenu with a list of items: Draw table, insert, delete, select, merge cells, split cells, split table, etc.

To insert or create a table, click on insert button and click on table on the displayed insert submenu dialogue box). The insert table is displayed. Now choose the number of columns button for either number of columns or rows. Click for 5 columns and 6 rows on each relevant button. Now click Ok button. A table of 5 columns by 6 rows is displayed. You can now start typing in each cell. Notice that as you start typing in each cell, it keeps on expanding automatically until all data are entered in the cell. Then you can move to the next cell. Now create a table of 4 rows by 3 columns.

SELF-ASSESSMENT EXERCISE 7

Type the following creating a table for it.

S/N	Names of Students	Reg No.	Score A	Score B	Grade
1	Olagun, Talulope	PAT/2009/6611	72	46	Merit
2	Mohammed, Bello	PAT/2009/6614	66	71	Credit
3	Okoro, Martha	PAT/2009/6619	84	76	Distinction
4	Ikworo, Ketu	PAT/2009/6620	42	36	Fail
5	Ikempi, Bartholomew	PAT/2009/6633	34	34	Fail
6	Solomon Godwin	PAT/2009/6643	49	66	Merit
7	Ezea, Magdalene	PAT/2009/6649	52	58	Pass.

4.0 CONCLUSION

Correct and thorough formatting reorganizes your typed document in a specified and desired appearance that you want when the document is printed. The difference between the same document typed by two different computer operators lies in formatting. What makes one

document more beautiful than the other is the major feature which distinguished electronic word processing from typewriting word processing?

5.0 SUMMARY

In this unit, you have studied how to bold, italicize and underline your document using the tools bar and keyboard commands. You also learnt how to give space between lines in your text. You can now align your text any way you want and also apply headers and footers. You also studied how to insert columns and rows and how to create tables and use them.

6.0 TUTOR-MARKED ASSIGNMENT

Is it necessary to learn how to bold, italicize and underline using both tools bar and keyboard or just one? Justify your stand. Discuss in details the differences in using the two.

7.0 REFERENCES/FURTHER READING

Ekemezie, W. N. and Ngene, N. J. (2004). *Computer and Information Technology*. Enugu: Kinsmann Publishers Ltd.

Obodo, G.C. (2008). *Computer Education Practices:* Enugu: Fidagina Global Book.

Okechukwu, Oliver O. (2006). *Introduction to Computer Applications, Programming and Internet Awareness.* Enugu: Our Saviour Press Ltd.

UNIT 8 GRAPHICAL DATA REPRESENTATIONS USING MS WORD

CONTENTS

1.0 INTRODUCTION

In the last unit, you studied formatting features such as using the tools bar and keyboard to bold, italicize and underline, setting line space, text alignment, etc. The present unit will assist you to learn how to use word processor to enter your data and represent such data graphically. It is very necessary that you use a computer so as to practicalise your learning. Learning how to use a computer without a PC is as good as not learning at all.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- use organisation chart to represent data graphically.
- use auto shapes, basic shapes, and word art to represent data.
- draw diagrams to represent data.

3.0 MAIN TEXT

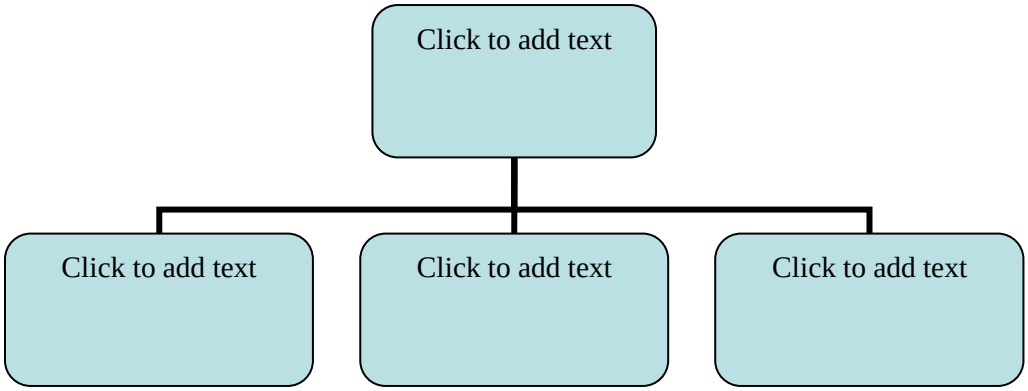
3.1 Pictorial Graph Representations

In using Windows XP, you can do not comfortable with these words so recast. pictorial graph representations. You can find pictures in the insert menu. Now scroll to insert menu and click on it. You will see displayed the insert submenu. Scroll down to picture button and the picture dialog

box is displayed. You will see the following buttons among others– Organisation Chart, New Drawing, Auto shapes WordArt, Chart.

3.1.1 Organisation Chart

Now click Organisation chart. You will see a chart like this and an Organisation chart dialog box.



With this chart, you can create a chart of your choice. Now create a family chart of your family. Type your name and the name of your wife in the topmost box. Type the names of your first three children in each of the three boxes below – one name for each box. Do you want to create more shapes for more children? Click on the left box and then go to Organisation chart dialog box beside the chart above and rest your cursor on the first tool bar. You will see displayed – insert shape. Click on this insert shape icon. A new box is added to the left box. Click on the centre box and then click on insert shape icon again. A new box is added to the centre box. Now add a new box to the right box. You can add names of more of your children.

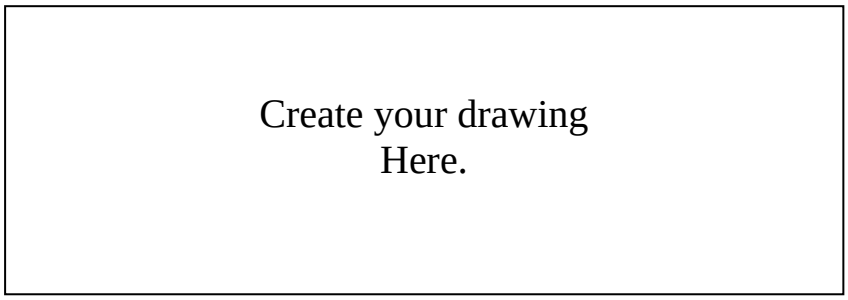
SELF-ASSESSMENT EXERCISE 1

Create an Organisation chart of your office using the above style of chart.

3.1.2 Auto Shapes Graphical Representations

Auto shapes is another form of graphical representation provided by MS Word processor. It is a part of pictorial representations. To access Auto shapes, scroll your cursor to insert menu. Click on it and scroll to Auto shapes. The Auto shapes dialog box will appear. Different icons representing Auto shapes are seen in the box. Their names are lines,

connectors, basic shapes, block arrows, flowchart, stars and banners, callouts, more auto shapes.
Now click on lines icon. Different kinds of lines will be displayed – line, arrow, double arrow, curve, freeform, scribble. Click on one of the lines, **say line.** What do you observe? You will see a box with inscription inside like this:



You can now use the auto shapes dialog box to create your choice of drawing. Click on line and move the cursor to the box above. When the cursor moves into the box, it changes to cross (+). To draw with that line of your choice on which you clicked on, hold the mouse button down and draw lines or drawings of your choice.

Can you draw a rectangle using the lines button?

Try to draw this. You will draw four different lines joining them to give the shape of a rectangle.

Click on connectors and use them to draw different drawings.

SELF-ASSESSMENT EXERCISE 2

Use the lines button to draw a rectangle.

3.1.3 Drawing Basic Shapes

Click on basic shapes button on the auto shapes. Place your cursor on the first (rectangle) shape and click on it. What do you see? You will see a displayed "create your drawing here" box. Move the cursor to this box and it changes to a cross (+). Click the mouse and the rectangular shape is displayed. Click again on the Auto shapes dialog box and click on any shape of your choice. Move the cursor to the drawing box. Click the mouse with cursor (+) inside the box and the drawing is copied in the box. Do this for two more shapes. Note that this copies the diagram inside the box. To remove the box so that the shapes stand alone, click

anywhere on the screen outside the box. To delete the shapes, press ctrl + A and the diagram is highlighted. Then press Del key to delete it.

SELF-ASSESSMENT EXERCISE 3

Draw five different auto shapes on your screen different from the ones you drew above.

3.1.4 Word Art

You can also use the MS Word art to exhibit graphical presentations of your work. If you are using Ms Windows XP, you will find WordArt in the insert menu. Click the insert menu and its submenu will appear. Rest your mouse on picture button to display the picture dialog box. You will see WordArt. Click on it. The WordArt Gallery will be displayed. Different WordArt styles are displayed. Click on any style of your choice and click Ok. Now your system will display the Edit WordArt Text. The box will display “your Text here”. You can type your text of choice here in the box. Now type this: I am great. Click Ok button. What do you see? What you have typed will appear on the screen according to your chosen WordArt style. Choose another style and click Ok button. Repeat this two more times.

You can use the WordArt to beautify your document especially in giving header to your document.

SELF-ASSESSMENT EXERCISE 4

Type: “Mr. President is here”. Create the WordArt of this statement using five different styles.

3.1.5 Chart

MS Word XP contains a chart that can help you to present data graphically. To access chart, click just on the insert menu and then rest your cursor on picture button for the picture dialog box to display. Click on chart and the document Database is displayed. This datasheet contains a tabular data with its corresponding bar graph. The datasheet table may contain some data. To type your own data, ignore the data in the table and type your own data. As you type your data in each cell, notice that the data in the cell wipes off. Alternatively, you may delete data in each cell and type your own.

Now key in the following data:

A School	B Physics	C Maths	D Chemistry	E English
Male	25	72	90	57
Female	64	38	64	67
Mixed	45	46	45	50

By the time you finish keying in, the computer displays the bar chart. Study the chart carefully. Cross check each score on the table above with the displayed bar graph. Three bar graphs are displayed for male, female, and mixed school for each subject – Physics, Mathematics, Chemistry and English.

SELF-ASSESSMENT EXERCISE 4

Use your system to draw a bar graph for the following data

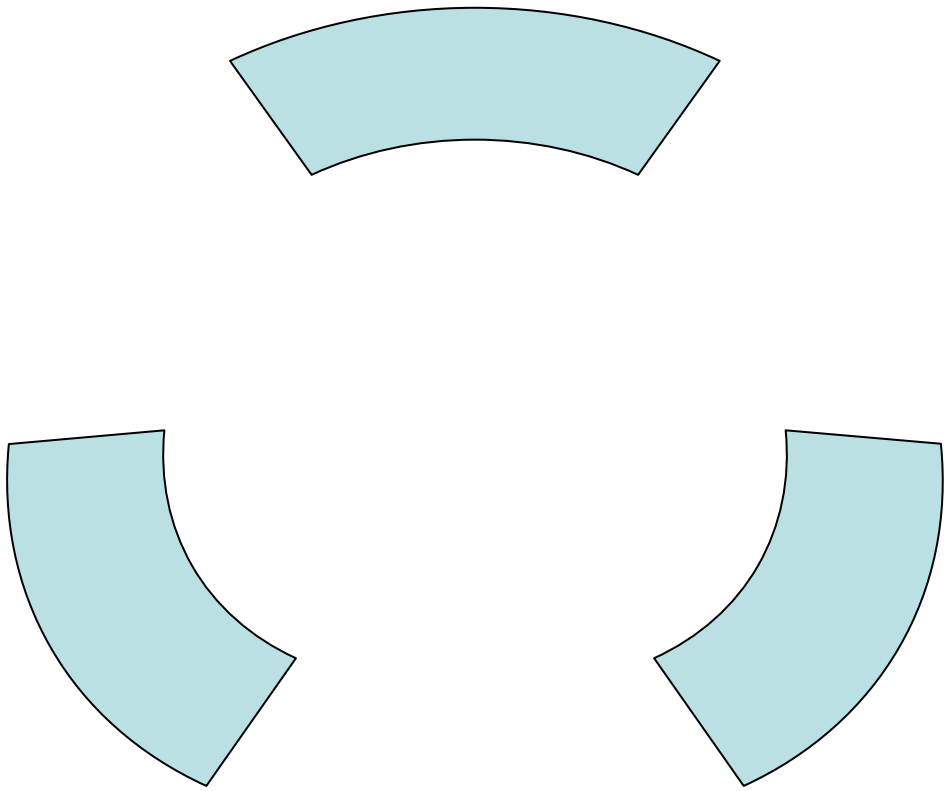
Location	Town 1	Town 2	Town 3
Urban	68	74	48
Semi-Urban	42	28	77
Rural	73	66	24
Semi-Rural	34	59	49

3.2 Diagrammatic Data Representations

MS Word Windows XP provides an avenue of representing data in a diagrammatic manner. A diagram is a kind of graph. Diagram can be found in the insert menu. Click insert and then click diagram in the insert submenu. The diagram gallery appears. This gallery shows six Organisation charts that can be used to show hierarchical relationships. You can select a diagram type of your choice to show a relationship. Select and click the first diagram and click ok button. The diagram appears on your screen with an Organisation chart dialog box besides it exactly like the one in **section 3.1.1.** You can use this diagram as you did in **section 3.1.1.** With this Organisation chart dialog box, you insert shape into the chart. You can also layout; select, auto format and text wrap etc your diagram, to your taste.

Click the second diagram titled cycle diagram and click ok button. The cycle diagram appears on your screen along side with the diagram dialog box. This box contains insert shape, more shape, backward, reverse diagram, layout, auto format, change to, text wrapping, etc. Now click on insert shape and watch the displayed diagram. What do you notice? Click on more shape backward. Do you notice anything? Click on more

shape forward and observe the diagram. Click on reverse diagram, and observe what happens on the diagram. Click on layout and the following will be displayed – Fit diagram to contents, expand diagram, scale diagram, auto layout. Click on each of these and watch the impact of each on your diagram. The cycle diagram is like this:



Where it is written in the cycle diagram, click to add text, you are expected to click at the place and add anything (by typing) you want to use the diagram to represent. Click Auto format and the diagram style gallery appears. There are different diagram styles in this gallery – out line, double outline, thick outline, primary colour, shaded, fire, 3-D, gradient, square shadows. Click on each one by one and watch the diagram carefully. If you click on one, say fire, and click Apply button, the diagram appears in free style. To delete diagram, press ctrl + A to block the diagram and press delete key. Do a similar practice on the Radial, Pyramid, Venn and Target diagrams. Note that in the diagram dialog box (submenu 1, there is a button on “change to”. You can use this button to change your diagram from Radial to Pyramid or to Venn, Target, etc.

I want you now to start afresh. Delete all you have done or save it. Click insert and click on diagram button for the diagram gallery to appear. Click on cycle diagram and click on ok button. Click on “change to” in

the diagram dialog box. Click on Radial. Watch your screen diagram. It changes to radial diagram. Click on pyramid and the radial diagram changes to Pyramid diagram. Click on Venn, and and then Target. What do you notice?

SELF-ASSESSMENT EXERCISE 5

Select a diagram style of your choice and represent a relationship you know.

4.0 CONCLUSION

MS Word processor can be effectively utilized for graphical data representations. Some of these graphical representations can be found in the insert menu. Picture and diagram submenu are available in the insert submenu. They can be extensively used to represent data pictorially, diagrammatically or in a chart form. Remember that the word processor also gives you room to create your own pictures, charts or diagrams in addition to some already provided in the system from which can select.

5.0 SUMMARY

In this unit, we have discussed pictorial graph representations. There are different types: organisation chart, auto shape, basic shapes, word art and chart. You also learnt about representing data in different kinds of diagrams. Some of these diagrams are ones you can select while others are ones you can create or complete to form a relationship of your choice.

6.0 TUTOR-MARKED ASSESSMENT

Which of the following is easier for you to use in doing graphical representations of data? Picture or diagram or both?

7.0 REFERENCES/FURTHER READING

Ekemezie, W. N. and Ngene, N. J. (2004). *Computer and Information Technology*. Enugu: Kinsmann Publishers Ltd.

Obodo, G.C. (2008). *Computer Education Practices*: Enugu: Fidagina Global Book.

Okechukwu, Oliver O. (2006). *Introduction to Computer, Applications, Programming and Internet Awareness.* Enugu: our Savior Press Ltd.

UNIT 9 RETRIEVING/OPENING A SAVED DOCUMENT AND PRINTING

CONTENTS

1.0 INTRODUCTION

In the last unit, you learnt about graphical data representations using mainly picture and diagram of various kinds. In this unit, you will learn how to retrieve/open an already saved document. You will also learn how to print preview a document and how to print a previewed document. You need a printer for this purpose and so you have to attach one to your **PC**. Buy enough printing paper for this unit. Make sure you format all your documents for printing very well.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- retrieve/open a document
- utilize the print preview using the print command in the file menu, tools bar and keyboard.

3.0 MAIN CONTENT

3.1. Retrieving/Opening Saved Document

To retrieve or open your document into memory, click the file menu's open command. Alternatively you can also click on the open icon on the tools bar or press ctrl+O on the keyboard. Now click the open command

using any of the three methods. Ms Word displays the open dialog box containing a list of names of all word documents previously saved in your system. Observe the box to see that the open dialog box has a text box (referred to as File name) where the mouse pointer is already positioned.

There are two ways you can retrieve your document as a beginner in computer; the first is to type the name of the document (File name) which you want to retrieve and click the open button. The second method is to scroll through the file name list in the open dialog box. Click the file name and click the open button. The document is displayed on the screen. Notice that as you type the file name of your document, it appears in the text box.

When you finish working on the document you have opened or retrieved, you can close the document. How can you do this? Now click the file menu and click the close button in the displayed file submenu. The document disappears from the screen. You can either open another document or start working on a new document etc.

SELF-ASSESSMENT EXERCISE 1

Open any three documents you have saved in this course and close each one.

3.2 Printing Your Document

There are two ways you can execute your print command to print your document. The first is by using the print command in the file menu or on the keyboard. Right now, click the file menu. In the displayed file submenu, you will find **"print"** click on print and the print dialog box is displayed.

3.2.1 The Print Preview Option

Before you start printing your document, there is need for you to have an idea of how your document will look like when you print it finally. You use the "print preview" feature to achieve this objective. This feature is found in the file menu and in the tools bar. In this print preview window, you will see the overall appearance of one page, or all the pages as the case may be. One of the advantages of previewing your document is that it can save you time and paper. This is because previewing reduces the number of times we print our document before it looks exactly the way we want it. I want you to preview a document.

Open one document already saved in your PC; click on file menu and then click on print preview. What do you observe? At this point, you can increase or decrease the magnification (zoom) to your taste. Notice that on top of your screen, some preview commands are displayed e.g. print, magnifier, one page, multiple pages, zoom, view ruler, shrink to fit, full screen, close preview, etc. Click on each of these windows and observe the changes in your document. **Note:** Do not click on print at this point. Click on zoom and choose a higher percentage. Click on say 100%, 150%, 50%, 10% etc. If you want to preview one page, click on one page. If you want to preview more than one page, click on multiple pages.

To close or exit the preview, click on the close button window. Do you notice anything? Your document on the screen returns to normal.

SELF-ASSESSMENT EXERCISE 2

Retrieve a document you have saved in your computer different from the one you used in the last exercise. Zoom it to 200%. Shrink it to fit. Fill the screen with the document and close the preview. Are you able to do all these? You can try it again with another document.

3.2.2 The Print Command

You are ready to print your document when you have finished making changes on it and you are satisfied with its . Then you can click the "**print"** button in the file submenu or on the tool bar or press ctrl+P on the keyboard. Make sure your printer is connected to your system before giving the print command. You can use the default settings in your printer or you can use the print command to choose different options. When you click the print button, the print dialog box is displayed. If you want to print with the default setting, click on "current page" button and click ok button. The printer prints the document.

SELF-ASSESSMENT EXERCISE 3

Open any one page document you saved in your computer. Preview that page and adjusting it the way you like. Print the document.

3.2.3 Changing Printer Settings

It is possible that sometimes you may need to print only one or two pages from a document of many pages instead of printing all the pages in that document. In this case, you may have to select the pages to be printed before asking your computer to print. You may also have the need to change printer settings or the printer itself. In cases like this, it is

advisable that you use the print command on the file menu. This is because if you click on the print icon on the tools bar, the printer will print all the pages in the entire documents using the default settings. In clicking the print command available in the file menu, or in pressing ctrl+P on the keyboard, the print dialog box is shown. You can now use this box to change the following.

3.2.3.1 Printer

If you desire, you can change the default printer or the printer settings. You may have different types of printers installed in your system e.g. Laser 1100, Laser 1300, Inkjet 850, etc. You can select any of these installed printers to print your documents job. You can select properties for your job by clicking on properties. For example, E.g. selecting the page size of your document (width and height) and nature of document e.g. letter, legal, custom size, tabloid, etc.

3.2.3.2 Page Range

There are three options in the printer page range. They are: all the pages, current page (where the cursor is positioned), and pages (in certain ranges/ selected pages). If you want all the pages to be printed then click “All” and ok button. If you want the current page where the insertion point is positioned, then click current page and click ok. Suppose you want to select some pages for printing, then enter each page or range of pages (e.g. 1-2) and put comma after each page or range of pages. For instance, rest the cursor on the pages box and type 1-5, 10, 12. Click ok and the printer will print pages 1 to 5, 10 and 12 only.

SELF-ASSESSMENT EXERCISE 4

1. Retrieve one page document you have saved in your computer. Print it.
2. Retrieve a document of not less than 10 pages in your system, print pages 3-4, 7 and 10.

3.2.3.3 Copies

This section of the print dialog box helps you to specify the number of copies of the document you want to print. Make your desired setting in the print dialog box (say 1 or 2 or 5) and click ok button. The printer starts printing your document.

SELF-ASSESSMENT EXERCISE 5

Open a document of not more than 5 pages in your system. Print 3 copies of page 1, 2 copies of page 2, 4 copies of page 3.

4.0 CONCLUSION

You cannot retrieve or open a document you have not saved. Save your document always and then you can retrieve it later. Your document should be formatted first before you print it. Poor formatting will lead to poor appearance after printing. To enhance the quality of your production, always preview your document before printing by using the print preview option. Check the printers setting before you print your document.

5.0 SUMMARY

Now that you have studied this unit, you should be able to retrieve or open your saved document. You would also able to preview your document before printing it. You can also print your document using either the print command in the file menu, tools bar or keyboard. You are now familiar with how to select printer's page range and number of copies before you print.

6.0 TUTOR-MARKED ASSIGNMENT

Describe the various kinds of printers available. Distinguish between Laser and Inkjet printers.

7.0 REFERENCES/FURTHER READING

Ekemezie, W.N. and Ngene, N.J (2004). *Computers and Information Technology*. Enugu: Kinsmann Publishers Ltd.

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MODULE 2 DATA ENTRY, PROCESSING AND ANALYSIS USING MICROSOFT EXCEL

UNIT 1 THE SPREADSHEET

CONTENTS

1.0 INTRODUCTION

In the last unit, we ended our study of Ms Word with how to open and print your document. In this unit, we are starting with the topic spreadsheet. Definitions, types, merit/uses of either the manual or electronic spreadsheet will be learnt. We will also learn about cell, model, workbook and worksheet. I encourage you to re-read this unit so as to have a thorough preliminary understanding of basic concepts before going to unit 2.

2.0 OBJECTIVES

At the end of this unit, the students should be able to:

- define spreadsheet, mention its types, and differentiate between them
- mention the merits of electronic spreadsheet
- state the different spreadsheet software
- distinguish between a cell and a model, a workbook and a worksheet
- describe the uses of spreadsheet program.

3.0 MAIN CONTENT

3.1 The Spreadsheet

The concept of spreadsheet is not a new one. This is because it is almost as old as when business started. Businessmen and women have used spreadsheet for many decades in keeping track of their money (income and expenditure) and for making predictions about their sales and profits. An example of this old spreadsheet is the ledger. In a simple manner, a spreadsheet is an array or rows and columns into which you can enter data and manipulate them. It is a workbook that consists of many sheets that contain rows and columns.

A spreadsheet is a tool that keeps track of transactions and the impact, which a single transaction makes on financial operations of a business. There are two kinds of spreadsheet - manual spreadsheet and the electronic spreadsheet**.**

SELF-ASSESSMENT EXERCISE 1

Define a spreadsheet in your own words.

3.1.1 The Manual Spreadsheet

The manual spreadsheet is defined as a handwritten tool used in keeping track of transactions and the impact of a single transaction on the financial operations of a business. The earliest kind of spreadsheet is .an accountant's ledger book. A ledger has columns and rows that are presented on paper like a graph sheet. Its cells are either square or rectangular. The manual spreadsheet has a limited number of rows and columns.

SELF-ASSESSMENT EXERCISE 2

What do you understand by a manual spreadsheet?

3.1.2 The Electronic Spreadsheet

The electronic spreadsheet is an electronic version of the manual spreadsheet that is used to manipulate numbers, execute calculations and to display the result of such calculations for the next action. It can also be defined as an application which uses mathematical formulas to carry out calculations on arranged data in a grid or matrix. It can simply be defined as an electronic version of an accountant's ledgers book. It is a computer software or program that carries out calculations on several columns and rows. A spreadsheet consists of rows and column where you enter and manipulate many numerical data.

The electronic spreadsheet is a software package / programme that is written by a software expert so as to handle all accounting and statistical problems. The expert (programmer) designed the programme in a manner that permits the user to do his / her work in the worksheet. Remember that this spreadsheet was designed after the traditional accounting worksheet (ledger book) that have long been utilized by accountants, managers of big companies and other financial experts to balance their sales, income, projections, expenditure and budgets. It is a package that is used as a general-purpose problem-solving tool. An electronic spreadsheet is an electronic workbook consisting of sheets, which contain rows and columns or charts.(The facilitator shows the students the window of a spreadsheet using Ms Excel or any other spreadsheet software and /or directs them to examine the window .in their own computer at home. Here is an example of a spreadsheet.

Microsoft Excel
File Edit View Insert Format ….
Tools Bar positions here…..

	A	B	C	D	E	F	G	H	I…
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
.									
.									
.									

SELF-ASSESSMENT EXERCISE 3

Explain in your .own words, the concept of electronic spreadsheet?

3.1.3 Merits of Electronic Spreadsheet

The use of the electronic spreadsheet makes work easier for accountants and other financial experts than when they use the ledger book. The ledger book makes their work tedious, untidy and rough. Balancing of daily accounts becomes a problem in using ledger book. While balancing of accounts is done electronically using electronic spreadsheet, it is done manually and mentally using ledger book.

In electronic spreadsheet, there is the ability to manipulate numbers without stress and it makes the application beautiful. In manual spreadsheet, it is very difficult to manipulate numbers and data and requires plenty of energy and time. In electronic spreadsheet, less time and energy is spent in processing and analysis than in manual spreadsheet. Errors are less likely in electronic than in manual spreadsheet. Errors are very prevalent in the later.

Electronic spreadsheets are very useful mainly in business organisation and in many other situations that get involved with working .with large numbers of figures e.g. computation of population figures, examination scores, academic records, etc.

The spreadsheet is designed to make your working life easier and to reduce the amount of time you spend keeping records, balancing books, and drawing graphs. It gives you much more time to focus on the future. Remark that the automatic features of the spreadsheet help you to make connections between different areas, uncover weak points, and predict future trends.

From all the above, you can deduce that the electronic spread sheet has simplified the work of bookkeepers and accountant and accountants in keeping track of the transactions of many and varied kinds of business. You should note remarkably that keeping track of transactions is easy because the size of electronic spreadsheets permits you to make more complicated calculations and forecasts.

Note also that one of the biggest advantages of electronic spreadsheet is the ability to allow formulae to be assigned to the cells. The formulae enable the CPU to do calculations automatically. And it is a great time – saver for the user. What are the components of the formulae? The formulae consists of addition (@ SUM), multiplication (*), division (/) and subtraction (-) or a combination of these functions.

Another advantage of this spreadsheet is the ability to make instant calculations as soon as the values and formulae are entered. There is another important feature that is useful to business people. It is the "what- if" feature. This feature permits the business people to see the effects/ impacts of a transaction before the transaction takes place actually. The feature assists the business people to avoid problems and to make and manage money. It is very easy to effect corrections in electronic spreadsheet. For instance, if you make a correction in one value, the spreadsheet recalculates all other values that is related to the changed value instantly.

Again, the electronic spreadsheet programmes provide analytical capabilities and statistical procedures for analysis from many and varied disciplines of life. For example, integrated graphics tools as a spreadsheet feature assists you to create maximum impact with reports and slide shows. The electronic spreadsheet can house a database manager that can enable the user to keep track of different information or records.

SELF-ASSESSMENT EXERCISE 4

Explain to a layman in computer usage why he should use the electronic spreadsheet.

3.2 Types of Spreadsheet Software

In the market, there are many and different kinds of spreadsheet programmes you can buy. Nevertheless, each of them functions basically in the same way. Some of the software are more complex to use than the others. You need to consider what you want the particular software for before you buy it.

However, some of the most popular spreadsheet software or programmes that are available for purchase are Microsoft Excel, Quattro Pro, Supercalc, Allways and Lotus1-2-3. Each of this software comes in various versions. The latest version of each offers more capabilities. In the whole of this course, we shall use Microsoft Excel (Ms–Excel or Simply Excel) for our illustrations.

SELF-ASSESSMENT EXERCISE 5

Find as many other Spreadsheet software as possible – not less than five.

3.3 What is a Cell and a Model?

At the intersection of each row and column in a worksheet is a cell in which numbers, letters or formulas can be entered, manipulated and stored. There are many cells in a worksheet. It has earlier been stated that a spreadsheet is a general-purpose problem- solving tool. However, the first step in solving a problem is to structure the problem. How can you structure a problem? One way to structure a problem is to build a model. What do you understand by a model?

A model is a simulation of a problem. To simulate means to create particular conditions that exist in real life using computer systems, models, etc to achieve a desired purpose. In the use of spreadsheet, a model is a collection of numbers, data and formula. You can solve a problem by entering the data into your model and changing the model based on your comprehension of what the model represents. In order to visualize the problem you want to solve, you can create charts from the data you have entered. Building the model means entering all the data and formulae. If you complete building of the model, the electronic spreadsheet software performs all the calculations required so as to help you find a solution to your problem.

SELF-ASSESSMENT EXERCISE 6

Is there any relationship between a cell and a model? Explain.

3.4 Workbook and Worksheet

A worksheet is a grid of rows and columns seen on the computer screen as you access a given spreadsheet application, say Ms Excel. Columns are represented by letters (e.g. A, B, C….) and rows are represented by numbers (e.g. 1,2,3,…..). In each worksheet, there are many cells. Each cell has an address called the cell reference. The cell reference comprises of the column letter and the row number. For instance, the cell where row 3 and column B intersect has a cell reference of B3.

A workbook contains many worksheets. In other words, a collection of worksheets will give you a workbook. A workbook may contain more or less than 200 worksheets.

SELF-ASSESSMENT EXERCISE 7

1. What is the difference between a workbook and a worksheet?
2. Describe cells A8 and C12 in terms of rows and columns.

3.5 Uses of Spreadsheet Application

Some of the uses of the spreadsheet are as follows:

i. Scientists use spreadsheet software/ applications to analyze research data, results of experiments and for keeping records.
ii. Accountants use the spreadsheet application to do tax planning, calculate tax, prepare income statement, profit and loss statement, keep records and balance sheets.
iii. Spreadsheet is a very important source of data based management systems.
iv. Managers in different organizations use spreadsheet progarmme to help them prepare budgets and track business transactions.
v. Finance planners in different establishments use spreadsheet software to make forecast. As an illustration, a manager can enter this year's sales figure in a formula to forecast projected growth over the next five or more years.

SELF-ASSESSMENT EXERCISE 8

How will you convince your friend to use spreadsheet application?

4.0 CONCLUSION

The spreadsheet application is a very important one in carrying out business, accounting and statistical analysis. There are two types of spreadsheet. They are the manual and the electronic spreadsheets. There are many advantages of using the electronic spreadsheet. Note that different kinds of spreadsheet software exist. The choice of which of the software/ programme to buy from the market depends on what you want to use the spreadsheet for. Basically, different spreadsheet programmes available in the market function the same way- though some are more sophisticated than others. Spreadsheet has wide applications across different businesses in daily life.

5.0 SUMMARY

In this unit, we have learnt about the concept / definition of the spreadsheet and its two types. We have also studied the advantages of the electronic spreadsheet. You have learnt the different kinds of spreadsheet software. You can define a cell and a model and distinguish between them. You have learnt about a workbook and a worksheet – their relationship and differences. You are now familiar with the uses of spreadsheet software.

6.0 TUTOR-MARKED ASSIGNMENT

1. Compare and contrast the electronic spreadsheet and manual spreadsheet.
2. What are the merits of manual spreadsheet and the demerits of electronic spreadsheet?

7.0 REFERENCES/FURTHER READING

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UNIT 2 MICROSOFT EXCEL

CONTENTS

1.0 INTRODUCTION

In the last unit you studied the manual and electronic spreadsheets. We discussed the merits of electronic spreadsheet, types of spreadsheet software and the meaning of a cell and a model. You noted the difference between a workbook and a worksheet. You learnt about the uses of spreadsheet application and what you have to consider before using spreadsheet. In this unit, you will study Ms Excel- what it is, how to start and exit it. You will also learn parts of Ms Excel, its functions and the worksheet. To learn these, you need to consistently practise what you learn with your PC.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- define excel, start and exit Ms Excel
- describe the parts and functions of Ms Excel
- locate and describe a cell and move the active cell from cell to cell
- describe the characteristics of a worksheet.

3.0 MAIN CONTENT

3.1 What Is Microsoft Excel (Ms Excel)?

Microsoft excel, abbreviated as Ms Excel or simply Excel, is an electronic spreadsheet designed to help you manipulate all calculations irrespective of its kind. This software enables you to manipulate or do

all financial, statistical, mathematical and engineering calculations. From the brief explanation, it can be said that excel is a spreadsheet programme that is used as a problem solving tool. Recall that a spreadsheet is an electronic workbook, which consists of an electronic spreadsheet that assists you to organize information into an electronic workbook consisting of many sheets. We shall use excel as an example of a spreadsheet software to illustrate our learning in this module.

SELF-ASSESSMENT EXERCISE 1

Define excel in your own words.

3.2 Starting and Closing Ms Excel

There are two ways you can start Ms Excel. Ensure first that your computer is switched on. Then start as follows.

a. **Click on start menu.** Point the cursor on all programmes, select Excel and click on it. Or
b. **Double click on Ms Excel's icon on the desktop.** This one is a shortcut approach.

Having done 'a' or 'b' above, the worksheet area is displayed in cells with rows and columns. Study this worksheet on your screen very carefully.

To close Ms Excel, there are two ways. You can use either of the two methods:

a. **Click the close window button at the top extreme right of your worksheet.** i.e. Click the close button at the top most right corner of Ms Excel. The application is exited or closed and you are back to the start menu/ desktop. OR
b. **Click the File menu in the Menus and click Close.** With these actions, you exit the programme.

SELF-ASSESSMENT EXERCISE 2

Activate the Ms Excel in your system and exit it.

3.3 Parts of Microsoft Excel Window

Ms Excel window has five components. These parts are as follows:

The Menu Bar

The menu bar is found at the top of your computer screen. It displays the following menu options- file, edit, view, insert, format, tools, data, window, student tolls and help. These are the components of the menu bar.

The Tools Bar

Immediately below the menu bar is the tools bar. It is full of symbols. To know the meaning of each tool bar symbol, rest your cursor on it and your system will display the meaning. It has several buttons; you can use many of these buttons to give the computer commands. Remark that some of the tools bar commands are available in some windows in the menu bar e.g open, save, print, print preview, spelling, etc. The tools bar helps you to have access to many of the commands in Excel.

The Formular Bar

In some versions of excel, the formula bar is located below the tools bar. You can use it to enter and edit your data in the worksheet window.

The Status Bar

The status bar is positioned at the bottom of your computer screen. It displays information about the present excel operations that you are using.

The Worksheet Window

This is the fifth and largest part of Ms Excel screen. We shall treat it in detail in the next session.

SELF-ASSESSMENT EXERCISE 3

Compare and contrast the menu bar and the tools bar in Ms Word and Excel.

3.4 Kinds of Functions Available in Ms Excel

Several types of functions are available in Excel. Some of these functions are described below.

- **Information Function**

This function provides information that are very necessary regarding the construction and use of cells.

- **Looking and Reference Functions**

This kind of function returns data which are found in one or more of the cells on the spreadsheet.

- **Text Function**

The text function carries out activities which examine the contents of a cell, locate letters and numbers within a cell, and also examine the length of data.

- **Date and Time Function**

It is the duty of this function to make available many values that are used for calculations and comparisons that are needed time and date. It is possible for the function to compare data in 2001 and 2009.

- **Database Functions**

This function uses the spreadsheet features of Ms Excel database.

- **The Financial Function**

The financial function provides many automatic formulae which are utilized in calculating/ computing loans, interests, annuities, present values and their depreciations, among many others.

- **Mathematical and Trigonometric Functions**

This function carries out numerical, trigonometric, logarithmic, square, square roots computations.

- **Logical Functions**

This function examines various “if” conditions such as the following: if a condition is satisfied, then calculate the following, otherwise ignore.

- **The Max Function**

The max function displays the highest value in a defined or given list or block. For example, suppose you want to find the maximum in the following and you have given this command.

MAX (21,16,42,69,100,3,56). The max function will display the value 100. MAX (A1:G1) gives the highest value in the defined block of numbers where the numbers are entered from cell A1 to G1. If the numbers are entered in cells G 1 to G7, the command will be max (GI: G7).

- **The Min Function**

This is the opposite of the max function. It displays the least value in a given range or list of cells containing some numbers. Consider this. MIN (21, 16, 42, 69, 100, 3, 56). If the number are entered in cells D7 to J7, then MIN (D7: J7) will give the least value which is 3.

- **The Round Function**

The round function rounds off the value of a given number to a required number of places. In using the round function, you must indicate the value of the number and a given number of place the it must be rounded off to for instance, round (46.2896421,5) means you round off the number 46.2896421 to 5 decimal place. This function will give the answer as 46.28964. Remark that while you can place any value in the argument, you can only set the number of place from –15 to + 15.

- **The Statistical Function**

The statistical function provides more advanced calculations such as descriptive statistics, mean, median, mode, correlation and inferential statistics like the T test, analysis of variance, regression analysis, etc.

- **The = Sum Function**

This function enables you to do addition. To use this function, type the first number into the beginning of the cell you want to sum and type the last number into the end of the cell you want to sum. If the first number is in B1 and last number is in B8, then type B1 + B8. Similarly typing C1 + C5 means you want to add numbers infrom cells C1 to C5. In other words = sum function requires you to type C1 + C5 and it gives you the sum. This saves you plenty of time and reduces your chances of making mistake. Note that you are not required to type B1 + B2 + B3 + … + B8 or C1 + C2 + … C5 for each cell address into a formula. A cell address

is the description of a cell using the row and column. Eg B1 means column B row 1.

- **The Average Function**

The average function provides an average or mean value of all the cells that are referenced in the block or selected cells. For example, the command AVERAGE (A1:D1) adds the values in cells A1, B1, C1 and D1 and divides by 4. It is important to note that only the cells that have values are used for the average calculations; cells that are empty are not used. For example, if cell C1 above does not have any value, the average command adds and divides by 3.

SELF-ASSESSMENT EXERCISE 4

Which two functions above can be of greatest help to a teacher in a classroom? Explain why it is so.

3.5 Ms Excel Worksheet

I want you to boot your computer system now; activate Ms Excel as you learnt above. What do you see? You will see a worksheet an area where you do your work. Others refer to it as spread sheet because it is spread out like a sheet ruled in rows and columns. The worksheet is like a ledger – made up in rows and columns. It is organized in a tabular structure with rows and columns. The columns run form A, B, C, D to Z, from AA, AB to Az, from BA, BB to Bz, etc up to 256 columns.

A cell is one box of a spreadsheet. It may be square or rectangular. And it can be adjusted (increased or decreased). You can reference a cell by using row and column co-ordinates. For example, cell D8 refers to the cell at the intersection of row 8 and column D. In your displayed screen worksheet, do you see a shaded cell area or a thick border surrounding one cell? This cell is called the active cell. When you enter any data using the keyboard, for instance, the data appears at the active cell. Now select another cell by pressing the four arrow keys. Press each arrow key 5 times and watch the movement of the active cell. Again, use your mouse to click on any cell on the worksheet the cell automatically becomes active.

You use the term **label** to make reference to text in a spreadsheet. For example, a cell may contain the label sex or location or school. It is important that you remember that cells may or may not contain labels or values. Labels may be numbers or letters or words or mathematical formulae used in calculations.

Remember that the mouse pointer (cursor) is the visual indicator which moves around your computer screen. When you move your cursor (mouse pointer) around your spreadsheet screen, the cursor changes to the shape of a white cross. You learnt earlier that you can use the mouse to point and click on any cell in the work- sheet. This will make the cell active i.e. the cell will be highlighted. A cell in a worksheet can have three kinds of data or information- text, number and fomulae. A text is any information which contains at least one alphabetic character eg location. A number can contain any or a combination of the digits 0 to 9 and/ or a fraction of a number e.g. 5, 764, 1/3, 0.612. A number may also contain any of the four basic operations (+, -, / .*), or a combination of two or more. A formula is a statement which describes the actions that are to be performed or carried out on the cells. They may contain any or more of the four arithmetic operations. A formulae can also show the order in which operations are to be carried out.

Remember once more, that when you activate (start) your Ms Excel, a blank workbook is displayed on your computer screen. This displayed workbook is an area set aside for you to store your data within the workbook. You have several sheets within a workbook. Thus, that sheet that is displayed on your screen when you start Ms Excel is your worksheet.

In addition, the maximum size of a workbook is 256 columns by 65,536 rows. The height of a row ranges from 0 to 401 points. The maximum length of a cell content is 255 characters. The maximum number of sheets in a workbook is 255 sheets depending on the memory of your computer.

Recall that a worksheet is a grid of rows and columns while a cell is the intersection of rows and columns while a cell reference is a name formed by the combination of row number and column name e.g. cell C10. A range is a spherical group of cells e.g. A1 to J10. It can be a single cell or a combination of cells. An active cell is the name given to a highlighted cell. You use a colon (:) to separate range of cell e.g. A1: J10.

SELF-ASSESSMENT EXERCISE 5

Activate cells B36, G24, A25, C1, E22, J19, Z14, AB21, AL4, and AW16.

4.0 CONCLUSION

Ms Excel is one of the spreadsheet packages. It is started in a similar manner like Ms Word. There are five parts of Ms Excel. This software

performs as many as 14 different functions each of which is robust. The worksheet is the sheet that greets your eyes as soon as you start Ms Excel. It has many rows and columns. There are uncountable cells in a worksheet. An active cell is a cell where the mouse pointer is resting and it is a place where the data you type registers. There are 256 columns and 65, 536 rows in Ms Excel.

5.0 SUMMARY

In this unit, you learnt the definition of Ms Excel and how to start(activate) and exit it. There are 5 parts of Ms Excel. There are several functions which Ms Excel can perform. The package can also do a lot of mathematical / statistical analysis and calculations. You studied also about the workbook and the worksheet. Note the difference between the two.

6.0 TUTOR- MARKED ASSIGNMENT

1. Describe ten functions of Ms Excel.
2. Describe the characteristics of a worksheet.

7.0 REFERENCES/FURTHER READING

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UNIT 3 SPECIAL FEATURES OF MS EXCEL

CONTENTS

1.0 INTRODUCTION

In the last unit, you studied the meaning of Ms Excel, how to start and close Ms Excel, parts of Ms Excel window and the different functions available in excel. You learnt about Ms Excel worksheet and how to activate cells. In this present unit, you will study some features of Ms Excel with regards to moving the active cell, function keys, saving your worksheet, labelling columns and rows, changing the width of columns and the scroll window. Do not be in a hurry to study this unit. Take your time and repeat each step as you practice what is presented with your computer.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- use the keyboard to move active cells, compare and contrast the function keys in Excel and Lotus 1-2-3
- save your worksheet and label your columns and rows

- change the width of columns manually using column submenu command and auto fit selection command
- scroll Excel window.

3.0 MAIN CONTENT

3.1 Introduction

The Ms Excel electronic spreadsheet works with numbers when you combine these three manual tools- the ledger sheet, the pencil and the calculator. The worksheet displayed on the screen is the ledger. The mouse and the keyboard constitute the computerized pencil. The CPU of your system is the calculator. Note that a spreadsheet formula is a rule that is expressed as an equation. Let us examine some features of Ms Excel.

3.2 How to Use the Keyboard to Move Active Cell

There are several ways some keys of the keyboard can be used to move the active cell. The movement of the active cell is important because its position determines where your data will be entered. The table below shows the relevant keys, their meanings and the direction each key can move the active cell. Now start Ms Excel. Is the worksheet displayed? Press each key in the table as shown, several times, and watch the movement of the active cell.

***Table 1*: Moving the Active Cell using Keyboard Keys**

S/ N	Key	Meaning	Action/ direction
1	←	Left arrow	One cell left
2	→	Right arrow	One cell right
3	↓	Down arrow	One cell down
4	↑	Up arrow	One cell up
5	Pg dn	Page down	One screen down
7	Ctrl + →	Ctrl+ right arrow	End right
8	Ctrl + ←	Ctrl + left arrow	End left
9	Ctrl + G	Go to dialogue box	Moves to any specified cell
10	End + any arrow	End plus any arrow	Moves to any specified direction
11	Home	Home	Moves to column A
12	Ctrl+ home	Ctrl + home	Moves to cell A1
14	Ctrl + End	Ctrl + End	Moves to the last cell on the intersection of worksheet ie the right most used column and

			the bottom cell opposite the home key
15	Alt + pg up	Alt + page up	Moves screen to the left
16	Alt + pg Dn	Alt _ page down	Moves one screen to the right
17	Ctrl + pg up	Ctrl + page up	Moves to the previous sheet in the workbook
18	Ctrl + pg Dn	Ctrl + page down	Moves to the next sheet in the workbook.
19	F5	`press F5	Displays Go to dialogue box
20	Shift + F5	Shift plus F5	Displays find and replace dialogue box
21	Shift + F4	Shift plus F4	Repeats the last find and replacement action.
22	Tab →		Moves one cell to the right.
23	End +	End + right arrow	Moves by one block of data within a row.
24	End + home	End + home	Moves to the last cell on the worksheet. This is the cell located at the intersection of the right most used column and the bottom most used row in the lower right corner or the cell opposite the home cell, which is typically a cell.
	End + enter		Moves to the last cell to the right in the current row that is not blocked.

I want you to make sure that you are familiar with the above operations because that will enhance how well you use Ms Excel in your work.

SELF-ASSESSMENT EXERCISE 1

Using dialogue box, move your active cell to AZ64, BB39, A6612, BF99, IV65536. After getting to each cell, press ctrl + home.

3.3 Function (F) Equivalent for Excel and Lotus 1-2-3

The default function key commands for Ms Excel and Lotus 1-2-3 are stated below. In some versions of the two software, there are 20 function keys while in the later versions there are 12. The function key equivalents for the Excel and Lotus 1-2-3 are shown in Table 2

***Table 2*: Function Key Equivalent for Excel and Lotus 1-2-3**

S/N	Function key	Ms Excel	Lotus 1-2-3
1	F1	Help	Help
2	F2	Edit	Edit
3	F3	Name	Name
4	F4	Absolute/ relative	Absolute/ relative
5	F5	Go to	Go to
6	F6	Ctrl + F6	Next window
7	F7	Spelling check	Query
8	F8	Table recalculates automatically, unless you select the "automatic except table" check box on the calculation Tab	Table
9	F9	Calculate	Calculate
10	F10	Graph	Graph
11	F11	Chart	—
12	F12	Save As	—

Note that some of the function keys may not be usable unless you have typed in some data relevant to its usage. For example, the spelling dialogue box obtained by pressing F7 key will not be displayed unless you type in a word in a cell. Now, type WANTING in the cell A1. Press F7. The spelling dialogue box appears showing suggestions. Click on the correct suggested spelling and click on change. The correct spelling is inserted.

SELF-ASSESSMENT EXERCISE 2

What are the differences and similarities between the function keys of Ms Excel and Lotus 1-2-3?

3.4 Saving your Worksheet

There are two commands for saving your worksheet. They are the 'save as' command and the 'save' command.

3.4.1 The "Save As" Command

The save as command is used to save your worksheet when you want to give your file a new file name or new location (disk or directory) or save the worksheet in a different format. The save as command can be accessed in two ways- from the file menu or the keyboard.

To access the save as command from the file menu, click the file menu and then click the save as window. The save as dialogue box appears. You can now save your worksheet as you did in Ms Word by giving it a new name. To use the keyboard, press F12 and save as dialogue box appears. You can save your document as usual. Type the word Aba in cell A1 and save it.

3.4.2 The Save Command

The save command is used when your worksheet has a file name already and you want to retain the same name, location and file format. There are three ways to access the save command- through the file menu, tools bar and the keyboard. To use the file menu, click the file menu and then click save button. The worksheet is saved. To use the tools bar, click the save window and the worksheet is saved. To use the keyboard, press CTRL+ S keys and the worksheet is saved. You can also save it by either pressing CTRL+ S or by using the save command in the file menu.

SELF-ASSESSMENT EXERCISE 3

Type the following in one A1: computer. Save it with Com. Type King in cell A2. Save this. Change the filename to coking.

3.5 Labeling Columns and Rows

Columns and rows of a spreadsheet are usually labeled with information. In the first instance, the rows are labeled with names of items which you want to track. Move the cursor to cell A1 for the title of the items. These items are listed in rows under column A1. I recommend that the listing of the items should start in cell A3. This means that cell A2 should be a blank space between the column and the first entry as shown below. Remember that for you to move to the next line/ cell, you have to press the down arrow key. Consider the example below:

cell A1- name of the student
cell A2- blank space
cellA3 -Okere, Olusola
cell A4- Mama, Tutu
cell A5- Abbatti, Joseph
cell A6- Ubele, Mark
cell A7- Gaby, Gaba
cell A8 Garuba, Titi
cell A9- Jacob
cell A10- Zaki, Kate

Now enter the above in your worksheet and save it.
To Label the columns, move the mouse pointer to cells B1, C1, D1, E1, F1 and G1 respectively. Enter your desired heading/ title into each cell. Example is shown below

Cell BI- MAT 416
Cell C1- EDU 406
Cell D1- MAT 422
Cell E1 -EDU 425
Cell F1 -EDU 423
Cell G1 -MAT 409

Enter these titles into your worksheet containing the names you have already typed above.

It is important to note that the column width and length can be expanded as you desire. The expansion limit of a cell is determined by the software.

SELF-ASSESSMENT EXERCISE 4

Describe in your own words how you can label columns and rows.

3.6 Changing the Width of Columns

Sometimes when you are working with Ms Excel, the need arises to increase or decrease the width of one or more columns. This is because there are times when the data you want to enter in a cell exceeds the default width of a column. This means that what you want to type cannot enter the cell. It will seem to overlap the next (column or row of) a cell. If you enter data in this overlapped cell, such new data will cover the overlapped data from the previous cell and thus cause part of the data entered in the previous cell not to be seen. In Ms Excel, there are three methods for changing the width of a column in a worksheet in order to accommodate more information in that cell.

3.6.1 Changing Column Width Manually

You can change the width of the column manually. How do you do this? Place the cursor in cell A1. Move the cursor slowly to the line joining cell A1 and B1. What do you notice? The cursor changes to a cross (+). When the cursor changes to a cross, drag the width to the right to increase the width or to the left to decrease it. Have you done it successfully? Now increase the width of cells C1, D3, A5 and F9.

SELF-ASSESSMENT EXERCISE 5

Increase the height of cells A2, B4, G10, and F30. (hint: place the cursor to the line joining, for example, cell A2 and A3 and drag as indicated in 3.6.1 above.)

3.6.2 Changing Column Width using Column Submenu Command

You can increase or decrease the width of your column using the column submenu command in the format menu. This gives you the opportunity to enter a specific width for cells within the column. You are advised to be precise when you are choosing the column width settings. In other words, be sure of the width or height you want and set it at such. Otherwise, it may lead you to trial and error process therefore wasting your precious time.

Let us now do it practically. Click the format menu. Scroll to the column submenu and click it. The column dialogue box appears. Set the width or height you want and click the OK button. The width or height or both according to your setting are adjusted automatically. To remove the adjustment menu, go back to column submenu command and set it at normal or exit the Ms Excel and start it again.

SELF-ASSESSMENT EXERCISE 6

Using the column command, adjust the width of the A column to 2 inches and the width to 1 inch. Remove the adjustment you have put.

3.6.3 Using the Autofit Selection Command to Change Column\Width

The auto fit selection command is also found in the format menu. First of all, select or highlight or block the cells in a column or row you want to increase/ decrease. Click the Format menu and then the autofit selection command. The row is either increased or reduced considering the cell that contains the longest cell data. Repeat this exercise for another column different from the first column you have just changed its width.

SELF-ASSESSMENT EXERCISE 6

Increase the width of the E column using the Autofit selection command. Remove the increase to return to normal.

3.7 Scroll Window

The spreadsheet has many thousands of cells. You can also see as much as the screen can contain. There are two sets of scrolling window. A set of two (up and down) are on the vertical right side of your worksheet. Right now, move your cursor to the down window at the bottom right side of the vertical side of the screen. Scroll down the window by clicking or dragging the mouse at this window. You can also use the down arrow of the arrow keys although it is slower. Use the down arrow key to scroll through the window. Move your cursor to the up arrow window at the vertical top right corner and scroll the spreadsheet upwards.

The second set of pair of left and right arrow windows are at the bottom of the worksheet. One is pointing left and the other is pointing right. The right window scrolls to the right and the left window scrolls to the left. Are you ready to scroll? Ok, move your cursor to the right arrow window or drag the mouse. The worksheet scrolls leftwards i.e. from right to the left. Move the cursor to the left arrow window. Click or drag the mouse. The worksheet moves rightwards i.e. from left to the right.

4.0 CONCLUSION

The mastery of the use of keyboard commands can go long ways in enhancing your use of excel. When you master the use of the function (F) keys, your work on excel will be easy and faster. Because of the unreliability of electricity in this country, there is need for you to save your work from time to time. If you don't save your work regularly, when electricity trips off, you will lose all you have typed. Label your columns and rows to ease your work. Use any of the three or all the methods of changing the width and height of columns when the need arises. The use of scroll window helps you to view parts of the spreadsheet. Remember in all that practice makes perfect. So keep your hands on the computer regularly practicing all you are supposed to. Regular practice will help you a lot.

5.0 SUMMARY

In this unit, you learnt how to use the keyboard to move active cells, the function key equivalents in Excel and Lotus 1-2-3, how to save documents, label columns and widths, change widths of a column and height of a row. And how to use the scroll window.

6.0 TUTOR-MARKED ASSIGNMENT

1. Compare and contrast the use of the function keys in Ms Excel and Lotus 1-2-3.
2. Describe 3 methods with which you can change the height of rows.

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UNIT 4 SPREADSHEET EDITING

CONTENTS

1.0 INTRODUCTION

In the previous unit, you studied some special features of Ms Excel. Some of them are using the keyboard to move active cells, comparing and contrasting the function keys of Ms Excel and Lotus 1-2-3, how to save your worksheet and label columns and rows. You also learnt how to change the width of columns manually using the column submenu command and the autofit selection command. You can also scroll Excel window. In this unit, you will learn how to edit your spreadsheet-correcting mistakes, deleting unwanted data, inserting and deleting rows and columns, making changes to labels and how to use the undo/ redo entry command. So far, you must have realized the importance of using your PC to learn this course. Make sure your PC is always in order. Do not press any key you are not sure of its use. Avoid trial and error pressing or clicking of keys/ button. That may damage your system.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- correct and delete mistakes in your worksheet and spell check data in cells
- erase cells using the edit menu delete command
- insert and delete rows and columns
- make changes to labels
- use the undo/ redo entry command.

3.0 MAIN CONTENT

3.1 Checking Spellings

With the use of Ms Excel, you can check the spelling errors of data or labels or information in each cell of your worksheet. The spelling checker window is found in the tools bar. It is marked ABC (Spelling and grammar). Click on it to display the spelling dialogue box. In the box, the dictionary is for different languages: English (US), English (Australia), English (UK), French (Canada), French (France), Spanish (modern- sort). Click on any one of your choice. For example, you can click on English (US)

Now, type: **English** in one cell. Click the spelling window button on the tools bar to display the spelling dialogue box. The box presents you several suggestions of words from which you can choose one. These are suggestions presented: English, enlist, angles, ingles, eagles. The correct suggestion is English. Click on English and click on change. The cell label or data is corrected to English.

SELF-ASSESSMENT EXERCISE 1

Type the following and use the spelling checker to correct the spellings: matematics, asesment, sugestion, flench, lench, blech, frence, lebuls, capitel, consecutine, chack, cancal, chage.

3.2 Correcting Mistakes

Editing involves the improvement on the quality of a piece of writing, such as a book, letter etc to be published by correcting the mistakes, and alignment of content to audience requirement. To correct a mistake in a worksheet is not complicated. When you want to correct a mistake, go back to the cell and type in the new or correct value. Notice that the new entry will cancel the old value. Once you have corrected the error/ mistake, observe that the other entries that are affected by the change are automatically recalculated and updated. This is one of the powers of the electronic spreadsheet.

I want you to type this word in cell B3: “coming”. Type 7324 in cell B4. Go back to cell B3 and type the word, come. Do not delete the word” coming” what do you notice? As you start typing come, the word coming is deleted in cell B3. Go back to cell B4 and start typing 7432. Do not delete 7342. What do you notice?

SELF-ASSESSMENT EXERCISE 2

Type the following figures in cells C13, D13, E16, A17, and B20 respectively: 67818, 124, 3420, 0.0064, and - 0,7693. Go back to cells C13, D13, C16, A17 and B20 and state them rightly as follows- 76818,126, 4420, 0.0664, 0.7693.

3.3 Deleting Mistakes in a Cell

When you type your data, it is possible to make mistakes. Your mistake can be corrected by using the backspace key to delete the mistake. Remember that using the backspace key deletes character by character if you are typing in a cell. After typing in a cell and you move to another cell, if you return to the former cell, you can delete using the backspace key, but all the data in the cell will be deleted at once by pressing the backspace key once. In other words, it will not delete character by character.

Recall that when you want to place a label in a cell (ie label a cell), you should select the required cell and type the letters or figures. In the process of typing, the data appears in the formula bar In front of insert function designated with fx. After typing, press Enter key and the active cell moves to the next cell vertically downwards

You can equally delete data in a cell by clicking the cancel (X) button on the formula bar when you are typing in a cell. Notice that when you start typing in a cell, the cancel (X) mark appears with a check mark. If you move to the next cell, the cancel mark and the check mark disappear. The check mark represents Enter.

Let us practicalise the above now. Type the word, **come**, in any cell of your choice. Press the backspace key once at a time. What do you observe? Type the word, **come,** again in one cell and the word, **go**, **start** and **bring** in other cells. The active cell is now in the cell where you typed bring. Delete bring by pressing the backspace key. Move to the cell containing start and press backspace key. Move back to each of the two cells containing go and come and press backspace key. Do you notice any difference in deleting each of the words, bring and the other three words?

Type the word correct in a cell. Notice that the cancel mark (X) and check mark appears in the formula bar. Click cancel and the word correct is deleted. Type the word, change, and click cancel. Type the word, retype and click cancel. Now type the words, insertion and appear in two different cells. The cancel and check mark appears when you have typed Appear. Click cancel to delete appear. Move the active cell

back to the word insertion. Notice that the cancel and the check marks do not appear. So you cannot delete insertion by clicking cancel. Press backspace or delete to delete insertion.

SELF-ASSESSMENT EXERCISE 2

1. Type each of the following words and delete each immediately after typing in one cell – Garuba, Amadi, Kemgbe
2. Type the four words in number 1 in vertical cells say cells A1, A2, A3 and A4. Press Enter key and move to cell A5. Move back to cell A4 and press Enter key. Move to cell A3 and press enter key. Do the same for cells A2 and A1
3. Type method, mode, feature, edit. Delete each by clicking cancel.

3.4 How to Erase/Delete Cells Using Edit Menu Delete Command

You can use delete command in the edit menu to erase or delete cells. You should take special note of the fact that when you use the delete command to erase a cell, the cell will be removed from the worksheet. The implication is that the column will be automatically adjusted to occupy the empty cell that has been erased/ deleted/ removed.

Can you type the following words in different cells: length, precise, decrease, data? Click the edit menu and click delete command in the edit submenu. Then delete dialogue box appears. The box contains the following:

Delete, Shift cells left, Shift cells up, Entire row, and Entire column

You can click any button in the box to delete what you want. Type the word “active” in a cell and delete it using the delete command. Type column, format, row, in different cells. Delete each.

SELF-ASSESSMENT EXERCISE 4

Type each of the following and delete each using the delete command: worksheet, subtract, identify, mathematics, formula.

3.5 How to Insert and Delete Rows and Columns

With the use of Ms Excel, you can insert rows and columns and also delete rows and columns you do not desire.

3.5.1 Inserting Rows and Columns

When you have already entered your labels or data, you may discover that you need more rows and columns in between the label or data you have typed. You do not have to delete every label or data which you have entered. The data you have entered may be so much that deleting them will waste your precious time. All you have to do is to create more rows or columns to suit your need. How can you do this? The insert menu provides the rows and columns commands which will help you to insert the rows or columns. Now you want to create a new row. Type the following in cells A1, A2, A3 and A4: Technique, save, previous, before respectively. I want you to create a new row in between cells A2 and A3. Make cell A2 active. Select the Row command from the insert menu and click it. A new row is inserted between cells A2 and A3. Can you now create a new column similarly?. Type the following words: Name, function, cause, Relevant in cells B1, C1, D1 and E1 respectively. I want you to create a new column between cells C1 and D1. Make cell C1 active. Select the column command from the Insert menu and click it. A new column (blank) is created. Remember that one reason for which you will create rows and columns is to improve the appearance of a worksheet or create cells for new labels or data.

SELF-ASSESSMENT EXERCISE 5

Type the following numbers 764, 342, 48, 5, 66, 81, 19284, 100, 2489 in cells C1, C2, C3 D1, D2, D3 E1, E2, E3 respectively. Create one row each between cells C1 and C2, C1 and C3, and create one column each between C1 and D1, D1 and E1.

3.5.2 Deleting Rows and Columns

You can also use your Ms Excel to delete some rows and columns. After entering your labels / data, you may discover that you have need to delete rows or column, make a cell active in the row or column you want to delete. Block or select all the cells by pressing the relevant arrow keys. Press the delete key.

At this point, type the following numbers in different Cells in a row:1, 17, 24, 3, 66, 49, 33 42, 44, 86, 100, 976, 842, 324, 19, 6, 53, 44. Make active the cell containing 1. To select or block all the cells with data, press down the shift key and press the right arrow key (-->) until all relevant cells are selected. Now press Delete (Del) key.

Type all the numbers above in different cells along one column. Make active the first cell containing 1. Block all the cells as above. Press delete key. All data in the column are deleted.

SELF-ASSESSMENT EXERCISE 6

Type the following in one row and delete it: 14, 17, 8, 0 13, 4, 8, 101, 66, 77, 58, 34, 8, 7, 3, 2, 7, 9, 14, 18. Retype these numbers along one column and delete it.

3.6 Making Changes to Labels

There are three methods that are available to you for making changes to labels or correcting mistakes. The following are the three methods.

1. **Retyping the entire label:** To do this, make the cell you want to correct its content active and retype the label or data.

2. **Using the Edit feature/mode:** You can use the Edit feature or mode to charge labels or correct mistakes in cells. To do so, make the desired cell active. Point the cursor at the formula box. Press F2 or click the mouse. Notice that the insertion point appears in your desired cell. Press the Delete or Backspace key to delete any character you want when you have made the changes or corrections. Then press the Enter key.

3. **Using the undo/redo entry**
   It is possible to use the undo/redo entry to edit data that you have just recently typed. You are expected to use undo entry immediately after you have pressed the Enter key when you want to remove a label from a cell. This is how you can use the redo entry. When you use the undo entry mistakenly or unintentionally, then you have to select redo entry in order to undo the undo entry command. Hence, the label/data will be returned to its original form.

You have already learnt how to correct mistakes by retyping in Section 3.1. Type 4567890 in any cell. Press F2 key or click the mouse. Notice that the insertion point is inside the active cell containing the number. Make the correction as 45678 by using the backspace key to delete 9 and 0.

Now type Amaraba. Click undo command in the tool bar. The word Amaraba is wiped out. Click the redo entry command and the word reappears. If you spend much time after typing the word before you click the undo entry command, it will not work out.

SELF-ASSESSMENT EXERCISE 7

Type the label NOUNT. Correct it as NOUN using retyping method and Edit mode differently. Type NOUT again. Undo this entry. Redo it. Undo and redo it again.

4.0 CONCLUSION

Editing a worksheet is very important and ought to be carefully and thoroughly done. There are different forms of editing which you ought to master and each is as important as the other. Correcting your mistakes beautifies your work and makes it devoid of various kinds of grammatical, spelling and / or other errors.

5.0 SUMMARY

In this unit, you have learnt how to edit your worksheet such as correcting your mistakes, deleting mistake in a cell, erasing cells using the Edit menu delete command, inserting and deleting rows and columns. You also learnt about how to make changes to labels through retyping, edit mode, and undo / redo command.

6.0 TUTOR-MARKED ASSIGNMENT

Describe comprehensively how you can edit a worksheet in Ms Excel.

7.0 REFERENCES/FURTHER READING

Obodo, G.C. (2008). *Computer Mathematics Education Innovations Issues and Applications*. Enugu: Floxtone.

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UNIT 5 SPREADSHEET FORMATTING

CONTENTS

1.0 INTRODUCTION

In the last unit, we learnt about spreadsheet editing – spelling correcting spelling mistakes, deleting errors, inserting and deleting rows and columns and making changes to labels. In the present unit, you will learn about formatting your worksheet with respect to fonts and font size, bold, italics and underline. Aligning your data, cut, copy and paste and adding border and colours to your work would also be covered. You will also learn about font colouring. Remember your PC has to be with you so as to learn effectively. Remember, no practice, no learning

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- select font and font size, bold, italicize and underline your text
- align your data, cut, copy and paste your data
- add borders and colour to you work
- fill the colour of your chosen font work
- fill the color of your chosen font after typing and by automatic function.

3.0 MAIN CONTENT

3.1 Ms Excel Formatting: Fonts

Formatting in Ms Excel is very important. The size of character and the design of the character can be changed to your taste as in word processing. Click the font window and study the different font names/ design. Compare the font names and designs with that of Ms Word. Are they the same or are there some differences? Note that many spreadsheet software features have as many fonts as word processors do. Click on font size to see the different available font sizes. The selection of font sizes is as in Ms Word. You already know how to select font sizes. Compare the font sizes in Ms Excel and Ms Word. Are they the same? Are there any differences?

Type “Babara” in cell J27. Select or highlight this cell. Click on one font, say, Arial. Watch the word you have typed. Click on Arabic typesetting and observe the text. Click on four more different fonts (names/ designs).

SELF-ASSESSMENT EXERCISE 1

1. Type the word, headquarter, in cell E5. Increase the width of the column to contain the word. Highlight E5. Click on 20 different fonts and watch your screen. What do you observe?
2. Still leaving the word highlighted, select the following point sizes and watch the text: 14, 18, 26, 48, 72.
3. Click inside the font size box where you have selected point size, say 12 written). Erase the point size by pressing delete key. Type the number 44. Press enter key. What do you notice? Delete 44 in the point size window. Type 68 and press enter. What do you notice?

3.2 Bold Italics and Underline (BIU)

You can bold, italicize and underline data/ labels in cells, columns or rows as the case may be. Type QWERTY in any cell of your choice. Highlight that cell. Click on B (bold) button on top of your screen or press ctrl + B keys. The text is bolded. Click on I (italics) and the text is italicized. Click on U (underline) and the text is underlined. Type the following numbers in different cells: 146, 138, 24, 16. Bold all the cells. Bold, italicize and underline these numbers by clicking B, I, U, on the top of your screen.

SELF-ASSESSMENT EXERCISE 2

Type the following numbers – one per cell:

12	34	67	54
23	5	65	76
23	45	45	78

Bold, italicize, and underline all of the numbers. Save the data.

3.3 How to Align Your Data?

The align function in Ms Excel or any other spreadsheet software allows you to change data positions in each cell of a spreadsheet. There are three positions you can align to. You can align left, centre, and right. Two steps are involved in aligning your data. The first step is to select the desired cells that you want to align. The second step is to click on the desired alignment button on the tool – bar: left, centre, right.

Key in the following data in cells A1, B1, C1,: 10, 11, 12 respectively. Key in 16, 17, 18, in cells A2, B2, C2. Block all the cells. Scroll your cursor to the tools bar. Click on align left. Observe the movement of the figures to the left of the cell. Click on align centre, the figure are at the centre of each cell. Click on align right and the data are all at the right corner of each cell.

SELF-ASSESSMENT EXERCISE 3

Enter the following data into cell A1-4, B1-4, C1-4, D1-4 AND E1-4

10	36	47	64	14
25	55	60	86	16
32	54	47	87	71
82	16	17	9	11

Align the data to the left, centre and right. Watch the position on the screen each time. Save these data you have just typed.

3.4 Cut, Copy and Paste in Ms Excel

The cut, copy and paste command in Ms Excel are similar to the ones in Ms Word. They are available on the keyboard and in the edit submenu. Remember that the keyboard command for cut is ctrl + X, copy is ctrl+ C and the paste command is ctrl + V. Go back now and read once more, how to cut, copy and paste in Ms Word. Recall the data you saved in SELF-ASSESSMENT EXERCISE 3 above. Make cell A1 active. Cut

10 in cell A1 by clicking cut or ctrl+ X and paste it in cell G1 by clicking paste or pressing ctrl+ V. Cut cells A2 and A3 and paste into G2 and G3. Cut and paste all figures in cells B1-3, similarly into cell H1-3. Cut cell C1-3 and paste in cells T1-3. Copy the data in cells A1, B1, C1, D1, and E1 and paste into cells A4, B4, C4, D4 and E4 respectively.

SELF-ASSESSMENT EXERCISE 4

Retrieve the data you used in SELF-ASSESSMENT EXERCISE 2. Copy and paste the whole data from the cells where they are to two different locations on your worksheet. Cut and paste the data from where it is on your worksheet to two different locations on the same worksheet.

3.5 Adding Borders to Rows and Columns

You can use Ms Excel to add borders to your data. Such borders can be added to cells or rows or columns. Type 5, 8, 16, 17 in 4 different cells that are together. Simply highlight the cell, row, column or entire data you want to add border to. Then, click on borders button on the tools bar menu. You will see different borders in the borders dialogue box from which you can choose. Click on some different borders and watch the borders created on your data after clicking.

Recall the data you saved in SELF-ASSESSMENT EXERCISE 3. Copy this data and paste it into 4 different places on your worksheet. Add one border to each of the 5 copies on your worksheet. Save this work

SELF-ASSESSMENT EXERCISE 5

Key in the following into different cells

	Aba	Okene	Oyo
i.	46	28	70
ii.	74	42	16
iii.	61	66	48

Add border of your choice to this data. Save this data. Copy this data and paste it in three different places on the worksheet. Add different borders to each. Save this data.

3.6 Adding Colour to your Work

You can add colour to specific cells, columns and or rows so as to improve the appearance of your work in Ms Excel. The fill colour

window or button can be found on the tools bar on top of your Ms Excel screen. Without entering data on your worksheet you can add colour to your cells, rows and/ or columns.

Now select cells A1 to A10. Scroll your cursor to the fill colour window on the tools bar. Click it. You will see up to 40 different colours in an 8*5 length by width array. Rest your cursor on each colour and the name of the colour will be displayed e.g. black, brown, olive green, dark-green, dark- teal, dark blue, indigo, gray-80%, dark –red, orange, dark-yellow, green, gray 50%, violet, light turquoise, pale blue, light yellow, light green, bright green, lavender, white. On top of these colours, you have 'no fill'. When you want to remove any colour, block the colour and click on 'no fill' and the colour is removed. Click on any colour say brown and cells A1 to A10 will appear with that colour.

Make cell B1 active. Select cells B1 to B10. Click on fill colour window and click on another colour, say, olive green. Cells B1 to B10 are now in olive green colour. Block cells C1 to C10. Click on fill colour window and click on another colour say dark green, cells C1 to C10 appear in dark green. Highlight cells D1 to D10 and fill it with blue colour. Select cells E1 to E10 and fill it with say bright green colour. Remember that if you have data in each column, the colouring does not affect the data. But you are advised to choose a colour that will make the data visible on the screen. There is a colour you will choose and the data will be almost invisible e.g a dark green.

I want you to remove each of the colours. Note that you have filled five different columns with 5 different colours. You can remove the colours one after the other. Make cell A1 active and highlight cells A1 to A10. Click on fill colour and then on no fill button. Cells A1to A10 colour disappears. Do the same thing for cells B1 to B10, C1 to C10, D1 to D10 and E1 to E10.

SELF-ASSESSMENT EXERCISE 6

Recall the data you saved in self assessment 5 above

1. Align these data to the centre.
2. Fill the Aba column with red colour. Fill the Okene column with bright green colour. Fill the Oyo column with any colour of your choice. Remove the colours. Fill each cell with a different colour. Save your data.

3.7 Font Colour

Ms Excel has a special feature of colouring your selected choice of font. This makes the software exceptional. You should also note that Ms Windows XP has this font colour function. Learning how to use it here will also help you to use it in Ms Word. There are many fonts from which you can select as you learnt in unit 3 suppose you select Arial. As you key in your data, you can make it to appear in different colours.
There are two ways you can fil the colour of your font. One way is to type the label or data before filling the colour. The second approach is to use the automatic fill colour function- as you type; the colour is being filled immediately.

3.7.1 Filling Colour of Font after Typing Label or Data

Type the words Adah, Belo, Tunde, Baker, in four different columns as labels. Make the cell containing Adah active. Click the fill colour button on the tools bar and click one colour of your choice. The colour appears on the cell.

Make the cell containing Belo active. Click on fill colour button and click on another colour. The colour appears in that cell. Colour the cells containing Tunde and Bakere similarly with different colours.

SELF-ASSESSMENT EXERCISE 7

Type the following in different cells.

	Enugu	Ondo	Borno
i.	146	200	129
ii.	396	420	960
iii.	269	49	100

Colour the labels differently and colour the figures under each label different from the colour of the label. Remove all the colours. Colour them again as you did before using different colours from the ones you had earlier used.

3.7.2 Filling Colour of Font Using the Automatic Function

The fill colour submenu has several colours and also has an automatic fill colour function. If you activate the activate function by clicking on it, as you type the label, the character appear in that chosen colour automatically.

You will retype the names above. Before you type Adah, make active the cell you want to type Adah, say cell A15. Click on the fill colour button on the tools bar. The fill colour dialogue box appears. Click on any colour. Start typing the name Adah. As you type, each character automatically appears in your chosen colour. Make active the next cell, say cell A16, click on fill colour button and click on another colour. Type Below. Each character appears in your selected colour. Do the same for the names, Tunde, and Bakare.

SELF-ASSESSMENT EXERCISE 8

1. Enter the data below into your PC

Jos	Ibadan	Calabar	Owerri
50	142	71	44
66	181	82	43
72	61	92	48

Align the data to the left. Make the labels (Jos, Ibadan, Calabar, and Owerri) in different colours. Colour the scores under each label different from the label of the scores. Remove the colours.

2. Retype the above data in different colours using the automatic fill colour function.

4.0 CONCLUSION

Remember once more that formatting a work will assist in revealing its beauty. You need to take time to format your work. It is good to for you to note the similarities and differences in Ms Word and Ms Excel formatting. If you note them well, it will go a long way to enhance your learning and effective use of your PC. If you have effectively gone through this unit, you will discover that the only thing that will help you learn effectively is constant and effective practice with your PC. Format your work very well and you will be proud of the result.

5.0 SUMMARY

In this unit, you have learnt how to format your worksheet with regard to fonts size, bold, italics and underline, how to align your data, copy, cut and paste. You also studied how to add borders and colour to your work and how to color fonts to add beauty to your work. I now hope you can format your worksheet very well.

6.0 TUTOR-MARKED ASSIGNMENT

Compare and contrast formatting in Ms Word and Ms Excel.

7.0 REFERENCES/FURTHER READING

Obodo, G.C. (2008). *Computer/Mathematics Education Innovations, Issues and Applications.* Enugu: Floxton.

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UNIT 6 DATA ENTRY, PROCESSING AND ANALYSES USING Ms EXCEL

CONTENTS

1.0 INTRODUCTION

In the last unit (Unit 5), we studied how to format your work in spreadsheet. You learnt about selection of fonts and font size, how to bold, italicize and underline, and how to align your data to left, centre or right. You also learnt how to copy, cut and paste in addition to adding borders to rows and columns and adding colour to your work and font. You can now fill the colour of your chosen font. In this present unit, we will learn about three factors necessary in classifying data /information. You shall also attempt to master how to enter data into your worksheet and be able to define the structure of a given set of data. You will note why it is necessary to avoid mistakes in calculations and how to quickly execute column and row calculations. In addition, you will learn how to present you data in vertical and horizontal manners. It is very necessary that as you study along, you should attempt to practice with the aid of your PC.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- describe the three factors that are necessary in data classification
- enter data correctly into the worksheet
- calculate sum, average, maximum and minimum values
- define the structure of a given set of data
- present data in vertical and horizontal structures.

3.0 MAIN CONTENT

3.1 Factors Needed in Classifying Information/Data

Entering data in a spreadsheet can pose problems to students and other people. Why is this the case? The difficulty such people encounter lies in the fact that they cannot distinguish between the three basic things needed to classify information in a spreadsheet. These are the label, value and formulas. Unless you can distinguish clearly how they are used, you may find it difficult to enter data in a spreadsheet. What do they mean?

A label is any heading or title used to describe a set of specific data. It could be a word, sentence or phrase or a string of alphanumeric text Examples of a word label are location, sex, height. Examples of sentence labels are: capitals of states in Nigeria, Types of clothes. Examples of alphanumeric text labels are location 1, location 2, and location 3, each contains alphabets and number. Note that a space which occupies a cell is also a label.

A value is any figure or number that enters into a cell e.g. 1,246,889, 469.84, 0.00106. A formula is defined as an instruction for calculation and manipulation of numbers and saved as figures in a spreadsheet.

3.2 Data Entry, Processing and Analysis

Remember that Column A has to be increased in Width to contain names.

Save table 1 as Data 1.

Table 1: **Structured Data**

A	B	C	D	E
Name of student	Course 1	Course 2	Course 3	Course 4
Yetunde, Lawal	68	42	84	26
Omogide, kingsley	72	82	44	91
Bagudu, Mohammed	16	56	61	68
Okereke, Ngozika	77	49	60	70
Okosisi, Franka	39	55	81	54
Godwin, Kenneth	61	66	72	88
Governor, King	73	39	38	58
Omora, Joseph	61	42	80	70
Lawal, Mary Rose	71	83	92	81
Papa, kekere	56	49	59	61
Ketu, Makamaka	48	49	40	46
Princewill, Akwaibom	71	84	88	77
Eket, Ufot	64	65	72	54
Kalaba, Kedu	81	34	82	66

The analysis (calculation) functions available in excel are sum, count, maximum, minimum, more functions are found in the Autosum menu on the tools bar.

Note that A, B, C, D and E represent the columns. The rows are labeled 1, 2, 3,…. The labels are names of students, course1, course 2, course 3, and course 4. The figures 68, 42, 84, 26….. are the values. If you make any mistake in entering the data, correct it. But try as much as possible to ensure they are accurately entered. Note that in table 1 above, the structure of the worksheet has been defined for you- name of student, course 1, 2, 3, and 4.

Now click on the auto sum menu on the tools bar. The auto sum submenu is displayed containing the possible calculations that it can provide. It is necessary to remark that you can calculate the sum, average, maximum and minimum for each column or row. Let us calculate the sum, average, maximum (max) and minimum for each column. For column B, select cells B1 to B14 (make active cell B1, hold down the shift key and press the down arrow key until B1 to B14 are selected). Have you done this? Click the auto sum menu. Click on sum. You see 858 in cell B15. This is the sum of all the figures in column B. Remove the highlighting by clicking anywhere outside the blocked cells in column B. To calculate the average, highlight cells B1 to B14 again.

Click auto sum and click average. The average of 61.28571 is displayed in cell B16. Remove the highlight in column B. Now, we want to find the maximum number in cells B1 to B14. In this case, highlight cells B1 to B14 again. Click auto sum and click on Max. 81 appear in cell B17. Remove the highlight. To calculate the minimum value in cells B1 to B14, select these cells. Click on auto sum and click on Min. The figure 16 appears in cell B18 as the minimum number.

3.2.1 Avoiding Mistakes in Calculation

I want to remind you to be very careful in selecting the cells for calculation. Remember that the sum (858) is in cell B15. If you want to calculate average after calculating sum, and you mistakenly select cell B15 containing the sum (858), the software will include 815 in the calculation to give a wrong answer of 114.4.

Remember to label the results of your computation. For example, Cell B15 contains the sum, so go to cell F15 and type sum. If you calculate average and it is recorded in cell B16, enter the label average in cell F16 and so on. This may help you to minimize the mistake of selecting the sum or average for calculation as the case may be.

SELF-ASSESSMENT EXERCISE 1

Calculate the sum, average, max, and min of the data entered in cells C1 to C14, D1 to D14, and E1 to E14 in table 1.

3.2.2 A Faster Method for Column Calculations

In the last section, you succeeded in calculating the sum, average, max and min. for each column of data. Doing this This will took some of your time. A faster approach is to calculate the results for all the columns at the same time. How can you do it?

Highlight all the data in columns B, C, D and E at the same time i.e in cells 1 to 14 of each column. Click the Autosum window and click on sum. The system displays the sum for each of the 4 columns at a time. Remove the highlight. Block cells 1 to 14 in each column again and click on Autosum and then on Average. The Average value of each of the 4 columns appears. Remove the highlight and block cells 1 to 14 of each column as usual. Click on Autosum and Max; the Maximum (max) value for each column is displayed.

SELF-ASSESSMENT EXERCISE 2

Obtain the minimum value for each column in the data contained in Table 1.you used above.

3.2.3 A Faster Method for Row Calculations

In section 3.2.2, we calculated the sum, average, max and min for each row. These calculations can also be made for the rows. You would need to save all your answers and the data. Let us consider row 1 (cells A1, B1, C1, D1) and calculate the sum, average, max, min, and count of the values in it. Count refers to the number of items (cells) in the row. Select all the four cells in row 1. Click Autosum and then click sum. The sum 220 appears in cell E1. Remove the selection by clicking outside the selected row 1. Highlight row 1 (cells A1, B1, C1, D1) again. Click Autosum and click Average. The average (56) appears in cell F1. Remove the highlighting. Highlight the 4 cells again, click Autosum and then click count. The count (number of items in row which is 4 appears in cell G1. Highlight cells A1, B1, C1 and D1 again, click Autosum and finally max. The maximum number appears in cell H1; 84 is obtained. The minimum value for the 4 cells in row 1 is calculated in a similar manner.

Save all your answers and the data.

SELF-ASSESSMENT EXERCISE 3

Calculate the sum, average, count, max and min for each of the rows 2 to 14 in table 1 which you saved in the last section.

3.3 Defining the Structure of Given Data

The structure of data may not be easily understood because of the way the data is displayed. In such cases you need to define the structure of the worksheet. Consider the example in table 2 below:

***Table 2*: Male and Female Scores in Urban and Rural Locations**

Sex	Urban	Rural
Male	48, 64, 10, 24, 66, 17, 81, 34, 24, 86, 72, 28, 32, 46 94, 10, 06, 28, 43, 66, 72 44, 50, 56, 17, 11, 59, 64	33, 42, 39, 61, 83, 66, 71 28, 92, 49, 68, 72, 29, 39 81, 29, 42, 58, 50, 54, 62 72, 89, 42, 99, 66, 70, 83
Female	34, 66, 66, 71, 42, 38, 08 10, 19, 42, 76, 84, 22, 91 14, 28, 71, 43, 50, 60, 66, 34, 43, 61, 16, 70, 07, 84 100, 61, 62, 98, 34, 42, 69 74, 10, 08, 40, 30, 38, 90 63, 55, 44, 61, 72, 93, 37 82, 76, 65, 59, 82, 10, 14	29, 42, 93, 66, 71, 82, 84 40, 41, 66, 70, 48, 92, 80 24, 16, 08, 91, 14, 29, 31 42, 84, 76, 43, 34, 22, 36 66, 67, 66, 68, 71, 29, 90 91, 99, 84, 41, 60, 71, 20 33, 44, 82, 29, 56, 58, 48

For you to enter the above data in your worksheet, you need to define the structure of the worksheet that will fit the data for recognition by excel. If you enter the data the way it is in table 2, you may be disappointed with the result you will get. Ms Excel software or any other spreadsheet may not recognize it or may give you wrong unimaginable results.

Now suggest a structure for the data in your worksheet. Pick up your pen and rough paper and make a draft of the structure to fit your spreadsheet. Have you done so? If you have not yet done so, do it now to help yourself. You will learn a lot if you do so. I advise you not to go beyond this point unless you do so.

Now compare your draft structure with the following:

***Table 3*: Data Entry Structure 1 (Vertical Structure)**

	A	B	C	D	E
1	Urban			Rural	
2	Male	Female		Male	female
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Etc					

Table 3 is a vertical structure of your data entry. Now, enter the data in Table 2 in the Data Entry structure in Table 3. Enter all the urban male scores in column A, one score for one cell. Enter all the urban female scores in column B. C is a blank column without entries. It is made blank to beautify your work. You have to create a space between labels to make it less confusing. Colour column C to separate urban and rural scores in column D and all the rural female scores in column E. Proofread /edit all the data you have entered in Table 3.

SELF-ASSESSMENT EXERCISE 4

Calculate the sum, average, count, maximum and minimum values for each of the following –urban male, urban female, rural male and rural female students in Table 3.

3.4 Horizontal Structure of Data Presentation

Recall that Table 3 is the vertical structure of data presentation or entry. Is Table 3 different from the data structured you designed? Is it the same? If it is the same, is there any other way the data in Table 2 can be presented other then vertically? Yes you can present the data in Table 2 horizontally. Table 4 shows an example of data presentation in horizontal structure. Compare this structure in Table 4 with what you have designed? Is there any relationship or difference?

Table 4 Horizontal structure data entry

	A	B	C	D	E	F	G	H	I	J	K
1	**Urban**	**Male**									
2		**Female**									
3											
4											
5	**Rural**	**Male**									
6		**Female**									
Etc											

Enter carefully all the urban male data in row 1 – cells C,D,E, F,G,H, Enter all the urban female scores in row 2 – cells C,D,E, F, G, H, … Give space, probably one or two empty spaces (rows); e.g rows 3 and 4, between urban data and rural data. Enter all the rural male scores in row 5 and all the rural female data in row 6. Fill columns 3 and 4 with a color of your choice. Save Table 4 using a filename.

Having entered your data, you are now ready to execute some calculations with your recorded data. Find the sum, average, count, maximum and minimum values for row 1, row 2, row 6 and row 7.

Select all the figures in row 1, click. Autosum and then click sum. What result did you obtain? Calculate the average, count, max and min in a manner similar to what you did for vertical data entry.
Do the same for rows 2, 5 and 6.

SELF-ASSESSMENT EXERCISE 5

Calculate the sum, average, count, maximum and minimum values for each column (male and female scores combined).

4.0 CONCLUSION

There are three basic factors you must consider before you enter data into a spreadsheet. They are the label, value and formulas. Data entry is a process that requires great careful process. You need to edit your data thoroughly to avoid mistakes. As wrong entry will lead to incorrect results, it is important to masterlearn better a faster method of calculation because it will save you plenty of time and energy. Correct To definition of the structure of given data will aid in accurate correctly will give rise to correct analysis of data and consequently yield expected results. You can present data for computations either vertically or horizontally.

5.0 SUMMARY

In this unit, you have studied the three factors relevant in classifying information in Ms Excel. You learnt how to enter and analyse data, avoid mistakes in computations, and carryout calculations in columns and rows using a faster method. I am sure you can also define the structure of a given unstructured data, and present your structured data vertically and horizontally.

6.0 TUTOR-MARKED ASSIGNMENT

Compare and contrast the vertical and horizontal structure of data presentation. What must you consider before you enter your data?

7.0 REFERENCES/FURTHER READING

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UNIT 7 USING THE FORMULA BAR FOR DATA PROCESSING AND ANALYSIS

CONTENTS

1.0 INTRODUCTION

In the last unit, you studied data entry, processing and analysis. You learnt how to enter data into a spreadsheet, the need to avoid mistakes in calculations, and how to execute column and row calculations. You also studied how to define the structure of a given data set and presenting your data vertically and horizontally. In this unit, you will learn how to use the formula bar to process and analysis data. You will also learn how to use this formula to sum data, find average, computer standard deviation, sine of an angle, maximum and minimum values. Remember that you cannot learn this unit effectively without your PC. Ensure that your PC has the latest version of Ms Excel loaded into it.

2.0 OBJECTIVES

At the end of this unit, you should be able to use the formula bar to:

- sum data
- find average
- calculate standard deviation
- calculate sine of an angle
- Determine maximum and minimum values

3.0 MAIN CONTENT

3.1 Using the Formular Bar to Sum Data

Recall that in all the calculations in unit 6, we did not use the formula bar. Besides the Autosum (∑) mean on the tools bar is a window ( ) click on this window and it will display the Autosum submenu containing sum, average count, max, min, more functions. All along, we have been using these to do our calculations.

Clicking on the Autosum menu (∑) itself gives the formula bar itself. Click on ∑ and the formula bar displayed as
= SUM ( )
Sum (number 1, number 2,)

Inside the bracket in the formula, the cursor will be clicking. You are required to enter the range of cells you want to find the sum of the scores. For instance = SUM (D16: D30) means that we find the sum of the scores from cell D 16 to cell D30. To execute this we have to type = sum (D16:D30) and then Press Enter key. This gives you the answer. Remember that before you click the Autosum to display the formula bar, you should first of all make active the cell where you want your answer to appear. Note that position of the active cell is where the formula bar will be displayed.

Now retrieve Table 1 in unit 6. Make cell B22 active. Click Autosum menu for the formula bar to display =Sum ( ). Within the bracket displayed by the formula bar, you may enter B1:B14 so that you now have = sum (B1: B14). You can then press the Enter key for the answer to be is displayed.

If you want to use the formula bar to calculate the sum of scores in row 1, click cell G1 for instance to make it active. Click Autosum (∑) and the Formula bar, =Sum ( ) appears; type B1: E1 and press Enter key.

Note that when you make cell G1 active and click on Autosum, sometimes it may display on its own the correct formula i.e = Sum (B1: E1). Examine to see if this is the case and just press the Enter key for the answer to be displayed.

SELF-ASSESSMENT EXERCISE 1

Using the formula bar, calculate the sum for data in Table 1 of unit 5 for course 2, course 3, course 4, row 2, row 3, and rows 4 – 14.

3.2 Using the Formula Bar to find Average

The formula bar can be used to calculate average of a given set of data. The formula for calculating average is '= AVERAGE (C10: C24)'

Remember that the formula bar is available in the Autosum menu on the tools bar. Usually when you click the Autosum (not the Autosum window), the formular displayed is
= SUM ( )
(SUM (Number 1, number 2…)
To fix the formula for Average, delete sum and type Average in its place to give '= AVERAGE ( )'.

Then type the range of cells in the bracket whose average you want to find e.g. A1: A8.

Now enter the following data in Table 1 into your worksheet. Save the data

Table 1: **Scores for Calculating Average**

	A	**B**	**C**	**D**	**E**
1	NAME	GS101	GS102	GS103	GS104
2					
3	Garuba, Godwin	46	27	57	49
4	Joseph Joseph	82	48	74	48
5	Abbah, Adde	58	66	60	40
6	Comfort, Moses	62	71	70	50
7	Chinenye Oke	71	38	64	43
8	Kate, Lindaline	66	49	58	42
9	Wankwo, Kenneth	34	60	43	46
10	Peters, Peter	14	70	58	45
11	Meka, Kendo	59	81	66	40
12	Fontus, Fortunate	67	61	71	41

Bold and italicize all the labels. Note that row 2 is empty; it has no entries. To find the average for GS101 in column B, make cell B13 active. Click Autosum (∑) menu for the formula = sum (B3: B12) to display in cell B13. Delete sum and type Average and then the range of cells to be used. You can type it in either small or capital letters. This gives = AVERAGE (B3: B12). You can press the Enter key to give the requisite answer.

To calculate the average for GS 102, make cell C13 active. Click Autosum menu to display = sum (C3:C12) in cell (13. Delete sum and type Average to replace e in the place of sum and press Enter key if the

are in agreement with what you want to. The answer is displayed stated D & E in cell C13.

You can equally calculate the sum and average of all the scores for all the four GS courses. You can do this as follows. Make the cell where you want the answer to appear active, say cell D13. Click on Autosum menu to display = Sum ( ). Enter B1: E12 inside the bracket to obtain = SUM (B1: E12) and press Enter. The answer displays in cell D13.

To calculate the average, make the cell where you the want answer to appear say cell D 14 active. Click Autosum in tools to give = sum ( ) Delete sum and type Average in its place. Type B1:E12 inside the bracket so that you have '= Average (B1: E12)'.

You can now press the Enter key to display the answer.

SELF-ASSESSMENT EXERCISE 2

USING the formula bar, calculate the average scores for each of the following: column D, column E, columns B and C, B and D, B and E, C and D, C and E, D and E, rows 3, 4, 5, 6, 7, 8,9, 10, 11, and 12.

3.3 Calculating Standard Deviation using Formular Bar

The abbreviation for standard Deviation is STDEV OR STDEVA. This is the abbreviation you use in the formula. Otherwise, Ms Excel will not accept your formula for calculation. It will display that you have entered a wrong formula. Suppose you want to calculate standard deviation for GS101 make the cell where you want the answer to appear active, say cell B15. Click Autosum and the formula = SUM ( ) appears in cell B15. Delete sum, type in its place STDEV and type B3:B12 with the bracket. As in other cases, press the Enter key and the answer displays in cell B15. The steps carried out above is equivalent to

'= STDEV (B3:B12) +Press Enter key = Answer'.

STDEV or STDEVA estimates standard deviation based on a sample. Note that standard deviation is a measure of how widely values are dispersed from the average value (the mean). If your data represent the entire population, you must compute the standard deviation using STDEVPA OR STDEVP.

Now calculate the standard deviation for GS101 again using the formula = STDEVA (B3: B12). What do you notice in the two answers? Repeat the calculation with '= STDEVPA (B3:B12)'. What do you notice?

There is a difference in this value of standard deviation because while the first was computed using a sample and standard deviation, the second the population.

SELF-ASSESSMENT EXERCISE 3

1. Calculate the sample standard deviations for each of the following: GS 102; GS103; GS 104; GS102 and 103; GS 101 and GS 104; GS103 and 104; GS 102 AND 103: GS101, 102.
2. Calculate the population standard deviation for each of the following: GS102; GS103; GS104; GS102 and 103; GS 101 and 104; GS 103 and 104; GS101, 102 and 103; GS 101, 102, 103 and 104.

3.4 Using Formula Bar to Calculate Sine of an Angle

The Ms Excel symbol for the sine of an angle is SIN. SIN (number) returns the sine of the given angle. Number written inside the bracket is the angle in radians for which you want the sine Remark that if your argument is in degrees, multiply by Pi/180 radians or use the Radians function to convert it to radians. The following table might help you in your conversion

Table 2: various formula for sine of an angle.

A	B
Formula	Description (Result)
=SIN (P1 θ) OR =SIN(22/7)	sine of pi radiaus
(0,approximately)	
=SIN (P1 θ)/2or =SIN(22/D/2)	Sineof pi/2 radiaus (1)
=SIN (30*p1 θ)180)	Sine of 30^o (0.5)
4=SIN (Radians (30)	Sine of 30^o (0.5)

3.4.1 To Calculate Sine Pi Radiaus = (22/7) Radiaus.

1. I want you to make cell K1 active. Click on Autosum menu to display the formula in cell K1. Move your cursor to sum and click on it. The cursor appears around the word sum Delete sum and type S/N in its place. Press the right arrow key or click in the bracket on the formula to more the cursor inside the bracket. Type 22/7 inside the bracket and press Enter key. The formula will look like this.

= SIN (22/7) + Press Enter key = - 0.00 26 (approximately 0). (Answer)
The answer appears in cell K1. Remember that the unit of 22/7 is in radians.

SELF-ASSESSMENT EXERCISE 4

Calculate Sin (22/9, Sin (16/3), Sin (44/7) Sin(11/7).)

3.4 .2 To Calculate Sin (Pi/2) = Sin (22/7)/2 Radians

Make cell K2 active. Click on Autosum to display the fomula. Correct or fix the formula as
= SIN (22/7/2) AND PRESS Enter key
The answer 1 is displayed in cell k2

SELF-ASSESSMENT EXERCISE 5

Calculate sin (pi/3), Sin (pi/9) Sin (pi /15).

3.4.3 To Calculate Sin 30 Degrees

When your argument is in degree, say Sin 30^o, multiply it by (22/7)/180. Let us calculate Sin 30^o. The abbreviation for SINE is SINI Make, say cell G7, active (where you want your answer to appear. Fix the formula as follows

= SIN (30*22/7)/180) + Enter key = 0.500 183 (answer)
This answer is usually approximated to 0.5.

I want you to calculate the value of Sin 90^o. Fix the formula as follows:
= SIN (90 * 22/7) / 180) + Enter key = 1 (answer)
Note that sin pi/2 = Sin $180^o/2$ = Sin 90^o, pi = 180^o

SELF-ASSESSMENT EXERCISE 6

Use the formula bar to calculate sin 140^o, Sin 69^o
Sin 89^o, Sin 176^o, sin 300^o, sin 41^o, Sin13^o, Sin 900^o

3.5 To Calculate Maximum and Minimum Values using Formula Bar

You can use the formula bar to calculate the maximum and minimum values of a given set of data. Consider the data in Table 3.

Table 3: **Data to Calculate Maximum and Minimum Values**

Group 1 scores	Group 2 scores
34, 18, 16, 48, 96, 73	24,42,33,94,86,68,88,99
24, 9, 17, 88, 66, 77	43,44,16,8,14,29,33,44
44, 43, 0, 49, 53, 19	45,96,67,53,48,49,66
48, 53, 34, 26, 94, 90	30,40,36,66,77,88,98,4

Enter the data in table 3 into your worksheet. We will now use them to calculate the maximum and minimum values as follows:

3.5.1 Maximum Value

The calculate the maximum value for group 1 scores, fix the following formula in a cell where you want the answer to appear, preferably below the column or row where you had entered the last figure. The formula is:

'= MAX ( )' When you press enter the answer is obtained.

To fix this formula, make a cell active where you want your answer. Click on Autosum (∑) and the formula displayed in your chosen cell is '= SUM ( )'. Delete SUM and type MAX in its place, enter the cell range inside the bracket, say A1:A24 and press Enter key. This can be represented as '= MAX (A1:A24) + press enter key = answer'
Can you now execute the operations indicated?

SELF-ASSESSMENT EXERCISE 7

Use the formula bar to obtain the maximum value for group 2 scores in table 3.

3.5.2 Minimum Value

To obtain the minimum value for group 1 scores, make a cell active where you want your answer to appear. Click Autosum and change the formula from:

= SUM ( ) to MIN ( ). Type the range of scores inside the bracket, say:

A1:A24 to obtain '= MIN (A1:A24). You can now press the enter key to obtain the right answer.

Execute this formula command and your computer will display the minimum value.

SELF-ASSESSMENT EXERCISE 8

Use the formula bar to calculate

i. The minimum value for group 2 scores in table 3
ii. The maximum and minimum scores for group 1 and 2 scores combined.

4.0 CONCLUSION

If the data is large, you will discover that it is faster to do your calculations using the formula bar. Its use facilitates the calculation. You can use the formula bar to calculate sum of values, average, count, maximum and minimum values, standard deviations, among many others. There is no doubt that its use will help you a lot in your computations.

5.0 SUMMARY

You have learnt in this unit how to process and analyze data. You can now use Ms Excel to sum data, find average, and compute standard deviations, for sample and populations. You also learnt how to use the formula bar to find, maximum and minimum values. I hope you did not find this unit frustrating with plenty of calculations. You need to learn this effectively for it will help you during your data analysis.

6.0 TUTOR- MARKED ASSIGNMENT

Describe clearly to an undergraduate student how you can use the formula bar to compute sample and population standard deviations.

7.0 REFERENCES/FURTHER READING

Ohiani, F. (2007). *Best Computer Guide*. Abuja: Insight Publishing.

UNIT 8 GRAPHICAL DATA PRESENTATIONS USING MS EXCEL

CONTENTS

1.0 INTRODUCTION

In the last unit, you learnt how to use the formula bar to process and analyze data- summing data, finding average, computing standard deviations, calculating sine of angle, finding maximum and minimum values. In this unit, you will learn how to use Ms Excel to present data graphically. You will learn to create chart using the chart wizard, insert pictures, create organizational chart and use auto shapes, word art and diagram gallery. There is need for you to practice the skills using your computer.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- create chart using the chart wizard
- use organization chart, auto shapes and word art to create pictures
- use the diagram gallery to present diagrams of data.

3.0 MAIN CONTENT

3.1 Creating Chart using the Chart Wizard

The chart wizard in Ms Excel can be found in the insert menu or on the tools bar. It is used in creating various charts. A chart is a graphical representation of your work in the worksheet. To access chart in the insert menu, click the insert menu. The insert submenu is displayed.

Scroll your cursor to chart and click on it. The chart wizard dialogue box is displayed. This dialogue box contains different types of chart. Some of the chart types are: bar (column), bar (row), line, pie, XY (scatter), area, doughnut, radar, surface, bubble, stock, cylinder, cone, pyramid. Click on each chart type and the chart wizard dialogue box displays the graph. For instance, click on bar (column), the column bar chart is displayed. Click on bar (row) and the row bar chart is displayed. Click on line and the line chart is displayed. Now click on each of the remaining chart types and observe the corresponding graph carefully.

When you have typed your own data, you have to choose the type of chart you want that suits the data. How is a chart created?

You will now create your own chart using a chart wizard. There are four steps in creating a chart. You have to consider the chart types, chart source data, chart options, and chart location.

Step 1: Chart Type

The chart type shows the list of charts available from which you can select your choice. There are different types of charts as mentioned above. Can you remember what they are? Note that each chart has two or more subtypes from which you can choose. Look at the chart wizard dialogue box carefully; you will see the section on chart sub type. If you want to see what your data will look like when you have selected the chart type, all you have to do is to click and hold down the "view sample button" at the bottom of the chart sub type section of the chart wizard dialogue box.

To select chart type, click on any chart type of your choice, say, pie, and click on the chart sub type. For example, pie has 6 charts subtypes, click on any of the six in which your chart is to appear. Then click on next. This brings you to step 2.

Step 2: Chart Source Data

The chart source data helps you to select the data and labels that you want to see in your chart. You may or may not want all your data to appear in your chart. Whichever case, select the needed data. I want you to specify the data and labels for the chart now. Click in the data range box in the source data dialogue box and select the cells on your worksheet. Note that you can choose between rows and columns to observe the different displays by your computer. Click next to move to step 3.

Step 3: Chart Options

In this step, you can turn on and off some standard options for the chart type you have selected. When you are changing these settings, you have to check the previous charts so as to ensure that you obtain the appearance that you want. The placement settings are bottom, corner top, right, left. To move to the last step, click next. Note that in this chart option, you enter the title for the chart and also label the X and Y axes.

Step 4: Chart Location

In this last step, you decide where to place the finished chart. You can place the chart on a worksheet or on its own chart sheet. In other words, select any location for the chart either in a new sheet or as an object in your current worksheet. To display the chart in your chosen location, click finish. Consider the data below.

	A	B	C
1.	12	23	43
2	23	14	25
3	43	21	27
4	23	41	28
5	32	40	41
6	31	34	40

Create a bar chart and a pie chart to represent these data.

To start, highlight all the scores in rows A, B, C. Then, click on insert menu and click on chart in the chart wizard display. The chart type dialogue box is displayed. Click bar and click on next. The chart source data is shown. Enter the data range you want to plot the chart in the data range box. i.e type in the box : = sheet 1 ! SAS1: SCS6. If you want it to display in columns, click on columns.

Click on rows and click on next to get to the third step (chart options). In chart option, enter the chart title as the bar chart. On category (X) axis, you can enter rows or columns in the category (X) axis on that box if you want either to appear on the X axis. Enter rows in that box and see how the chart is displayed. Click next and you get to step 4 (chart location). You decide now where you want the chart to be placed- either as new sheet or as an object in a sheet of your choice. Click the box beside “as new sheet” and click finish. The chart is displayed on a new (fresh) sheet different from the sheet where the data is saved. If you click on the box by the side of ‘As object in” and enter sheet 1 in that box, then the graph will appear on the sheet 1 where your data is recorded.

If the chart is on a new sheet, click on sheet below the screen to go back to sheet 1 where you were working.

I want you to create the chart in columns. Highlight the data again. Click on insert menu and click on chart. Click on bar and click on next to display the chart source data. Then, click on columns. Enter the data range as:= SAS1: SCS6, and click on next to move to step three (chart options). Enter the title as bar chart, and enter row in the category (X) axis box. Click next to move to the last step (chart location). Choose your locations, say, “as object in” and click on it. Click finish and the chart is displayed on sheet 1 where you have your data.

SELF-ASSESSMENT EXERCISE 1

1. Go through the above chart creation again.
2. Create a line chart, XY (scatter) and doughnut chart of the data above.

3.2 Pictorial Graph Representation

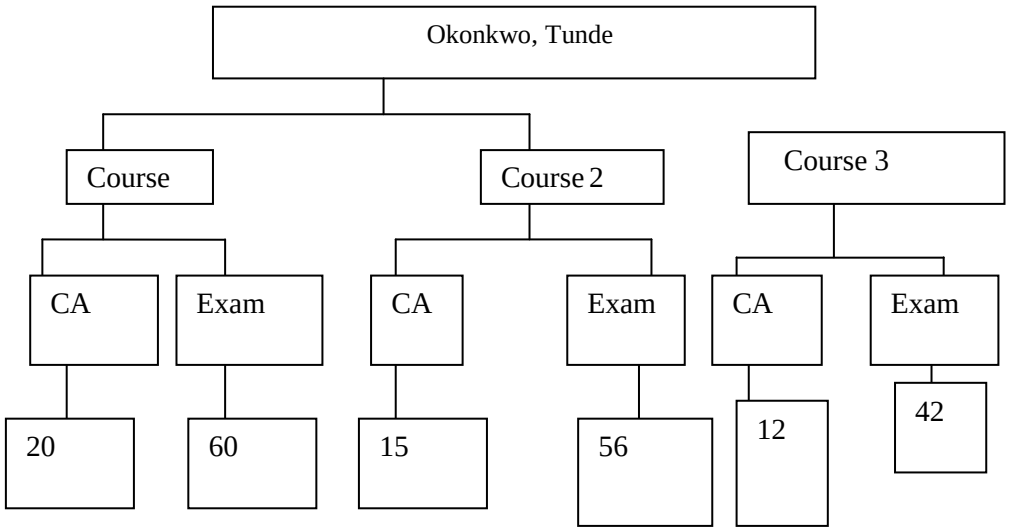
There are three kinds of pictorial graph representations in Ms Excel that I want you to learn. They are: organisational chart, autoshapes, and word art.

3.2.1 Organisational Chart

The organizational chart in Ms Excel is found in the insert menu. It is the same organization chart you studied in Ms Word in module 1, unit 8. Click on the insert menu and click on picture in the displayed insert submenu. Then, the picture dialogue box is displayed. Click on organizational chart and the chart is displayed. Go back to unit 8(Ms Word) and remind yourself how to use the organizational chart to represent data. Take your time and read it again. Do all the exercises in that unit to acquaint yourself on how to use the organizational chart to represent data graphically.

SELF-ASSESSMENT EXERCISE 2

Create an organizational chart for the information below:



3.2.2 Auto Shapes

Recall that in Module 1, unit 8 (Ms Word), you studied about autoshapes graphical representations. The auto shapes in Ms Excel are the same with those in Ms Word. Now, go back to unit 3.1.2 of module 1 and revise how to create autoshapes. Repeat the SELF-ASSESSMENT EXERCISE 2 under unit 3.1.2.

SELF-ASSESSMENT EXERCISE 3

Draw the various lines, connectors and basic shapes available in the autoshape dialogue box on your Ms Excel screen worksheet. Draw a triangle with the lines. What are the similarities and differences on the use of auto shape in Ms Word and Ms Excel?

3.2.3 Word Art

The word art is another graphical representation that is available in Ms Excel as in Ms Word. You learnt about using the word art to create different styles of data presentations in unit 3.2.4 of module 1, when you studied Ms Word. Go back to this unit and revise how to use the word art to beautify your document. Repeat the SELF-ASSESSMENT EXERCISE 4 under unit 3.1.4.

SELF-ASSESSMENT EXERCISE 4

Type the statement: MY NAME IS BABA. Create 10 different word art styles on your screen for this statement. What are the differences and similarities between the use of word art styles in Ms Excel and Ms Word?

3.3 Diagram Gallery

Recall that diagram gallery is one of the graphical features of Ms Word which you studied in unit 8 of module 1. It is also a significant feature of graphical representation in Ms Excel. Click the insert menu and you will see diagram in it. Click on diagram and the diagram in the insert submenu will appear. There are six different diagrams in this diagram gallery. They are used to show hierarchical relationships. Click on each of them and the names of each diagram appear below the diagrams e.g organisational chart, cycle diagram, radial diagram, pyramid diagram, Venn diagram, target diagram. Click on any of them and click ok button? What do you see? The diagram appears with a diagram box by its side. In this box, you have insert shapes, move shape backward or forward, reverse diagram, layout, auto format, change to, etc.

Click on each of them one by one and see the change it makes on the displayed diagram.

SELF-ASSESSMENT EXERCISE 5

Generate data in your area of specialization that can fit into each of the six diagrams in the diagram gallery. Represent such data graphically in six different diagrams.

NB: There may be different data for each diagram.

4.0 CONCLUSION

Ms Excel can assist you to represent given data graphically through the use of chart creation, pictures and diagrams. There is need for you to be highly imaginative and creative for you to use Ms Excel to do graphical representations of your data. Note that many times the graphical representations of data beautify and simplify your data and make your data captivating and brief. Long descriptions of data in words and figures are minimized when charts, pictures and diagrams are used in representing data.

5.0 SUMMARY

In this unit, we studied how to create charts using the chart wizard. The stages involved include There are chart type, chart source data, chart options, and chart locations. Various kinds of pictures can be used to represent data- organization chart, auto shapes, word art. I am sure you can now use the diagram gallery to represent data of diverse kinds. If you are not very sure, then revise this unit again.

6.0 TUTOR-MARKED ASSIGNMENT

How can you use the chart wizard to create a chart? Formulate your own data and describe how you can create a pie Chart for your data.

7.0 REFERENCES/FURTHER READING

Obodo, G. C. (2008).*Computer/Mathematics Education Innovations: Issues and Applications*. Enugu: Floxtone Press.

MODULE 3 DATA ENTRY, PROCESSING AND ANALYSIS USING SPSS

UNIT 1 DATA EDITOR AND DATA ENTRY

CONTENTS

1.0 INTRODUCTION

In the last unit, you learnt about graphical data representations using Ms Excel. That was the last unit in Excel. In this unit, you will study how to use a different package, called SPSS – Statistical package for Social Sciences. It is a good package that will assist you to process and analyse data. In this unit, you will study SPSS Data entry and how to save your data. You will also study how to enter your data into the data editor.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- describe the characteristics of the SPSS data editor
- save your data in SPSS
- enter your data into the data editor.

3.0 MAIN CONTENT

3.1 SPSS Data Editor

SPSS stands for statistical package for social sciences. There are several versions of this package but we shall use the version, SPSS 15.00 for windows. To start SPSS, boot your system and then click on the start button for the programmes to display. Then select SPSS 15.0 for windows and click on it. The SPSS data editor is displayed. Alternatively if SPSS is on the desktop, double click it to display the data editor.

The data editor is like the Ms Excel spreadsheet. It has columns and rows. The columns are numbered Var, Var, Var, etc. In these columns, you enter labels of your work. The rows are numbered 1, 2, 3… The intersection of columns and rows gives rise to cells. Just like in Ms Excel, the active cell is where the cursor is. Data entry in Ms Excel and SPSS are similar.

The SPSS is used to calculate many statistical functions in descriptive and inferential statistics.

3.2 Saving your Data

There are four ways of saving your document. One is saving a newly created document using the Save As command. The other is to save a document that already has a file name. The third is the use of the" Save All Data" command while the fourth is the use of the keyboard.

3.2.1 Save as Command

When you start entering a new set of data you need to save it by giving it a file name. As soon as you enter few data, click file on the Status Bar to display the file submenu. Then click Save As command to display "Save Data As' dialogue box. Beside the box by "File Name' below the box, type in the file menu of your choice and click on Save at the right bottom corner of the dialogue box. Immediately, the file menu will appear on top of screen.

3.2.2 Saving Data using File Menu

When you have saved a document using the Save As Command, you may edit that document to remove or add or correct data. In this case, click the File Menu and Click Save. Your corrections are saved. Alternatively, you can press Ctrl + S on the keyboard to save the document.

3.2.3 Save all Data Command

The Save All Data Command is peculiar to SPSS. You use it when you are ready to save all your data. When you are ready to save all your data after using the Save As Command to create a file name, then click on Save All Data Command to save all your data.

3.2.4 Using Keyboard to Save

You can use the keyboard to save your document as was done in Ms Word and Ms Excel by pressing Ctrl + S.

3.3 Data Entry

Data Entry using SPSS needs a lot of care; on top of the colums, you will find written Var, Var, Var, Var, Var, ….,where Var stands for variable. You need to enter the variable labels for each column in this location A sample of the data editor is shown below.

	Var	Var	Var	Var	Var	Var	Var	Var	…..
1									
2									
3									
4									
5									
6									
7									
8									
9									
.									
.									
.									

The data editor has several menus such as file, edit, format, transform, analyse, help, and many others. Each menu has several submenus. The File menu has the following submenus among others: new, open, close, cut, copy, paste. The edit menu has spelling, grammar, etc submenus. The analyse menu has mean, frequency, crosstab, linear regression, multiple regression etc submenus.

Below the screen, you will see two windows named Data view and variables view. If you are entering your data, Data view will be highlighted showing you are using it. The data you enter goes into the cells – in the variable label position (Var) on top of your data editor. If you want to label your columns, click variable view below the screen and the variable view data editor is displayed like below.

		Type	Width	Decimals	Labels	Values	Missing	Columns	Align	Measurement
1										
2										
3										

Type the variable label for column 1 in the first cell under name. Type in each cell all the labels you want say: Olo, Asa, Kuv, Koto, Mega, Kenke. In the 'type' column, the nature of the data, say Numeric, is displayed. Now click on the first cell under Type column. The right corner of the cell is highlighted with some dots (…). Click on this highlighted corner and the variable Type dialogue box is displayed e.g Numeric, Comma, Dot, Scientific notation, Data, Dollar, Custom I, l Click on the width column to select the size of the width of the clumn your document will appear. In the decimals column, you choose the number of decimals you want your document to appear in eg 0. 1,2,3, etc. In the labels column, you type in yur labels, say Oko, Kuv, Koto, etc. If there is any missing values, you ener them in the missing values column. Choose the columns you want your document to appear in in the columns column above. The align column helps you to select your desired alignment. Indicate the measurements you want in the measurement column. The missing values are values you may have omitted in the process of entering your data. Enter the missing values each in one cell under the missing column.

Currency, String. Click on any of them that suits the data you want to enter in that column e.g. Numeric. If what you want to enter are dates, in that column click on date. In this variable Type dialogue box, the width of that column that you desire and the number of decimal places you have chosen will appear. Now click Ok button in this box to return to variable View editor.

Click on the first cell under width and you will see up and down buttons. It is here that you can adjust the width of each cell under this column the way you like. Click on the up button to increase the width to your taste and click on the down button to decrease the number.

Now move the decimals column. Make the first cell there active by clicking in the cell. The up and down buttons are shown. Set the number of decimal places you want your data to display using either the up or down arrow. It you want your data to appear as whole numbers set it at 0. If your data is in whole numbers and you set the number of decimal places to be 2, then your data will appear as 3.00, 4.00, 80.00, etc.

The next column is label. Type in each cell the label you want. The label may be the same as the name you have chosen.

The column is the values column. Click on the first cell under values. The right corner is highlighted with dots (…) click on the highlighted right corner to display the value labels dialogue box. You can attach values to your labels eg. Sex can be any of male and female. Give a value of 1 to male and a value of 2 to female or vice versa. For type of school (male, female, co-education), you can give the value 1, 2, and 3 to male, female and co-education schools. Suppose your data is classified using sex as a variable. In the value box, type 1 and in the label box, type male. Once you do this, the Add box is highlighted. Click on the Add box and 1 = "male" appear in the empty bigger box in this value labels dialogue box. Type 2 in the value box and female in the label box and click Add. You notice that 2 = "female" appear in the empty bigger box. Click Ok button in value box. You are now back to the values column in the data view editor and you will see {1, male}… in the first cell under values column.

Go to the missing column and click on the first cell there. The Missing values dialogue box is displayed..; you can either click on No missing values or discrete missing values and click Ok, you are back to the missing column. Type in the missing values in each cell under the missing values column.

The next column is titled columns. You can adjust the columns up or down using the up or down buttons respectively.

The next column is the align column. Click on its first cell and you will see a down arrow button. Click on the down button window and you will see three options – Left, Centre, Right. Choose only one of them depending on how you want your data to align.

The last column is the measure column. Click on the first cell under this column. A down arrow appears. Now Click on it and and three types of scales are displayed. They are scale, ordinal, nominal. What is the scale of your data? If your data is scaled, click on scale. If your data is ordinal, click on ordinal. If your data is nominal, click on nominal. When you have set all the above in the variable view editor, click the Data View button at the bottom of the screen (beside the variable view button). What do you see? The data view editor is displayed with labels Olo, Asa, Kuv, Koto, Mega, and Keke in each of the cells as labels. You can now enter the figures as shown below.

***Table 1*: Data**

Now enter the following data into your data editor and save it.

Data 1

	Olo	Asa	Kuv	Koto	Mega	Kenke
1	21	23	45	38	48	72
2	43	34	65	49	92	73
3	65	45	87	66	64	74
4	32	45	32	71	71	81
5	54	23	49	23	55	18
6	67	48	14	48	50	34
7	87	69	198	91	61	16

The data editor is before you on the screen Click on the Variables View so as to enter all the labels: Olo, Asa, Kuv, Koto, Mega, Kenke. The variable view editor is displayed. Type Olo, Asa, Kuv, Koto, Mega, Kenke in cells 1, 2,3,4,5, and 6 under Name column, under the type column, select numeric. This is because the data is numerical (dealing with numbers). Under the width column, select 8 for each under the decimals column, select 0 for each cell. This means you do not want your data to appear in decimals. Under the label column, type Olo, Asa, Kuv, Koto, Mega, Kenke in each of the 6 cells. Since each of the above is the name of a person, you do not have to give label values to your data. For the missing column, select none. For columns column, select 8. For the align column, select right and in the measure column, select scale. This is because the figures are scaled values. You have entered all your labels now. Click on the data view editor at the bottom of the screen. What do you see? The first to the sixth columns have labels Olo, Asa, Kuv, Koto, Mega, Kenke written on top.

Now enter the values under each label. Save the document. It is advisable to save your document immediately after entering the labels. This is because if electricity supply is cut off you will lose all data you have entered. Now click file menu and click the save as button to display the save as dialogue box. Besides the file menu, type data 1 or any other name you want to use inside the box. Click Save and you will notice that the file menu appears on top of the screen as data1.sav if data1 was the name you used.

It should be noted that the most difficult aspect of SPSS is data entry. This is because if you do not enter your labels and data correctly, the SPSS may not accept your data or it may give you wrong results.

Therefore you need to enter your data carefully obeying all instructions; remember practice makes perfect.

You should note that the data in table 1 above is a straight forward one. There are data that have two or more classifications under each label. An example is shown below.

***Table 2*:**

Type of School	**Table 2: Location by School Data Entry**			
	Urban	**Rural**	**Semi urban**	**Semi Rural**
Male	66	43	64	38
	42	89	48	61
	49	67	82	49
	72	48	19	34
	24	19	43	55
Female	48	34	17	38
	49	67	81	44
	66	91	66	96
	72	82	48	84
	48	43	90	60
Mixed	48	83	72	49
	84	42	42	69
	66	34	91	73
	50	24	61	48
	43	66	41	69

The first and foremost thing you have to do is to enter the labels and give them values. Click variable view below the screen. Type: school, location and scores under the name column in cells 1, 2 and 3 respectively. Under type column, select numeric for each cell. Under width column, select 8 for each of the 3 cells 1, 2 and 3, or any number of your choice. Under the decimals column, select number of decimals you want your data to appear in; say 0 if your data does not have decimal. If your data has 2 decimal places select 2 decimal places using the appropriate up or down button. In the label column, enter all the names you entered under Name column in cells 1, and 2 i.e. school in cell 1 and location in cell 2. Do you know why nothing is typed in cell 3? Click on the values column to display the value labels dialogue box. In this box, click the first cell. Click the highlighted right corner of the cell to display the value labels dialogue box. You are going to represent school as follows:

1 = Male
2. = Female
3. = Mixed

To enter the values, type 1 in the value box and click in the label box and type male. The Add box is now highlighted. Click the Add button and 1 = "male" is entered in the big empty box. Click in the value box again and Type 2 there and click the label box and type female. The Add box is highlighted automatically. Click on the Add and 2 = "female" is added into the big box. Click in the value box again and type 3 there. Click in the label box and type mixed. Click the Add button and 3 = "mixed" is added in the big box. Click OK button and {1, male}… appears in the first cell under values column. Click the empty second cell under values column and click the highlighted right corner. The value labels dialogue box displays again. Now enter the following:-

1. = "urban"
2. = "rural"
3. = "semi urban"
4. = "semi rural"

In the box beside value, type 1 and type urban in the box beside label. Click Add and the variable label 1 = urban is added in the big empty box. Click in the value box again and type 2. Click in the Label box and type rural. Click Add and 2 = rural appears in the box. Click in the value box and type 3. Click in the label box and type semi urban. Click the Add button and 3 = semi urban is added in the box. Click in the value box and type 4. Click in the Label box and type "Semi rural" Click Add and 4 – Semi rural is added. The dialogue box will now appear as in the table below:

Add
1 = urban
2 = rural
3= semi-urban
4 = semi-rural

Remove

You have now entered all the variables and their labels. You can now click the OK button and notice that {1, urban}… appear in the second cell under values column. Now, click on the missing column and then click on "No" missing values button in the missing dialogue box "None" will appear in each of the cells under Missing column. You can carry out similar activities under the columns, align and Measure columns. Under columns, select the column size of your choice. Under align, select the alignment of your choice. Under Measure column, select the measure

that suits your data. Now go back and proofread all you have entered to be sure they are correct. If data in any cell is not correct, make that cell active and press delete. The data is deleted. If all the data are correct, click data view at the bottom of the spreadsheet to return to the data editor. What do you notice? The first three column labels appear as follows:

Table 3: **Labeling Column**

	School	Location	Scores
1.			
2.			
3.			
4.			
:			

It is now time for you to enter your data into the data editor as follows:-

Table 4: **Entering Values and Scores**

	School	Location	Scores
1.	1	1	66
2.	1	1	42
3.	1	1	49
:			
6	2	1	48
7.	2	1	49
:	2	:	:
11	3	1	48
12	3	1	84
:			
16	1	2	43
:	:	:	:
21	2	2	34
:	:	;	:
26	3	2	83
:	:	:	
31	1	3	64
:	:	:	:
60	3	4	69

Save these data as “data 2”

SELF-ASSESSMENT EXERCISE 2

Enter the data in Table 4 into the data editor and save it as “Data 3”.

***Table 5*: Type Variable Data**

	Sex	**Location**					
		School 1	School 2	School 3	School 1	School 2	School 3
1.	Male	48	66	48	71	43	66
2		64	59	60	48	36	64
3.		34	43	71	81	49	65
4.		43	61	81	66	58	48
5.		65	58	32	70	61	43
6.	Female	70	43	43	50	48	40
7.		62	34	56	55	70	61
8.		54	38	51	44	76	61
9.		58	59	43	61	50	54
10.		45	70	60	39	61	53

4.0 CONCLUSION

The most difficult aspect of SPSS processing and analysis is entering the data. The difficulty lies in defining labels correctly and entering them into the cells; it requires wisdom to enter data into the SPSS data editor. Using the variable view data editor will help you to master quickly how to define and enter labels correctly. Remember to save your work and/or changes you make very regularly. If you cannot enter labels correctly, then you may not get any output (result) or what you get as output may be wrong. Do not be in a hurry in entering your data. Be patient and proof read all you have entered very well. Data entry in SPSS is a rigorous exercise.

5.0 SUMMARY

In this unit, you learnt about SPSS data editor and its characteristics. You also learnt how you can save your data – using the Save As command, Save command in the File menu, Save All Data Command in the File menu and using the keyboard. You also learnt how to enter various kinds of label and data.

6.0 TUTOR-MARKED ASSIGNMENT

Describe in details when you can use each of the four methods of saving your data in SPSS. Why is saving necessary? Construct a data of your choice and describe how you can enter them into the data editor.

7.0 REFERENCES/FURTHER READING

www.spss.com.

Obodo, G.C. (2008). *Computer/Mathematics Education Innovations, Issues and Applications*. Enugu: Floxton.

UNIT 2 EDITING DATA IN SPSS, REPORTS AND DESCRIPTIVE STATISTICS

CONTENTS

1.0 INTRODUCTION

In the last unit, we studied how to enter data in the SPSS data editor and save it in different ways. In this unit, you will learn about editing your data, how to analyse reports and how to obtain calculations concerning descriptive statistics with regards to frequencies, descriptive, explore and cross tabulations of your data. Make sure that SPSS version 15.0 or any other one is installed in your computer.

2.0 OBJECTIVES:

At the end of this unit, you should be able to:

- edit your data in SPSS, analyse reports using OLAP cubes
- do descriptive statistical computation using SPSS with regards to frequencies, descriptive, explore, and cross tabs.

3.0 MAIN CONTENT

3.1 Editing in Spss

The following editing functions are available in SPSS. They are Undo, Redo, Cut, Copy, Paste, Paste variables, Clear, Insert variable, Insert cases, Go to, and Options. We shall study some of these functions as it is applicable in SPSS. Notice that the SPSS data editor is like the Ms Excel spreadsheet except that the columns are labeled differently.

3.1.1 Undo and Redo Commands

The Undo entry command in used when you have mistakenly deleted data/character you do not wish to delete. You click the Undo command on the Edit menu or on the Tool bar to immediately bring back the data. In SPSS, for you to use Undo command to retrieve data, you must have moved to another cell. It is only then that you can go back and undo what you had done. The Redo command is used to do what you had undone with the Undo command. For example, type 23 in any cell, click the Undo command. It will not delete or undo the data. Press delete key, it will not delete, press Backspace key and the data is deleted.

Now type 23 again, move the active cell to another cell below or right or left or above where you have typed 23. Move back to the cell where you typed 23 earlier and click Undo; you will notice that 23 disappear. Click Redo, 23 appears again.

SELF-ASSESSMENT EXERCISE 1

Type 126 in any cell of your choice, Undo and Redo this data for five times. Repeat this with the figure, 12, 674 typed in any cell, is there any difference in using this command and in using it in Ms Word and Ms Excel?

3.1.2 Cut, Copy and Paste Commands

The Cut, Copy and Paste commands are similarly used as in Ms Word and Ms Excel. Now retrieve data which you had saved in Unit 1. Have you done so?

Can you compare and contrast editing mode in SPSS, Excel and Word?
I want you to copy the whole data in Unit 1 and paste it in two different positions on your data editor. Do you remember how to do so? Go back now and read how to do so in Ms Word or Ms Excel.

Block/select/highlight any data of your choice. Press Ctrl + C (to copy the data). Move the cursor to any position you want to place the data.

Make one cell active there and press Ctrl + V to paste the data you have just copied). The data is displayed. Move the cursor three cells below the data you pasted. Make one cell active there, press Ctrl + V again. The data is pasted a second time; you can paste the data a third, fourth, fifth, etc. time continuously. Note that you copied the data once but you can paste it several times.

I want you to cut and paste the first two sets of data you copied and pasted above. How would you do it? Select the two sets of data, press Ctrl + X (to cut the data). Make a cell active where you want to paste it, press Ctrl + V. What do you observe? The data is pasted. Make another cell active where you want the data to be pasted again, press Ctrl + V. Do this more times. Delete all the data you pasted by cutting only. (Do not paste)

SELF-ASSESSMENT EXERCISE 2

Enter the following data in your data editor.

43	44	24	0	16
22	3	16	18	28
5	8	9	38	50
43	48	39	21	2

i. Copy and paste this data five times.
ii. Cut and paste this data five times.
iii. Delete all you have pasted by cutting.

3.2 Analysing: Reports

You can prepare your reports using the OLAP cubes.

3.2.1 Olap Cubes Statistics

OLAP (Online Analytical Processor) cubes method is one for computing totals, means, and other univariate statistics for continuous summary variables that are found within the categories of one or more categorical grouping variables. You should note that a separate layer in the table is provided for each category of each grouping variables.

The summary variables are numerical or quantitative (cumulative variable that are measured on an interval or ratio scale) e.g. scores. The grouping variables are categorical e.g. location (Urban, Rural), Sex (Male, Female). The values of the categorical variables can be numeric or short string.

In OLAP cubes statistics, it is assumed that some of the optional subgroup statistics (e.g. mean, standard deviation), are based on normal theory. Hence, they are appropriate for quantitative variables with symmetric distributions. However, other statistics such as median and range are suitable for quantitative variables which may or may not meet the normality assumption.

The OLAP cubes method is very useful for obtaining summary statistics for scale variables that are broken down into categories of one or more grouping variables. This procedure includes a wide variety of statistics from simple words sums and percentages to complicated measures of central tendency and dispersion; you can use any number of grouping variables.

3.2.2 How to Obtain Olap Cubes

To use the OLAP cubes to calculate, you have to first select Analyse from the menus. You can then click on Reports and then click on OLAP cubes Further, you need to select one or more continuous summary variables, and then select one or more of the categorical grouping variables. Thereafter select the different summary statistics by clicking statistic e.g. sum, mean, standard deviation, standard error, depending on what you want. Remember that you must select one or more grouping variables before you can select summary statistics. If you are interested in calculating difference between pairs of variable or pairs of groups which are already defined by a grouping variable, click difference. If you want to create custody table titles, click title.

SELF-ASSESSMENT EXERCISE 3

Create a data of your own containing summary and grouping variables and obtain the OLAP cubes for the data.

3.2.3 Olap Cubes Differences

The dialogue box for OLAP cubes differences permit you to calculate percentage and arithmetic differences between summary variables or between groups which are defined by a grouping variable. Note that differences are usually computed for all the measures you have selected in the OLAP cubes statistics dialog box.

The difference between variables in the dialogue box determines differences between given pairs of variables. The summary statistics values for the second variables (known as the minus variable) in each pair are subtracted from the summary statistics values for the first variable in the pair. In order to determine percentage differences, the

value of the summary value for the minus variables is used as the denominator. It is important for you to note that you must select at least two summary variables in the main dialogue box before you can specify differences between variables. Consider the variables, method and sex. Suppose you entered data for each of the two variables in your data editor. You can apply the OLAP cubes differences to find the differences of scores between the two sets of data.

In other words, the differences between groups help you to calculate the difference between pairs of groups that are defined by a grouping variable. Here, the summary statistics values for the second category in each pair (lake the minus categories) are subtracted from the summary statistics values for the first categories in the given pair. Note that to calculate percentage differences; the value of the summary statistics for the minus categories is used as the denominator. Remember that you must select one or more grouping variables in the main dialogue box so that you can specify differences between groups.

How do you obtain OLAP cubes differences from your SPSS software? From the menus, choose Analyse and click on it. Then choose Reports and click on OLAP cubes. Next select two or more summary variables or one or more grouping variables, and click Differences.

SELF-ASSESSMENT EXERCISE 4

For the data you created above, obtain the OLAP cubes differences.

3.3 Descriptive Statistics

There are different kinds of descriptive statistics available in SPSS 15.0 version. They are frequencies, descriptive explore, crosstabs, ratio, pp plots, Q-Q plots, let us examine them using some data.

3.3.1 Frequencies

The frequencies procedure gives you good statistical and graphical displays which are useful in describing different kinds of variables. You should note that the frequencies method in a good place to begin to look at your data. If you want to obtain a frequency report and bar chart, you have to arrange the distinct values in either ascending or descending order. Alternatively you can order/arrange the categories by their frequencies. When a variable has many distinct values, you can label your charts with frequencies or percentages.

Several statistics and plots are available when frequencies are used. They are frequency counts, percentages, mean, median, mode, sum,

standard deviation, variable range, minimum and maximum values, standard error of the mean, skewness and kurtosis and their standard errors, quartiles, user – specified percentiles, bar charts, pie charts, and histograms. Let us access the data which you had saved as data 1 in Unit 1. With the data in the data editor, select Analyse from the menus and further select descriptive statistics from the Analyse submenu. You can now click on frequencies in the displayed descriptive statistics dialogue box. The frequencies dialogue box is displayed and in the left hand box, you will see the labels of data 1 displayed there as follows: Olo, Aso, Kuv, Kato, Mega, Kenke. The right hand box is empty, it is titled the variables. In between the two boxes an arrow pointing right. Click on Olo and click on the arrow, Olo is transferred to the right hand box and the arrow now faces the left. Next click on Asa and the arrow faces right again. When you click on the arrow, Asa is transferred to the right hand box. Now transfer Kuv, Kolo, Mega and Kenke in the same way. Have you done that? Click on display frequency tables below the left hand box and click on statistics to display the frequencies, statistics box. In this box, you find percentile value, central tendency, dispersion, quartiles etc. The display is as follows:

Percentile value
Central tendency
Dispersion
Quartiles
Percentiles
Mean
Median
Standard deviation
Skewers etc

Click on, say, the percentile value, central tendency and dispersions that you require.

Click on charts to select the kinds of charts you want from the frequencies, charts dialogue box. The available chart types are none, bar charts, pie charts, histograms. Click on one or more of your choices, say, bar charts. Click on continue to return to the frequencies dialogue box again. There are two columns here – ‘order by’ column and multiple variables column. Click on your choice on each column. In the ‘order by’ column, you have the following: Ascending value, descending values, ascending counts, descending counts. Under the multiple, select one or more by clicking. You may not need all the charts at a time. Select the one you need. Practice how to plot one chart before .the other.

In the Variables column, you see the following: compare variables, organize output by variables, and suppress tables. Choose any of your

choice. Click continue after you have made your choice. You will come back to frequencies submenu. Click Ok. The software displays the output (results) of what you have asked it to do. Scroll down the output window on the right to see your results. If you are satisfied, you can save and or print it.

SELF-ASSESSMENT EXERCISE 5

Retrieve data 2 which you had saved in unit 1. Calculate the quartiles, mean, median, mode, sum, standard deviation, variance, and standard error of the mean. Plot the bar charts, pie charts and histograms for the data.

3.3.2 Frequencies: Descriptive

The descriptive method of frequencies gives univariate summary statistics for several variables in a single table and calculates standardized values (Z-scores). Your variables may be ordered according to the size of their means-either in descending or ascending order, alphabetically or by the order with which you have chosen your variables.

To obtain the descriptive statistics, do the following. From the menus, choose Analyse, Descriptive Statistics and Descriptive…. Select one or more variables. There are two options available to you.

1. Select “Save standardized values as variables” to Save Z-scores as new variable.
2. Click options for optional statistics and display –order.

Retrieve data 2 above. On the descriptive dialogue box, select the variables of your choice, for example, scores and location. Click on options to display options dialogue box. Select relevant statistics e.g mean, sum, standard deviation, kurtosis, etc. Click continue and then click OK.

The output box showing your results in displayed as follows:

Mean……. 12.56
Sum ……. 256
Standard deviation……. 4.76
Kurtosis…… 1.98

SELF-ASSESSMENT EXERCISE 6

Consider the data below

Location	Male Score	Female Score
Urban	4, 6, 8, 10	3, 2, 4, 6, 5
	6, 4, 3, 7	8, 9, 6, 5, 7
	8, 9, 3, 2	7, 7, 7, 8, 6
Rural	4, 8, 9, 10	9, 10, 7, 6, 4
	9, 5, 5, 6	10, 4, 3, 4, 5
	6, 7, 8, 9	6, 7, 8, 9, 10
	10, 3, 4, 7	2, 6, 3, 3, 8

Calculate the mean, standard deviation, variance, range and standard error of the mean. Save these data as Data 3.

3.3.3 Frequencies: Explore

The Explore method in SPSS gives summary and graphical displays of your data – either for all your cases (data) or separately for groups of cases (data). The following are the reasons for using the Explore method.

- Data screening
- Outlier identification
- Description
- Assumption checking
- Characterising differences among subpopulations (groups of data).

Note that data screening may indicate that your data contains unusual values, extreme values, gaps in the data, or other peculiarities, exploring your data may aid you to know how to determine, whether the statistical techniques you want to use for data analysis are appropriate or not. This kind of exploration may show you that you need to transform your data if the technique has the need for normal distribution. Alternatively, you may decide that you need non parametric test/statistics for your data.

Now retrieve data 2 above, click Analyse, Descriptive statistics and then explore. The explore dialogue box appears, observe that in the big box on the left, three variables are displayed. They are scores, school and location. On the right, there are three boxes labeled dependent list, factor list and label cases by your scores in data 2 are dependent variables. Thus click scores and click the arrow beside the dependent list box. Scores is seen in the box, click school on the left box and click the arrow beside the factor list box. School is seen the box. Below, the big box on

the left, you see display; click both button so that all statistics and plots, click either of them. On the bottom right of the box, you see three buttons. Statistics to display explore statistics dialogue box. Then click 'Descriptive' and click 'Continue'. Click plots to display 'Explore plots' dialogue box. In this box, click your choice (s) eg factor levels together, dependents together, none, etc. If you want all the different factor levels or dependent variables to appear together in the table, then choose "factor levels together". If you do not want them together, then choose none. Click continue to come back to explore dialogue box. Click options to display the explore. Options dialogue box, click on your choice in this box and click continue. Click Ok, the output document (SPSS viewer) showing results are displayed, scroll the right side window to see all your results.

SELF-ASSESSMENT EXERCISE 7

Using the data you saved as data 2, apply explore statistics technique to treat the data considering (1) scores by location (2) scores by location by sex.

3.3.4 Cross Tabs Statistics

The cross tabs statistical method provides two way and multiway table and a variety of tests. It measures percentage association for two – way tables. You should note very well, that the structure of the table and whether or not the categories are ordered determines the type of test or measure you will use. Cross tabs statistics and measures of association are calculated for two-way tables only.

It is important to note that the cross tabulation table is the basic technique to use in examining the relationship between two categorical (nominal or ordinal) variables. Where it is possible, you can control the layering variables. You can do this by choosing the needed layers from the layering variables list in your computer.

How is a nominal variable defined? A variable is regarded as nominal when its values represent categories that have no intrinsic ranking e.g. the department of an organization where a person works. The following are examples of nominal data – school type (male/female/mixed), region (East /West / North / South), religious affiliation (Catholic / Protestant/ Pentecostal). A variable is said to be ordinal when its values show categories with some intrinsic ranking e.g. levels of agreement from strongly agree to strongly disagree, achievement scores of students are ordinal because higher values are indicative of more of the property that was measured. A layering variable is defined as follows, if your rows are used to represent height of a classroom while the columns represent

the width, then the layer gives the depth. In a Lay Man's view, a layer is a set of wide materials placed severally on top of each other eg a layer of mats. This layer will eventually result to depth or height of that mat. .

The cross tabs method helps you to execute tests of independence and measures of association and agreement for nominal and ordinal data.
Now retrieve the data you saved in section 3.4.2 as data 3. We want to obtain cross tabulations for data 3. From the menu choose analyse, descriptive statistics, and cross tabs, select one or more row variable and one or more column variable. Optionally, you can do the following:

- Select one or more control (layering) variables
- Click statistics for tests and measures of association for two – way tables or sub-tables
- Click cells so as to obtain observed and expected values, percentages, and residuals
- Click "formal" for controlling the order of categories.

What do you notice? You will notice that the computer displays the output results of your commands. Study the results to see if it gives you what you desire.

SELF-ASSESSMENT EXERCISE 7

Consider the data below

Type of Students	Sex	
Undergraduate	Male	Female
	48	96
	72	44
	86	24
	35	46
Postgraduate	88	96
	72	42
	36	24
	48	56

Obtain the cross tabulations for the above data. Is the above data ordinal or nominal? Consider this in your cross tabulations and thus obtain relevant correlations for your data

4.0 CONCLUSION

In this unit, you learnt how to edit your data editor using the Undo/Redo commands and the Cut/Copy/Paste commands. You studied how to use

the OLAP cubes to obtain descriptive statistics of your data. I am sure you can also now summarize your data by using descriptive statistics such as frequencies, descriptive, explore and cross tabs.

5.0 SUMMARY

6.0 TUTOR-MARKED ASSIGNMENT

Compare and contrast editing mode in SPSS and Ms Word. What is OLAP cubes? How can you use it to carry out calculations? For the data you saved as 'Data 3', calculate the quartiles, mean, median, made, sum, variance, standard deviation and standard error of the means plot bar charts to represent the data.

7.0 REFERENCES/FURTHER READING

www.spss.com.

Obodo, G.C. (2008). *Computer/Mathematics Education Innovations, Issues and Applications.* Enugu: Floxton.

UNIT 3 THE t TEST AND ONE-WAY ANOVA

CONTENTS

1.0 INTRODUCTION

In the last unit, you learnt how to edit data in SPSS and how to analyse reports, using OLAP cubes statistics. You also learnt about descriptive statistics comprising of frequencies.
In this unit, you will learn about the t-test and one-way ANOVA using SPSS.

2.0 OBJECTIVES

At the end of this unit, you should be able to use SPSS to:

- compare means using one-sample t test, independent-samples t test and paired-samples t test
- compare means using one-way analysis of variance (ANOVA).

3.0 MAIN CONTENT

3.1 The t Test

In this section, independent –samples t test, paired-samples t test and one-way analysis of variance (ANOVA) are treated.

3.1.1 Means

The means procedure computes the means of subgroups and other related univariate statistics for the dependent variables that are within the categories of one or more of the independent variables. You may compute a one-way ANOVA to find out if the means differ significantly.

Examples of univariate statistics you can calculate are sum, number of cases, mean, media, mode, grouped media, standard deviation, standard error of the mean, maximum, minimum, range, variance, kurtosis, skewness, percentages, geometric mean, harmonic mean etc. Optional calculations you can do are one-way ANOVA, eta, eta squared, and tests of linearity R and R^2.

It is good for you to note that the means procedure is very useful for both description and analysis of scale variables. What is a scale variable? A variable is said to be scaled if its values represent ordered categories with a meaningful metric, enabling distance comparisons between values to be appropriate. Age in years, scores of students and income in thousands of Naira are examples of scale variables.

Using the descriptive features of the means procedure, you can execute a variety of statistics to characterize central tendency and dispersion. Central tendency is an attribute of a distribution that shows where the values of the distribution tend to cluster (congregate). There are three measures of central tendency. They are mean, median and mode.

Dispersion is an attribute of frequency that concerns the spread of the values. The following are examples of measures of dispersion – range, variance, standard deviation and inter quartile range.

You can layer or stratify any number of grouping variables into cells that precisely define your comparison groups. There is a hypothesis testing features available in the means procedures. Hence, you can test for differences between group means using one-way ANOVA. For instance, two classes of students were taught using discovery and lecture methods differently. They obtained means of 76.9 and 67.2. If there are 52 and 32 students respectively in the two classes, then one can test the hypothesis of no difference between the two groups using t-test or one-way ANOVA. Note that the one-way ANOVA in Means helps you to do, linearity tests and association measures to enable you comprehend the structure and strength of the relationship between the groups and their means.

For your data, remember that the dependent variables are quantitative while the independent variables are categorical. The values of

categorical variables can be numerical or short string (e.g. using Var to represent variables).

Now enter the following data into the data editor and save it as Data 4.

Location	**Sex**	
	Male	**Female**
Urban	4, 6, 8, 10	1, 2, 4, 6, 5
	6, 4, 3, 7	8, 9, 6, 5, 7
	8, 9, 3, 2	7, 7, 7, 8, 6
Rural	4, 8, 9, 10	9, 10, 7, 6, 4
	9, 5, 5, 6	10, 4, 3, 4, 5
	6, 5, 5, 6	6, 7, 8, 9, 10
	10, 3, 4, 7	2, 6, 3, 3, 8

Define your variables as follows

Sex: 1 = Male, 2 = Female

Location: 1 = Urban 2 = Rural

Do you still remember how to enter your data? Go back to the unit 1 where you learnt how to enter data and revise.

To obtain subgroup means, do the following: From the menus choose analyse, compare means and means. Select one or more dependent variables. You may use one of the following procedures to select your categorical independent variables.

- Select one or more independent variables, say sex, location as in data above. Note that SPSS will display separate results for each independent variable.
- Select one or more layers of independent variables. Note that each layer subdivides the sample. For examples, if you have one independent variable (say, sex) in layer 1 and one independent variable (say, location) in Layer 2, the output results shown on the screen is a crossed table, as opposed to separate tables for each independent variable.

If you desire, click ‘Options” for optional statistics such as an ANOVA table, eta, eta squared, R and R^2.

With the Data 4 still on your data editor, click analyse, compare means and Means. The means submenu is displayed – scores, sex, location. Scores is dependent variable while sex and location are independent variables. Click on scores and click on arrow to place scores in

Dependent list box. Click on sex and click on arrow to place sex in independent list box. Click on location and click on arrow to transfer location to the independent list. The windows will appear as follows:

Variables		Dependent Variables
Scores		
Sex	Options	
Location		
		Independent Variables

Here, there are one dependent variable and two independent variables. Click on "Options" to select cell statistics you want. Click on "ANOVA table and eta" and on "Test for linearity". Click on continue to return to the Means dialogue box. Click OK and the results are displayed. Study your displayed results to ensure it gives you what you want. Notice that the results are displayed separately for each independent variable eg scores by sex, scores by location. The ANOVA results are also displayed separately for each independent variable.

Now go back to the means dialogue box. I want you to place one independent variable into a layer (location), and the other into the independent list box (sex). Leave scores in the dependent list box. Note that sex and location is in the independent list. Click on location and click on "Next" button.

The layer box displayers layer 2 of 2. This shows that the result will display a 2 x 2 table. Click "Options" to select the relevant cell statistics. Click on "ANOVA table and eta" and on "Tests of linearity". Click "Continue" to return to the Means dialogue box. Click OK. The result is displayed. Study the displayed results carefully.

SELF-ASSESSMENT EXERCISE 1

Compare and contrast the above computations with layer and without layer.

3.1.2 One Sample t Test

This type of computation is used to test whether the mean of a single variable differ from a specified constant. For instance, you may wish to test whether the average 1Q score for a group of students differs significantly from 100 or a malt manufacturer may want to take a sample of malt bottles from the production line so as to check if the mean volume of the samples he collected differs from 33cl volume at the 95% confidence level (0.05 probability or significance level).

Thus, the one-sample t test procedure:

- Tests the difference between a sample mean and a known or hypothesized value.
- Permits you to specify the level of confidence for the difference.
- Produces a table of descriptive statistics for each test variable.

To test the values of a quantitative variable against a hypothesized test value, you need to choose a quantitative variable and enter a hypothesized test value. In data 4 above, the quantitative variable is scores. Let your hypothesized test value be 10. Click on "Analyse", "Compare Means" and "One-Sample T Test". The one-sample t test dialogue box is displayed. Click on scores and click on arrow button to transfer scores into the test Variable box. See the "Test Value" box below the "Test variable" box. Click on the "test value" box and type 10, the hypothesized test value. Click OK button and the result is displayed showing two tables – one-sample statistics table and one-sample t test table. The result for one sample statistics may look like this depending on the version of SPSS you are using:

One-sample statistics
Mean…….20.65
Median……....0
Mode……0
Kurtosis……0

The output for the one-sample t-test may look like this:

One sample t test
Hypothesized test value……10
T value……..3.43
Df……..32
Sig of……..0.002

SELF-ASSESSMENT EXERCISE 2

A group of students in a class scored the following out of a maximum of 10 marks

4	6	8	6	9
7	2	6	2	3
4	6	5	7	9
10	6	7	8	9
4	3	6	7	6
8	7	2	6	9

Conduct a one way- sample t- test for these data using hypothesized test value of 10, 5, 6, 7, differently.

3.1.3 The Independent- Samples t Test

This approach compares the means for two groups of data. Ideally, it should be noted that for this test, that the samples (subjects) ought to be randomly assigned to the two groups. This is because one wants to ensure that any difference in sample responses is due to the treatment or lack of treatment and not necessarily to other factors. This may suggest that the independent-samples t test is most applicable to experimental or quasi experimental data. For example, this procedure is not applicable to average income earned by male and female workers. No person is randomly assigned to be a male or female. In situations like this, you ought to make sure that the differences in other factors do not enhance a significant difference in means or otherwise. Note that differences in income earned by someone may be influenced by other factors such as level of education attained, quality of skills possessed, type of employer (federal, state or private).

The independence-sample t test statistical method tests the significance of the difference between the means of two samples. You can also use it to do the following.

i. Describe the statistics for each test variable in your data
ii. Specify a confidence interval for the difference between the two variables (95% or any value of your choice).

You need to be careful in entering your data in using this procedure. The value of the quantative variable (eg scores or figures) of interest are in single column in the data file. The independent samples t test procedure uses a grouping variable that has two values which separate the data into two groups. The grouping variable can be numeric (e.g. values like 1 and 2, 3.4 and 6.8) or a short string (like yes or no, true and false). Consider this example. You can use a quantitative variable, like age, to separate your data into two groups by specifying a cutoff point eg. Cutoff point 18 splits age into an under-18 group and a 18- and over group. A cutoff point of 40 splits students scores into an under-40 grouping (indicating failure) and a 40- and over group (indicating pass).

If you have switched off your system, retrieve Data 4 you had saved. Click on Analyse, Compare Means and Independent – Samples t test. The Independent-Samples t test dialogue box is displayed. Three variables are displayed in “Test variable” box; place sex in the “Grouping Variable” box and you will see (Sex??) inside this box. Click inside the “Define Groups” box below the “Grouping Variable” box.

The Define Groups box is displayed. In this box, there are two methods of defining your groups – use of specified values and cutoff point. Let us use the "Use specified values" under which you have Group 1 and Group 2. Type 1 in Group 1 box and 2 in Group box 2. Click "Continue" to return to the Independent-Sample t test dialogue box. The Group variable box now appears as "Sex (1, 2) and no larger as sex (??). Click "Options" and select a confidence interval of 95%. Click "Continue" and click OK button on the Independent-Sample t test dialogue box, Two tables are displayed – the Group Statistics table and the Independent Samples test table.

SELF-ASSESSMENT EXERCISE 3

Using Data 4, you had saved; Obtain the independent samples t test for location as grouping variable.

3.1.4 Paired-Samples 1 Test

This technique compares the means of two variables for a single group and calculates the differences between values whose average differs from 0. For example, in a quasi experimental design involving a teaching method as a treatment, a group of students will obtain a pair of scores on pre-test and post-test. In other words, there are pre-test and post-test scores for each student. The basic idea in this "pre-post" design is simple. If the treatment has no effect, the mean difference between the pre and post test scores is equal to 0 and the null hypothesis holds. If the treatment has an effect, the average/mean difference is not 0 and the null hypothesis is rejected. The data may consist of two measurements that are taken on the same subject (say English) or one measurement taken on a matched pair of subjects (say English language and Mathematics).

In addition to the above, the paired-sample t test produces

i. descriptive statistics for each test variable
ii. The Pearson product correlation coefficient between the pair of scores and its significance and a confidence interval for the average difference (65% or a value you choose).

Consider the data below. Enter the data into your data editor.

	Pretest	**Posttest**
Male	4, 8, 6 7, 8, 9 7, 5, 6	14, 16, 20 16, 18, 15 14, 16, 19
Female	3, 4, 9	17, 16, 13

	6, 3, 4, 4, 8, 6 3, 4, 5	14, 16, 18 12, 10, 12 14, 16, 15

How can you label these data? Remember that labeling data is dependent on the nature of statistics you will carry out. Recall that data in paired-samples t test procedure must be paired. Hence, enter your data as follows. Enter pre male, pre female, post male, and post female as labels in the table below.

	Pre Male	**Pre Female**	**Post Male**	**Post Female**
1	4	3	14	17
2	8	4	16	16
3.	6	9	20	13
4.	7	6	16	14
5	8	3	18	16
6	9	4	15	18
7	8	4	14	12
8	5	8	16	10
9	6	6	19	12
		3		14
		4		16
		5		15

Do not forget to define your variables after entering the data in the data editor.

Click analyse and paired-samples t test. The paired samplest t test dialogue box is displayed. Click pre-male and post-male and then click arrow. Then the variable “pre-male-post-male” enters the paired variables box. Click again on pre-female and post-female and click the arrow. The paired variable pre-female-post-female enters into the paired variables box. Click Options to select 95% confidence interval. Click “continue” and click OK. The t test results are displayed. Study the displayed results very well. Remember that it is your duty to choose the title of your labels. The number of character of your labels must not exceed 8. For example, you may choose to title pre-male as sex 1 ( ) or any other that makes meaning to you.

SELF-ASSESSMENT EXERCISE 4

Conduct the paired samples t test for

i. Pre-male – pre-female
ii. Post-male – post-female

3.2 One-way Anova

The full name for ANOVA is analysis of variance. This statistical technique gives a one-way analysis of variance for a quantitative dependent variable by a single factor (independent) variable. This procedure is used to test the hypothesis that several (more than two) means are equal. It should be noted that one-way ANOVA is an extension of the two-sampled t test.

In as much as one-way ANOVA helps you to determine differences among the means, you may wish to verify which means differ. When you want to compare means, there are two methods available to you. They are a priori contrasts and post hoc tests. Tests that are set up before running the experiment are called contrasts tests. Tests that are run after the experiment has been conducted are called post hoc tests.

It is possible to use the one-way ANOVA procedure to test the hypothesis that the means of three or more groups are not significantly different. Note that one-way ANOVA also offers you the opportunity to do the following.

- Group-level statistics for the dependent variable
- A test of variance equality.
  A plot of group means range tests, pairsnise multiple comparisons, and contrasts, which will help you to describe the nature of the group differences.

Note that in data for one-way ANOVA, factor variables should be integers, and the dependent variable should be quantitative (internal level of measurement).

3.2.1 Anova Assumptions

There are several assumptions on which ANOVA is anchored.

- Each group is an independent random sample from a normal population.
- Analysis of variance is robust to departures from normality.
- The data should be symmetric.
- The groups should come from populations with equal variance.

In order to test these assumptions, use the Levene's homogeneity-of-variance test. This is available in SPSS 15.0 version.

There are several statistics that the one-way ANOVA procedure offers for each group. They are number of cases, mean, standard deviation, standard error of the mean, minimum, maximum, and 95% - confidence interval, variance, analysis-of-variance table and robust tests of the equality of means for each dependent variable, user-specified a priori contrasts, and post hoc range of tests and multiple comparisons: Bonferroni, Sidak, Tukey's honestly significant difference, Hochberg's GT2, Gabriel, Duncan's multiple range tests, Scheffe, least significant difference, etc.

To obtain a one-way ANOVA, on the data view, click on Analyse and the submenus will come up. Choose compare means, and then one-way ANOVA. Select one or more dependent variables and then select a single independent factor variable. The Options box is used when you want further calculations that are not available in the other windows. If you click Options, possible alternatives are displayed. You can choose any. The contrasts are mainly for highly advanced calculations in mathematics. For any of the post hoc comparisons you need, click on any of them.. It helps you to determine, when there is a significant difference, where the significant difference lies, i.e which factor or sub-factor is mainly responsible for the significant difference.

A one-way analysis result may look like this:

Source of variation Sum of var df Mean Square…F-cal….Sig of F
Between sex
Within sex
Total

SELF-ASSESSMENT EXERCISE 5

Compute the one-way ANOVA for the data below.

	Pretest	**Physics**	**Maths**	**Econs**	**English**
1	14	34	61	38	28
2	16	64	42	42	33
3.	18	44	36	39	36
4	22	42	50	32	41
5	10	58	54	58	42
6	11	38	39	53	29
7	6	50	43	54	49

8	8	51	48	48	48
9	11	49	49	40	34
10	2	38	29	43	50

4.0 CONCLUSION

The t-test and one-way ANOVA in this unit appear under the 'compare means' in the analyse submenu t-test statistics is usually used to compare two means. It is important that you note the characteristics of the one –sample t test, the independent-samples t test and paired-sample t test. One-way ANOVA is used to compare more than two means. Note that it can also be used to compare two means like t test.

Now consider the following data. Enter the data into your data editor as it is below.

S/N	**Pretest**	**Posttest 1**	**Posttest 2**	**Posttest 3**
1	5	30	41	26
2	14	38	32	44
3	12	28	41	33
4	5	40	38	38
5	15	18	10	49
6	13	29	40	40
7	14	38	30	38
8	8	36	29	43
9	7	34	41	41
10	17	54	40	38
11	5	24	39	28
12	9	34	51	52

Click analyse on the menus and rest your cursor on compare means. Move your cursor to one-way ANOVA and click on it. The one-way ANOVA dialogue box appears. It will contain the following variables in the left hand box – pretest, posttest I, posttest II, posttest 3. You can now lick on pretest and then on the arrow beside the factor box, to move the pretest inside the factor box. Click on posttest 1 and click on arrow beside Dependent list, posttest 1 appears in the dependent list box. Similarly, place posttest 2 and posttest 3 inside the dependent list table. Hence there are 3 variables in the dependent list and one factor in the factor box 1.

Now click on Post hoc window below the one-way ANOVA box and select a post Hoc multiple comparisons that you want, say Scheffe. Click on continue to return to one-way ANOVA dialogue box. Click on options to open and specify what you require.

5.0 SUMMARY

In this unit, we have studied how to carry out analysis of data using t-test. Means are usually computed before t test analysis is run. The t test compares means of two variables. The one-sample t test is used to test whether the mean of a single variable differs from a given constant. The independent-samples t-test compares the mean of two groups of data. The paired-samples t test is used to compare means of two variables for a single group. The one-way ANOVA is this unit is an extension of the paired sample t test.

6.0 TUTOR-MARKED ASSIGNMENT

What are the differences and relationship between the following kinds of t-test: one-sample t test, independent-samples t test and paired-samples t test? When can one-way ANOVA be used in place of t-test?

7.0 REFERENCES/FURTHER READING

www.spss.com.

Obodo, G.C. (2008). *Computer/Mathematics Education Innovations, Issues and Applications.* Enugu: Floxton.

UNIT 4 GENERAL AND GENERALIZED LINEAR MODELS ANALYSES

CONTENTS

1.0 INTRODUCTION

In unit 3, you studied means, one-sample t- test, the independent – samples t test, paired-sample t test, one-way ANOVA, its assumptions and computations.

In this unit, you will learn about univariate analysis and its assumptions. You will also study how to enter data for univariate analysis and do computations on univariate analysis specifying different models. You will also study multivariate analysis (analysis involving one or dependent variables with one or more independent variables), its assumptions, data entry and computations. It is important that you install the latest version of SPSS 15.0 Evaluation Model in your system. It is a more usable and application version than its previous versions. You need to be patient in designing your data and consequently entering your data.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- state the assumptions for univariate and multivariate analyses
- distinguish between the univariate and multivariate analyses
- enter data for univariate and multivariate analyses
- carryout computations on univariate and multivariate analyses.

3.0 MAIN CONTENT

3.1 General Linear Model (GLM)

There are two aspects of general linear model we shall discuss in this unit. They are the univariate and multivariate analyses.

3.1.1 Univariate Analysis

The General Linear Model (GLM) univariate analytical procedure provides analysis of variance (ANOVA) and regression analysis for only one dependent variable by one or more independent (factor) variables. The factor or independent variables divide the data into groups. Using GLM procedure, you can investigate the interactions between factors (independent variables) in addition to investigating the effects of each factor. An example is the intraction between sex and location of students. Some of these factors may be random factors. You can also include the effects of covariates and covariate interactions with factors in your analysis, where necessary. Note that for regression analysis, the independent (predictor) variables are usually specified/defined as covariates.

It is important to note that in GLM univariate procedures, both balanced and unbalanced models can be tested. A design is unbalanced if each cell in the model contains unequal number cases. You can use post hoc tests to evaluate the differences existing between specified means that are significant.

We will now give an example to illustrate this procedure. Data (scores) are gathered for some undergraduate students in a university for four years. There are two semesters in a year. The scores of the students is the dependent variable. Other factors (independent variables) include year (1, 2, 3, 4) and gender (male/female) and semester (First/Second).

Consider the data in Table 1. Design how you will organise the data and enter the data into the SPSS data view.

***Table 1*: Scores by Semester by Sex by Year**

1st Semester			**2nd Semester**		
Year	Male	Female	Male	Female	
1	60, 70, 56 43, 51, 60 71, 48, 50	63, 43, 44 51, 72, 66 38, 40, 51	32, 60, 80 91, 71, 67 89, 30, 40	41, 49, 61 66, 71, 59 49, 61, 66	
2.	60, 70 24 43, 56, 66 71, 48, 39 42, 34, 80	81, 41, 36 42, 60, 50 51, 26, 81 43, 61, 71	49, 59, 53 63, 64, 66 71, 81, 58 49, 61, 80	39, 61, 70 80, 60, 71 61, 66, 64 53, 54, 69	
3.	46, 72, 88 34, 28, 66 61, 59, 50	81, 44, 53 76, 26, 77 39, 54, 49	36, 91, 76 83, 84, 70 46, 51, 60	71, 81, 90 60, 70, 80 59, 66, 71	
4.	46, 71, 81, 60 38, 29, 16, 77 83, 43, 56, 71 55, 61, 28, 72	40, 41, 42, 53 48, 60, 70, 71 51, 56, 80, 90 71, 46, 81, 28	22, 36, 81, 42 71, 30, 80, 76 83, 81, 72, 92 36, 55, 51, 71	73, 43, 44, 61 66, 65, 54, 43 34, 48, 90, 59 71, 72, 81, 41	

The above data consist of scores by semester (2), by sex (2) by year (4) variables i.e. 2 x 2 x 4 independent variable data. The scores of students constitute the dependent variable. Semester, sex and year are the independent variables.

Compare your own data entry design with the one suggested below:-

Sex 1 = Male Year 1= First year
Sex 2 = Female year 2 = Second year
Semester 1 = First Semester Year 3= Third year
Semester 2 = Second Semester year 4 = Fourth year

Now study the design of your data entry below

***Table 2*: Data Entry Design for Univariate Analysis**

	Semester	**Sex**	**Year**	**Score**
1	1 1	1 1	1 1	60 70
:	:	:	:	
	1 1	2 2	1 1	63 43
	:	:	:	:
	2 2	1 1	1 1	32 60
	:	:	:	:
	2 2	2 2	1 1	: :
	:	:	:	:

	Semester	**Sex**	**Year**	**Score**
37	1	1	2	60
38	1	1	2	70
:	:	:	:	:
49	1	2	2	81
50	1	2	2	41
:	:	:	:	:
61	2	1	2	49
62	2	1	2	59
:	:	:	:	:
73	2	2	2	39
74	2	2	2	61
:	:	:	:	:

3.1.2 Univariate Analysis Assumption

The following assumptions are made in carrying out all univariate analyses

1. The data are from a random sample in a normal population.
2. All the cell variances are the same in the population

3. Though data ought to be symmetric nevertheless, ANOVA shows a robust departure from normality
4. To check the above assumptions, all your need to do is to use homogeneity of variances tests and spread-versus level plots.

You may now enter your data using the above design. Enter your own data using your own design and see if it will work out.

Now click analyse and move your cursor to general Linear Model (GLM). In the GLM dialogue box, the big vertical rectangular box to the left will contain all the variables you have entered – scores, semester, sex, and year. Remember that in univariate analysis, you can only have one dependent variable i.e. scores in this case. Below is the diagram.

Variable	dependent variable
Scores	
Semester	
Sex	
year	
	Independent variables

The other variables are fixed factors (independent variables) and random factors. There is a provision for covariates. Click on scores and click on the arrow beside dependent variable box. Similarly place semester, sex and year into the fixed factors box. Click on model box to display the univariate model box. In this box, click on "full factorial" and click continue. Click on the sum of squares you want – either type I, II, II or IV. Click in the box beside "include intercept model" to choose it. Now click on "continue" to get back to "Univariate" dialogue box. Click OK. The results of the univariate analysis are displayed. Study the results carefully. You should note that it is not possible to display the results here because of the voluminous nature of the results usually more than 30 pages It is better viewed on the screen as a student. Neveertheless, part of the result will like this:

One –way ANOVA for Pretest

Source of variation	Sum of squares	df	Mean squares	F	Sig
Between groups	772.250	8	96.531	2.216	.227
Within groups	130.667	3	43.556		
Total	902.917	11			

The GLM model found in Univariate dialogue box contains buttons for specify model, factors and covariates. Models, sum of squares, and include intercept in model. You can specify model by clicking either on

full factorial or custom. A full factorial model contains all the factor mean effects. All covariates mean effects, and all factor-by factor interactions. It does not contain covariate interactions. If you select custom, then you must specify only subset of interactions or factor-by-covariate interactions. There is need for you to indicate all the terms you want in the model.

The factors and covariates are listed with "F" for fixed factor and "C" for covariate. In a univariate analysis "R" represents a random factor.

Note that the model you choose depends on the nature of your data. When you have selected "Custom" you can select the mean effects and interactions that are relevant to you in your analysis.

There are four methods of calculating the sums of squares – Type 1, Type II, Type III, Type IV. Nevertheless, for balanced or unbalanced models with no missing cells, the Type III sum of squares method is the most commonly used.

Remember that the intercept is usually included in the model. If you assume that the line of best fit passes through the origin, you can exclude intercept.

Go back to the Univariate dialogue box. Place "scores" as dependent variable. Place "semester" and "sex:" as fixed factors. And place "year" as covariate. Select full factorial as model. Click Type III. Click continue to return to Univariate dialogue box. Click OK. The univariate analysis of variance results are displayed. Compare the result when you used "Year" as covariate and when you did not use any covariate before now.

SELF-ASSESSMENT EXERCISES 1

For the data in table 1 which you have entered, repeat the analysis by

i. Choosing custom model
ii. Using sex as covariate
iii. Using semester as covariate
iv. Repeat numbers 1, 2, and 3 using Type I, Type II and Type IV sum of squares for each analysis. Study your results and compare them.

3.2 Multivariate Analysis

The GLM multivariate analytical technique is used for analysis of variance and regression analysis for more than one dependent variable

(multiple dependent variables) by one or more factor (independent variable) or covariates. Remember that the factor variables divide the data into groups. This technique can be used to test the null hypothesis concerning the effects of factors/variables on the means of various groupings of a joint distribution of dependent variables. The procedure enables you to investigate interactions between factors in addition to effects of individual factors. You can also investigate the effects of covariates and covariate interactions with factors.

Note that for regression analysis, the independent (predictor) variables are specified as covariates. Remember that a design is said to be balanced if each cell in the model contains the same number of cases. It is unbalanced when the cells do not contain the same number of cases. Note that if more than one dependent variable is used in analysis, the following multivariate analysis of variance will be provided: Pillaic's trace, Wilks' Lambda, Hotelling's trace, Roy's largest root criterion with appropriate F statistics. The univariate analysis of variance for each dependent variable is also provided. It should be noted that after an overall F test has shown significant difference, you can use post hoc tests to evaluate differences between specified means. The post hoc multiple comparison tests are performed for each dependent variable separately.

The following post hoc, range tests and multiple comparisons are available – least significant difference, Bonferron, Sidak, Scheffe, Ryan-Einot – Gabriel – Welsch multiple F, Student – Newman – Keuls, Tukey's honestly significant differences, Duncan, Gabriel, Waller Duncan t test etc. The following descriptive statistics can be obtained – observed means, standard deviations, and counts for all of the dependent variables in all cells, the Levene test for homogeneity of variance, Box's M test variable, and Bartlett's test of sphericity.

Always remember that the dependent variable ought to be quantitative. Factors are categorical (in groups, say sex= male and female) and can have a numeric values (eg 1,2, etc) or string values of up to eight characters. Covariates are usually qualitative variables that are related to the dependent variable.

3.2.1 Assumption in using Multivariate Analysis

The following assumptions are made in using multivariate analysis.

1. For the dependent variables, the data are a random sample of vectors from a multivariate normal population,
2. In the population, the variance – covariance matrices for all cells are the same.

3. Though data should be symmetric, ANOVA is robust to departures from normality.
4. If you want to check assumptions, you can use the homogeneity of variances tests (including Box's M) and spread-verses-level plots. If you desire, you can examine residuals and residual plots.

3.2.2 How to Obtain Glm Multivariate Tables

To obtain GLM multivariate tables, I encourage you to do the following.

1. From the menus, you have to choose analyse, General Linear Model, Multivariate specifically.
2. Select at least two dependent variables.
3. Optionally, if need be, specify fixed factor(s) (covariates), and WLS Weight. WLS weight means weighted least squares (WLS) weights.

3.2.3 Multivariate Analysis Computations

Consider the data in Table 3. Design the data entry procedure and enter the data into your data editor. Save these data as Data 7.

	1st				**2nd**			
	Male		Female		Male		Female	
	Score 1	Score 2	Score 1	Score 2	Score 1	Score 2	Score 1	Score 2
1	20	16	16	17	16	11	17	20
	16	20	17	18	17	12	18	14
	17	17	18	16	10	16	10	16
	14	18	10	14	11	17	9	11
	10	12	9	11	13	12	5	12
	9	16	4	10	8	13	6	15
2	8	17	11	8	9	14	10	16
	16	10	10	6	16	20	12	14
	17	16	16	17	20	18	14	14
	19	17	19	16	20	19	18	20
	20	18	20	20	14	16	19	16
	11	10	21	19	10	14	20	20

Compare your design for entering your data with the one below. Define labels as follows:-

Semester 1 = First Semester
Semester 2 = Second semester
Sex 1 = Male

Sex 2 = Female
Age 1 = Below 15 years
Age 2 = 15 years and above
Score 1 = Scores in first test
Score 2 = Scores in second test

Table: **Data Entry for Multivariate Analysis**

1.	1	1	1	20	16
2	1	1	1	16	20
	:	:	:	:	:
7	1	1	2	8	17
8	1	1	2	16	10
	:	:	:	:	:
13	1	2	1	16	17
14	1	2	1	17	18
	:	:	:	:	:
19	1	2	2	11	8
20	1	2	2	10	6
:	:	:	:	:	:

Having entered your data, click Analyse, General Linear Model and Multivariate… The system will display the multivariate dialogue box with the following variables – Sem (semester), sex (sex), age (age), score 1, score 2. The two dependent variables are score 1 and score 2. Transfer them to the Dependent variables box. Use age as covariate therefore; transfer it to the covariate(s) box. Transfer sex and semester to the fixed factor (s) box. Click on model to see the multivariate Model dialogue box. Click on custom and the following factors and covariates will appear – semester (S, sex (F) age (C). Transfer all three factors to the model box on the right side. Click on interaction box window. The following kinds of interactions will display – interaction, main effects, All 2-way, All 3-way, All 4-way, All 5-way. Click on interaction. For sum of squares, choose Type III. Click on the box besides "Include intercept model" to select it. Click on continue. You will return to multivariate dialogue box. Ignore contrasts because it is used for repeated measures of scores. The data you are analysing are not obtained from repeated measures. If you are interested in Plots… click on it and select your choice. Click on options to display the multivariate options dialogue box. This box will display overall, semester, and sex. If you are interested in calculating the three kinds of means for the three factors,

transfer the three factors to the 'Display means for' box. If you want to compare main effects, click in the box beside "compare main effects". Choose the confidence interval adjustment of your choice of LSD (none). Choose the kind of calculations you want computed such as descriptive statistics, parameter estimates, homogeneity tests, lack of fit test etc. Choose 0.05 significance level and click continue. To return to multivariate dialogue box. Now click OK. The General Linear Model result is displayed as follows: between – subjects factors, descriptive statistics (overall) semester, and sex each for scores/and scores 2), Box's test of equality of covariance matrices, multivariate tests and showing results for intercept, semester, sex and age. Each of these shows Roy's Largest Root. The Levene's test of equality of error variances is also shown. Tests of between – subjects effects is usually shown separately for scores 1, and scores 2 for each of the following factors – semester, sex and age. Parameter estimates results are also shown separately for score 1 and score 2. Other results are displayed are lack of fit, univariate tests, estimated marginal means, pairwise comparisons, multivariate tests, etc.

Study the displayed results very carefully and ensure it is what you want. If not, go back and select your variables (dependent and factor) correctly. The results are in several pages that makes it very voluminous to be displayed here for lack of space...Remember that what you feed the computer is the result it will give you. If you feed the computer with wrong variables, it must give you wrong results. To save the results of your analysis, click file and save it using the "Save As" command as usual.

SELF-ASSESSMENT EXERCISES 2

1. For the data you used above, use the factorial model instead of custom model and repeat the analysis.
2. Repeat the above analysis using semester, sex and age as factors. Do not use any covariate. Use the custom model and all-3-way interaction. Use Type 1 error.

Repeat this analysis two using each of Type II and Type IV errors. Save the output of each analysis. Compare and contrast your results.

4.0 CONCLUSION

Two aspects of Generalized Linear Model (GLM) have been presented in this unit – the univariate and multivariate analyses. The univariate analyses helps you to do ANOVA and regression analysis when one dependent variable by one or more factor are involved. The multivariate analysis helps you to do ANOVA and regression when two or more

dependent variables by one or more factors are involved in your data. It is important you learn effectively when to use the two of them. You must be careful to choose exactly what you want in your analyses. You must have observed that the most important thing in SPSS is your data entry. For different analyses, data entry procedure differs. Hence, you must be very careful to design your data entry carefully so as to obtain correct results. Notice also that SPSS 15.0. Evaluation which is used in this book is different in many ways from the older versions of SPSS. Do not use the SPSS 15.0 production facility version. It may not help you for now.

5.0 SUMMARY

In this unit, we discussed the General Linear Model (GLM). Two types were discussed - univariate and multivariate analysis. I am sure you can now design your data entry and enter the data into the data editor and save them. You also learnt how to use your SPSS to run a univariate analysis. Remember that univariate analysis require only one dependent variable with one or more factors. Data design and entry multivariate analysis was also treated. You should now be able to run your multivariate analysis. Remember that it requires two or more dependent variables with one or more factors. I want you to study carefully the differences between a univariate and multivariate analysis.

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the differences and similarities between the univariate and multivariate analyses. Compare and contrast the assumptions underlying the univariate and multivariate analyses.

7.0 REFERENCES/FURTHER READING

www.spss.com.

Obodo, G.C. (2008). *Computer/ Mathematics Education Innovations, Issues and Applications.* Enugu: Floxton.

UNIT 5 CORRELATION, REGRESSION, DATA REDUCTION AND NON PARAMETRIC TESTS

CONTENTS

3.1 Correlation

Correlation is a measure of how variables or rank orders are related. Before you calculate a correlation coefficient, you have to screen your data for outliers (that may give rise to misleading results) and secondly, obtain an evidence of a linear relationship. Three kinds of correlations will be discussed here. They are bivariate, partial and distance correlations.

3.1.1 Bivariate Correlation

The Bivariate correlation method calculates Pearson's correlation coefficient, Spearman's rho, and Kendall's tau-b with their significance levels. Pearson's correlation coefficient is a measure of linear association. It is important to note that two variables can be perfectly related. Nevertheless, if the relationship is not linear, it may not be appropriate to use Pearson's correlation coefficient in measuring their association.

Note that the bivariate correlation method calculates the pairwise association for a given set of variables and displays the results in a matrix. This method is useful in determining the strength and direction of the association between two scale or ordinal variables. Pairwise means when you are calculating a measure of association between two variables in a large set of data, you include cases in the calculation when the two variables have non missing values, irrespective of the values of the other variables in the set. Recall that a variable is treated as a scale when the values of the variable represent ordered categories (e.g scores in percentage) with a meaningful metric, so that distance comparisons between values are appropriate. Examples of scale values are test scores, income in naira, and age. A variable is ordinal when the value of the variable represent categories with some intrinsic ranking, e.g, (pass levels, from very good, good, fair to bad.) Examples of ordinal variables are questionnaire or attitude scores that range from strongly agree to strongly disagree and preference rating scores.

For the data, use symmetric quantitative variables for Pearson' s correlation and quantitative variables or variables that have ordered categories for Spearman's rho and Kendall's tau-b. Note that Pearson's correlation coefficient assumes that there are measures for two variables per respondent.

When we use Pearson correlations, you can obtain statistics for each variable or for a pair of variables. For instance, for each variable, you can obtain the following statistics- mean, standard deviation and numbers of cases with non missing values. For each pair of variables, you can obtain Pearson's correlation coefficient, spearman's rho, Kendall's tau-b, cross product of deviations and covariance.

To obtain bivariate correlations, choose the following from the Menu-analyse, correlate, bivariate. Then select two or more numeric variables. From the following bivariate dialogue box, you can obtain the following options: correlation coefficients, test of significance, and flag significant correlations

3.1.2 Correlation Coefficients

When your data are quantitative, and normally distributed, choose the Pearson's correlation coefficient. When your data are not normally distributed or they have ordered categories, you are advised to choose Kendall's tau-b or spearman. Each of them measures the association between rank orders.

3.1.3 Test of Significance

There are two available tests of significance procedures: two tailed or one tailed probabilities. Note that if the direction of association of your data is known in advance, you are advised to choose one tailed test. Otherwise, you are expected to choose two tailed test.

3.1.4 Flag Significant Correlations

In the correlations window, you need to indicate that the correlation of your data at 0.05 level are to be marked with asterisk and those significant at 0.01 be marked with two asterisks.

SELF-ASSESSMENT EXERCISE 1

In your own words, explain the concept of bivariate correlation.

3.1.5 Bivariate Correlation Computations

Retrieve the data you have saved as Data 5 in Unit 4 with headings premale, prefemale, postmale, post female. Select analyse, correlation and bivariate. The bivariate correlation dialogue box is displayed. The four variables are each quantitative. So you can only compute the pearson's correlation coefficient. Transfer the four variables into the variable box. Click Pearson. Click two tailed. Click "flag significant correlations" click options to display the bivariate correlations option dialogue box. Click means and standard deviation, cross product deviations and covariance, and exclude cases pairwise. Click continue to return to the bivariate correlation dialogue box. Click ok to display the results (output) of the data. The result should show your chosen descriptive statistics and Pearson's correlations for the four variables.An example of the output is as follows.

Correlations

		Premale	prefemale	postmale	Postfemale
Premale	pearson	1	-0.371	-0.760	0.353
	Sig		0.326	o.847	0.351
	Sum of squares Cross products	21.566	-10.556	-2.111	12.444
	Covariance	2.694	-1.319	2.64	1.556
	N	9	9	9	9

Now rank the pre male and post female scores. Compare your ranking with the following:

Table 1: **Ranking of Pre Male and Post Female Scores**

	Pre male rank	**Post male rank**
1	9	9
2	2	4
3	6	1
4	5	4
5	2	3
6	1	7
7	2	9
8	8	4
9	6	2

Compare your own ranking with the ranking in table 1. Enter the data (ranks) in table 1 into your data editor. After entering your data expressed in ranks, select analyse, correlate, bivariate…. In the displayed bivariate correlations dialogue box, transfer the two variables shown (pre male and post male) into the variables box. Since the data are ranked, do not select Pearson's correlation. Select Kendall's tau-b and Spearman correlations. Click on options in the bivariate correlations option box. Select "means" and 'standard deviations', exclude cases pairwise. Click continue and then ok. The Kendall's tau-b and Spearman rho correlation coefficients are displayed. An example of the output is as follows.

			Premale	Postmale
Kendall's tau	Premale	Corr. Coeff.	1.000	-0.0125
		Sig.	.	0.661
		N	9	9
	P0stmale	corr. Coeff.	-0.125	1.000
		Sig	0.661	.
		N	9 9	
Spearman'S rho	Premale	Corr. Coeff.	1.000	-0.130
		Sig.	.	0.738
		N	9	9
	Postmale	Corr. Coeff.	-0.130	1.000
		Sig	0.738	.
		N	9	9

SELF-ASSESSMENT EXERCISE 2

In data 5 which you had retrieved above, rank the pre female and post female scores. Calculate the relevant correlation coefficient for the data.

3.1.6 Partial Correlation

This procedure calculates correlation coefficients that describe the linear relationship between any two variables while it is controlling for the effects of one or more additional variables. An example is this: is there a relationship between education funding and school drop outs? One expects a negative correlation but one study reports a significant positive correlation. This is because the report shows that as education funding increases, school dropout rates appear to increase. Controlling for the rate of attendance to school/ lessons, however, virtually eliminates the observed positive correlation. Education funding and dropout rates appear to be positively related because more people have access to schools where funding decreases.

Now, retrieve the data you saved as data 5 on pre male, pre female, post male, post female. Select analysis, correlate, partial and you would notice that the partial correlation box is shown. Select pre male as controlling variable. Select two tailed, display actual significance level. Select options to display "partial correlation" option dialogue box. Select "means" and "standard deviation", zero- order correlations, and exclude cases list wise and then click continue.

The following are the statistics you can choose from in partial correlations options:

1. Means, and standard deviations. This will be displayed for each variable. It shows also the number of cases with non missing values.
2. Zero- order correlation: selecting this displays a matrix of simple correlation between all variables, including control variables. You can select either of 1 or 2 or both.
3. In missing values, you can select one of the following alternatives:

a. Exclude cases list wise: this means excluding from all computation cases having missing values for any variable, including a control variable.
b. Exclude cases pair wise: note that for calculations of the zero-order correlations on which partial correlations are based, any cases that has missing values for both or one of the pair of variables is not used.

Now click Ok in the partial correlations dialogue box. The results (output) of the computations are displayed- the descriptive statistics results, correlation results for each variable without any controlling variable effect and with controlling variable effect.

SELF-ASSESSMENT EXERCISE 3

Using your data 5 saved above, compute correlations using pre male and pre female scores as control variables. Compare your results with the previous one you used.

3.2 Linear Regression

There are different kinds of regression analysis available in SPSS but we shall deal with linear regression. Linear regression estimates the coefficients of the linear equation, that involves one or more independent variables, which best predicts the value of the dependent variable. For example, you can try to predict a student's total yearly scores in a class (the dependent variable) from independent variables such as location, sex, age, education and years of experience.

It should be noted that the data for dependent and independent variables ought to be quantitative. Variables that are in categories like age, sex, location, years of experience should be recoded to binary (dummy) variable or any other type of contrast variable.

3.2.1 Assumptions for Linear Regression

The following are the assumptions underlying linear regression. They are:

1. For every independent variable value, the distribution of the dependent variable must be normal.
2. The variance of the distribution of the dependent variable need to be constant for all the values of the independent variable.
3. The relationship between the dependent variables and each of the independent variable should be linear.
4. All observations need to be independent.

3.2.2 Statistics to Compute

Various kinds of statistics can be calculated for each variable. Some of them are as follows: number of valid cases, mean, and standard deviation. For each model, the following can be computed: regression coefficient, correlation matrix, and partial correlations, multiple R, R^2 adjusted R^2, change in R^2, standard error of the estimate, analysis of variance table, predicted values, residuals, etc.

3.2.3 How to obtain a Linear Regression Analysis

You can obtain a linear regression analysis by choosing or selecting analyse, regression and linear. The linear regression dialogue box appears and within it you can do the following:

1. Select a numeric dependent variable
2. Choose one or more numeric independent variables
3. You may or may not choose the following:

a. group the independent variable into blocks and specify different entry procedures for different subsets of the variables
b. choose a selection variable to limit the analysis to a subset of cases having a particular value(s) for the variable
c. choose a case identification variable so as to identify points on plots.
d. Choose a numeric WLS weight variable for a weighted least-squares analysis,where WLS means weighted least- squares

3.2.4 Computations of Linear Regression

Retrieve the data you had saved as data 3 with the labels, sex, location scores in unit 2. Select analyse, regression and linear. The linear regression dialogue box is displayed. Your three variables in data 3 are displayed- sex, location, and scores. Transfer scores to the dependent variable box. Transfer sex and location to the independent variable(s) box. Select enter as the method of analysis to be used. Ignore selection variable, case labels and WLS weight. They are for advanced statistical computations. Click on statistics to display the linear regression statistics dialogue box. Select the regression coefficient you need, e.g. estimates, confidence intervals, covariance matrix, R squared change, model fit, descriptive, part and partial correlations and collinearity diagnostics. There are two residuals- Dubin- Watson, and case wise diagnostics. Select one of them. Click continue to return to the linear regression dialogue box.

If you want to plot graphs, then click on plot, to display linear regression plots dialogue box. You may select the dependent variable for the X axis and the other variable for the Y axis. You may click on histogram, normal probability plot, produce all partial plots if you need them. Click on save and save predicted values, residuals, distances, influence statistics, prediction intervals and coefficient statistics the way you want. If you do not need them, ignore them and click on continue to return to the linear regression dialogue box. Click on options to display linear regression options dialogue box. In this box, choose as you need, the probability level of F (say 0.05), use of F- value, include constant in equation. Click continue, click ok. The system displays linear analysis as follows:

Descriptive statistics, correlations, variance entered/ removed, model summary, ANOVA, coefficient, residuals statistics etc depending on what you had chosen. Study the displayed results very carefully. Any time you run into problems or you need more information, click the help button. You may get relevant information in each box to help you. Each of the above will have detailed results that run into several pages too cumbersome to publish here. However, an example of the ANOVA table is as follows:

Source	Type III Sum of squares	df	Mean square	F	Sig
Corrected model	672.244	4	168.061	0.751	0.562
Intercept	21169.433	1	21169.433	94.599	0.00
Year	148.965	1	349.516	1.562	0.218
Semester	349.516	1	135.435	0.605	0.440
Sex	135.435	1	10.694	0.048	0.828
Semester x sex	10.694	1	223.780		
Error	10517.679	47			
Total	174038.000	52			
Corrected total	11189.923	51			

R Squared = 0.060 (Adjusted R squared = -0.020

SELF-ASSESSMENT EXERCISE 4

1. Retrieve the data you have saved as data 2 in unit 3. Do a linear regression analysis of data 2 with variables school, locations, and scores.
2. Run a linear regression analysis on the data below. Choose relevant statistics, plots and options to suit the data.

S/N	Age	Class	Scores
1	11	1	65
2	12	1	48
3	13	1	62
4	14	1	71
5	10	1	80
6	12	2	49
7	14	2	33
8	13	2	49
9	12	2	56
10	11	2	61
11	12	3	70
12	14	3	82
13	13	3	33
14	10	3	74
15	12	3	40
16	13	1	64
17	12	2	55
18	10	3	50
19	11	1	49
20	14	2	60
21	10	3	49
22	11	3	59

23	14	2	65
24	13	1	70
25	12	1	80

3.3 Data Reduction

To access data reduction, click analyse and then data reduction. Under data reduction, we will study factor analysis. Now, click factor analysis for the factor analysis dialogue box to appear.

3.3.1 Factor Analysis

In factor analysis, you are attempting to find out the underlying variables or factors that explain the pattern of correlations observed among a group of variables. Note that factor analysis is used in data reduction. Its duty is to identify a small number of factors which explains most of the observed variance in a larger number of manifest variables. You can also use factor reduction to generate hypothesis concerning causal mechanisms or to screen variables that are meant for subsequent analysis. For example, we can identify co linearity before performing a linear regression analysis.
It is very important to note that factor analysis method gives room for a high degree of flexibility as follows:

1. It offers seven methods of factor extraction
2. It offers five methods of rotation, including direct oblimin and promax for non orthogonal rotations
3. It provides for three methods of calculating factor scores, and such scores can be saved as variables for further analysis.

Recall that factor analysis is mainly used for data reduction or for structure detection. The objective of carrying out data reduction is to eliminate redundant (highly correlated) variable(s) from the data file. This helps to replace the whole data file with a smaller number of uncorrelated variables. On the other hand, the objective of structure detection is to investigate the latent (or underlying) relationship between the variables. Note that data for factor analysis should emanate from variables with quantitative data at either interval or ratio level. Categorical (independent) variable data such as location, sex, religion, country of origin, school type are not suitable for factor analysis. Any data suitable for calculating Pearson's correlation coefficient are suitable for factor analysis.

3.3.2 Factor Analysis Assumptions

The following are the assumptions in factor analysis:

1. The data should have a bivariate distribution for each pair of variable
2. Observations ought to be independent
3. Variables are determined by common factor and unique factors. Common factor are factors estimated by the model. Unique factor are those that do not overlap between observed variables
4. The calculated estimates stand on the assumption that all unique factors are uncorrelated with each other and with the common factors.

3.3.3 Computations in Factor Analysis

Consider the following sets of scores in five tests

S/n	Test 1	Test 2	Test 3	Test 4	Test 5
1	23	65	65	34	27
2	47	78	66	44	43
3	38	67	67	54	43
4	96	77	54	56	48
5	50	60	74	83	22
6	71	50	80	50	61
7	51	56	72	39	40
8	71	62	53	49	9
9	45	62	90	10	10
10	48	72	69	60	66
11	51	65	72	48	49
12	62	44	55	66	62
13	22	77	84	43	11
14	15	71	90	19	29
15	31	61	50	60	74
16	55	66	34	43	26
17	12	23	31	45	56
18	33	44	52	18	47
19	56	74	46	47	48
20	11	28	39	48	83
21	87	65	9	68	30
22	55	54	65	66	77
23	71	82	27	19	13
24	24	43	33	25	36
25	66	45	56	56	67
26	21	91	93	38	21

27	61	73	82	23	31
28	9	62	82	18	32
29	21	23	8	54	46
30	66	74	38	54	45

Now enter the data into your data editor of SPSS. Save this data as data10. Do a factor analysis for data 10. How do you do this? To obtain a factor analysis, from the menus, choose analyse, data reduction and factor:, select the variables for the factor analysis from the factor analysis dialogue box. There are five variables in data 10. They are: test 1, 2, 3, 4 and 5. Enter each of them into the variable box. Click the Descriptives, to display the factor analysis: Descriptive dialogue box. In this box, select relevant statistics that you need e.g. univariate descriptives, initial solution. Select also the correlation matrix that you need e.g. coefficients, significance levels, determinants, KMO and Bartlett's test of sphericity, inverse, reproduced, anti- image. Click continue and return to factor analysis dialogue box. Click extraction… to display the factor analysis: extraction box. Select one method of extraction you want e.g. principal components, unweighted least squares, generalized least squares, maximum likelihood, principal axis factoring, alpha factoring, image factoring. For this particular analysis in this example, select principal components. Under analyse in the dialogue box, select either correlation matrix or covariance matrix. Under display select either unrotated factor solution or scree plot or both. Under extract select either " Eigen values over" or a number of factors. For this analysis, select "EIGEN VALVES over" click continue to return to factor analysis dialogue box again. Click on rotation….., to see the factor analysis : rotation display box. There are six methods – none, varimax, direct oblimin, quartimax, equamax, promax. Select varimax method. Under display, select either "rotated solution" or loading plot(s)" or both. Click continue to return to factor analysis dialogue box. Click on scores…, to show the factor analysis: factor scores dialogue box. Click on "save as variables" to create one new variable for each factor in the final solution. Select one of these three methods for computing the factor scores- regression, Bartlett, or Anderson- Rubin. For this analysis, select regression and select "display factor score coefficient matrix". Click continue. You are back to factor analysis dialogue box. Click options to see the factor analysis: option dialogue box. Click on the kinds of "missing values" you want. There are three options- exclude cases listwise, exclude cases pairwise, replace with mean. Click on the type of coefficient display format" you want: either sorted by size or suppress absolute values less than. "in each case above always click the help button to read the functions of each window/ button. Select continue to return to the factor analysis dialogue box. You have covered the five components of factor analysis – descriptives…, extraction…, rotation…, scores…., and options… you can now click ok

button to display the results of the analysis. Study your displayed results to see if that is what you want. You may save the results or not using the output dialogue box displaying the results of the analysis. Return to your data editor and observe that two factors are saved for you- factor 1 and factor 2. The result on your data editor with the two saved factors will look as follows.

Test 1	Test 2	Test 3	Test 4	Test 5	Factor 1	Factor 2
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.

In other words, in your editor, you have tests1, 2, 3, 4, 5, factors displayed on the screen. This is because you clicked “save as variables” in the factor analysis factor scores “dialogue box”. You can print the results of your analysis as usual. Note that the detailed results will run into several. pages too cumbersome to include here.

SELF-ASSESSMENT EXERCISE 5

1. Repeat the factor analysis for data 10 above using generalized least squares extraction method, covariance matrix analysis, number of factors extract technique, direct oblimin rotation method and Bartlett method.
2. Repeat the above factor analysis in number 1 using each of the remaining three extraction methods.

3.4 Non Parametric Tests: Chi Square Tests

There are various kinds of non parametric tests, but we shall learn only about chi square test in this course. The chi square test statistical approach tabulates variables into categories and thus calculates a chi square statistics. The chi square test is a goodness-of-fit test that compares the observed and the expected frequencies in each category of the variable so as to test that all the variable categories have the same proportion of values. Alternatively, chi square can test whether each category contains a user- specified proportion of values.
From the above, you can discern that the chi square test method of analysis tabulates a variable into categories and can test a hypothesis to find out if the observed frequencies do not differ from the expected value. Note that the chi square test helps you to do the following:

1. obtain descriptive statistics and/ or quartiles on the concerned variable
2. include all categories of the test variable or the test may be limited to a specified range of value.
3. use customized or standard expected values.

The following kinds of data are useful for chi square statistical test- ordered or unordered numeric categorical variables at ordinal or nominal scale levels of measurement. You can convert string variable to numeric variable by using the automatic Recode procedure which you can find in the transform menu.

3.4.1 Assumptions for Non Parametric Tests

The following are the assumptions underlying the non parametric tests:

1. they do not need assumptions regarding the shape of the given distribution
2. data are assumed to be a random sample.
3. the expected frequencies for each category should be at least a value of 1
4. the expected frequencies of not more than 20% of the category should be less than 5

The following are examples of cases that you can use chi square test

1. whether a bag of table tennis balls contains equal proportions of red, blue, green, white, orange, and yellow balls.
2. whether the number of students in a class have equal number of students within the age brackets of 11-12, 13-14, 15-16, and 17-18 years
3. whether the people who attended a party are wearing 10% blue, 30% brown, 15% red, 25% yellow and 30% other kinds of clothes

You can obtain the following statistics using the chi square test procedure- mean, standard deviation, minimum, maximum, quartiles, number and percentage of missing and non missing cases, number of observed and expected cases for each category, residual and the chi square statistics.

3.4.2 Chi Square Computations

Enter the following data into your data editor and save it as data 11.

Key: SA - Strongly Agree
A - Agree
D - Disagree
SD - Strongly Disagree

Test the hypothesis that there is no significant difference between the frequency responses of the respondents in each category.

S/N	SA	A	D	SD
1	23	10	84	35
2	43	67	111	21
3	21	21	112	54
4	6	34	95	27
5	6	67	85	43
6	21	67	112	14
7	43	34	111	14
8	24	43	84	43
9	25	34	54	34
10	24	43	54	22
11	7	23	22	34
12	7	22	122	22
13	6	23	95	35
14	43	22	84	21
15	21	21	84	54
16	21	34	66	27
17	21	10	66	35
18	21	67	84	21
19	43	21	84	54
20	6	34	95	27
21	7	67	122	43
22	7	67	22	14
23	24	34	54	14
24	25	43	54	43
25	24	34	84	34
26	43	43	111	22
27	21	23	112	34
28	6	22	85	22
29	6	23	95	35
30	21	22	112	31
31	43	21	111	54
32	24	34	84	27

To obtain a chi square test, choose from the menus analysis, non parametric tests, chi square…; select one or more of your test variables. Note that each variable gives a separate test. In other words, for data11, select SA, A, D and SD as variables. There will be separate results for each of them. Select the expected range' e.g. (get from data11 and expected values" (e.g. all categories) in the displayed chi square test dialogue box. Click exact and select the type of exact tests you want. There are three of them- asymptotic only, Monte Carlo and exact. Select asymptotic only for this present analysis. Click continue to return to chi square test dialogue box. Click options to show the chi square test; in options dialogue box, under statistics, select descriptive and quartiles. Click continue to come back to the chi square test dialogue box. Click ok button and the results of the chi square test analysis is displayed as output SPSS viewer. Study the results very carefully, part which may appear as follows, depending on your entries.

Chi Square test	32.4	Sig.	0.0234
Mean	44.65		
Std dev	32.13		
N	32		

SELF-ASSESSMENT EXERCISE 6

Repeat the above analysis using data 11 with " Monte Carlo" exact tests. Compare and contrast your results with that of the asymptotic exact test you obtained above.

3.5 Data Transfer from One Package (Software) to Another

While you are working on one package/ software (say SPSS), you can go to Ms Excel or ms word, to transfer data from either of them to SPSS. You can transfer data from one package to another by either copying or cutting a text and pasting it in a relevant package. For example, you are already working on SPSS. You can go to Ms Excel and copy or cut a text so that you can paste it in SPSS or to check something and/ return to SPSS. How do you achieve this?

Remember you are working on SPSS (or activate SPSS if you are not working on SPSS). Go to the bottom of your screen for a double right arrow direction. Click on the double right direction arrow. Two or more windows will show- show desktop, launch Microsoft outlook. Click on show desktop. The desktop appears. If you have Ms Excel icon on the desktop, double click it to access Ms Excel. If not, click on start button to display the programmes menu. Select Ms Excel and click it. Ms Excel is displayed. Copy or cut the relevant text (data) click SPSS on the bottom of the screen and paste the copied or cut text on the SPSS screen.

Having pasted on SPSS data editor screen from Ms Excel, you can copy or cut from Ms Word to SPSS in a similar manner. Now copy or cut a text from Ms Word to SPSS. Remember that three packages are running- SPSS, Ms Word and Ms Excel.

Now access SPSS. With SPSS still on, activate Ms Excel. With SPSS and Ms Excel still on, activate ms word. To close down the system, you need to be very careful. Remember that three programmes are running simultaneously. To exit ms word, click at the close button at the top right corner of the screen. To exit Ms Excel, click on Ms Excel at the bottom of the screen and click at the close button on the top right corner of the screen. Te exit SPSS, click at SPSS at the bottom of the screen to display SPSS data editor. Then click at the close button at the top right corner of the screen to return to the desktop.

3.5.1 Another Method of Accessing another Package

Another method of accessing a package different from the one you are working on currently, is by the use of minimise at the top right corner of the screen. Now activate SPSS to show its data editor. Click minimise and the system returns to desktop. Double click Ms Excel (if its icon is on the desktop) or select it from programmes menu and click on Ms Excel once. minimise Ms Excel to return to the desktop again. Select Ms Word now by double clicking its icon on the desktop or clicking it once in the programmes menu. Three programmes/ packages are currently running. You can copy/ cut and paste any text or part of it from one package to another.

To exit them, remember to exit each one after the other. Click the close button on the displayed Ms Word to return to the desktop. Click Ms Excel at the bottom of the screen to display Ms Excel worksheet. Then, click the close button at the top right corner to exit Ms Excel. Click SPSS at the bottom of the screen to display its data editor. Click the close button to exit SPSS or use the close button in the file menu.

SELF-ASSESSMENT EXERCISE 7

1. Copy a text of your choice from Ms Excel and paste it in ms word.
2. Copy a table of data of your choice from Ms Word to Ms Excel.

4.0 CONCLUSION

You can see that SPSS can be used to do more robust statistical calculations than most of the packages you know. It can help you to do most of your calculations. You should have noticed by now that data

organisation for each kind of calculation is different. Notice also that the variables for different types of calculations also differ. Most kinds of correlations, regressions, data reduction and nonparametric tests can be easily computed using SPSS. Always use the Help button to get more information.

5.0 SUMMARY

In this unit, you have learnt about using SPSS to do calculations involving correlations, regression, data reduction, and nonparametric tests. At every step, remember that the Help button will be of great advantage to you.

6.0 TUTOR-MARKED ASSIGNMENT

1. Distinguish between bivariate and partial correlations.
2. Compare and contrast linear regression and factor analysis.
3. What are the assumptions underlying linear regression, factor analysis and nonparametric tests.

7.0 REFERENCES/FURTHER READING

www.spss.com.

Obodo, G.C. (2008). *Computer/Mathematics Education Innovations, Issues and Applications.* Enugu: Floxton.