

Computer Applications

for Secondary Schools Vocational Stream

Student's Book
Form Two



Tanzania Institute of Education



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Computer Applications

Secondary Schools Vocational Stream

Student's Book Form Two

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THE UNITED REPUBLIC OF TANZANIA
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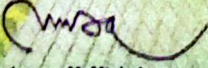
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Commissioner for Education



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Acronyms and Abbreviations

3D	Three dimensions
ATC	Arusha Technical College
DIT	Dar es Salaam Institute of Technology
GPA	Grade Point Average
GUI	Graphical User Interface
MS	Microsoft
NIT	National Institute of Transport
PDF	Portable Document Format
SQA	School Quality Assurance
TIE	Tanzania Institute of Education
UDSM	University of Dar es Salaam

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Dr Aneth A. Komba

Director General

Tanzania Institute of Education

Preface

This textbook, *Computer Applications for Secondary Schools Vocational Stream*, has been written specifically for Form Two students in the United Republic of Tanzania. It has been written in accordance with the 2023 Vocational Stream Curriculum for Ordinary Secondary Education as adopted from the 2024 Vocational Education and Training Authority Curriculum Mapping.

The book consists of One module which is Office Applications. The module contains illustrations, activities, and exercises. You are encouraged to do all the activities and exercises, as well as other assignments that your teacher will provide. Doing so will enable you to develop the intended competencies



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Module

Office applications

Introduction

Using a computer, the task of recording, organizing and manipulating data, and subsequently, presenting it in an attractive manner becomes much neater and easier. The set of computer applications that enable a person to perform these tasks are called productivity applications. However, in Microsoft Windows, these applications are called office applications.

This module comprises three units, namely spreadsheet applications, database applications, and presentation applications. Competencies developed will enable you to use office applications to create spreadsheets and perform numeric calculations on data; create databases and store data efficiently; as well as, create beautiful presentations and print handouts.

To cover this module effectively the following tools are recommended, in order of preference; computers (desktop, laptop, notebook, tablet, or smartphone), as well as productivity (office) software for spreadsheets, databases, and presentations such as the Microsoft Office Suite that includes Microsoft Excel, Microsoft Access, and Microsoft PowerPoint.

Unit 1 : Spreadsheet applications

This unit consists of five elements which are: starting and closing a spreadsheet application, navigating the worksheet interface, entering and formatting data, manipulating data using formulas, and working with charts and graphs. Competencies developed will enable you to use spreadsheet applications.

Element 1: Starting and closing workbooks and worksheets in a spreadsheet application

By the end of this element, you will be able to: identify spreadsheet applications, start a spreadsheet application, create a workbook, save a workbook, add a worksheet to a workbook, rename a worksheet, and close the spreadsheet application.

The competencies developed will enable you to open, name, save and close a workbook as well as worksheets within it.

Introduction to spreadsheets

A spreadsheet is a document in which data is organized in rows and columns. In this organization, data can easily be analyzed and manipulated in many ways. Software that manipulate spreadsheets are known as spreadsheet applications. There are various spreadsheet applications including Microsoft Excel, Apple Numbers, OpenOffice Calc, LibreOffice Calc, Google Sheets, Excel 365, Airtable, Gigasheets, Quip, Smartsheets, and Zoho Sheets to name but a few.

For learning and practical demonstration of spreadsheet applications in this book, we will use Microsoft Excel (MS Excel) 2016 running on the Microsoft Windows 11 operating system. However, any other spreadsheet application running on any operating system can be used depending on the availability. It is important to note that, although there can be some differences between spreadsheet applications in terms of appearance and how things are done, the final results of all practical demonstrations shown in this book will be the same regardless of the spreadsheet application used.

Starting Microsoft Excel

To start MS Excel, follow the steps in Activity 1.

Activity 1

Starting MS Excel

Steps:

1. Click on the **Start** Button  on the left side of your computer screen.
2. From the **Search** box type "Excel". See Figure 1.

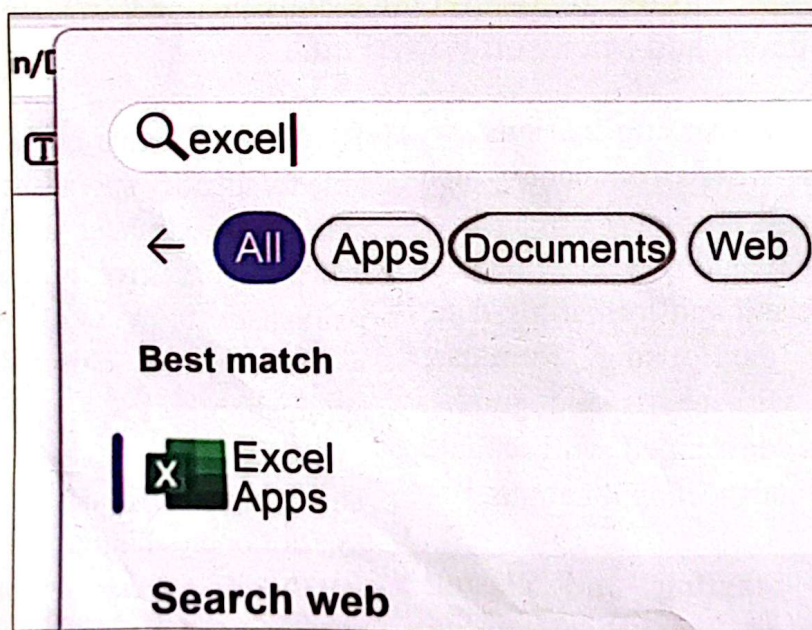


Figure 1: Searching for Microsoft Excel

- Press the **Enter** key on the keyboard or click on the "Excel" icon that appears on the list.

MS Excel will open and appear as shown in Figure 2.

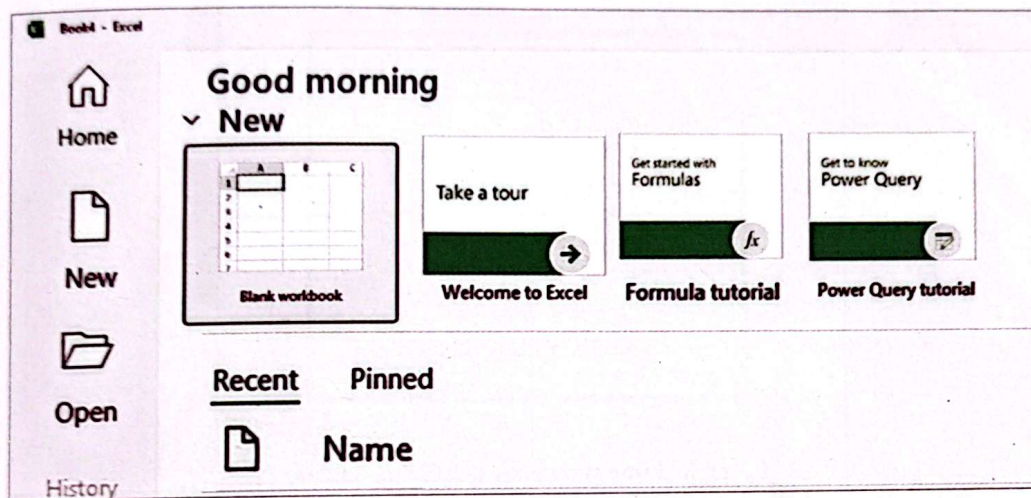


Figure 2: The initial MS Excel window

Note: The procedures shown in Activity 1 may vary slightly from one spreadsheet application to another, or when using different operating systems.

Creating a workbook

A workbook is a file that spreadsheet applications use to organize data. To create a new workbook in MS Excel, follow the steps outlined in Activity 2.

Activity 2

Creating a new MS Excel workbook

Steps:

- Open the MS Excel application. You will see the **Blank workbook** icon as shown in Figure 3.

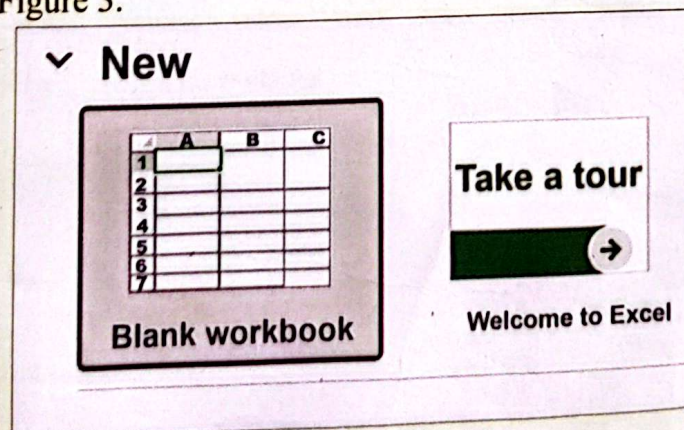


Figure 3: Blank workbook icon

2. Click on **Blank workbook** as shown in Figure 4 or press **Ctrl + N**.

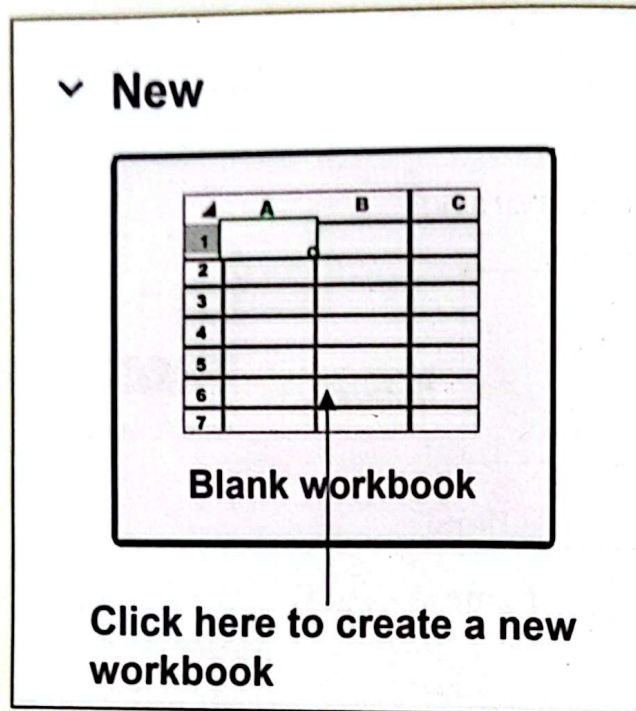


Figure 4: Creating a new workbook

Adding a worksheet in a workbook

When a new workbook is created for the first time, it creates a single worksheet named *Sheet1* by default. A worksheet is a collection of cells where data are kept and manipulated. Cells are arranged in rows and columns. The rows are labeled using numbers while columns are labeled using letters as illustrated in Figure 5.

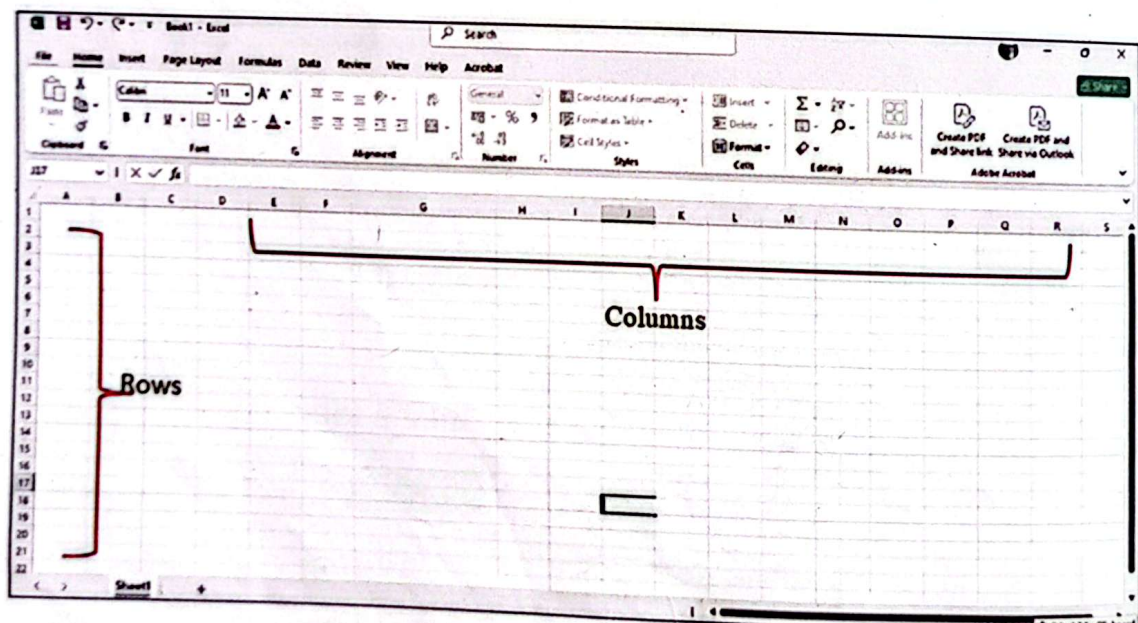


Figure 5: Rows and columns of a worksheet

You can insert many worksheets in one workbook of a spreadsheet. To insert a new worksheet in a workbook, click on the plus (+) sign at the bottom of the active sheet as shown in Figure 6(a). A new worksheet, named *Sheet2*, will be added as illustrated in Figure 6(b).

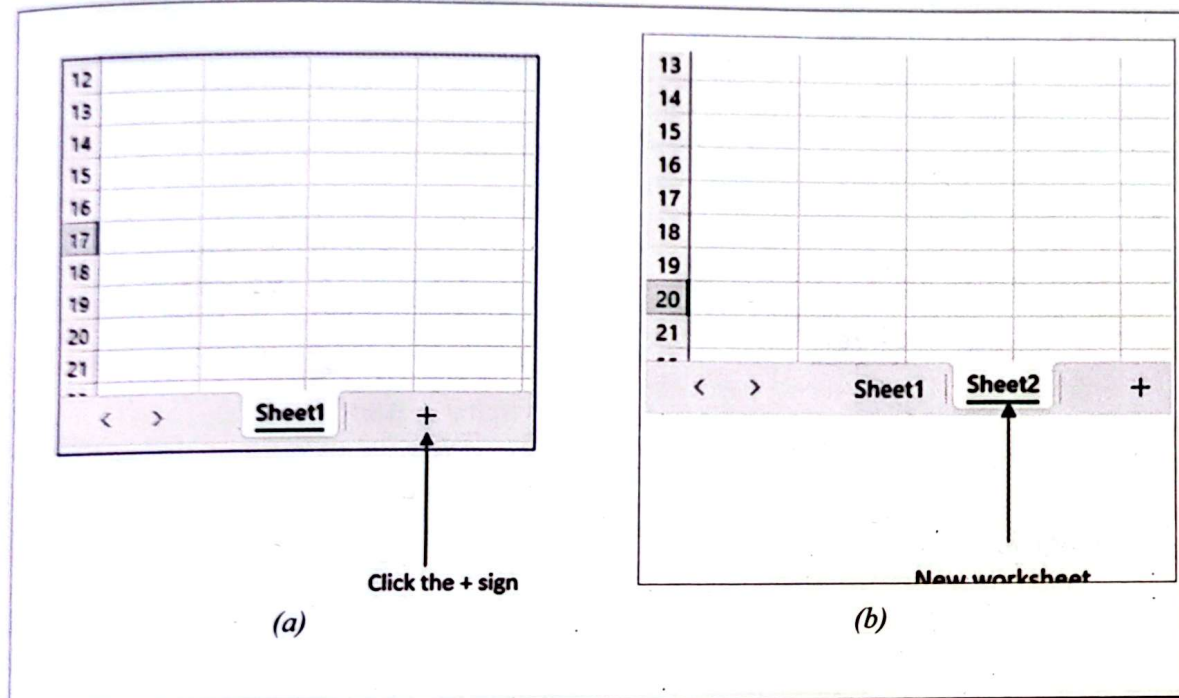


Figure 6: Adding a new worksheet

Renaming a worksheet

You have seen that a workbook can contain multiple worksheets. By default, these worksheets are named in sequence as *Sheet1*, *Sheet2*, and so on. When a workbook is opened *Sheet1* becomes the active worksheet by default. This default naming of worksheets is not convenient as it does not tell the kind of information contained in a particular worksheet.

It is therefore a good practice to rename the worksheet by assigning it a meaningful name that will tell what kind of information is in the worksheet. To rename a worksheet follow the steps in Activity 3.

Activity 3

Renaming a worksheet

Steps:

1. Right-click on the name of the sheet you want to rename, for example, *Sheet1* as in Figure 7.

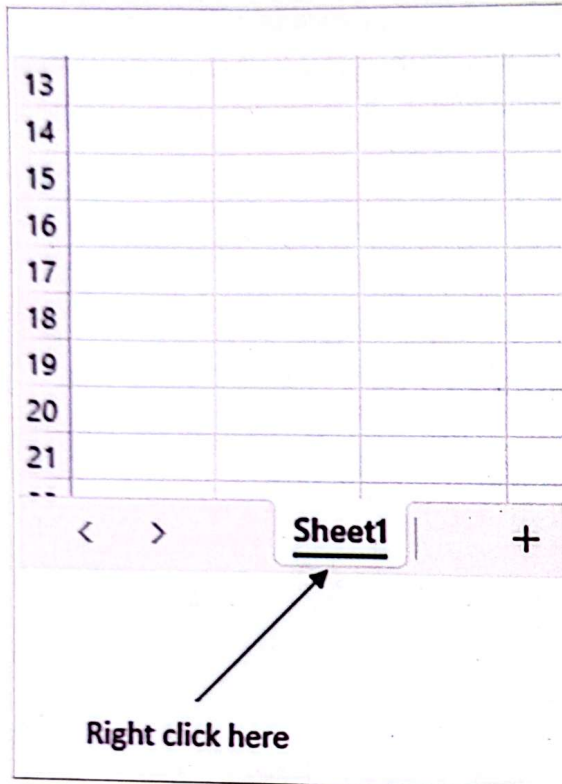


Figure 7: Worksheet name

2. Choose **Rename** from the options menu as shown in Figure 8. You will see the name *Sheet1* highlighted as in Figure 9.

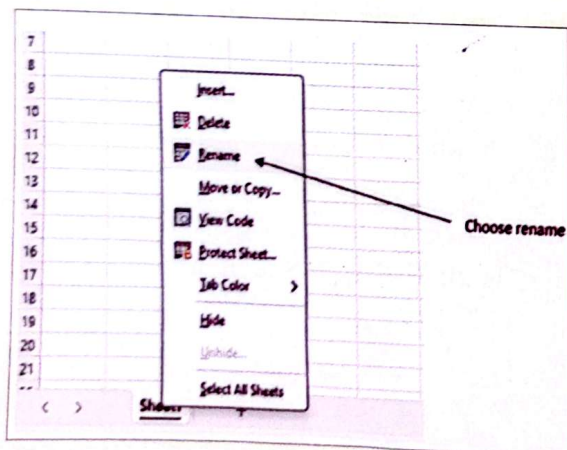


Figure 8: Renaming a worksheet

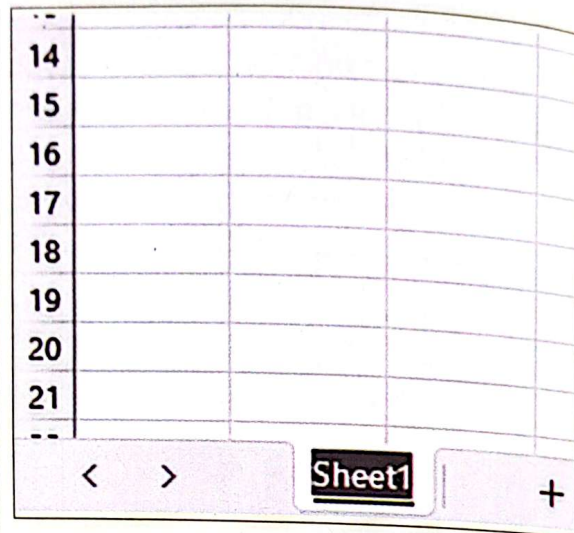


Figure 9: Highlighted worksheet name

3. Type the new name, for example, *List of Students* as in Figure 10.

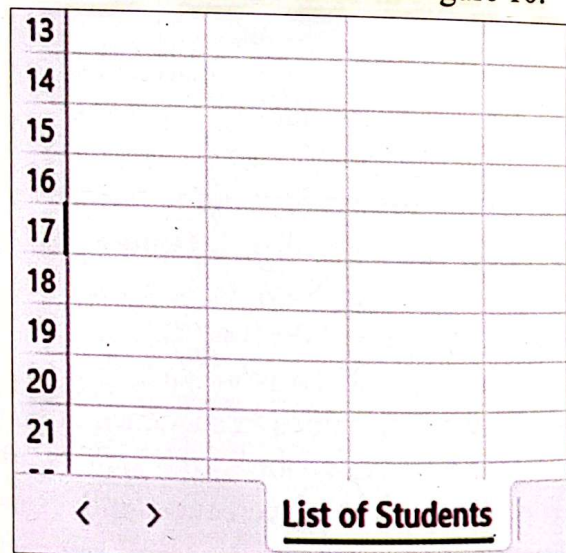


Figure 10: Renamed worksheet

4. Press **Enter** to finish renaming the worksheet.

Note: When renaming a worksheet, the sheet name cannot be blank, cannot contain more than 31 characters, and cannot include certain special characters like /, \, ?, *, :, [, or].

Saving a workbook

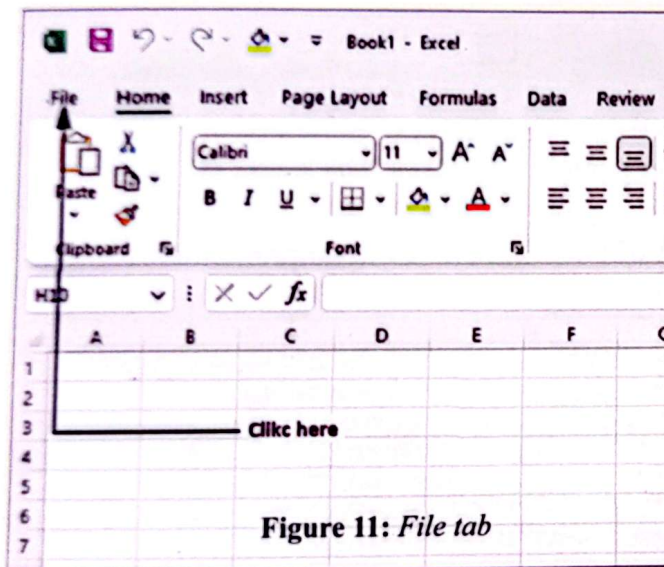
After making changes in a workbook, it should be saved to retain the changes when you close the file. The next time you open the file you should be able to see the changes you made in the workbook if you had saved the file. Activity 4 outlines the steps of saving a workbook.

Activity 4

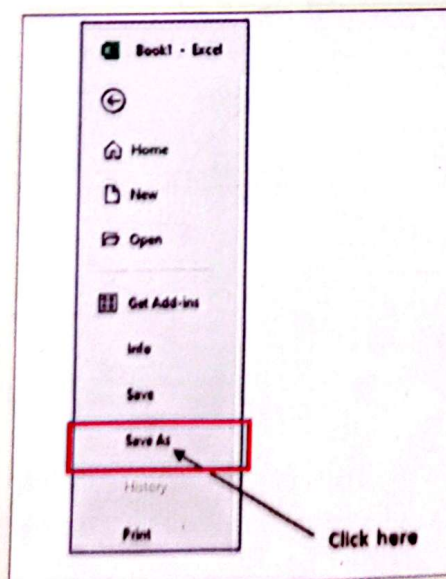
Saving a workbook

Steps:

1. Click on the **File** tab as shown in Figure 11.



2. Click **Save As** as shown in Figure 12.



3. Select the location to save the workbook as shown in Figure 13.

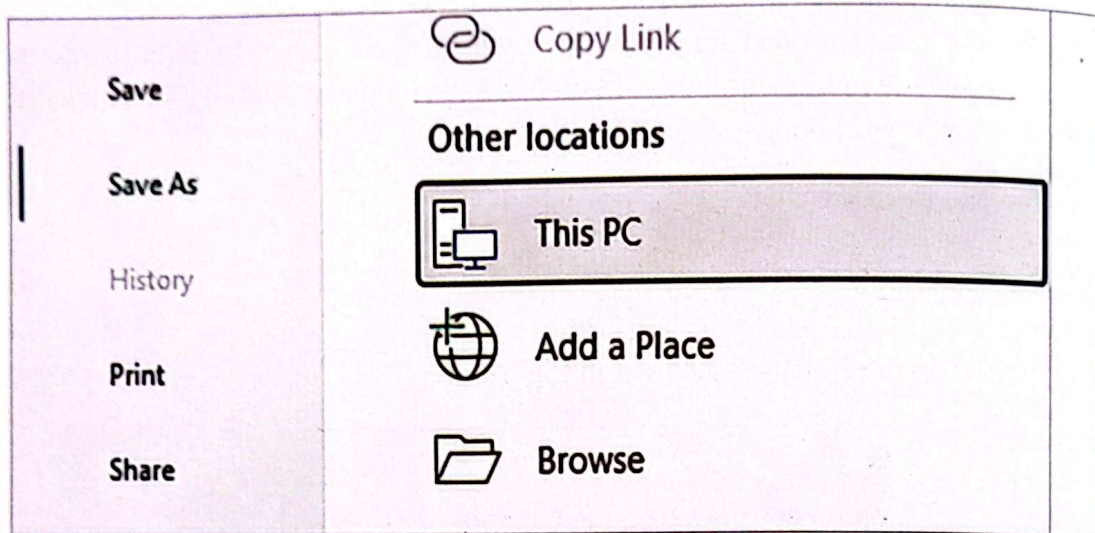


Figure 13: Selecting a location to save the workbook

4. Type the name of a workbook, for example *Students Annual Results*, in the file name box as in Figure 14.

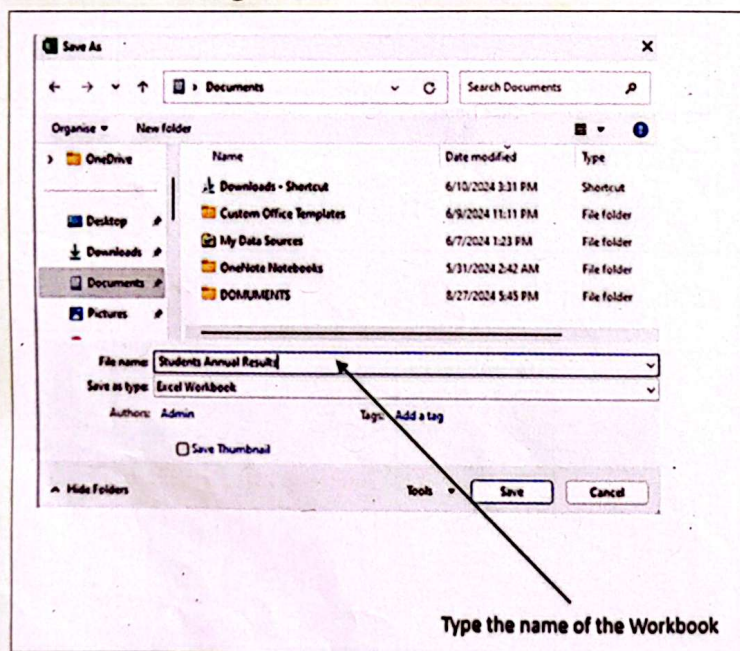


Figure 14: Naming the workbook

5. Click **Save** to save the workbook as shown in Figure 15. Note that once saved, by default, an MS Excel file will have the extension *.xlsx* appended to its file name. The extension helps the operating system to determine the right application to use when opening the file.

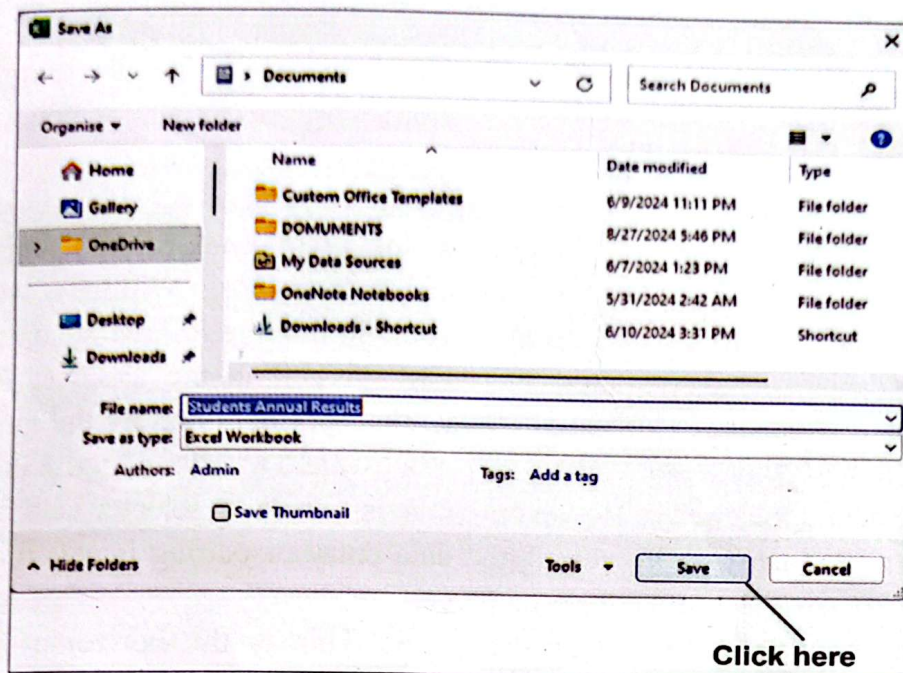


Figure 15: Saving the workbook

Note: The **File** menu view is also called the backstage view. This is because the commands in this menu manipulate the entire workbook rather than the actual content in the worksheet. The same applies to all the other office applications.

Closing a workbook

After you finish working on your workbook, it is time to close it. To properly close the workbook, it is advised to save it first. Saving your work means you can find and use it again later. Click on the close sign "X" at the top right corner to close the workbook as shown in Figure 16.

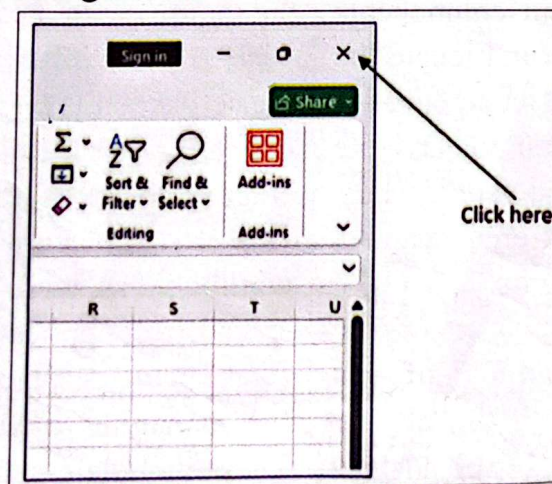


Figure 16: Closing a workbook

Exercise 1

1. What are the different ways you can start MS Excel?
2. How can you quickly create a new workbook in MS Excel?
3. How do you save your work before closing MS Excel?
4. Irene was learning to use MS Excel. While working on a computer, she successfully opened MS Excel, created a new workbook, added a worksheet, and renamed it. However, the power suddenly went out right after she finished these steps. When she later restarted MS Excel on the same computer, she couldn't find her workbook; explain why.
5. In the **File** menu, what is the difference between **Close** and **Exit** commands?
6. Open and close MS Excel using two different approaches. Which approach do you prefer? Why?

Element 2: Navigating the spreadsheet window

By the end of this element, you will be able to recognize different components of the MS Excel window and locate the commands to use. The competencies developed will enable you to navigate a window of a typical spreadsheet application and use its different features to perform your desired tasks.

Recognizing components of a spreadsheet window

A window of a typical spreadsheet application contains different components as illustrated in Figure 17.

A brief description of some of these components is as follows.

Workbook: This is a collection of one or more worksheets, where you can store and manipulate data.

Worksheet: This is an individual tab within a workbook where data is entered and manipulated. Within a worksheet, you will find the following components;

Cell: A cell is the smallest unit in a worksheet, identified by the intersection of a row and a column (e.g. A1). The cell that is currently selected and ready for data entry or editing is called an active cell.

Row: This is the horizontal group of cells. Rows are labeled with numbers starting from 1.

Column: This is a vertical group of cells. Columns are labeled with letters starting from A.

Fill handle: This is a small black square at the bottom right corner of an active cell. If you click on the square and drag the mouse without releasing the click, the fill handle populates all the adjacent cells (in the direction of the movement of the mouse) with data.

Name box: A place where the name of the active cell is displayed.

Formula bar: A place where you can enter or edit texts and formulas.

Title bar: A place where the name of the workbook as well as the name of the spreadsheet application are displayed.

File menu: A place where commands for managing a workbook are found. These include creating new and opening existing workbooks, saving workbooks, and printing a worksheet.

Quick access toolbar: This is a customizable toolbar for frequently used commands.

Ribbon: This is the toolbar at the top of the MS Excel window that contain tabs with various commands and tools.

Status bar: A place where information about the current worksheet is displayed.

Context menu: The context menu is used to improve user interaction with spreadsheets using the popup menu anywhere within a worksheet. The menu opens when you right-click on either a cell or column header, or row header in the spreadsheet.

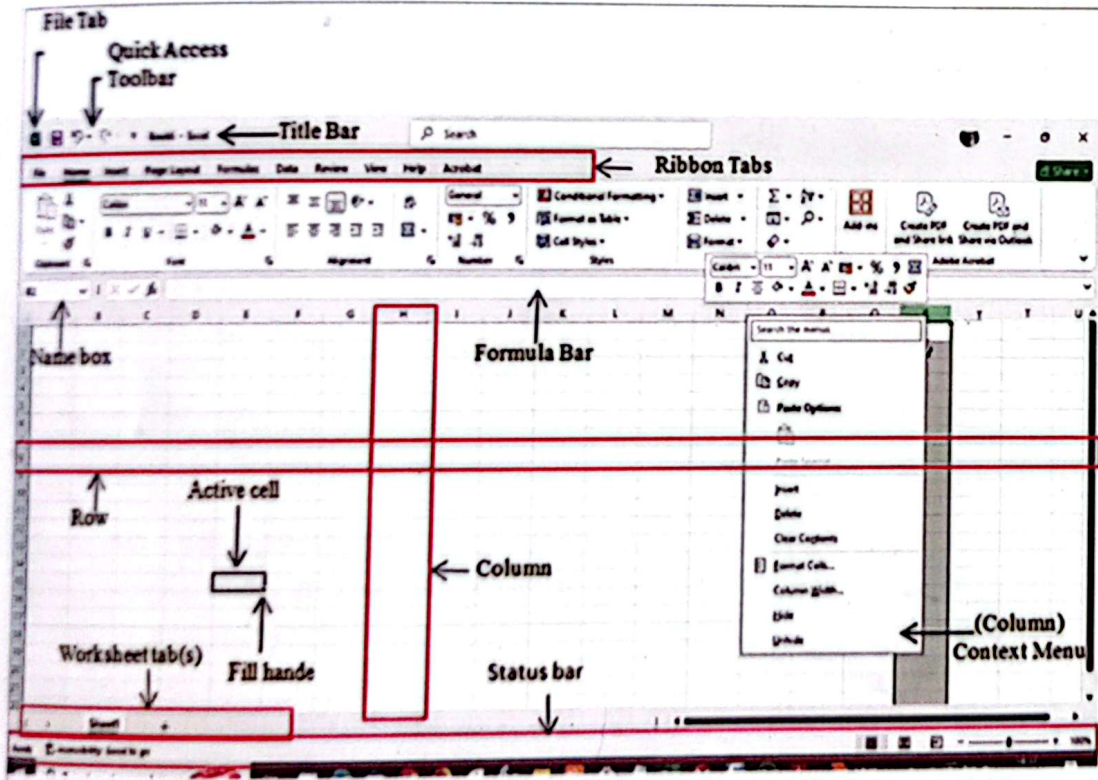


Figure 17: Components of a spreadsheet application window

Navigating the spreadsheet window

Navigating the spreadsheet window can be done using different techniques that allow easy movement from one component to another. The following are techniques that can be used to navigate an MS Excel window.

Basic navigation options

Arrow keys: Move up, down, left, or right within the worksheet. Figure 18(a) presents the arrow keys.

Scroll bars: Use the horizontal and vertical scroll bars to move around the worksheet. See Figure 18(b).

Mouse Click: Click on any cell to make it active and therefore, editable as shown in Figure 18(c).

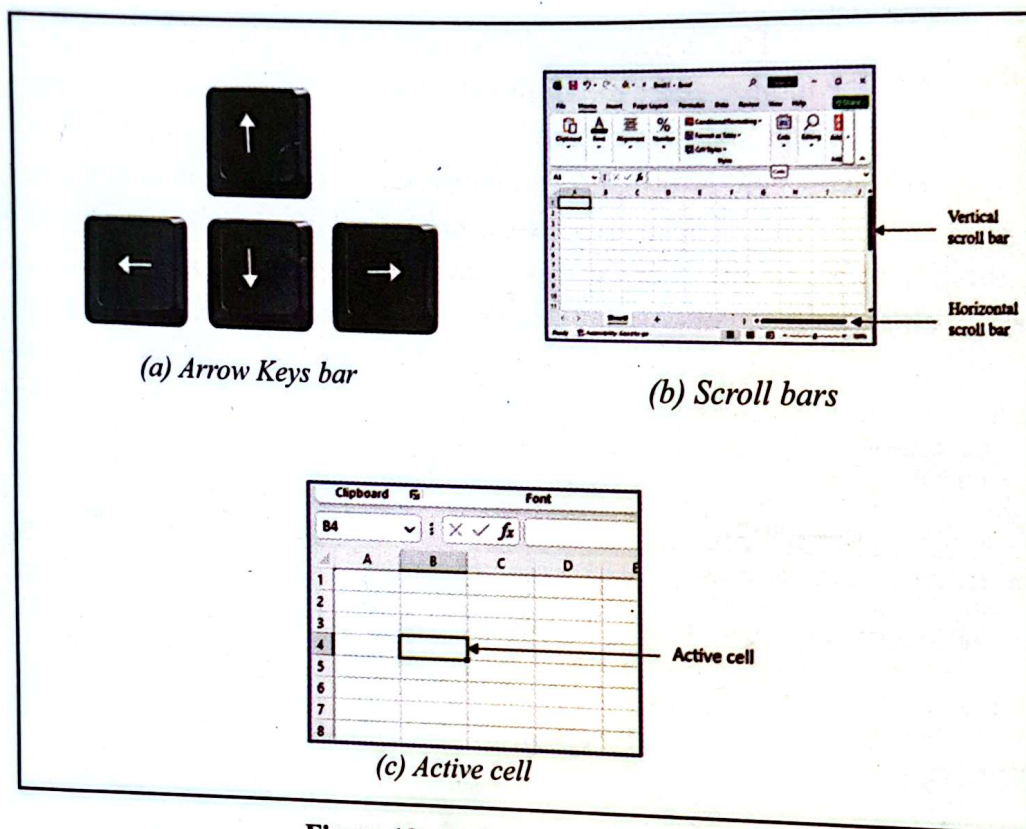


Figure 18: Basic navigation options

Keyboard Shortcuts: These are key combinations where several keys are pressed simultaneously to move the cursor to a particular area in the worksheet. These combinations include:

Navigating within a worksheet

Ctrl + Arrow: Jump to the edge of the data region in the direction of the arrow.

Ctrl + Home: Move to the beginning of the worksheet (cell A1).

Ctrl + End: Move to the last cell with data.

Navigating between worksheets

Sheet Tabs: Click on the sheet tabs at the bottom to switch between sheets.

Ctrl + Pg Up: Move to the previous sheet.

Ctrl+ Pg Dn: Move to the next sheet.

Using the ribbon: You can access different commands through the different tabs available in the ribbon as follows;

File tab: Contains functions that manipulate the workbook, such as opening, closing, saving and printing worksheets or the entire workbook.

Home tab: Contains the most frequently used commands including cell content formatting, alignment, as well as commands for inserting, deleting, filtering and sorting data.

Insert tab: Contains commands for addition of different objects into the worksheet. Such objects include charts, images, special tables and equations.

Layout tab: Contains commands that determine how the worksheet looks, including alignment of different objects, worksheet background, and, appearance when printed.

Formulas tab: Contains commands used to write out formulas.

Data tab: Contains commands used to manage data stored in the worksheet as well as moving (importing) data into the worksheet.

Review tab: Contains commands to follow up and correct mistakes in the worksheet.

View tab: Contains commands to change how the worksheet appears on screen including zooming in and out; and, arrangement of windows when working with multiple workbooks at the same time.

Name box and formula bar: Here you can specify where, and what you want to write in the worksheet.

Name box: Located to the left of the formula bar, it shows the address of the active cell. You can also type a cell address here to jump to that cell.

Formula bar: Located at the top of the worksheet window labeled with function symbol (f_x). It is used to enter or edit data and formulas in the active cell.

Follow the steps in Activity 5 to navigate in MS Excel.

Activity 5

Navigating in Excel

Steps:

1. Launch MS Excel.
2. Open an existing workbook or create a new one.

3. Use the arrow keys (up, down, left, right) to move one cell at a time in the respective directions.
4. Press **Ctrl + Arrow** to jump to the edge of the data region in the direction of the arrow.
5. Press **Home** to move to the beginning of the row.
6. Press **Ctrl + Home** to move to the first cell (A1) of the worksheet.
7. Press **Ctrl + End** to move to the last cell with data.

Using Page Up and Page Down

1. Press **Page Up** to move up one screen.
2. Press **Page Down** to move down one screen.
3. Click on the name box, type a cell address (e.g., B10), and press **Enter**.
4. Click on the sheet tabs at the bottom to switch between sheets.
5. Press **Ctrl + Page Up** to move to the previous sheet.
6. Press **Ctrl + Page Down** to move to the next sheet.

Exercise 2

1. Open a new worksheet in MS Excel and type your first name in cell A1. Now, go to cell address Z1896 and type your surname. Using a keyboard shortcut only, go back to where you wrote your first name. Again, using only a keyboard shortcut, go back to where you wrote your surname. What shortcuts did you use in the two scenarios?
2. Which key combination allows you to

- switch between different worksheets within the same workbook?
3. What is the purpose of the name box in MS Excel?
 4. How can you open the navigation pane in MS Excel?
 5. Which feature allows you to quickly find and jump to specific elements like tables, charts, and images within a workbook?
 6. How can you quickly navigate to a specific cell in MS Excel?
 7. What is the function of the **Scroll Lock** key in MS Excel?
 8. How can you quickly move to the beginning of a worksheet?
 9. Which feature in MS Excel helps you navigate large workbooks by providing a list of all sheets and elements?
 10. Mpoki was recording results of an experiment in MS Excel. After inputting about 15 values, he tried to save his work using keyboard shortcuts. However, he accidentally pressed a key combination that moved his cursor back to the first cell instead of saving the file. What keyboard shortcut might Mpoki have mistakenly used? What is the keyboard shortcut he should have used to save the work?

Element 3: Entering and formatting data

By the end of this element, you will be able to associate data types to different data values, enter data in a spreadsheet, use efficient data entry tips, and format

data. The competencies developed will enable you to populate your spreadsheet with data.

Associating data types to different values

A spreadsheet accepts different types of data including the following:

Number: This represents numbers including integers, decimals, percentages, and other numeric values. For example, 156, 2.45, and 75%.

Text: This represents text information such as names of people, like Mariam, and John, and names of places like Tanzania and Kariakoo.

Alphanumeric: This represents alphanumeric data, which consist of a combination of letters, numbers, and symbols, for example, a car plate number "T959-AVU".

Date and Time: These represent dates and times, such as 25/12/2024, and 12:00.

Logical: This represents quantities that are either TRUE or FALSE, for example, whether a given day is a holiday.

Currency: This represents monetary values formatted with currency symbols and decimal places, for example, TZS 1,000,000.00, or \$100.50.

Entering data in a spreadsheet

In this section, you will learn how to enter data into a spreadsheet. To enter data into a spreadsheet, follow the steps outlined in Activity 6.

Activity 6

Entering data in a worksheet

Steps:

1. Start MS Excel.
2. Create a new workbook or open an existing one from previous activities.
3. Click on the cell where you want to enter your data. The selected cell becomes active and will be highlighted as shown in Figure 19.

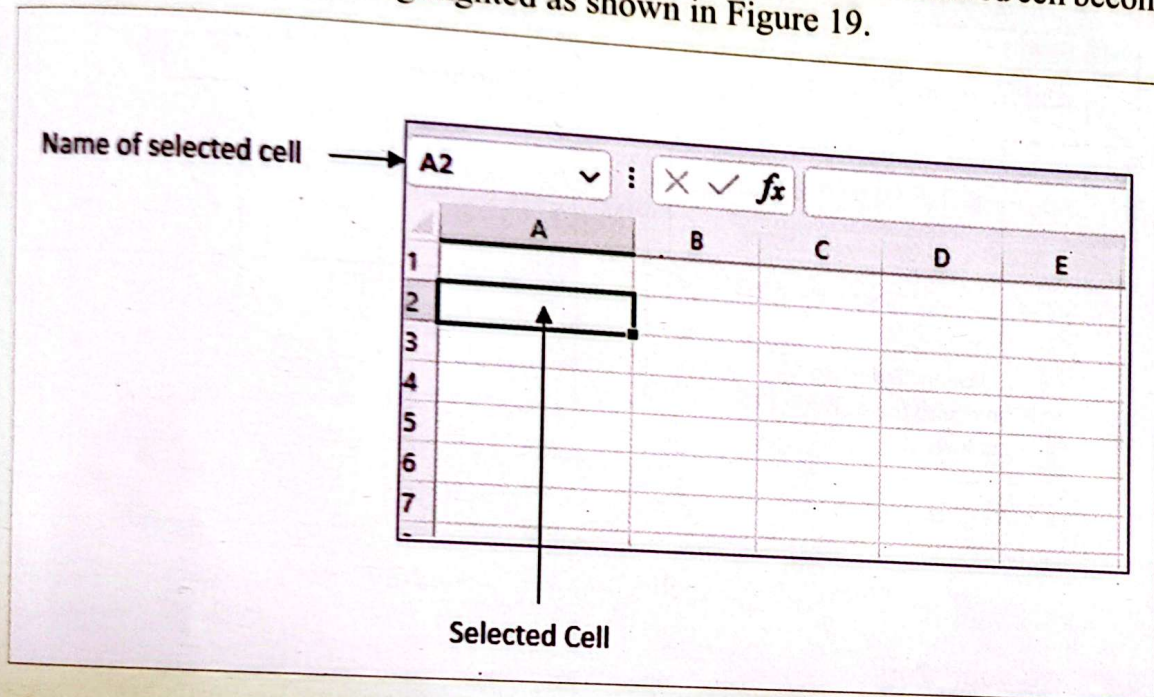


Figure 19: Active cell

4. Type the data you want to enter; this can be text, a number, or a date as shown in Figure 20.

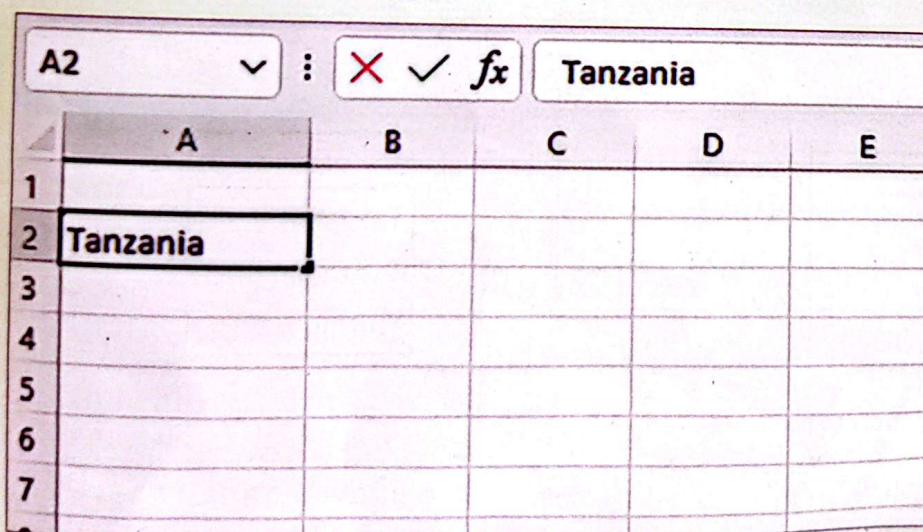


Figure 20: Entering data into a cell

5. Press **Enter** or **Tab** to finish. Pressing **Enter** will make the cell below the current cell active, as shown in Figure 21(a), while pressing **Tab** will make the cell to the right of the current cell active as shown in Figure 21(b).

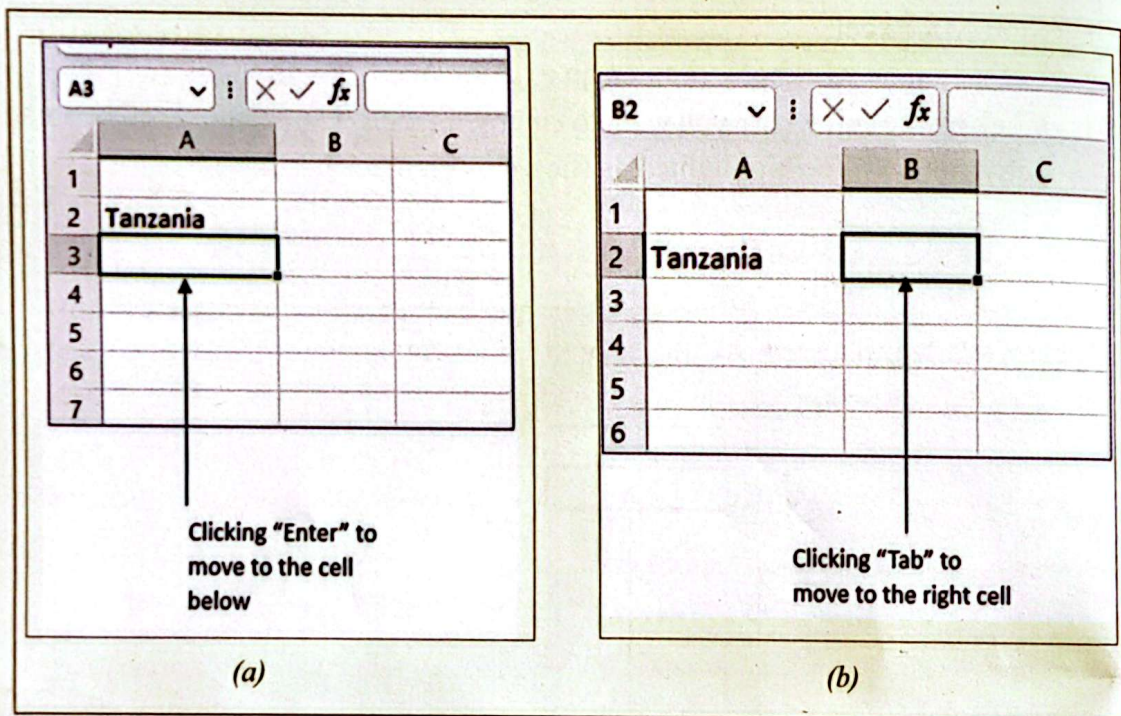


Figure 21: Navigating using Enter and Tab keys

6. Save your work.

Note: Alternatively, you can quickly copy data or formulas to adjacent cells by clicking on the **Fill Handle** and dragging it over the cells you want to fill as shown in Figure 22(a). The result is illustrated in Figure 22 (b).

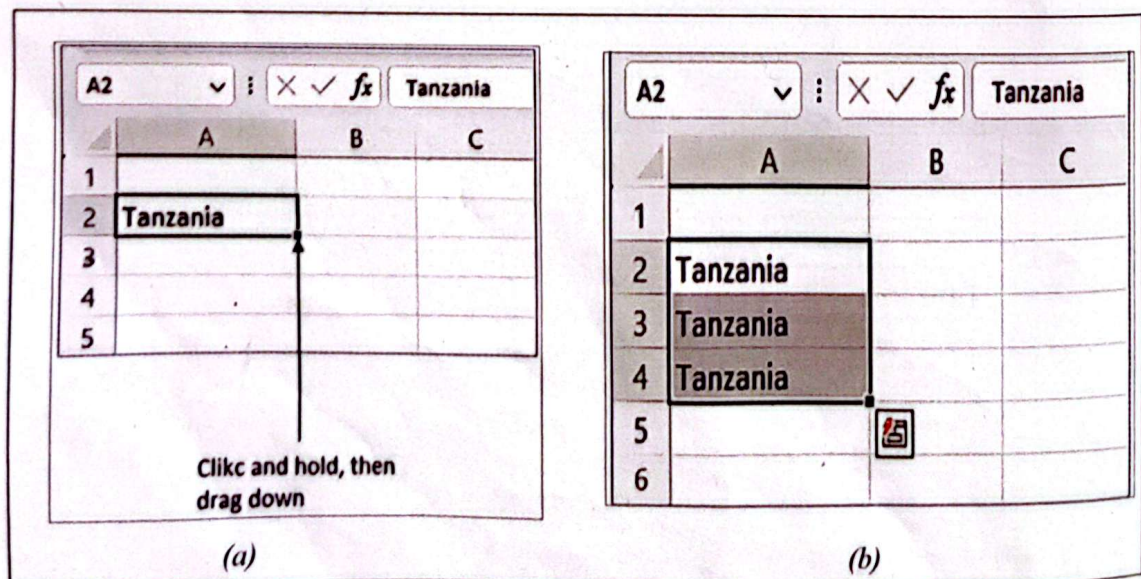


Figure 22: Using the Fill Handle to fill data

Tips for efficient data entry

Entering data into a spreadsheet application can be a tedious and repetitive task especially when you have a large quantity of data to enter. To address these challenges, spreadsheet applications offer features that help users become more efficient when entering data. Some of these features include:

Auto-fill: Use the **Fill** command in the **Editing** group of the **Home** tab to quickly fill cells with repetitive or sequential data.

Data Validation: Set validation rules using the **Data Validation** command in the **Data Tools** group of the **Data** tab to ensure accuracy of your data. For example, you can restrict cell entries to be of a particular data type (such as numbers only) or to only a certain range of values.

Freezing panes: Keep important headers, columns or rows in view while scrolling through your data by using the **Freeze Panes** command in the **Window** group of the **View** tab.

Keyboard shortcuts: Use keyboard shortcuts to speed up the process of data entry; for example **Ctrl + C** for copy and **Ctrl + V** for paste.

Usually, entering data in a spreadsheet involves filling many cells in a worksheet with data of different data types. This is known as populating a worksheet. Follow the steps in Activity 7 to quickly populate a table with students' information in MS Excel.

Activity 7

Populating a worksheet

Steps:

1. Start MS Excel.
2. Create a blank workbook, and save it as *Students Registration*.
3. Rename *Sheet1* to *Form Two*.
4. Select A1 and type *ID* in it.
5. Press the **Tab** key on the keyboard to go to cell B1 and type *NAME*.
6. Press the **Tab** key on the keyboard to go to cell C1 and type *CLASS*.
7. Press the **Tab** key on the keyboard to go to cell D1 and type *REGISTRATION*.
8. In the cells B2 to B11 enter the following names: Zawadi, John, James, Ally, Mariam, Janeth, Angela, Sylvester, Mbwana and Brenda.
9. In cell C2, type *Form Two*. Proceed to fill cells C3 to C11 using the **Fill** command. You can do this by first selecting all cells from C2 to C11, and thereafter, clicking on **Fill**, and then **Down**.
10. In cell D2, type the number 201. Proceed to fill cells D3 to D11 using the **Fill** command. This time click on **Fill** and then **Series....** A dialogue box will pop up. Note that the series is automatically configured to be

in **Column** format; of a **Linear** type, with a **Step value** of 1. Click **OK**.

Compare and contrast the results you obtained in this step against the results you obtained in step (9).

11. Proceed to fill cells A3 to A11 using the **Fill** command after typing number 1 in cell A2. Figure 23 has been provided as a guide for the data you have to fill.
12. Save your work.

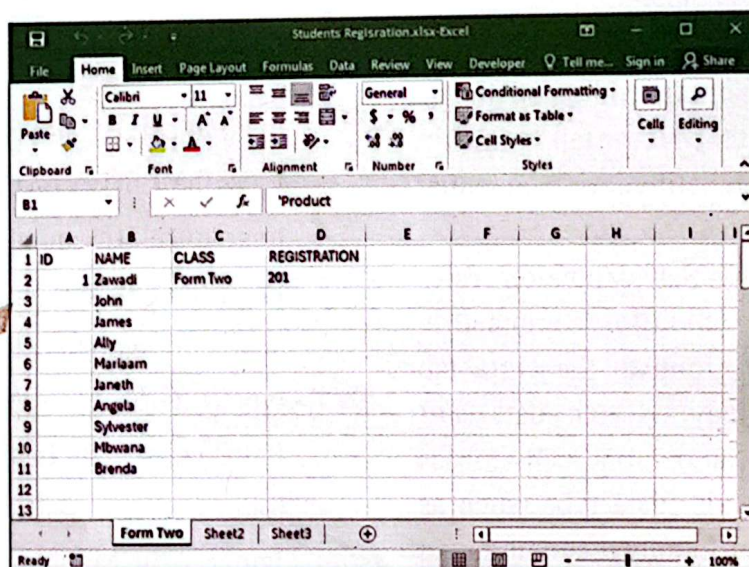


Figure 23: Populating a worksheet with data

Formatting data and cells

Formatting is the process of making changes to the default layout as well as appearance of data in a workbook. Formatting makes a worksheet more appealing. MS Excel offers many features that allow you to format a worksheet in different ways.

Formatting the content of cells: There are several ways in which the content of cells can be changed to fit the desired look, including the following;

Changing font style: In MS Excel, you can change the font style and font size. This means you can change the default font to a different one that you like. To change the font style, follow the steps in Activity 8.

Activity 8

Changing font style

Steps:

1. Start MS Excel.

2. Open an existing workbook or create a new one.
3. Select the cells where you want to change the font style. You can also select an entire row or column by clicking on the row number or column letter.

Using the ribbon commands

1. Go to the **Home** tab on the ribbon.
2. In the **Font** group, click the drop-down arrow next to the current font name.
3. Hover your mouse over the desired font from the list and simply click on it or press the **Enter** key to apply it. Refer to Figure 24.

Using the Format Cells dialog:

1. Right-click on the selected cells and choose **Format Cells**.
2. In the **Format Cells** dialog box, select the **Font** tab.
3. Choose the desired font from the list and click on it.

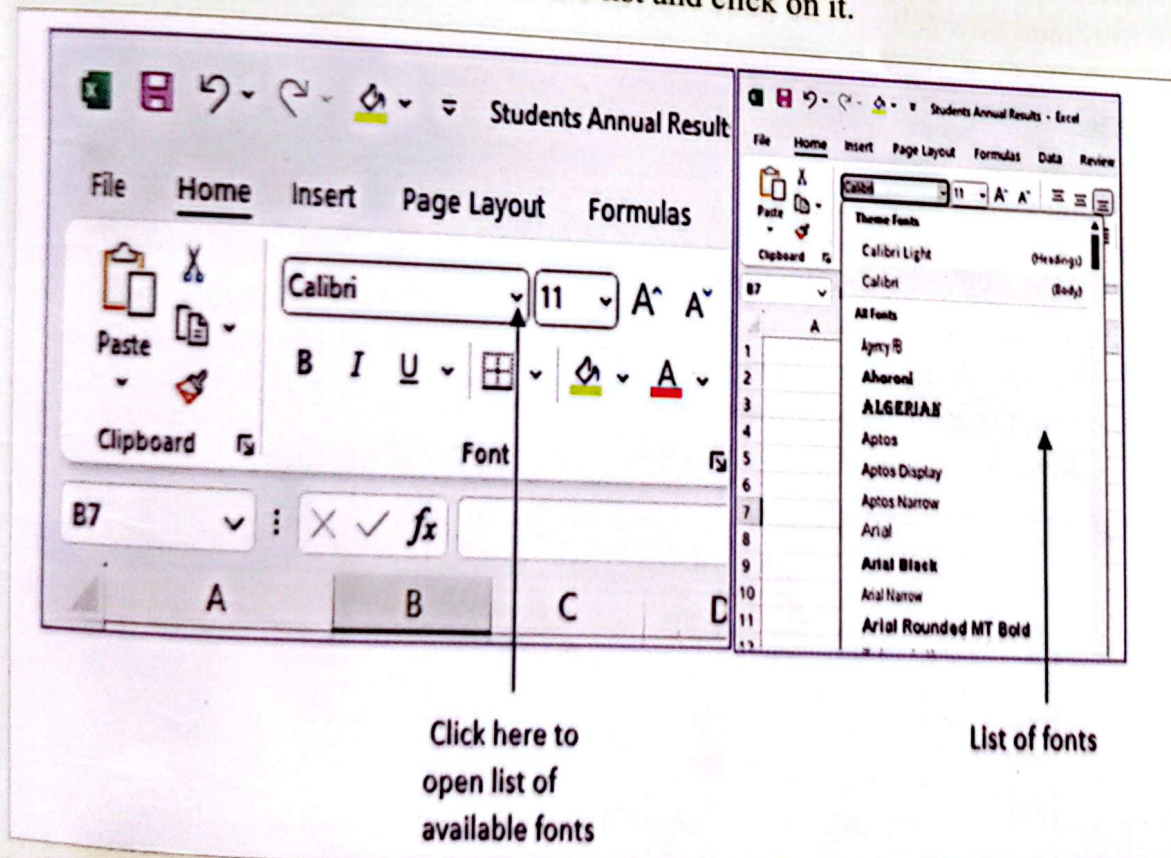


Figure 24: Selecting font style

Note: If you know the exact name of the font, type it in the box then press **Enter** to apply it. You can also bold, italicize, change the font color or the highlight of the content of a cell using commands in the **Font** group.

Changing font size: To change font size, follow the steps outlined in Activity 9.

Activity 9

Changing font size

Steps:

1. Go to the **Home** tab, and then go to the **Font Size** section.
2. Click the down arrow in the **Font Size** to show the list of available font sizes.
3. Select the preferred font size then press **Enter** to apply it.

Note: In the drop-down list of font sizes, if the required font size is not in the list, type it manually and press **Enter** to apply.

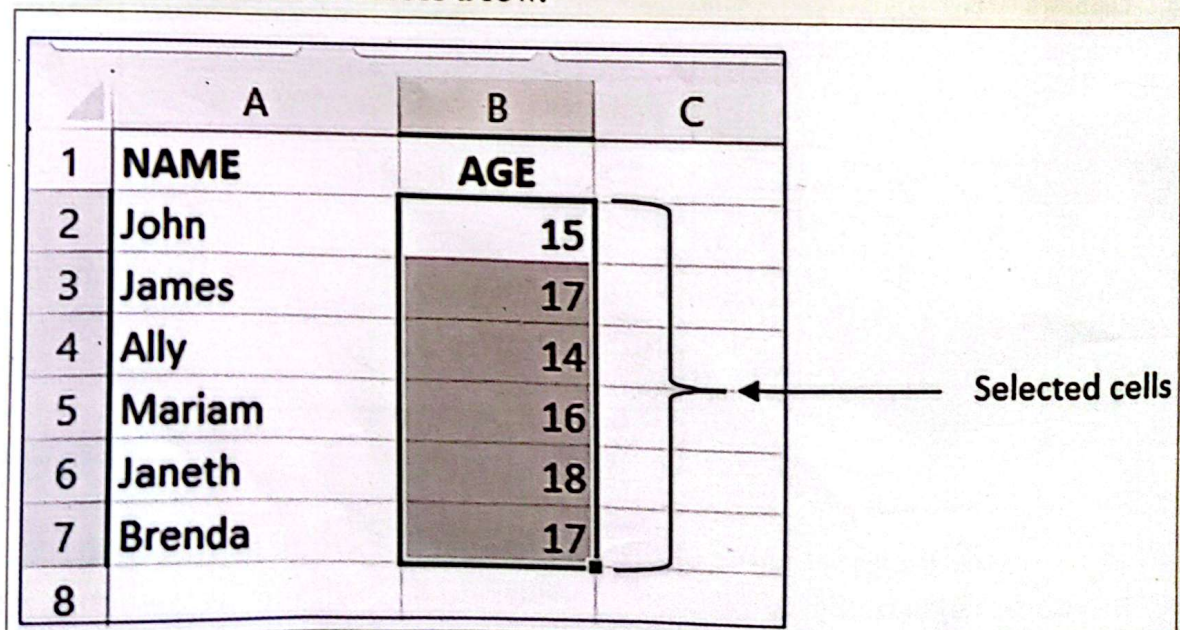
Changing cell alignment: Cell alignment is the way of arranging the position of content in a particular cell. There are various alignment options such as **Align Left**, **Center**, **Align Right**, **Justify**, **Top Align**, **Middle Align**, and **Bottom Align**. Activity 10 illustrates how cell content alignment can be done.

Activity 10

Changing cell alignment

Steps:

1. Start MS Excel and open an existing workbook or create a new one.
2. Select cells or a range of cells whose content you need to align as shown in Figure 25. To select a range of cells, click on the first cell in the range and drag the mouse to the last cell in the range. The selection can be done both down a column or across a row.



	A	B	C
1	NAME	AGE	
2	John	15	
3	James	17	
4	Ally	14	
5	Mariam	16	
6	Janeth	18	
7	Brenda	17	
8			

Figure 25: Selected cells

3. Select **Home** then go to the **Alignment** section as shown in Figure 26.

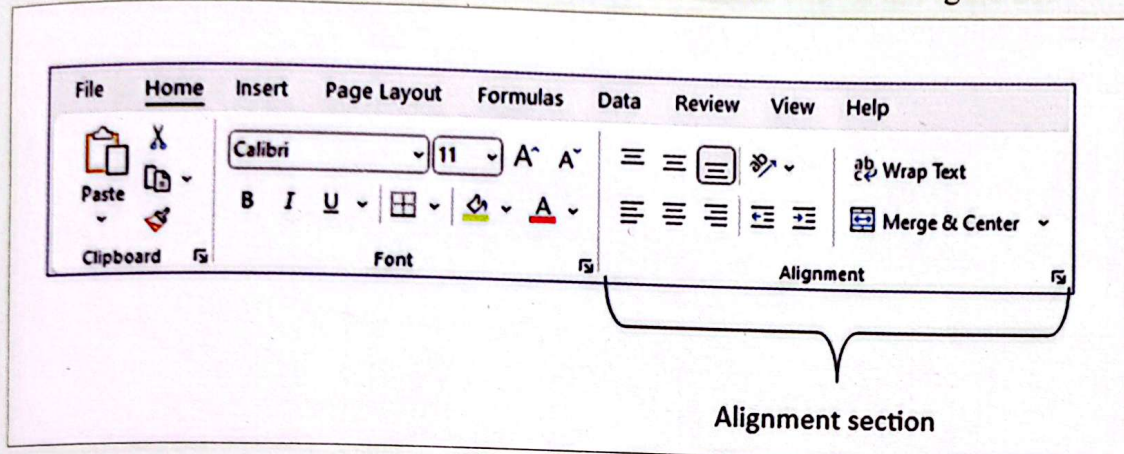


Figure 26: Alignment tools

4. Select the desired alignment option then click on it. For example, in Figure 27(a), the content of column B has been aligned to the right. Choosing Center aligns the content of column B to the center as shown in Figure 27(b).

	A	B	C	D	E	F	G
1	NAME	AGE					
2	John	15					
3	James	17					
4	Ally	14					
5	Mariam	16					
6	Janeth	18					
7	Brenda	17					
8							

(a)

	A	B	C	D	E	F	G
1	NAME	AGE					
2	John	15					
3	James	17					
4	Ally	14					
5	Mariam	16					
6	Janeth	18					
7	Brenda	17					
8							

(b)

Figure 27: Cell alignment with content centered

Note: To get information about each alignment option, hover the cursor over a particular alignment option and a tooltip with a description will pop-up as illustrated in Figure 28.

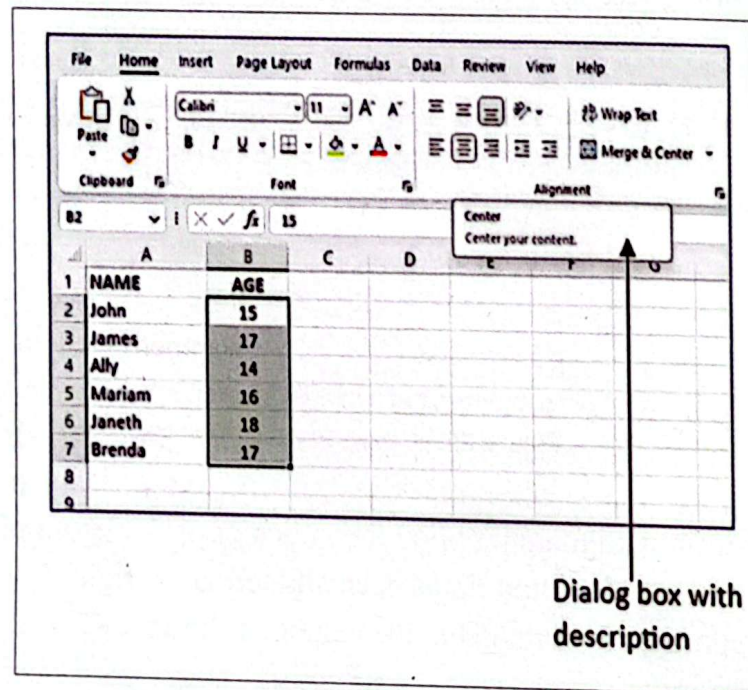


Figure 28: Tooltip describing content alignment

Exercise 3

1. The spreadsheet shown in Figure 29 was created in LibreOffice Calc. Reproduce the worksheet in MS Excel

Figure 29 shows a screenshot of a LibreOffice Calc spreadsheet titled 'Examination results.xlsx'. The spreadsheet contains a table of examination results for 'FORM TWO EXAMINATION RESULTS' (First term 2023/2024). The table has four columns: Registration, Test I, Test II, and Final Exam. The data is color-coded by row (alternating green and blue). The table is as follows:

	Registration	Test I	Test II	Final Exam
6	3019	24.00	13.00	30.00
7	3004	13.50	20.00	66.00
8	3037	17.00	25.00	80.00
9	3023	16.75	18.50	43.00
10	3004	23.50	18.70	78.00
11	3002	21.75	25.00	48.00
12	3003	24.00	25.00	67.00
13	3028	24.25	23.00	69.00
14	3024	21.25	21.00	30.00
15	3015	23.00	23.30	34.00
16	3013	27.00	21.50	72.00
17	3021	29.00	22.50	70.00
18	3016	12.75	23.00	21.00
19	3035	23.25	22.75	69.00
20	3011	18.00	20.00	30.00

Figure 29: Sample worksheet

2. Start MS Excel then create a workbook named *Form II students*. Populate the first worksheet with data about all students in your class (registration, first name, middle name, surname, gender). Label the columns accordingly and give the worksheet a title that reflects the content. Save your work and exit MS Excel.
3. Open the worksheet you created in question 2. Add a second worksheet and name it *Girls* then add a third worksheet and name it *Boys*. Move all the records about girls from your worksheet in question 2 to the *Girls* worksheet and do the same for the boys' records. Delete the gender column from each of the new worksheets. Save your work and exit MS Excel.
4. In questions 2 and 3 above:
 - (a) What do you think was the reason to separate the data into two worksheets?
 - (b) Why do you think the gender column was no longer needed after splitting the data?
5. Spreadsheets are very versatile, capable of accomplishing many tasks that are beyond data analysis. In this question you are going to use MS Excel to prepare your weekly class time-table. To do this, you can adapt the template shown below to suit your specific situation. Format the timetable nicely and print it for use.

	Monday	Tuesday	Wednesday	Thursday	Friday
0700-0800					
0800-0900					
0900-1000					
1000-1100					
1100-1200					
1200-1300					
1300-1400					

Formatting cell values: In addition to changing the appearance of the content of the cells, you can also change how the values are represented. For example, for cells containing numbers, you can format the numbers to reflect whether they are integers or decimal numbers with decimal points. The content could also be formatted as a currency with an appropriate currency symbol.

Similarly, the content of a cell can be formatted as a date, time, text, or fraction, to name but a few. This kind of formatting is useful since it restricts the kind of values that a cell can accept and therefore, avoids entering the wrong data, for example,

entering a name instead of a number. To format cell values in MS Excel, follow the steps in Activity 11.

Activity 11

Formatting cell values

Steps:

1. Start MS Excel and open an existing workbook or create a new one.
2. Select cells you want to format by clicking and dragging your mouse over these cells, or by holding down the **Ctrl** key and clicking on individual cells.
3. Open the **Format Cells** dialog by right-clicking on the selected cells and selecting **Format Cells** from the context menu as shown in Figure 30.

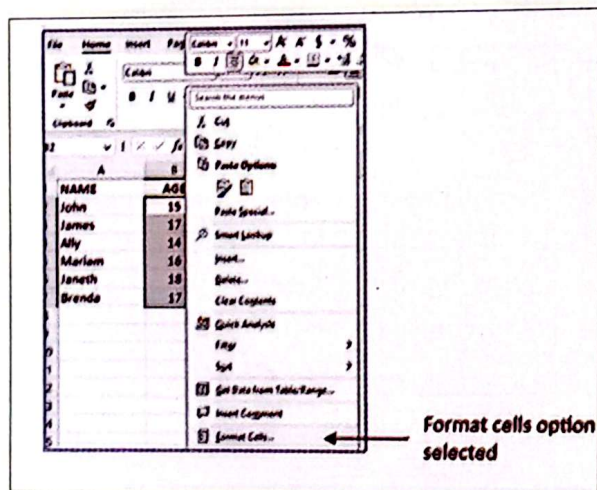


Figure 30: Selecting the Format Cells option

4. In the **Format Cells** dialog box, select the **Number** tab as shown in Figure 31.

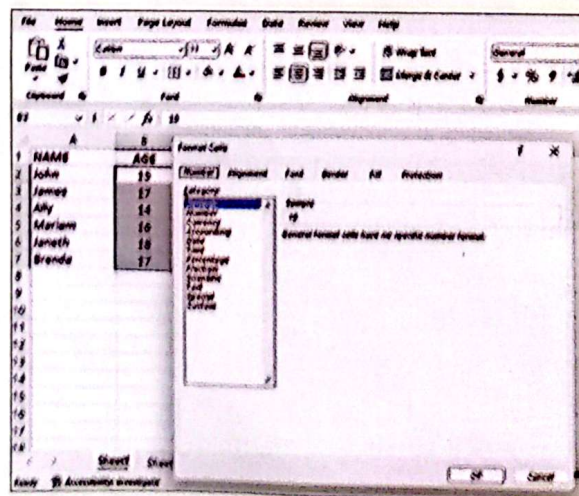


Figure 31: Selecting the Numbers tab

5. Select the desired format category and click **OK** to apply the changes to the selected cells.

Changing the appearance of a cell: A group of cells in a worksheet form a table. Sometimes, for the sake of clarity or simply visual preference, you would want to change the appearance of a cell. For example, you can show one or more borders of the cells in the table. In this way, for example, you could “draw” only the top and bottom borders, or all borders around all cells. Moreover, you can also adjust the sizes of the cells by adjusting the row height or column width. Alternatively, you could combine several cells to form one large cell, an action that is commonly known as merging the cells.

Applying borders to cells: Applying borders in a worksheet will improve legibility of your data. In MS Excel, a border can be applied using the ribbon commands, the **Format Cell** context menu, and keyboard shortcut commands. To apply borders to a cell, follow the steps in Activity 12.

Activity 12

Applying borders to a cell

Steps:

Using the Ribbon commands

1. Start MS Excel and open an existing workbook or create a new one.
2. Select the cell or cells you want to apply borders to as shown in Figure 32.

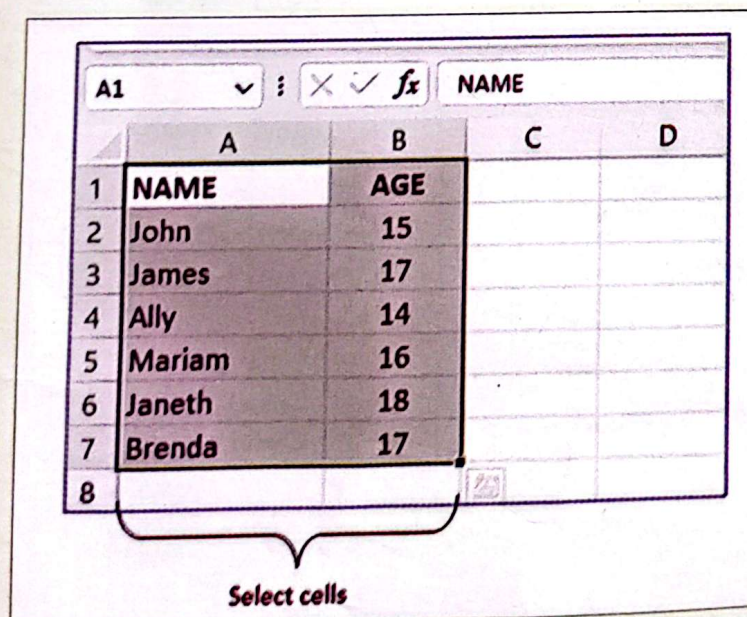


Figure 32: Selected cells

3. Click on the **Home** tab in the ribbon.
4. In the **Font** group, click the arrow next to the **Borders** button as shown in Figure 33.

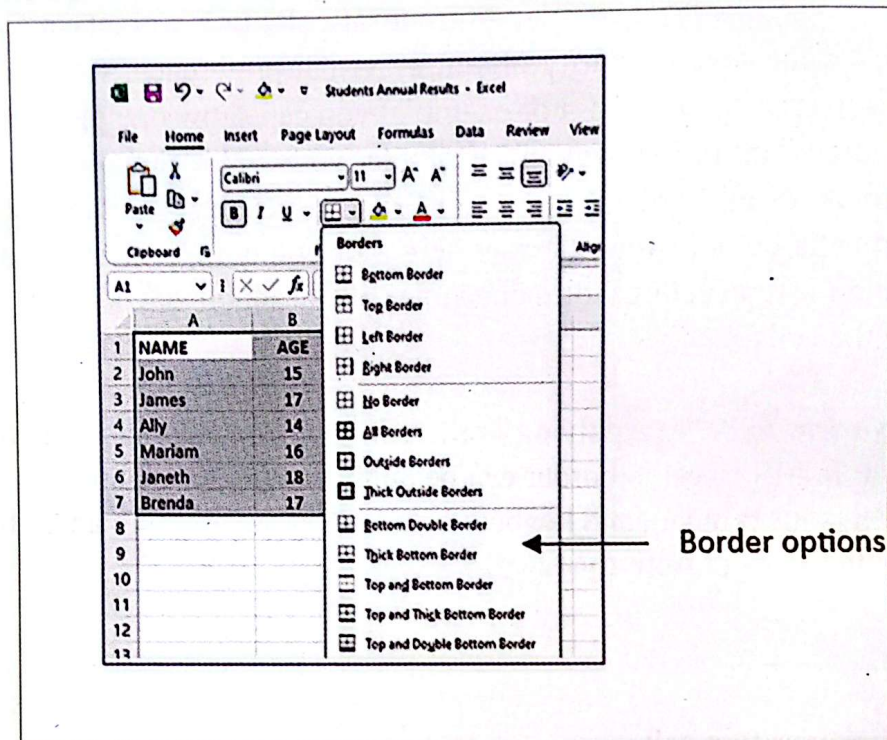


Figure 33: Border options

5. Click on the border option you want to use. For example, **All borders** was selected in Figure 34(a) and consequently, all cells were bordered on all sides as shown in in Figure 34(b).

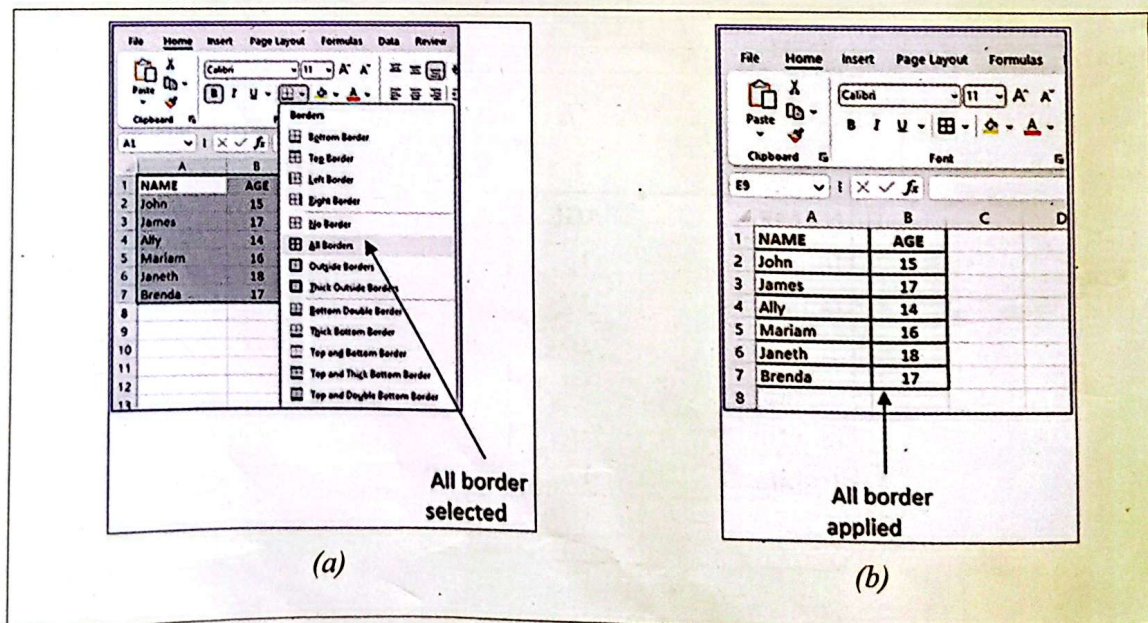


Figure 34: Cells with borders on all sides

Using the Format Cells context menu

1. Select the cells where you want to apply borders.
2. Right-click on the selected cells and choose **Format Cells**.
3. In the **Format Cells** dialog box, click on the **Border** tab.
4. Choose the border style you want to apply then click **OK**.

Using Keyboard Shortcuts

1. Select the cells where you want to add borders.
2. Press **Alt + H + B + A** to apply all borders.

Note: You can customize the border style, color, and thickness in the **Format Cells** dialog box. To remove borders, follow the same steps but select **No Border** from the options.

Merging cells in a worksheet: The **Merge Cells** command combines two or more adjacent cells into a single larger cell. This is often used to create a title, header, or label that spans multiple columns or rows. Merging cells is useful for organizing and formatting data. **Merge Cells** is found in the **Home** tab. It has the options **Merge & Center**, **Merge Across**, and **Merge Cells**. You can also reverse the merging using the **Unmerge** command.

Note: When multiple cells are merged, only the value or formula in the top-left cell remains; other values are lost.

To merge cells in a worksheet, follow the steps in Activity 13.

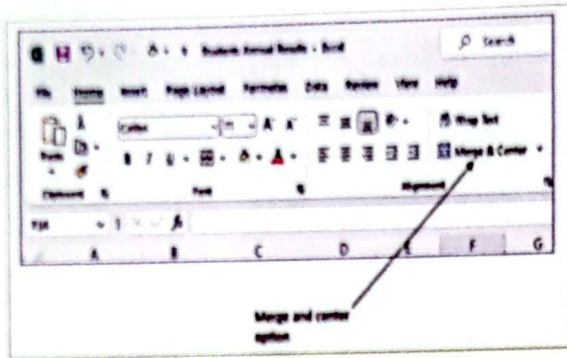
Activity 13

Merging cells

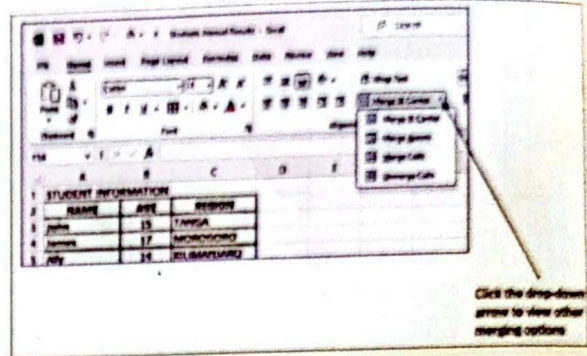
Steps:

1. Start MS Excel.
2. Create a new workbook, and save it as *School*.
3. Rename *Sheet1* to *Students*.
4. Type *STUDENT INFORMATION* in cell A1.
5. In cell A2 type *NAME*, and proceed to fill cells A3 to A5 with the names John, James, and Ally respectively.
6. Similarly, in cell B2 type *AGE*, and proceed to fill cells B3 to B5 with the values 15, 17, and 14 respectively.
7. In cell C2, type *REGION* and proceed to fill cells C3 to C5 with the values Tanga, Morogoro and Kilimanjaro respectively.
8. Select cells A1 to C1.
9. Go to the **Home** tab on the toolbar.
10. Click the **Merge & Center** button in the **Alignment** group as shown in Figure 35(a). If you want different options, click the drop-down arrow next to it as

shown in Figure 35(b).



(a) Merge and center option



(b) Other merging options

Figure 35: Merge options

If the cells contain data, a warning will appear to caution you on the possibility of overwriting data in the merged cells.

11. Click **OK** to merge. The two images in Figure 36 shows cells before and after the merging operation.

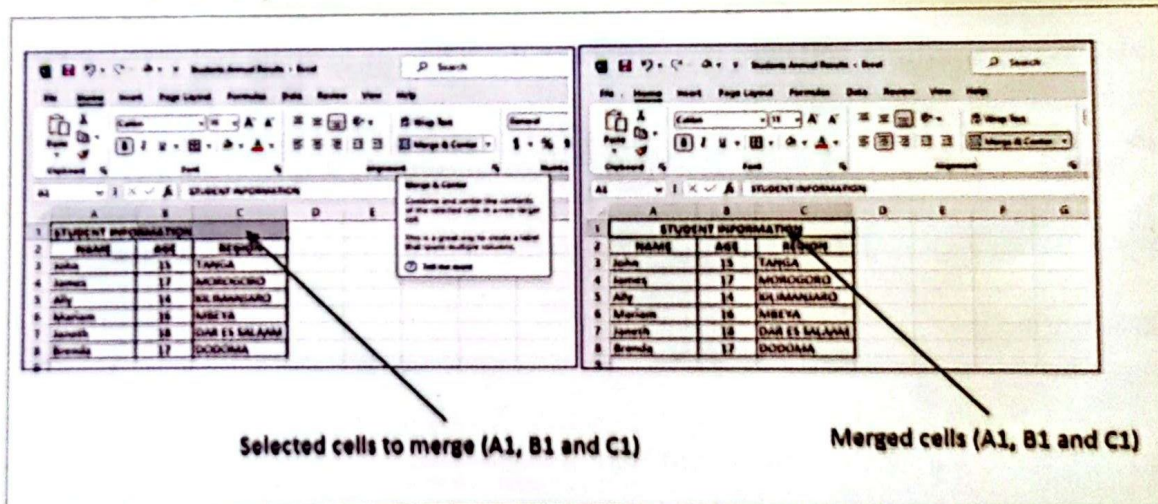


Figure 36: Merging cells

Adjusting column width: Adjusting the column width in MS Excel means changing the width of a column to better fit the data within it. This can help make your spreadsheet more readable and organized. Adjusting column width can be done in either of the following ways.

Manual Adjustment: You can manually drag the boundary on the right side of the column header to increase or decrease the width.

AutoFit: This feature automatically adjusts the column width to fit the longest piece of data in the column.

Setting a specific width: You can enter a specific number for the column width through the **Format** menu.

The steps in Activity 14 demonstrate how to change the column width in MS Excel.

Activity 14

Adjusting column width

Steps:

Using the mouse

1. Place your cursor on the right edge of the column header.
2. When the cursor changes to a double-headed arrow, click and drag horizontally to adjust the width.

Using the ribbon

1. Select the column(s) you want to adjust.
2. Go to the **Home** tab.
3. Click on **Format** in the **Cells** group.
4. Choose **Column Width**.
5. Enter the desired width and click **OK**.

Using AutoFit

1. Select the column(s) you want to adjust.
2. Double-click the right edge of the column header, or go to the **Home** tab, click **Format**, and choose **AutoFit Column Width**.

Using the context menu

1. Right-click the column header.
2. Select **Column Width** from the context menu.
3. Enter the desired width and click **OK**.

Note: The same steps used for adjusting column width are used when adjusting row height; therefore, follow the same steps when adjusting the row height. Note, however, that when using the mouse, you will have to drag the mouse vertically.

Exercise 4

1. How do you enter data into a cell in MS Excel?
2. What is the purpose of the **AutoFill** feature in MS Excel?
3. How can you format a number as currency in MS Excel?
4. After typing data into a cell how do you move to the next cell in the same row?
5. What does the keyboard shortcut **Ctrl + C** do?
6. What does the keyboard shortcut **Ctrl + V** do?
7. What is the shortcut command **Alt + H + B + A** used for?
8. The figure below shows part of a worksheet containing scores for three assessment components for 15 form II students at Mtakuja Secondary School. The second and third columns constitute continuous assessment while the fourth constitutes the final examination score. Use the worksheet to answer the questions that follow.

D19					
	A	B	C	D	
1	Registration	Test	Test	Final Exam	
2	3019	24	13	50	
3	3004	14	20	66	
4	5037	17	25	80	
5	5023	17	18.5	43	
6	5004	24	18.7	78	
7	5002	22	25	48	
8	5003	24	25	67	
9	5029	24	23	89	
10	5024	21	21	30	
11	5015	23	23.3	34	
12	5013	27	21.5	72	
13	5021	29	22.5	70	
14	5016	13	25	21	
15	5035	23	23	69	
16	5011	18	20	30	
17					

- What is the name of the active cell?
 - How do you make the heading titles fit in the columns?
 - Suggest a data type for each column.
 - Rearrange the records in descending order of the Registration field.
- Reproduce this worksheet in MS Excel and save it.
 - Open the worksheet you created in question 9 and use it to perform the following activities.
 - Insert a column between the third and fourth columns and label it *Total CA*.
 - Make *Total CA* the sum of second and third columns.
 - Label the column after *Final Exam*, *Final Score*.
 - Make *Final Score* the sum of *Total CA* and half of *Final Exam*.

Element 4: Manipulating data using formulas

By the end of this element, you will be able to perform basic arithmetic, calculating the minimum, the maximum, and the average of given data in MS Excel.

You will also be able to perform logical functions on data. The competencies developed in this element will enable you to use spreadsheet applications to manipulate data using formulas.

Performing basic arithmetic operations

Basic arithmetic operations such as addition, subtraction, multiplication, and division can be done easily using a spreadsheet application.

Addition: Follow the steps in Activity 15 to perform addition in MS Excel. Note that for instructions where you are supposed to type content appearing between quotation marks, you do not type the quotation marks.

Activity 15

Addition in MS Excel

Steps:

Using the addition operator (+)

- Start MS Excel and create a new workbook or open an existing one.
- Click on the cell where you want the sum to appear.
- Type "=" in the formula bar to start the formula.
- Click on the first cell you want to add.
- Type "+".
- Click on the next cell. Repeat steps (4) and (5) for all cells you want to add.
- Press **Enter**. An example is shown in Figure 37.

Font		Alignment		Number		Format
=B4+C4+D4						
	A	B	C	D	E	
1						
2						
3		Physics	Mathematics	Biology	Total	
4		320	211	179	=B4+C4+D4	
5						
6						
7						

Figure 37: Addition using the "+" operator

Using the SUM Function

1. Click on the cell where you want the sum to appear.
2. Type "=SUM(".
3. Select all the cells you want to add.
4. Type ")" then press **Enter**.

Using AutoSum

1. Select the cell where you want the sum to appear.
2. Go to the **Home** tab.
3. Click on the **AutoSum** button (Σ) in the **Editing** group.
4. MS Excel will automatically select the range it thinks you want to add. Adjust the range, if necessary, and then press **Enter**.

Subtraction: Follow the steps in Activity 16 to perform subtraction in MS Excel.

Activity 16

Performing subtraction in MS Excel

Steps:

Using the subtraction operator (-)

1. Click on the cell where you want the result to appear.
2. Type "=" to start the formula.
3. Click on the cell containing the number you want to subtract from.
4. Type "-".
5. Click on the cell containing the number you want to subtract.
6. Press **Enter**.

Using the SUM Function with negative numbers

1. Click on the cell where you want the result to appear.
2. Type "=SUM (".
3. Select the cells you want to subtract, ensuring that the number to be subtracted is negated first.
4. Type ")" then press **Enter**.

Multiplication: Follow the steps in Activity 17 to perform multiplication in MS Excel.

Activity 17

Performing multiplication in MS Excel

Steps:

Using the multiplication operator (*)

1. Click on the cell where you want the result to appear.
2. Type "=" to start the formula.
3. Click on the first cell you want to multiply.
4. Type "*".
5. Click on the second cell you want to multiply.
6. Press **Enter**.

Multiplying Multiple Cells

1. Click on the cell where you want the result to appear.
2. Type "=" to start the formula.
3. Enter the cell references you want to multiply, separated by asterisks. For example, "=A1*B1*C1".
4. Press **Enter**.

Using the PRODUCT function

1. Click on the cell where you want the result to appear.
2. Type "=PRODUCT "(".
3. Select the range of cells you want to multiply by clicking and dragging over them.
4. Type ")" then press **Enter**.

Division: To perform division in MS Excel, follow the steps in Activity 18.

Activity 18

Performing division in MS Excel

Steps:

Using the division operator (/)

1. Click on the cell where you want the result to appear.
2. Type "=" to start the formula.
3. Click on the cell containing the number you want to divide (dividend).
4. Type "/".
5. Click on the cell containing the number you are dividing by (divisor).
6. Press **Enter**.

Using the QUOTIENT Function

1. Click on the cell where you want the result to appear.
2. Type "=QUOTIENT(".
3. Enter the cell reference for the dividend; followed by a comma, and then the cell reference for the divisor.
7. Close the parenthesis ")" and press **Enter**.

Calculating average

There are four different ways through which you can calculate the average of numerical values in a set of cells in a spreadsheet. The steps in Activity 19 demonstrate how to calculate an average of cell values in MS Excel.

Activity 19

Calculating average

Steps:

Adding and dividing by the number of cells

1. Click on the cell where you want the result to appear.
2. Type "=".
3. Type "(".
4. Add all cells using "+" (as explained in Adding using the plus sign "+" section).
5. Close the parenthesis ")"
6. Type "/", followed by the number of cells whose average is to be calculated.
7. Press **Enter**.

Using the AVERAGE Function

1. Click on the cell where you want the average to appear.
2. Type "=AVERAGE(".
3. Select the range of cells whose average you want to calculate.
4. Type ")" then press **Enter**.

Alternatively, the AVERAGE function can be added from the function library by clicking on the **Formulas** tab, then **More Functions** in the **Function Library** group. Select **Statistical**, then choose AVERAGE and proceed as above.

Using the Average command from the Editing group

1. Select the cell where you want the average to appear.
2. Go to the **Home** tab.
3. Click on the **AutoSum** button (Σ) in the **Editing** group.
4. Choose **Average** from the resulting drop-down menu.
5. MS Excel will automatically select the range it thinks you

want to average. Adjust the range, if necessary, and then press **Enter**.

Finding maximum and minimum values

In some cases, you are interested in finding the maximum and the minimum values in a group of cells. You can use library functions in MS Excel to do this task very easily. Follow the steps in Activity 20 to find the maximum and minimum values in MS Excel.

Activity 20

Finding the maximum and minimum values

Steps:

Using the MAX and MIN Functions

1. Click on the cell where you want the maximum or minimum value to appear.
2. Type `"=MAX("` to find the maximum value or type `"=MIN("` to find the minimum value.
3. Select the range of cells whose maximum/minimum you want to find.
4. Type `)"` then press **Enter**.

Using AutoSum

1. Select the cell where you want the maximum or minimum value to appear.
2. Go to the **Home** tab.
3. Click on the **AutoSum** button (Σ) in the **Editing** group.
4. Choose **Max** or **Min** from the drop-down menu.
5. MS Excel will automatically

select the range it thinks you want to evaluate. Adjust the range, if necessary, and then press **Enter**.

Using a library function

1. Click on the cell where you want the maximum or minimum value to appear.
2. Go to the **Formulas** tab.
3. Click on **More Functions** in the **Function Library** group.
4. Select **Statistical**, then choose **MAX** or **MIN**.
5. Enter the range of cells you want to evaluate in the **Number** field then click **OK**.

Using the logical IF function

The MS Excel **IF** function runs a logical test and returns one value for a **TRUE** result, and another for a **FALSE** result.

For example, the expression `"=IF(A1>70,"Pass","Fail")"` will insert the text "Pass" in the target cell if the value of cell A1 is greater than 70 or "Fail" otherwise. The **IF** function can be combined with other logical functions like **AND** and **OR** to extend the logical test. To test conditions in MS Excel, follow the steps in the example in Activity 21.

Activity 21

Using the IF function

Steps:

1. Open an MS Excel worksheet then type the number 80 in cell B5.
2. Press **Enter** to move to cell B6.

3. In cell B6 type the expression "`=IF(B5>80, "TRUE", "FALSE")`". This expression checks if the value in cell B5 is greater than 80. If it is, the cell B6 will display **TRUE**; otherwise, it will display **FALSE**.
4. Press **Enter**.
Now observe the content of cells B7 to B12 after typing the following formulas.
5. In cell B7 type "`=IF(B5>75, "OK")`" then press **Enter**.
6. In cell B8 type "`=IF(B5>85, "OK")`" then press **Enter**.
7. In cell B9 type "`=IF(B5>75,10,0)`" then press **Enter**.
8. In cell B10 type "`=IF(B5>85,10,0)`" then press **Enter**.
9. In cell B11 type "`=IF(B5>75, "Yes", "No")`" then press **Enter**.
10. In cell B12 type "`=IF(B5>85, "Yes", "No")`" then press **Enter**.

Exercise 5

1. Which function would you use to add up a range of cells?
2. Which function would you use to find the average of a range of cells?
3. What does the **IF** function do in MS Excel?
4. How do you find the maximum in a range of cells? How do you find its minimum?
5. What is the "*" sign used for in

arithmetic operations?

6. After editing data in a worksheet, what will happen if the close button is clicked before saving the file?
7. Which sign is used for arithmetic division in MS Excel?
8. What is a function library in a spreadsheet?
9. Baraka receives 30,000/- every month as his pocket money. Use MS Excel to find the following:
 - a. The amount of money he saves every month.
 - b. The item that he spends most of his money on.
 - c. The item that he spends the least amount of money on.
 - d. The amount of money he will have saved if he maintains his spending habits for a whole year.

Baraka's Monthly Budget

1	Bus fare	8,000
2	Snacks	4,000
3	Stationeries	5,000
4	Entertainment	3,000
5	Offerings	4,000
6	Gifts for siblings	3,000

10. Open the worksheet you created in Question 9 of Exercise 4, and do the following:
 - (a) Add two columns to the worksheet, namely, *Grade* and *Status*.
 - (b) Determine the grade of each student based on the final

score using the following grading: 0–20: F, 21–40: D, 41–50: C, 51–60: B, 61–75: B+, 76–100: A.

- c. Determine the status of each student using the criteria: F–D: Fail, C–A: Pass.
- d. Determine the pass rate.

Element 5: Visualizing data using charts

By the end of this element, you will be able to create different types of charts. The competencies developed in this element will enable you to visualize data using charts.

Visualizing data using charts

A chart is a visual representation of data. Charts make it easier to visualize data. Charts can also help to summarize data, identify trends, patterns, and make comparisons in the data. Spreadsheets offer various types of charts to suit different needs, these charts include the following:

Column Chart: Ideal for comparing different categories.

Line Chart: Great for showing trends over time.

Pie Chart: Useful for displaying proportions or percentages.

Bar Chart: Similar to column charts but with horizontal bars.

Area Chart: Combines elements of line and bar charts to show trends over time.

Scatter Chart: Displays relationships between two variables.

Map Chart: Represents data geographically.

Stock Chart: Used for financial data like stock prices.

Surface Chart: Shows relationships among three data sets in three dimensions (3D).

Radar Chart: Compares multiple data series on a circular grid.

Follow the steps in Activity 22 to create, format, and customize bar charts in MS Excel.

Activity 22

Creating a bar chart

Steps:

1. Open an existing workbook or create a new one and populate it with some data.
2. Select the cells you want to include in the chart as shown in Figure 38.

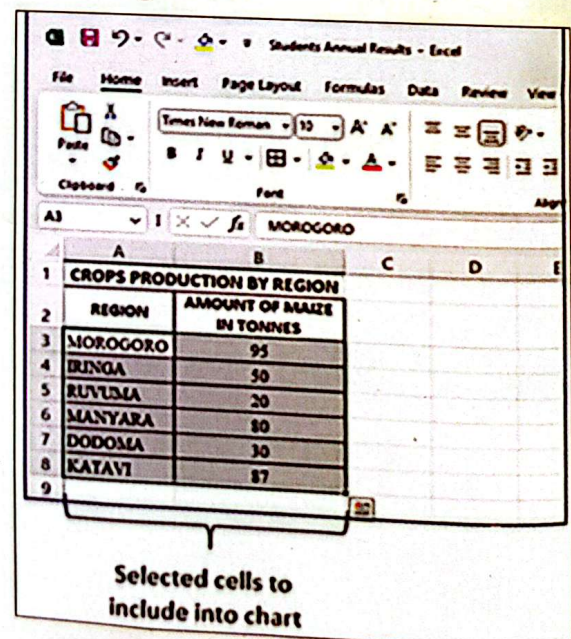


Figure 38: Selected cells

3. Go to the **Insert** tab on the ribbon then in the **Charts** group, choose the type of chart you want (e.g., column, line, pie, bar,

etc.). Refer to Figure 39.

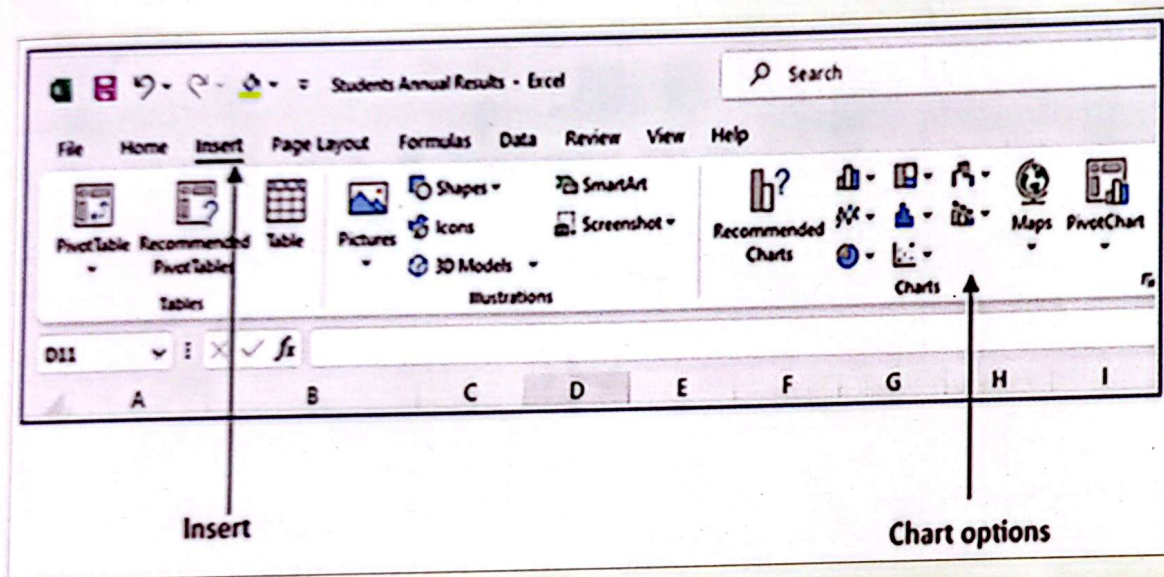


Figure 39: Choosing a chart type

4. Click on the type of chart you desire (An example of a **Bar chart** is given here). MS Excel will insert a **Bar chart** into your worksheet as shown in Figure 40.

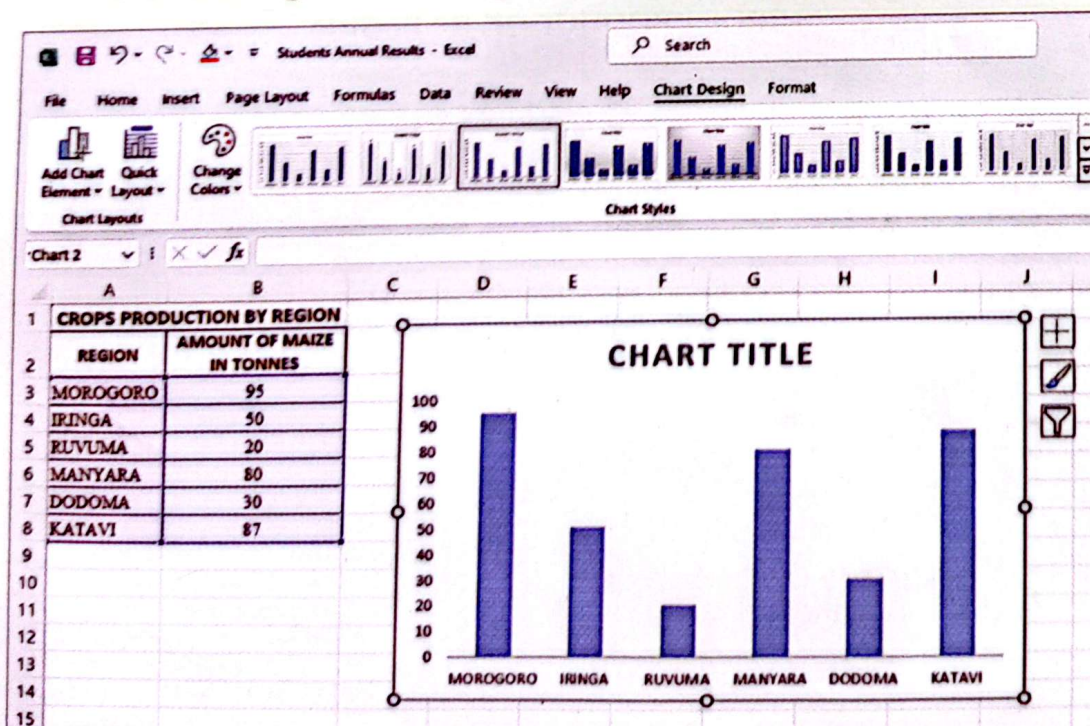


Figure 40: Inserted Bar chart

5. Customizing the *Chart Title*: Click on the chart title to edit it as shown in Figure 41(a). An example of a chart with an edited title is shown in Figure 41(b).

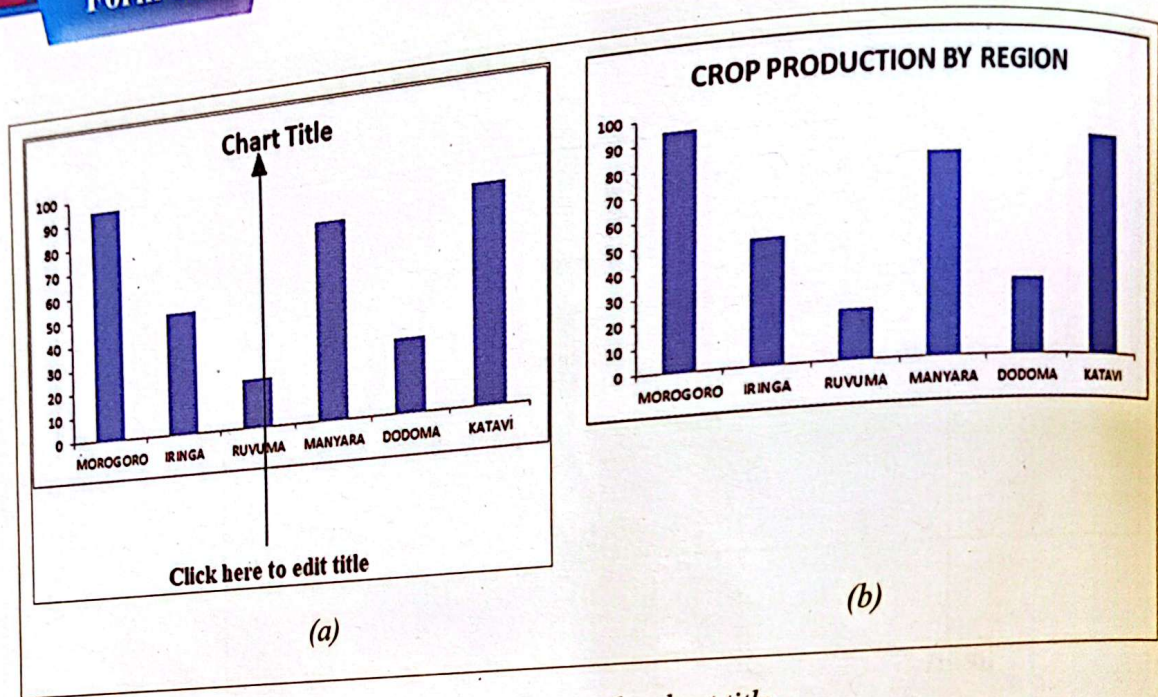


Figure 41: Editing the chart title

6. Customizing *Axis Titles*: Add titles to the X and Y axes by clicking on the chart and then selecting **Chart Elements** (the plus sign) and checking **Axis Titles** as shown in Figure 42.

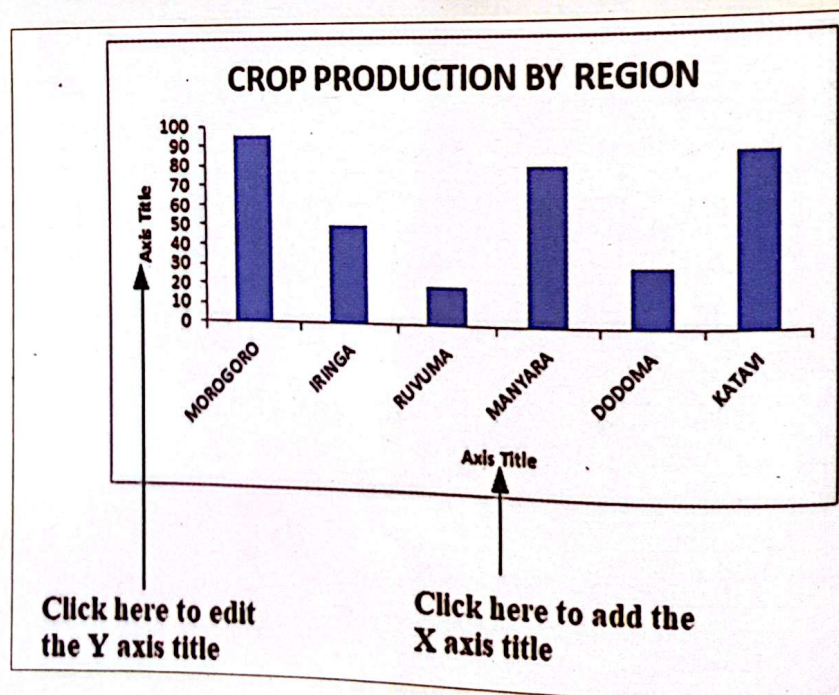


Figure 42: Labeling chart axes

7. Customizing the *Legend*: Adjust the legend position by clicking on the chart, selecting **Chart Elements**, and then **Legend**.
8. Format your chart: Use the **Chart Design** and **Format** tabs to customize colors, styles, and other formatting options as illustrated in Figure 43.

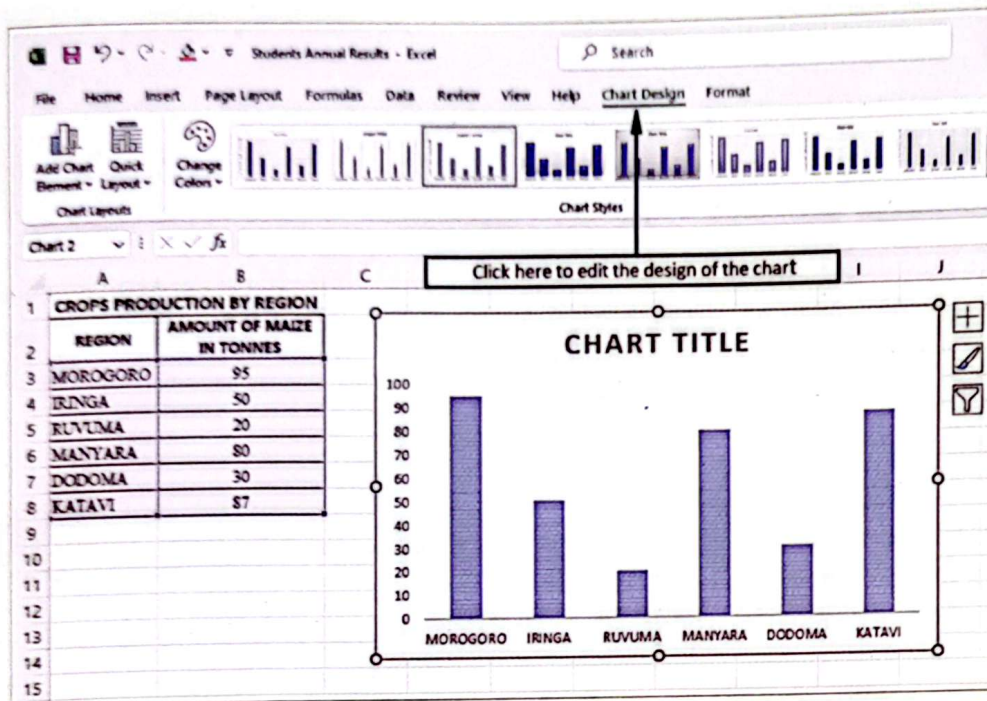


Figure 43: Chart design and format

Exercise 6

1. In the year 2024, the world population by continent is as shown in the table below. Use these data to do the following in MS Excel.
 - (a) Find the world's population.
 - (b) Find the percentage of the world's population living in each continent.
 - (c) Create a suitable chart for visualizing these data.
 - (d) According the chart you created, what can you say about the distribution of people in the continents of the world?

Continent	Population
Asia	4,950,363,066
Africa	1,515,135,021
Europe	744,756,859
North America	613,119,734

2. The table below shows monthly average temperatures (degrees Fahrenheit) in one of the cities in Tanzania for twelve months: January – December. Use MS Excel to visualize the data and comment on the weather in the city.

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Temp.	60	59	57	55	50	45	50	56	58	58	59	60

Unit 2 : Database applications

This unit consists of five elements namely, familiarizing with database applications, creating tables, creating queries, creating forms, and creating reports. Competencies developed will enable you to create databases, insert data in tables, retrieve and manipulate data; and finally, generate reports.

Element 1: Familiarizing with a database application

By the end of this element, you will be able to define the concept of databases; and to open and close a database application. The competencies developed will enable you to define databases and use their different features.

Introduction to databases

Take a moment and imagine all the information that your school has kept about you. This information would include, for example, your personal details, your examination results from tests and examinations that you have taken so far, as well as your parents'/ guardian's information.

Now imagine having to keep all this information for all the students at your school! It surely requires a lot of space. However, this is only the beginning. Now, try to imagine what it takes to look

for a particular piece of information for a particular form II student; the exercise now becomes much tougher! Right? So, how can we make this job easier? The answer is to use a database application.

A *database application* is a computer application that manages databases. A *database* is a collection of data such as words, numbers, videos, pictures or other files stored in *tables*. The data are usually organized in such a way that their storage, manipulation and retrieval are easy.

The storage, manipulation and retrieval of data are normally done using *queries*. Sometimes, to make data entry and retrieval easy, *forms* are used. Finally, *reports* are created to organize data in a database in a printable format. *Tables*, *queries*, *forms* and *reports* are collectively called database objects.

There are many database applications, including Microsoft Access, LibreOffice Base, and FileMaker to mention but a few. In this module, however, we will practice with Microsoft Access 2016 as it comes within the Microsoft Office suite which is widely used.

Opening MS Access

To start the application, follow the steps in Activity 23.

Starting MS Access

Steps:

1. Click on the **Start** button.
2. In the **Search** box type "Access".
See Figure 44.

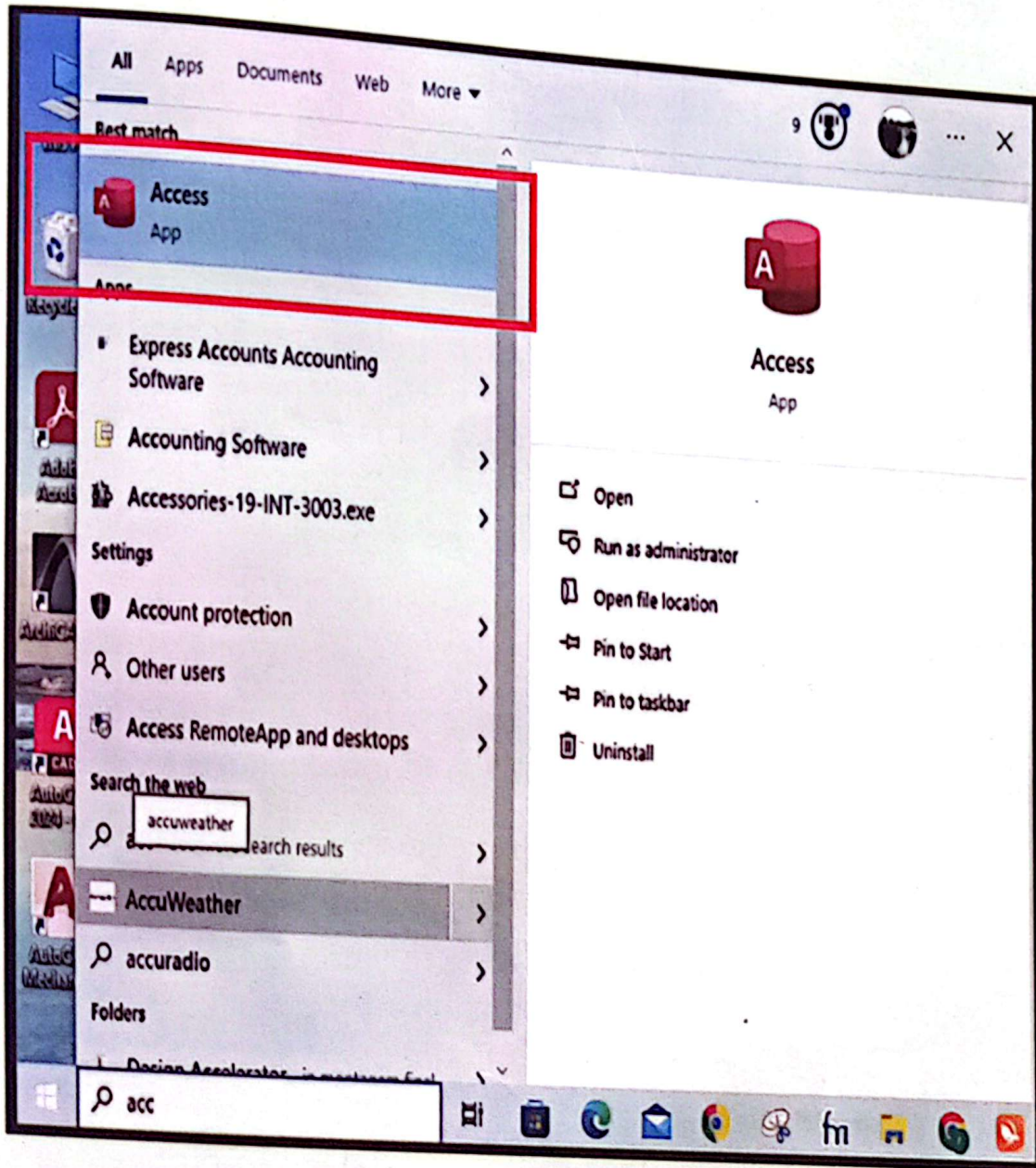


Figure 44: Opening Microsoft Access

3. Click on the **Access** icon. MS Access will open.

Creating a database in MS Access and closing the application

When you open MS Access you will see a window similar to the one shown in Figure 45. From here, you can create a new database by following the steps in Activity 24.

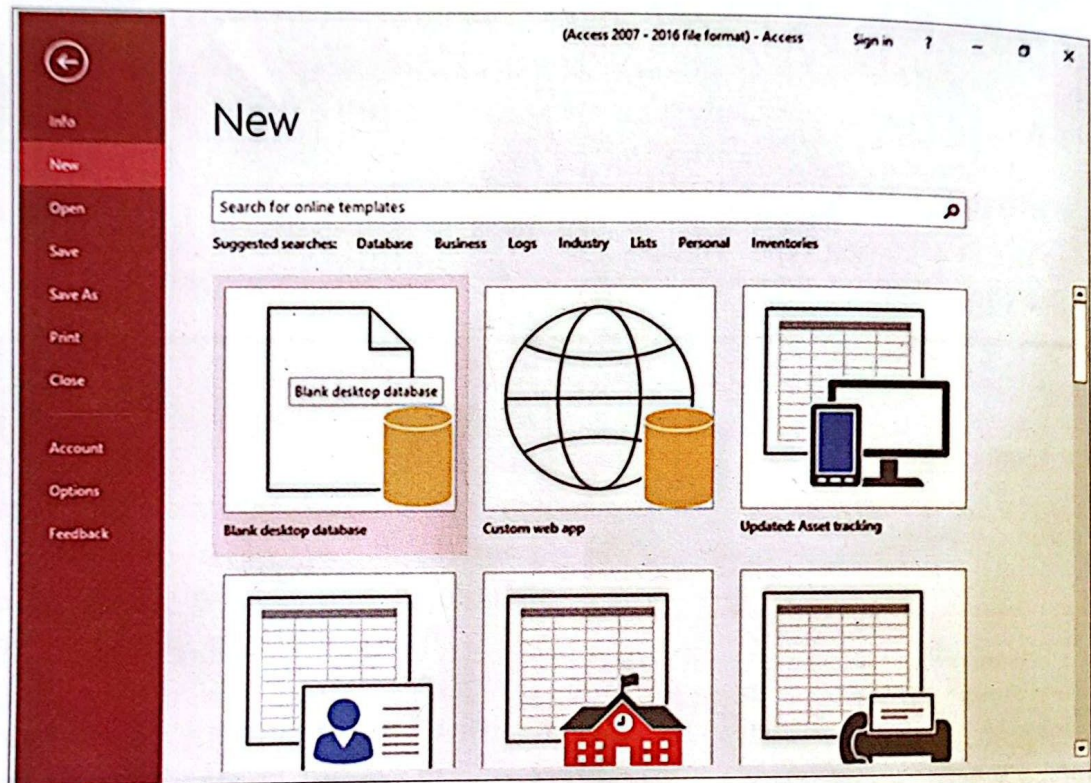


Figure 45: Opening Microsoft Access

Activity 24

Creating a database

Steps:

1. Open MS Access.
2. Click **Blank desktop database**. A popup box appears where you can type in the name of the file. Type the name *MyFirstDatabase* as shown in Figure 46.

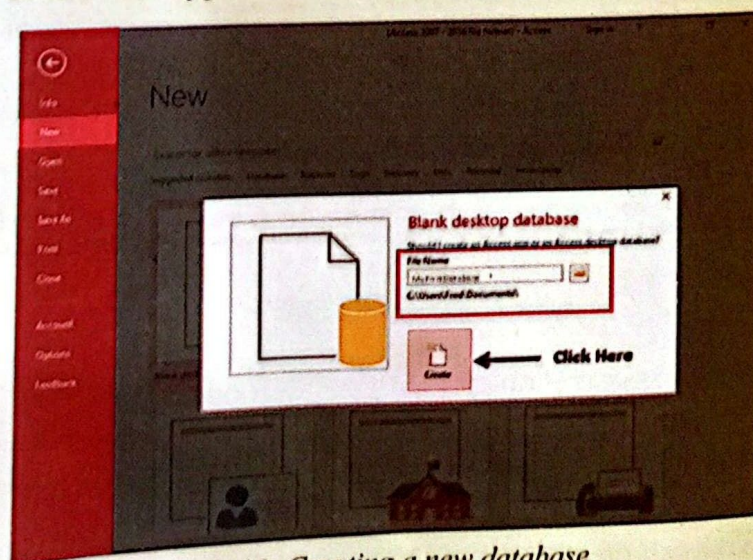


Figure 46: Creating a new database

3. Click on **Create** to create and open the database.

Once a new database is created, you are now ready to populate it with data. This is because the newly created database contains a default table called *Table1* as shown in Figure 47. You can proceed to close MS Access by clicking on the **X** mark as shown in Figure 47.

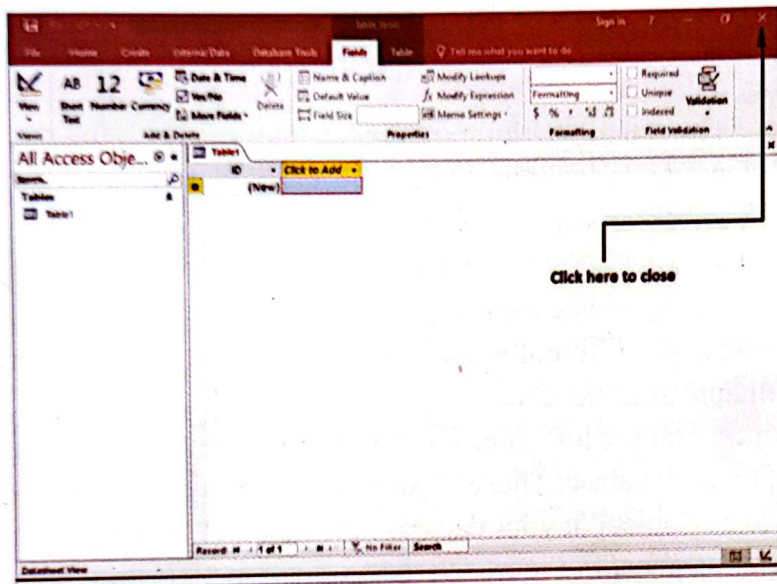


Figure 47: Closing Microsoft Access

Navigating MS Access

Just like you did before, open MS Access and this time you should be able to see the previously created database at the left pane on the window as shown in Figure 48. Clicking on the file name opens up the database.

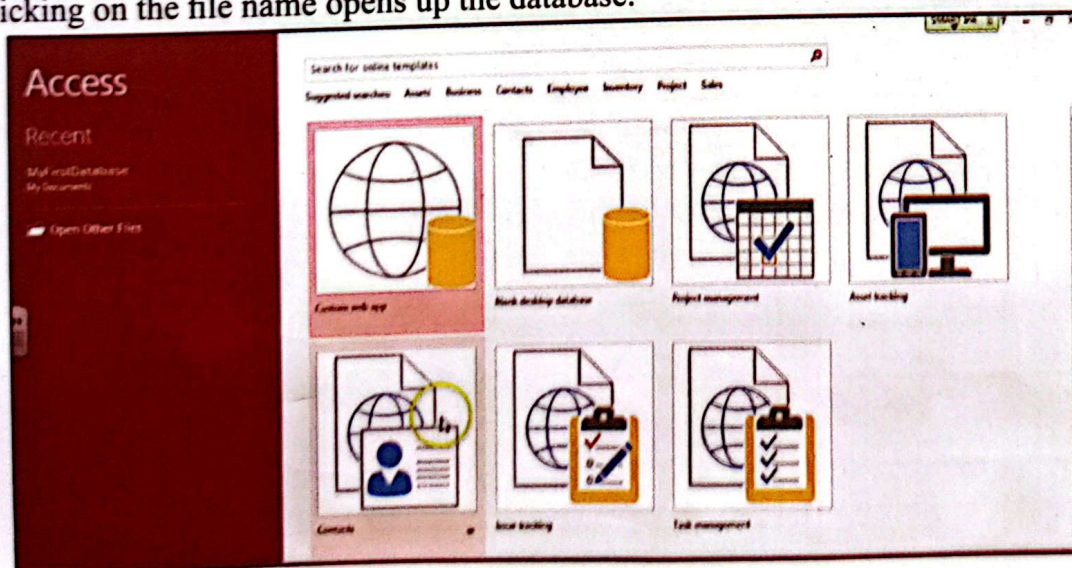


Figure 48: Opening a database

Looking at the window you will see the following:
The Ribbon at the top of the screen: This is the toolbar that contains different commands, organized in tabs. In Figure 49 you can see five tabs; **File**, **Home**, **Create**, **External Data**, and **Database Tools**.

File: A collection of commands to create, open, print, save, and publish the file. These are usually referred to as backstage commands.

Home: A collection of the most frequently used commands, mostly for formatting (copying, pasting, italicizing, and bolding.)

Create: Commands to create the different objects that make up the database.

External Data: Commands to allow for either getting data from other applications, such as Microsoft Excel, or sending data to these applications.

Database Tools: These are commands that deal with how the database works behind the scenes (what you do not see directly).

As you keep working on different objects in the database, you will notice that new, relevant tabs will appear as needed.

The Navigation Pane on the left side: The pane shows all the objects that have been created in a particular database. These objects are tables, queries, forms, and reports. You can switch to any object in your database at any point in time by simply clicking on it in the navigation pane. In Figure 49, the navigation pane is still empty since you have not created anything yet. And, finally;

A blank working area, occupying the remaining space, where the object that you are currently working on will be displayed. This is the space containing *Table1* in Figure 49.

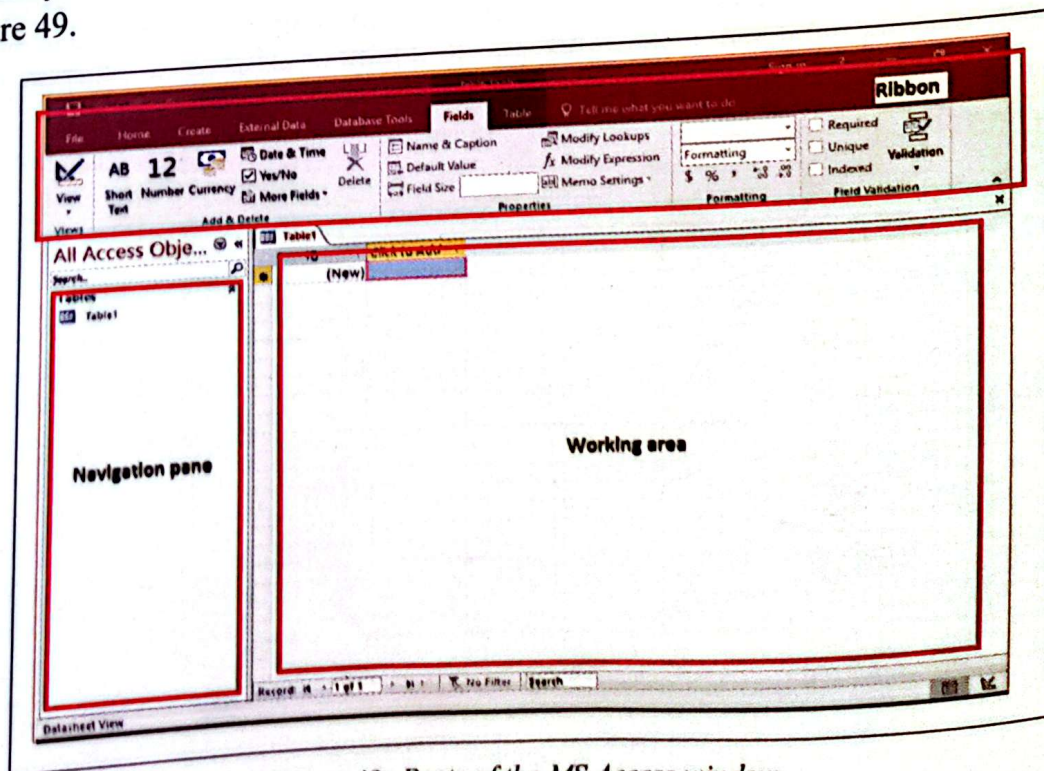


Figure 49: Parts of the MS Access window

Exercise 7

1. Create a blank database named *InventoryManagement* and save it on your computer. Identify and briefly explain the purpose of the following tabs on the ribbon: a) **File** b) **Home** c) **Create** d) **External Data** e) **Database Tools**
2. Use the **Navigation Pane** to explore how objects (such as tables, queries, forms, and reports) are organized.
3. In the **Create** tab:
 - (a) Create a table called *Products*.
 - (b) Create a query in **Design View**.
 - (c) Create a simple form for the *Products* table.
 - (d) Open the **Report Wizard** and navigate through it (no need to generate a report yet).
4. Open two existing objects such as a table or a query.
 - (a) Use the tabs at the top to switch between these objects.
 - (b) Close one of the open objects and confirm that it no longer shows in the tab bar.
5. Open an existing database and add the **Save** and **Undo** commands to the quick access toolbar.
6. Open the *Products* table and switch between the following views:

- (a) **Datasheet View**.
- (b) **Design View**.
- (c) Briefly explain the difference between these views.

7. Use the **Help** feature (by pressing **F1**) to search for "creating queries" and note down one useful tip you found.

Element 2: Creating tables and entering data

By the end of this element, you will be able to recognize tables in a database, create tables in **Datasheet View** as well as **Design View**; rename tables, enter data, save tables, and close a database.

The competencies developed in this element will enable you to create tables, name them and save them for future use.

Recognizing tables in a database

A table is a way of organizing data in a grid of rows and columns. Table 1 is a typical example of a table which contains information about some students. Database applications also use tables to organize data. When you create a new MS Access database a table named *Table1* is created by default as it was shown in Figure 49.

Table 1: Student identity information

Registration	Surname	First Name	Age
201	Mtemi	Zawadi	15
202	Tembo	Kulwa	14
203	Ngurumo	Juma	17
204	Mwembe	Baraka	16
205	Mtama	Neema	15
206	Mponda	Fadhili	16

Note: In MS Access, the rows, columns and data stored in a table have special names. Specifically, you will see:

A *Field*: This is a column in the table.

A *Record*: This is a row in the table.

A *Value*: This is a data item in the table.

Creating a table in the Datasheet View

In the **Datasheet View**, a table is created and displayed as a grid with columns and rows just like in Table 1. You can therefore also enter data into your table as soon as you create it. To create a table in **Datasheet View**, follow the steps in Activity 25.

Activity 25

Creating a table in the Datasheet View

Steps:

1. Start MS Access and open an existing database or create a new database. If you open a new database, you will notice a blank table called *Table1* already created by default. Just ignore this table for now.
2. Click on the **Create** tab and then click on **Table**. *Table2* will be created as shown in Figure 50.

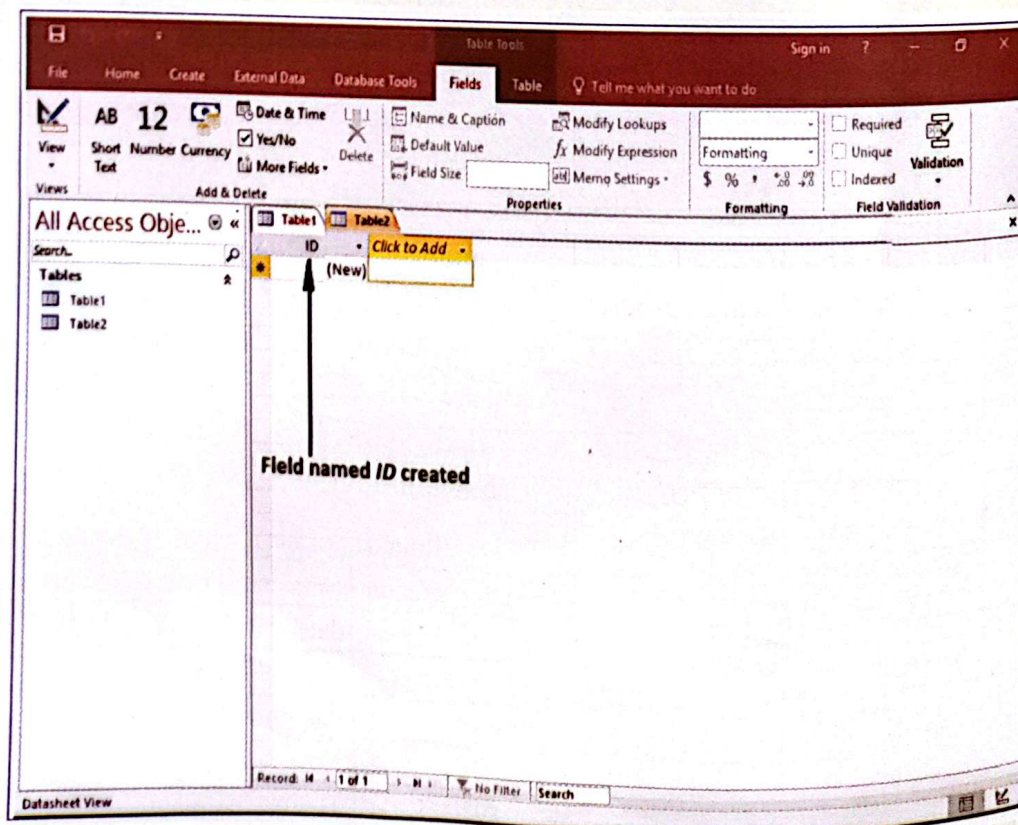


Figure 50: Creating a table in the Datasheet View

Note also, that the first *Field* in *Table2* has also been created and it is called *ID*.

Creating a table in the Design View

In the **Design View**, you cannot display or enter data in your table. However, in the **Design View**, you can specify the field names and data types in each column of the table. To create a table in the **Design View**, follow the steps in Activity 26.

Activity 26

Creating a table in the Design View

Steps:

1. Launch MS Access and open an existing database or create a new database.
2. Click on the **Create** tab and then click on **Table Design**. *Table2* will be created

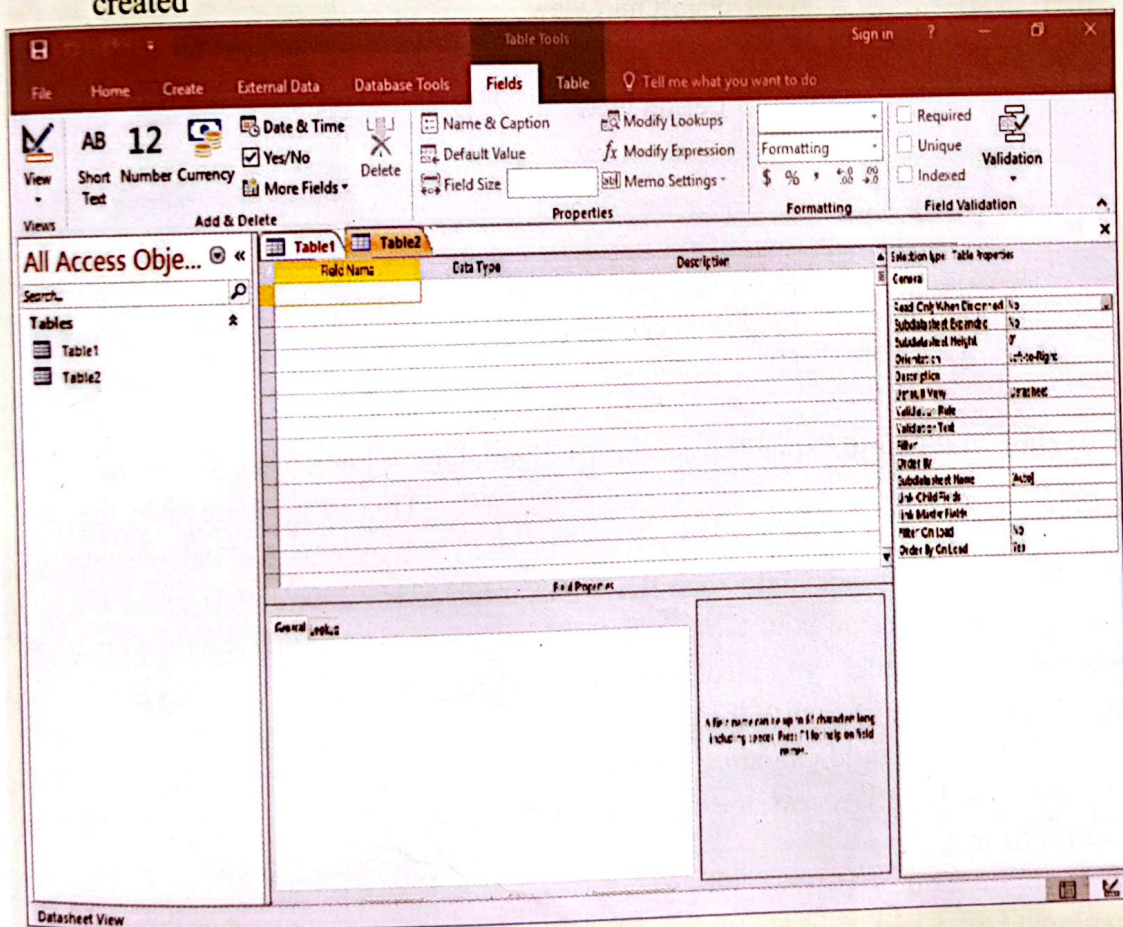


Figure 51: Creating a table in the Design View

Note, in Figure 51, that two more tabs appear on the ribbon; **Fields** and **Table**. They have been labeled as **Table Tools**. Note further, that, in any table you create, you can toggle between the **Design View** and the **Datasheet View** by selecting the desired view from the **View** command in the **Home** tab as shown in Figure 52.

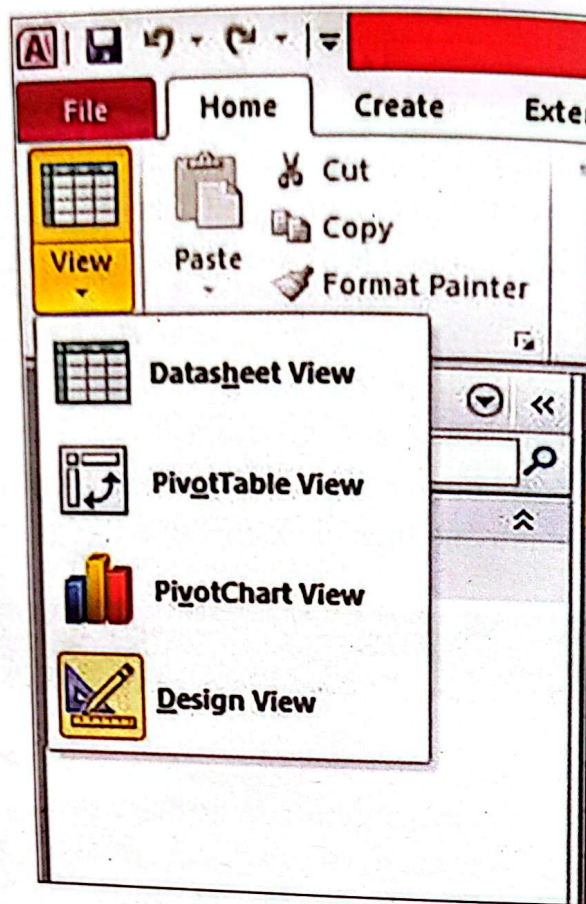


Figure 52: Different table views

Entering data and specifying data types

In MS Access, you must specify what kind of information goes into each field. After you have created your table, when you enter field names, you also have to specify the data type that will be stored in that field. Each field can store data of only one type. In MS Access, the different data types are:

Short Text: This is either text, or a combination of text and numbers up to 255 characters, for example, James, 0712 345678, and T 114 ABC.

Long Text: This is either text, or a combination of text and numbers like before, but allowing up to 63, 999

characters, for example, a page of a book.

Number: This is numeric data that can be used in mathematical calculations, for example, 216, 200000980, and 23527.

Date/Time: These include date and time values for the years 100 up to 9999.

Currency: These are numeric data that can also be used in mathematical calculations allowing numbers with one up to four decimal places.

AutoNumber: These are numbers that are automatically generated by MS Access when a new record is created. MS Access increases the number by 1 from one record to the next and the values in this field are always unique in each record.

Yes/No: These allow only two values in the field at a time. These values can either be Yes/No, True/False, or On/Off

Attachment: These are complete files containing different types of data, for example, a .pdf document, an MS Word file, or an MS Excel file.

Hyperlink: These are addresses of resources that can be accessed through the internet, for example, https://www.tutorialspoint.com/ms_access/ms_access_data_types.htm.

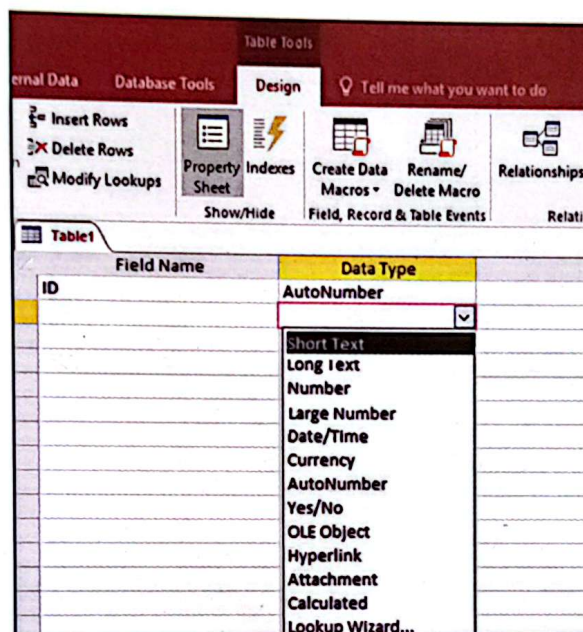


Figure 53: Defining field data type

To specify the data types and populate a table created either by default when opening MS Access, or in the **Datasheet View**, follow the steps shown in Activity 27

Activity 27

Specifying data types and entering data in a table created in the Datasheet View

Steps:

1. Start MS Access and open an existing database or create a new database.
2. Create a new table in the **Datasheet View** or open any existing blank table.
3. Note that the *ID* field is already created.
4. Click beside the *ID* field on **Click to Add**. A menu of data types will appear. Select Short Text as shown in Figure 53.

5. In the highlighted field name *Field1*, type *Surname* then press **Enter**. When you press **Enter**, you will be taken to the next field.
6. Repeat steps (2) and (3) to create two more fields, namely, *First Name* which is of data type **Short Text** and *Age* which is of data type **Number**.
7. Proceed to fill the table by entering the data given in Table 2.

Table 2: Students' Names and Ages

Surname	First Name	Age
Mtemi	Zawadi	15
Tembo	Kulwa	14
Ngurumo	Juma	17
Mwembe	Baraka	16
Mtama	Neema	15
Mponda	Fadhili	16

8. Your table should look similar to that shown in Figure 54.

ID	Surname	First Name	Age
1	Mtomi	Zawadi	15
2	Tumbo	Rufa	14
3	Ngurumo	Juma	17
4	Mwendu	Baraka	16
5	Mtama	Nicoma	15
6	Maonda	Fadhi	16

Figure 54: Table populated with data

Exercise 8

In the table you created in Activity 27:

1. Highlight any of the values (1 -6) and attempt to change the values. Is it possible to do so? If you can change the values, how can you prevent them from being changeable?
2. If you could not change the values in question 1 above, what can you do to make these values changeable?
3. Add another field named *PassportSizePic* where you can upload passport size photos of each student.
 - (a) What is the data type of this field?
 - (b) Upload the photos to the table.

To populate a table created in the **Design View**, follow the steps in Activity 28.

Activity 28

Specifying data types and populating tables created in the Design View

Steps:

1. Start MS Access and open an existing database or create a new database in the **Design View**.
2. Note that there are no any fields created by default, instead, you are required to enter the field name and its data type shown in Figure 55.

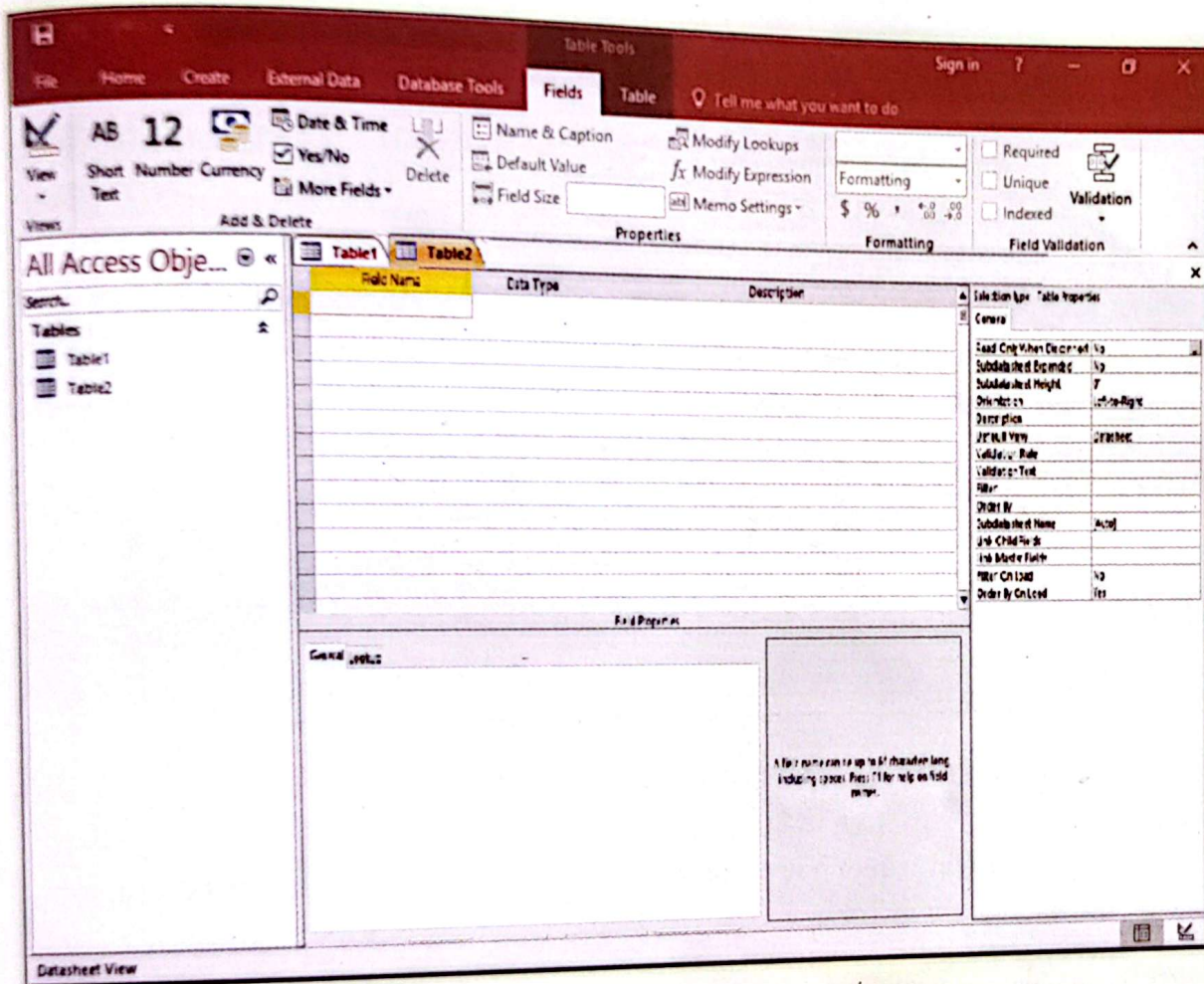


Figure 55: Defining data in MS Access

3. Proceed to insert the field names and data types as shown in Table 3.

Table 3: Field names and their data types

Field Name	Data Type
Registration	Number
Surname	Short Text
First Name	Short Text
Town	Short Text
Departure Date	Date/Time
Departure time	Date/Time
Guardian	Short Text

4. Your table will be similar to that shown in Figure 56.

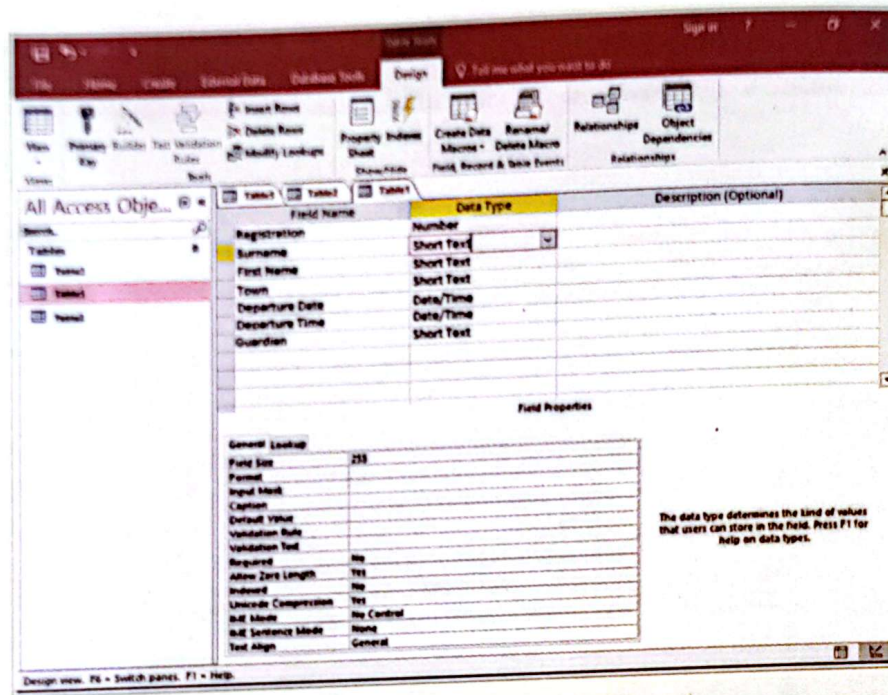


Figure 56: Creating fields in a table in Design View

5. Toggle to **Datasheet View** and proceed to populate the table as before. Use the data given in Table 4.

Table 4: Students' travel information

Registration	Surname	First Name	Town	Departure Date	Departure Time	Guardian
201	Mtemi	Zawadi	Mtwara	28/06/2024	10:00	Mother
202	Tembo	Kulwa	Dar es salaam	30/06/2024	11:00	Grandfather
203	Ngurumo	Juma	Dar es salaam	30/06/2024	11:00	Father
204	Mwembe	Baraka	Mbeya	29/06/2024	06:00	Father
205	Mtama	Neema	Morogoro	01/07/2024	14:00	Mother
206	Mponda	Fadhili	Songea	29/06/2024	05:00	Aunt

When storing data in a database, it is important to assign one of the fields, in every table, as the **Primary Key**. A **Primary Key** is the field that is assigned to uniquely distinguish between each record in a table. For example, in Activity 27 each student can be identified uniquely via their ID whereas in Activity 28 the same students have unique registration numbers, but with slightly different information in each table.

The ability to identify a record uniquely allows you to link between records that are related but kept in separate tables in a database as you will see later. To assign a **Primary Key** to a table, follow the steps shown in Activity 29.

Activity 29

Assigning the Primary Key in a table in MS Access

Steps:

1. Launch MS Access and open a table created in **Design View**, as for example, the table created in Activity 28.
2. While in **Design View**, select the field to be made the **Primary Key**.
3. Click on **Primary Key** command in the **Design** tab shown in Figure 57.
4. Alternatively you can right-click on the field name *Registration* and select **Primary Key** from the context menu that pops up. This is also shown in Figure 57.

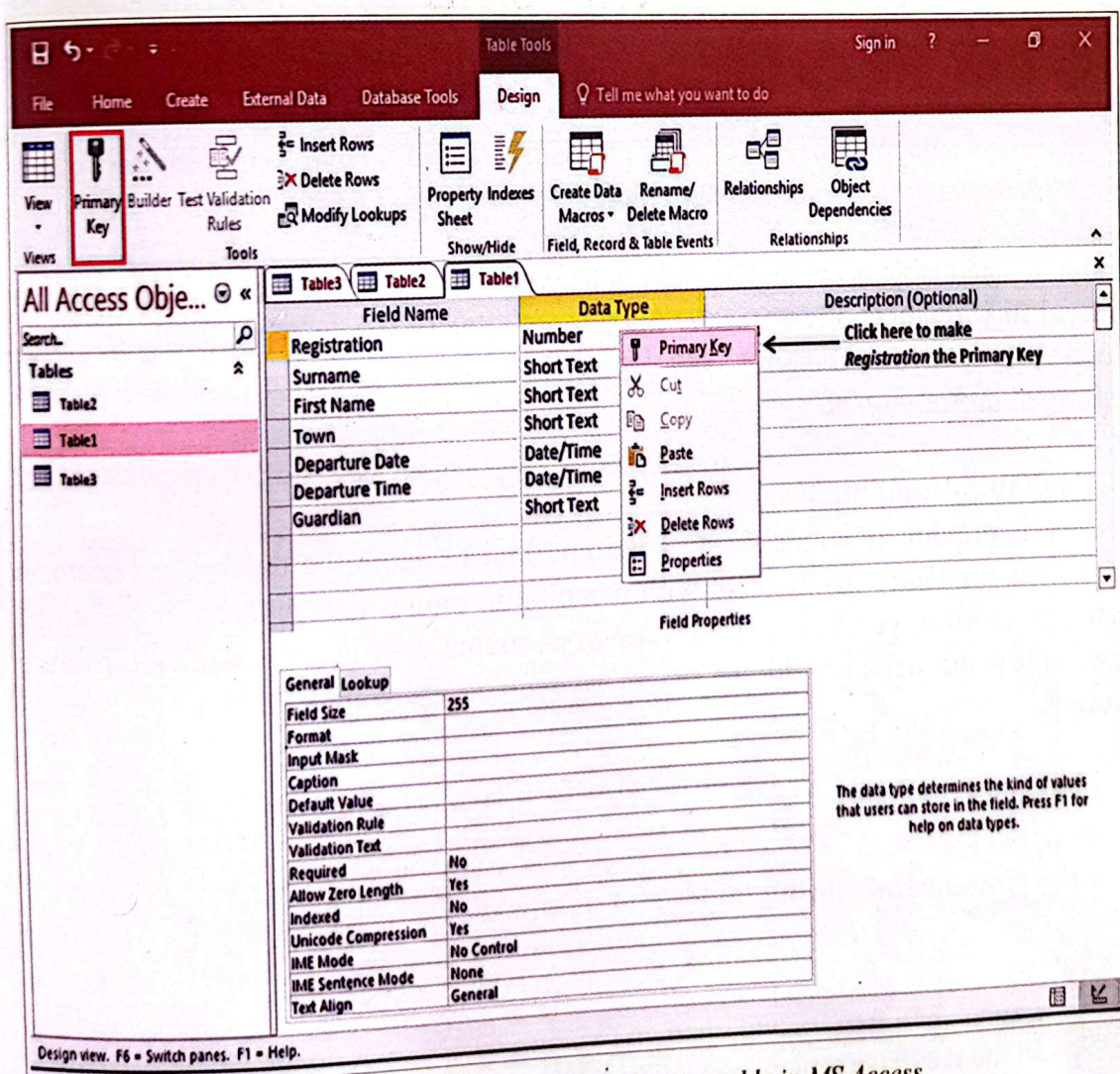


Figure 57: Assigning a Primary Key to a table in MS Access

5. A small key will appear beside the *Registration* field to indicate that it is the **Primary Key** in this table as shown in Figure 58.

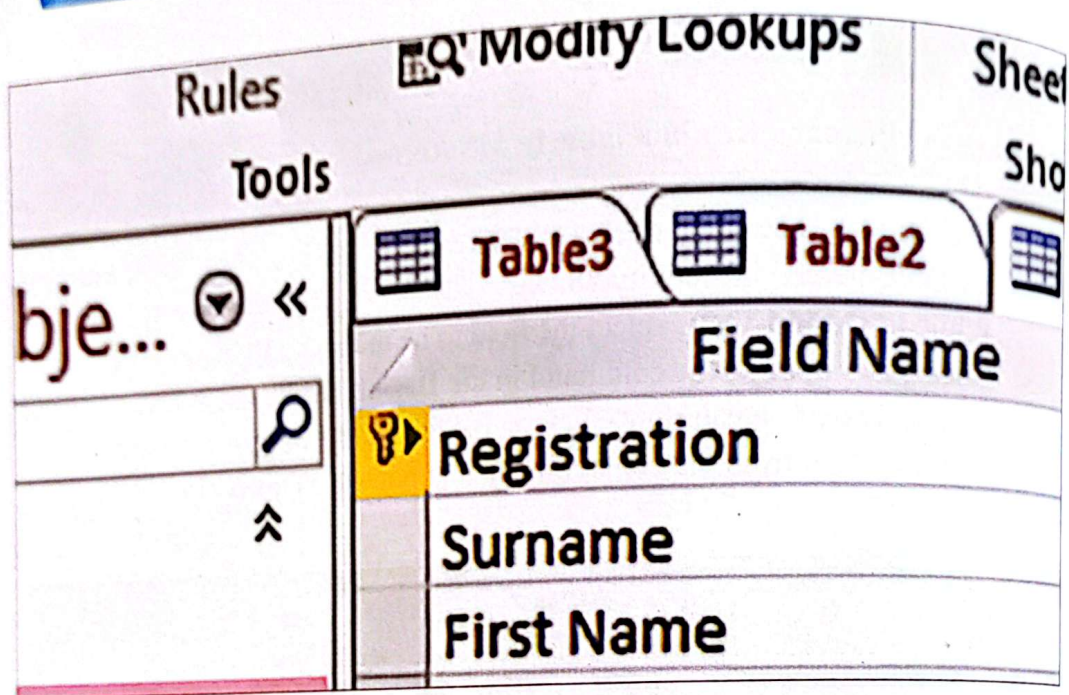


Figure 58: The Primary Key

Note: When a table is created by default as you create a database, or when a table is created in **Datasheet View**, the *ID* field automatically becomes the **Primary Key**. For a table created in **Design View**, the primary key has to be assigned manually as described in Activity 29.

Saving tables and databases

As it was previously emphasized, it is important to name the databases we create as well as the tables inside them with meaningful names that reflect what is stored inside. Moreover, you have to save your work so that your data is retained for future use. Follow the steps in Activity 30: to save a table, as well as save a database and close it.

Activity 30

Saving, naming and closing tables and databases

Steps:

Saving a table

1. Launch MS Access and open an existing database or create a new database.
2. In the database, open an existing table or create another table.
3. Right - click on the table name. A context menu with a space to input the name will appear.
4. Type the desired name for the table and click **OK** to save. In the example in Figure 59, the table has been named *Students Travel Information*.

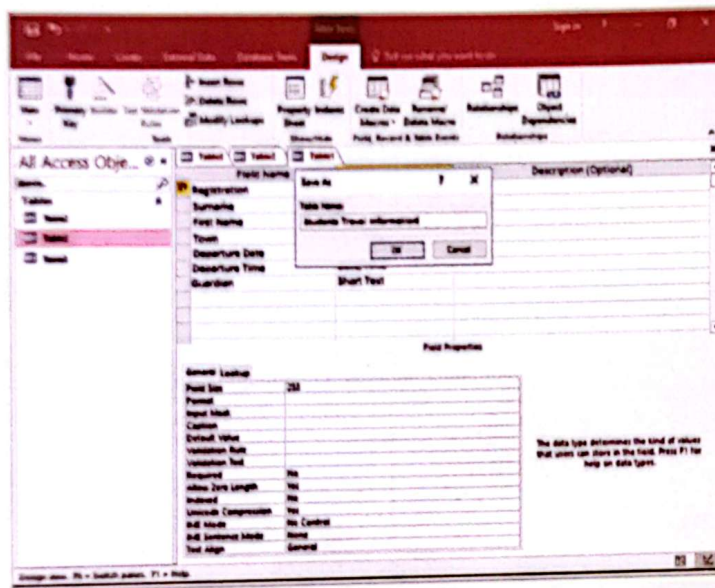


Figure 59: Saving and renaming a table in MS Access

- Alternatively, select the table that you want to save and rename and click on **Save Object As** in the **File** menu. Proceed to type the desired name and click **OK** to save.

Saving a database

- In the currently open database, click on **Save Database As** in the **File** menu.
- A window similar to that in Figure 60 will appear. Here you will have an option to save your database in different formats.

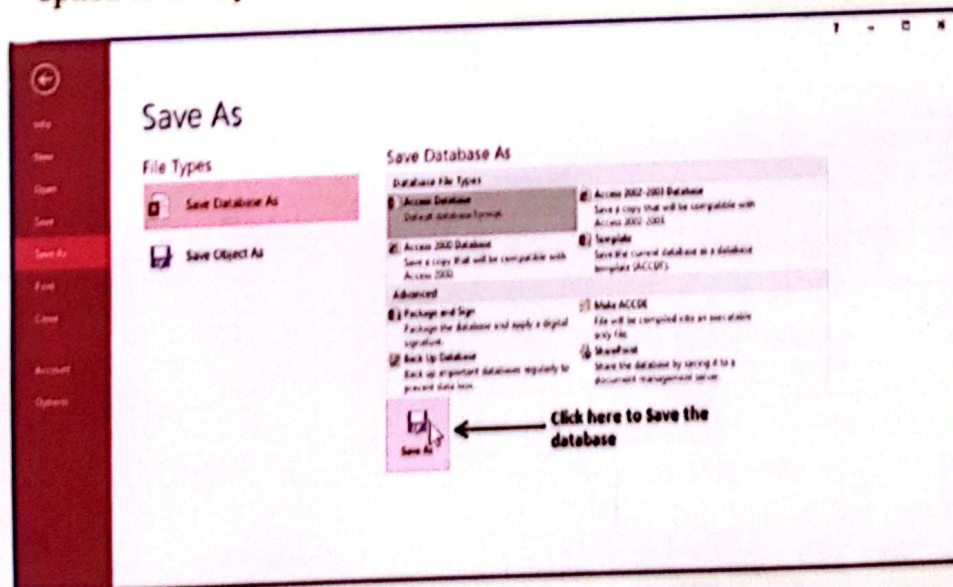


Figure 60: Choosing database formats

- Select **Access Database** which is the default format. Click **Save As**.
- A popup will appear to warn you in case there are objects in the database that are left open. This is shown in Figure 61.

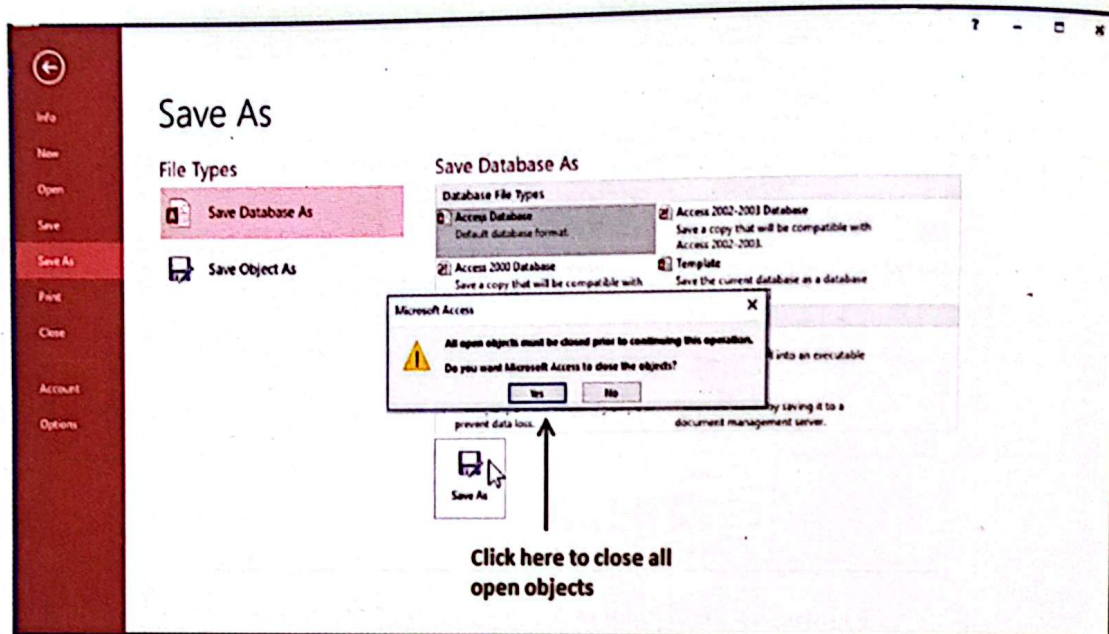


Figure 61: Warning to close open objects in the database

5. Click **Yes** to allow MS Access to proceed to saving the database.
6. A window will appear where you can select the location to save your database and specify the name of the database.
7. Type the desired name for the database. In the example in Figure 62 the database has been named *Form Two Students*.

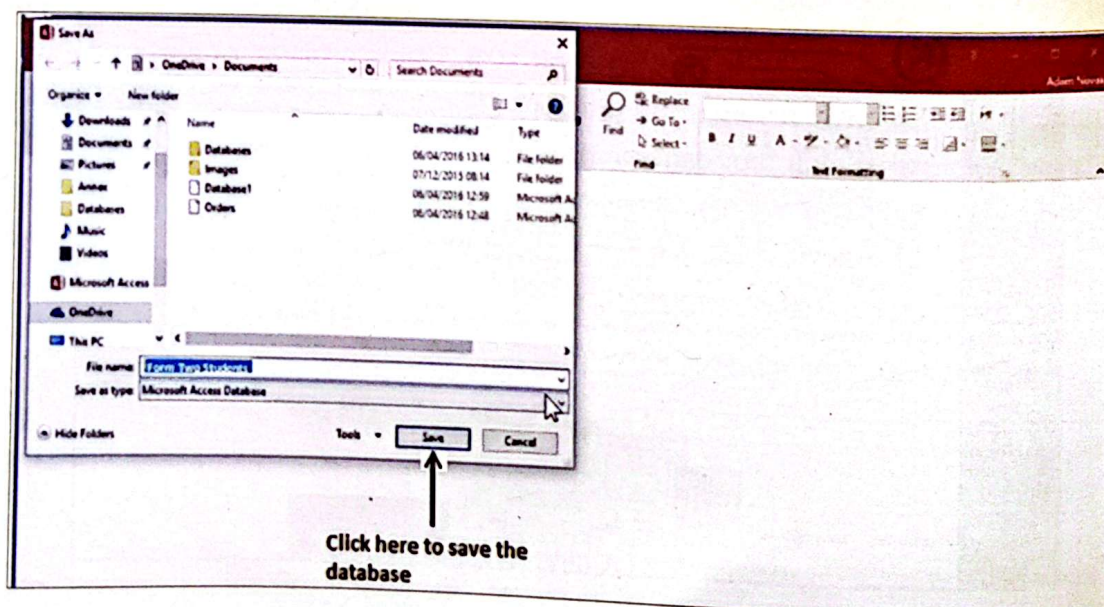


Figure 62: Saving a database in MS Access

8. Click **Save** to save the database. Just like before, an extension will be appended to the file name. In MS Access the extension is *.accdb*.

Exercise 9

1. Assume that you have joined an organization that keeps track of its customers' information using MS Access. Each customer's record should contain the following fields: *CustomerID* (a unique identifier), *FirstName*, *LastName*, *Email*, *PhoneNumber*, and, *City*. Create a simple database to manage the customer records by performing the following tasks:
 - (a) Create a new database named *CustomerManagement*.
 - (b) Design a table named *Customers* with the fields listed above. Ensure that:
 - (i) *CustomerID* is set as the **Primary Key**.
 - (ii) *Email* is required and must not allow duplicates.
 - (c) Enter 5 sample customer records into the table.
 - (d) Save and close the table, then reopen it to verify the data.
 - (e) Sort the customer list by *City*.
 - (f) Use a query to display only customers from the city of Dar es Salaam.
2. You have been tasked with designing a simple database to manage a library's book collection. The database needs to store the following information

for each book: *BookID* (a unique identifier for each book), *Title*, *Author*, *ISBN*, *YearPublished*, and, *Category*. Create the database by performing the following tasks

- (a) Create a new table named *Books* with the fields listed above.
- (b) Set *BookID* as the **Primary Key**.
- (c) Try entering two records with the same *BookID*. What happens?
- (d) Now, remove *BookID* as the primary key and set *ISBN* as the **Primary Key** instead.
- (e) Enter duplicate *ISBNs* into two records. What behavior do you observe?
- (f) Why is it important for a table to have a **Primary Key**?
- (g) What criteria should you use when selecting a field to be the **Primary Key**?

Element 3: Creating queries

By the end of this element you will be able to describe queries, create queries and manipulate data in tables using queries.

You will also be able to link tables in a database. You will create and use the SELECT query, the APPEND query, the UPDATE query and the DELETE query. The competencies developed in this element will enable you to add, manipulate, modify and delete data in a database.

Description of queries

A database query is a statement that can insert, retrieve, manipulate, modify or delete data stored in a database. There are four types of queries, which are SELECT, APPEND, UPDATE, and DELETE with which you can view, add, modify, calculate, summarize, combine data from different tables, and erase data from a database.

Creating SELECT queries

The SELECT query is used to fetch or retrieve data from a database. It allows users to access the data and retrieve specific data based on specific conditions. There are different ways that you can fetch data from one or more databases as outlined in the following sections.

From several fields in a table: This is useful when you want to view or access only part of the records in a particular table. Suppose you want to find out, from the *Form Two Students* database, where each student will be travelling to.

Recall that in the *Form Two Students* database there is a table named *Students Travel Information* that contains this information. Instead of displaying the entire table, a SELECT query can be created to query the *Students Travel Information* table for just this information.

To create this query, follow the steps in Activity 31.

Activity 31

Creating a SELECT query

Steps:

1. Start MS Access and open the *Form Two Students* database.
2. Click on the **Query Design** command in the **Create** tab. A popup will appear with a list of all the tables in the database as shown in Figure 63.

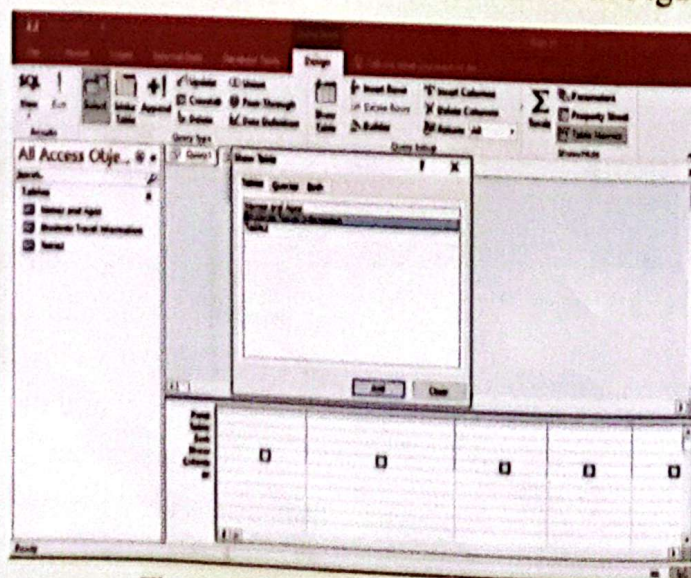


Figure 63: Selecting a table to query

3. Select the table you want to work with by either double-clicking it or simply selecting it and clicking **Add** on the popup menu. In the example, a table named *Students Travel Information* is selected.
4. Click **Close** to close the popup. The table *Students Travel Information* will appear in the main working area showing its fields.
5. Select the fields you want to extract from the table by double-clicking them. In this example the fields *First Name* and *Town* were selected as shown in Figure 64.

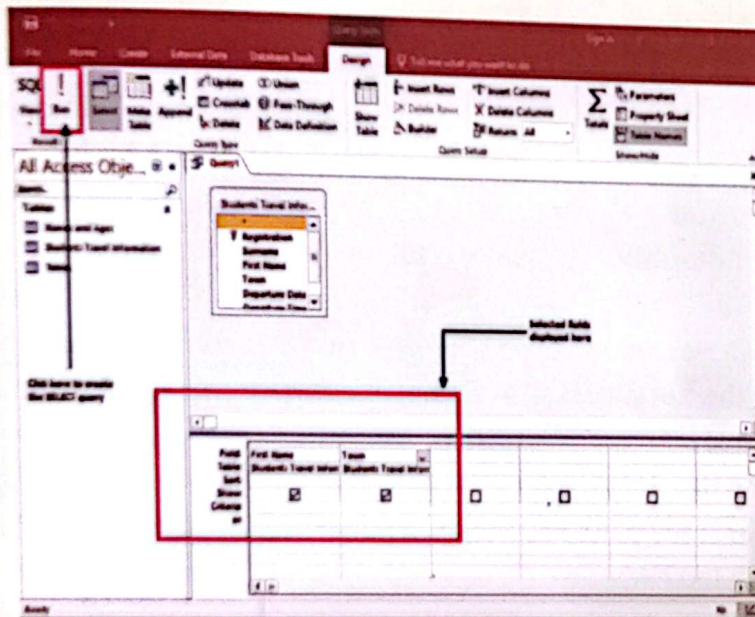


Figure 64: Creating a SELECT query

6. Click on the **Run** command in the **Design** tab.
7. The results of running the query are shown in Figure 65.

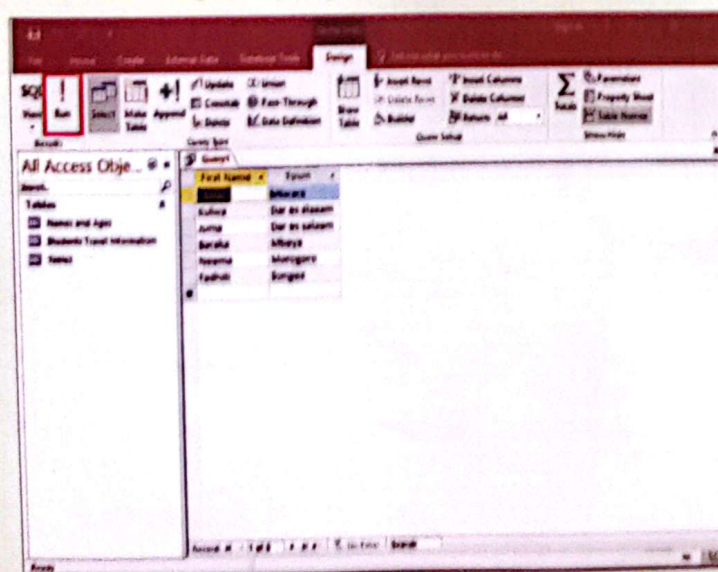


Figure 65: Results of a SELECT query

From multiple tables in the database: It is possible to extract records from multiple tables at once only if the tables are linked. The links between tables are called *relationships*. For example, we can clearly see that our two tables, *Names and Ages* and *Students Travel Information*, contain different kinds of information for the same users. However, MS Access cannot establish this link automatically. The usual practice is to have one field, preferably the **Primary Key**, form one table (the *Students Travel Information* in this case) as a field in the second table (*Names and Ages*). The **Primary Key** in the table *Students Travel Information* is known as a **Foreign Key** in the table *Names and Ages*. To relate two tables as explained, follow the activities in Activity 32.

Activity 32

Creating a relationship between two tables

Steps:

1. Start MS Access and open the *Form Two Students* database.
2. Create the **Foreign Key** by adding the *Registration* field to the *Names and Ages* table.
3. Click on the **Relationships** command in the **Database Tools** tab.
4. Just like in the previous section, a popup will appear with a list of all the tables in the *Form Two Students* database as shown in Figure 66.

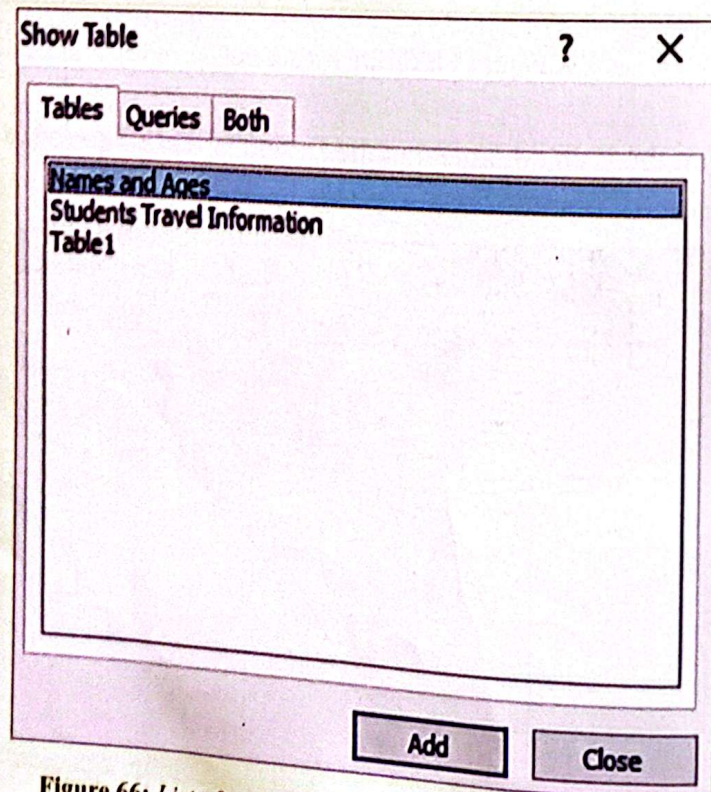


Figure 66: List of tables in the *Form Two Students* database

5. Select the two tables that you want to link, in this case, *Names and Ages* and *Students Travel Information* by clicking **Add** each time.
6. Click **Close** to remove the popup dialog box.
7. Choose the **Primary Key** in one table which is a **Foreign Key** in the other table. Click on this field from the first table and drag it to the second table. For example, in Figure 67 the field *Registration* was chosen.
8. Upon releasing the mouse, a popup dialog box as shown in Figure 67 will appear.
9. Up to this point, the records between the two tables are about to be linked by linking the fields named *Registration* in tables named *Students Travel Information* and *Names and Ages*.
10. Click **Create** to link the two tables.

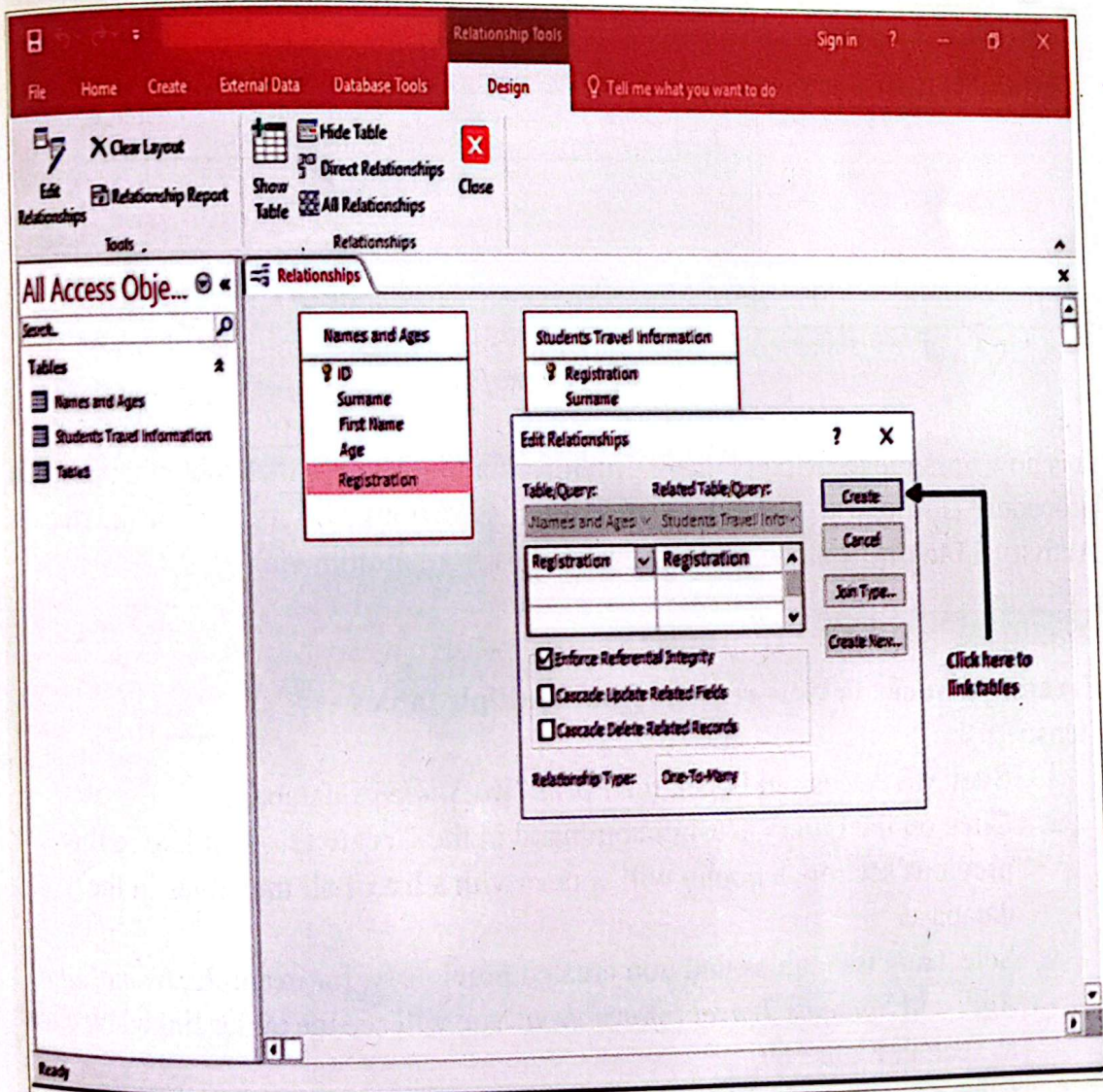


Figure 67: Linking tables

11. The two tables will appear with a line joining them as shown in Figure 68.

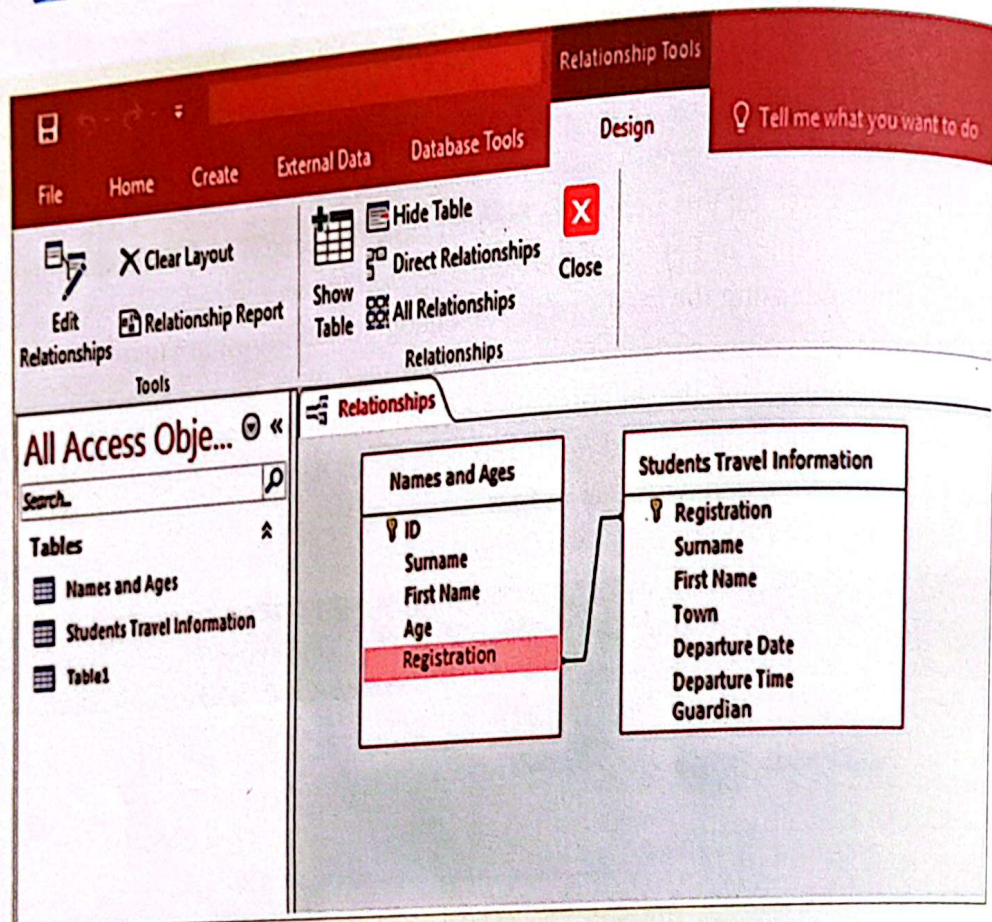


Figure 68: Linked tables

It is now possible to extract meaningful information from the two tables at once. The procedure is similar to that demonstrated in the previous activity. Follow the steps in Activity 33 to create a query to review records from multiple tables.

Activity 33

Creating a query to view records from multiple tables

Steps:

1. Start MS Access and open the *Form Two Students* database.
2. Click on the **Query Design** command in the **Create** tab. Just like in the previous section, a popup will appear with a list of all the tables in the database.
3. Select any two tables that you created previously, for example, *Names and Ages* and *Students Travel Information*. You will see the tables linked by a line as seen in Figure 69.
4. Click **Close** to close the popup.
5. Select the fields you want to extract from the table by double-clicking them. In this example the fields chosen were *Registration*, *First Name*, *Age* and *Guardian* from the two tables as seen in Figure 69.

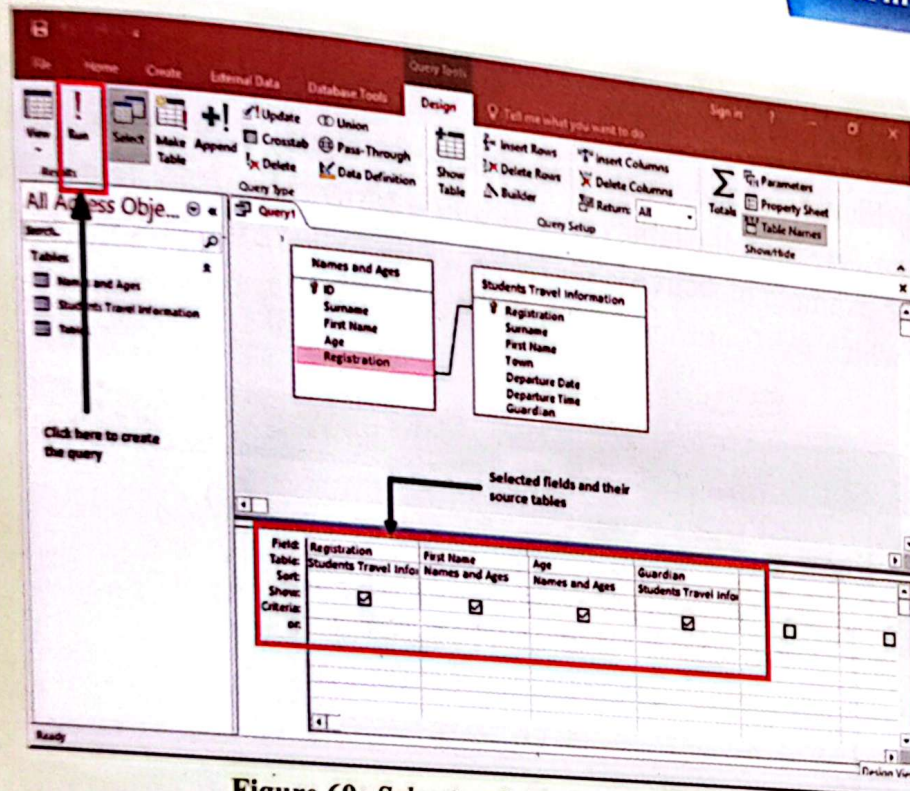


Figure 69: Selecting fields from two tables

6. Click on the **Run** command in the **Design** tab.
7. The results of running the query are shown in Figure 70.
Note that Figure 69 and Figure 70 are the same query but in **Design View** and **Datasheet View** respectively.

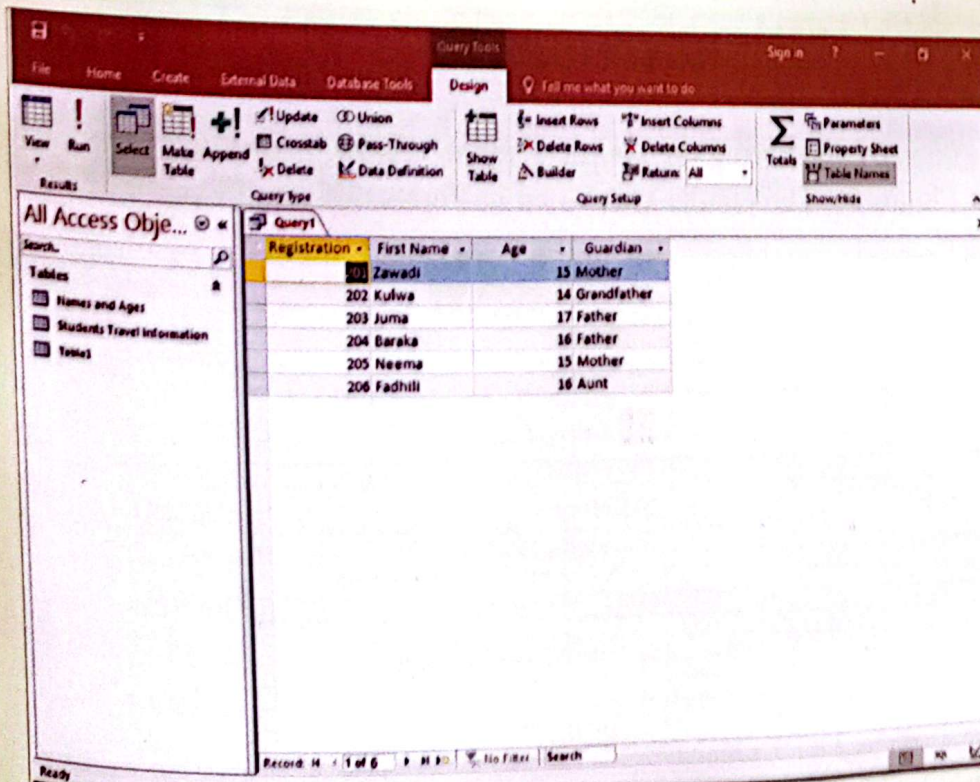


Figure 70: Completed query in Datasheet View

With variable field values (parameter queries): In this case, you can view only those records for which the specified field's value matches that of the parameter. For example, in Figure 71, the query was set out to display *Registration*, *First Name*, *Age* and *Guardian* from the tables *Names and Ages* and *Students Travel Information* similar to the example in Activity 33. However, here there was a restriction that only records for which the *Guardian* is "Mother" or the *Registration* is ">203", are to be displayed.

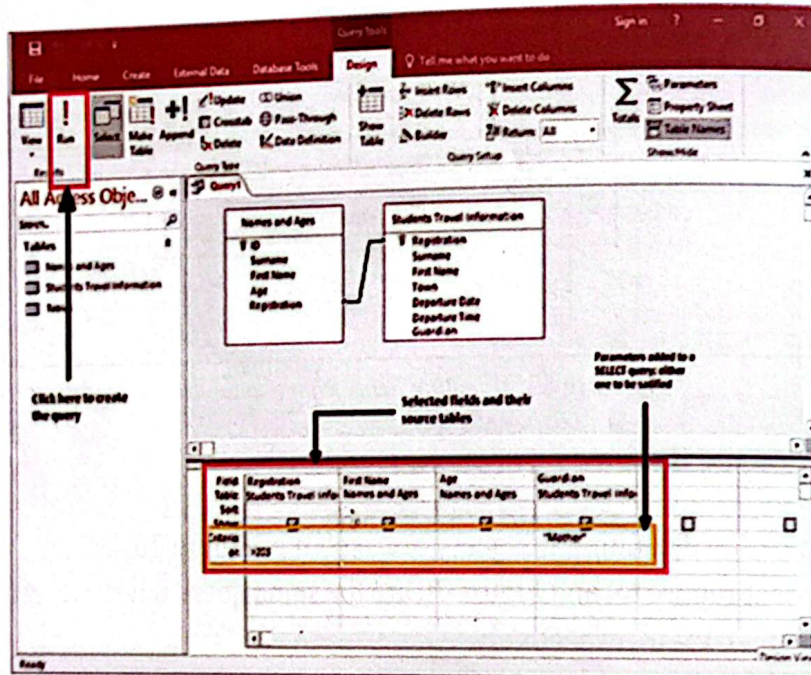


Figure 71: Query with parameters

This was done by specifying the **Criteria** in the *Guardian* and *Registration* fields as shown in Figure 71. The results are shown in Figure 72.

Query Setup				
Registration	First Name	Age	Guardian	
201	Zawadi	15	Mother	
204	Baraka	16	Father	
205	Neema	15	Mother	
206	Fadhili	16	Aunt	

Figure 72: Results of running a query with parameters

You can also specify the parameter(s) so that the user is prompted to enter the criteria. Queries created in this way allow for the SELECT criteria to be variable. The

procedure is the same as before with the exception that the prompt for the criteria is typed within square brackets in place of the criteria as shown in Figure 73. The result of running the query is popup is two consequent dialog boxes, the first, requesting for the criteria for the *Guardian* field, and the second, requesting for the criteria for the *Registration* field, also shown in Figure 73.

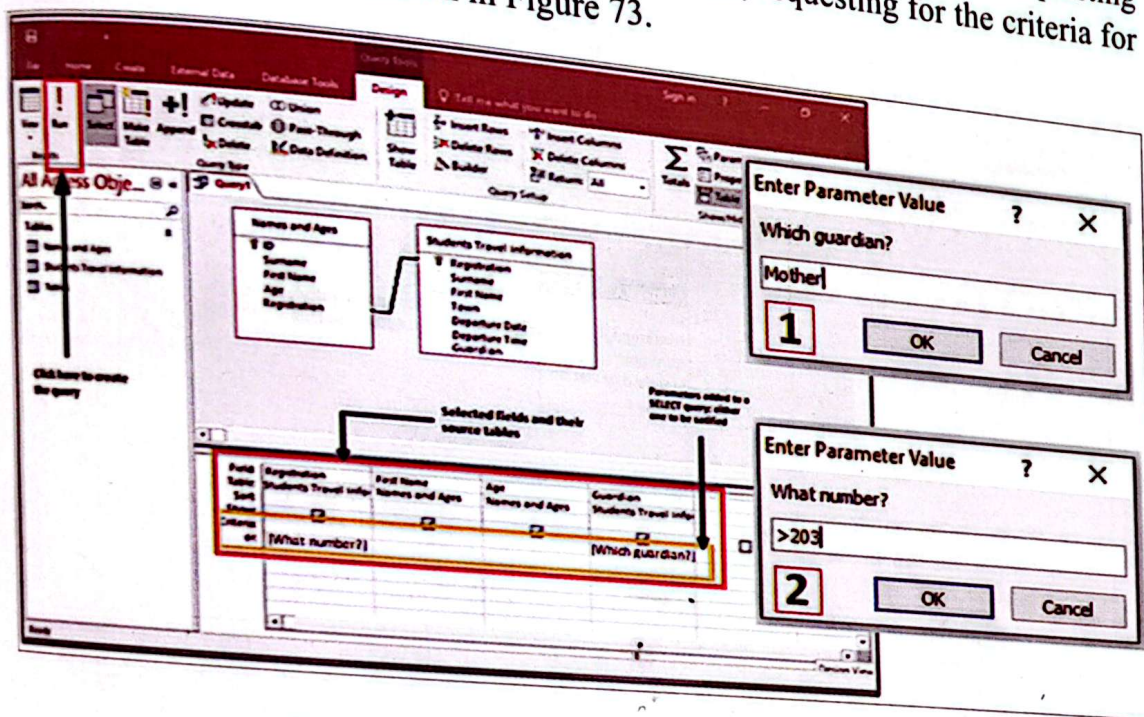


Figure 73: Prompting for user input of parameters

Summarizing data: The SELECT query can also be used to summarize data. For example, you could count the number of records in a table. Follow the steps in Activity 34 to count the number of records in a table and display minimum and maximum ages.

Activity 34

Using the SELECT query to summarize data

Steps:

1. Open the query created in Activity 33 in **Datasheet View**.
2. Select the *Age* field.
3. Click the **Home** tab and click on **Total** as shown in Figure 74.
4. The total will appear at the bottom of the field.
5. Click on the drop-down menu and select **Average**. You will see the number 15.5, equal to the average of the ages in the table.
6. Repeat steps (2) and (3) for the *Registration* field.
7. Click on the drop-down menu and select **Minimum**. Record the result.
8. Repeat steps (5) and (6), but this time select **Maximum**.

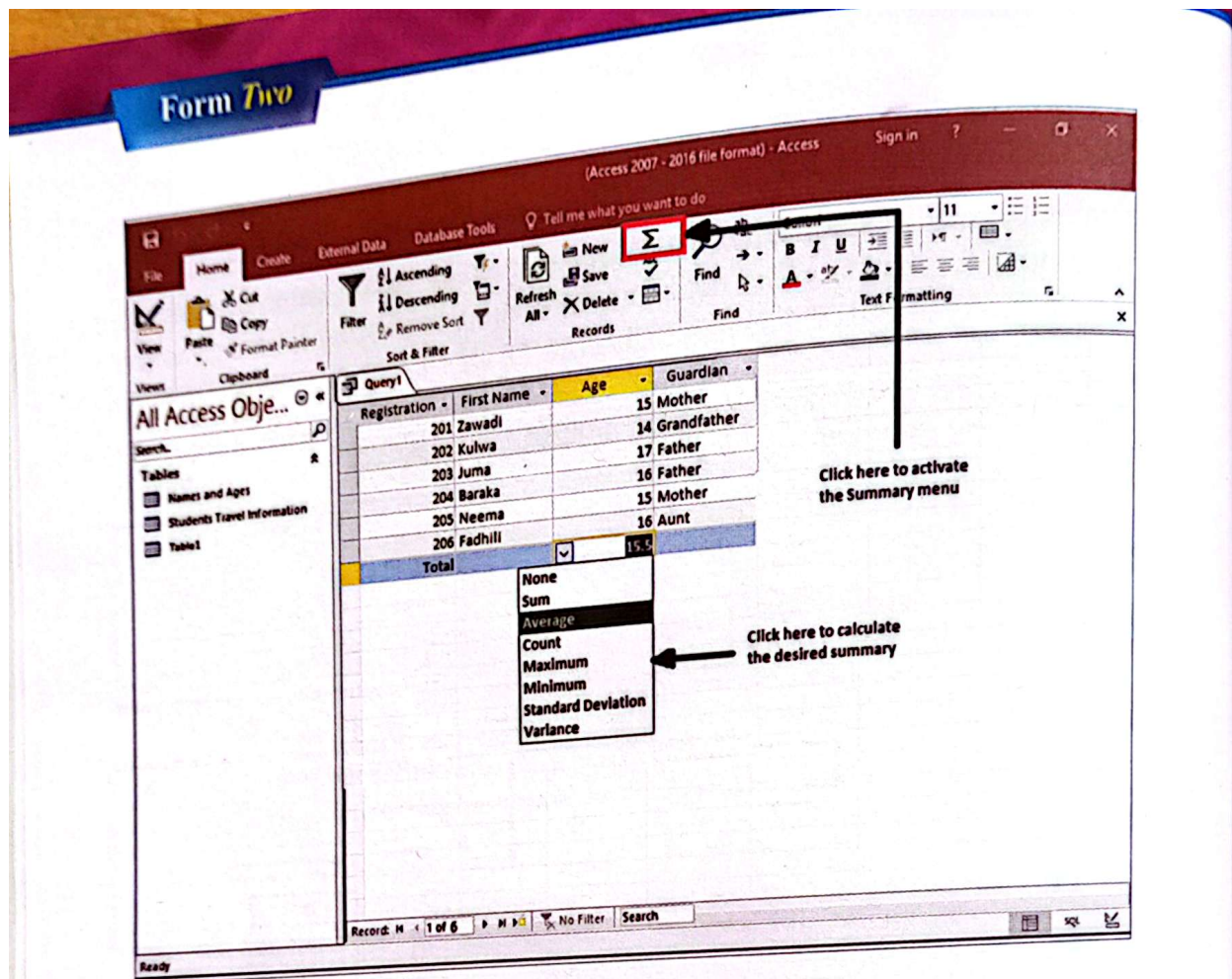


Figure 74: Summarizing data with a Select query

Creating an APPEND query

This query is used to add records from one table (the source) to another (the destination). It usually changes the destination table and hence one needs to be careful before appending data to a table. To append data, a query is created like before. However, after creating the query, clicking on the **Design Tools** tab allows for the normal query to be converted into an APPEND query by clicking on **Append**. Follow the steps in Activity 35 to add records to a newly created table.

Activity 35

Creating an APPEND query

Steps:

1. Launch MS Access and open the *Form Two Students* database.
2. Create a table named *Travel Info*, in **Datasheet View**, with the following fields: *ID*, *Registration*, *Town*, *Departure Date* and *Departure Time*. Remember to assign appropriate data types.
3. Create a SELECT query to extract the *Town*, *Departure Time* and *Departure Date* fields from the *Students Travel Information* table. Check the query in **Datasheet View** to see the results. You should be able to see the results similar to those in Figure 75.

Town ▼	Departure Ti ▼	Departure D ▼
Mtwara	10:00:00 AM	6/28/2024
Dar es slaam	11:00:00 AM	6/30/2024
Dar es salaam	11:00:00 AM	6/30/2024
Mbeya	6:00:00 AM	6/29/2024
Morogoro	2:00:00 PM	7/1/2024
Songea	5:00:00 AM	6/29/2024
*		

Figure 75: Query to extract travel information from a table

4. Back in the **Design View**, click **Append**. A dialog box will appear prompting you to specify the table to move the data to. Select *Travel Info*, and then click **OK** as shown in Figure 76.

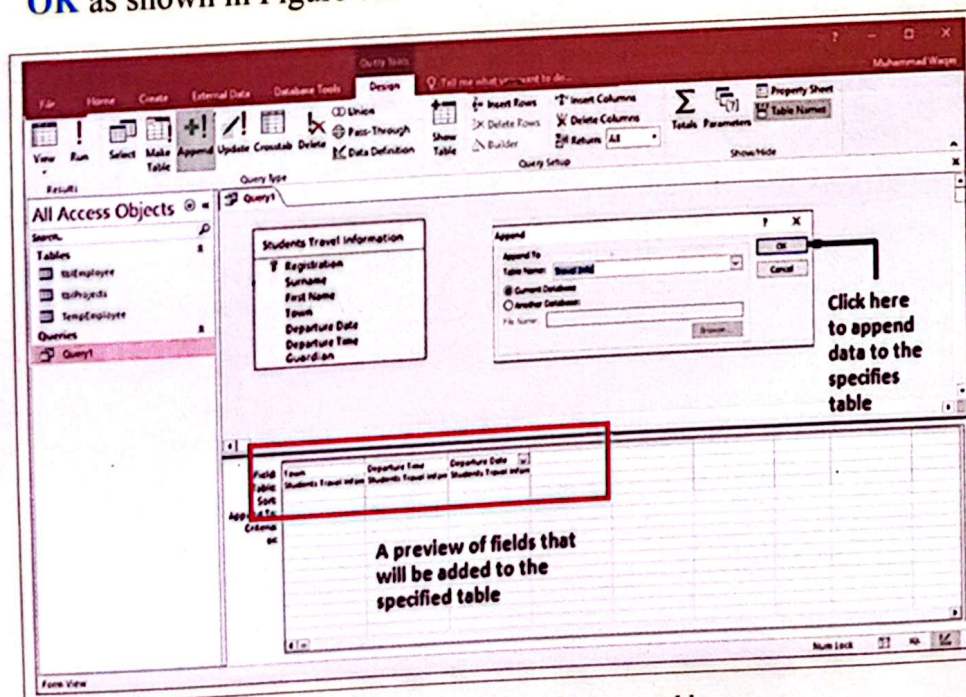


Figure 76: Appending data to a table

5. You will see a warning that a number of records (6 in this case) are about to be affected.
6. Click **Yes** to append the data into the table as shown in Figure 77.

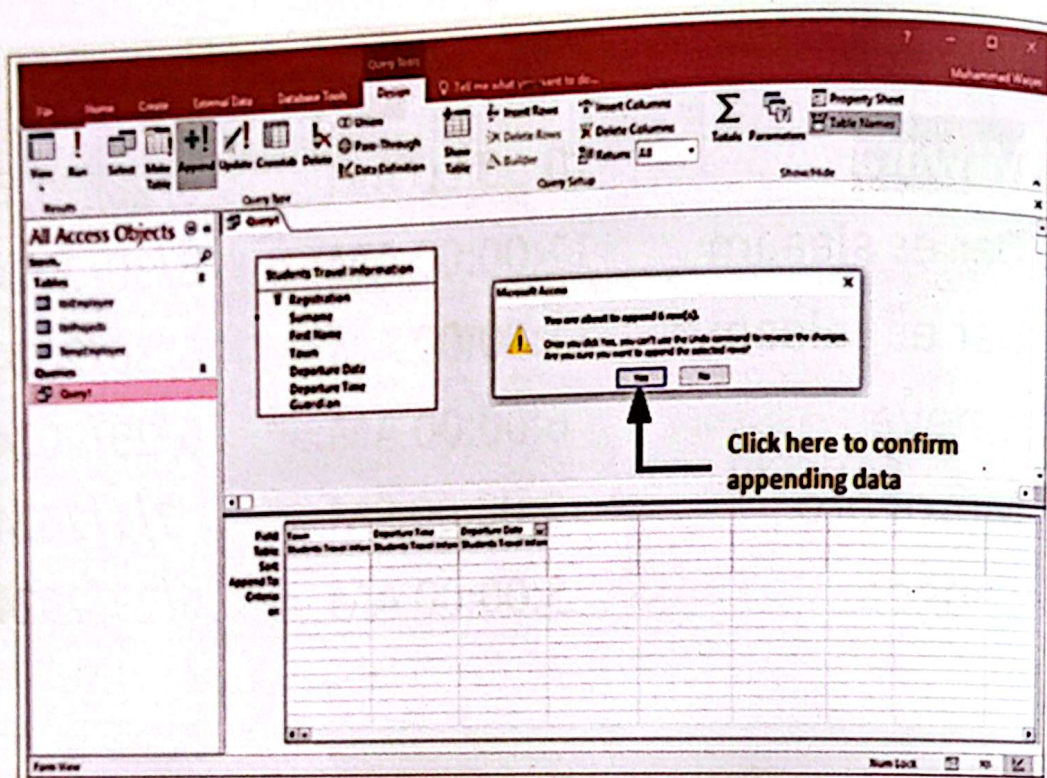


Figure 77: Completing appending data into a table

7. Check the *Travel Info* table in **Datasheet View** to see the added records. You will see results similar to those shown in Figure 78.

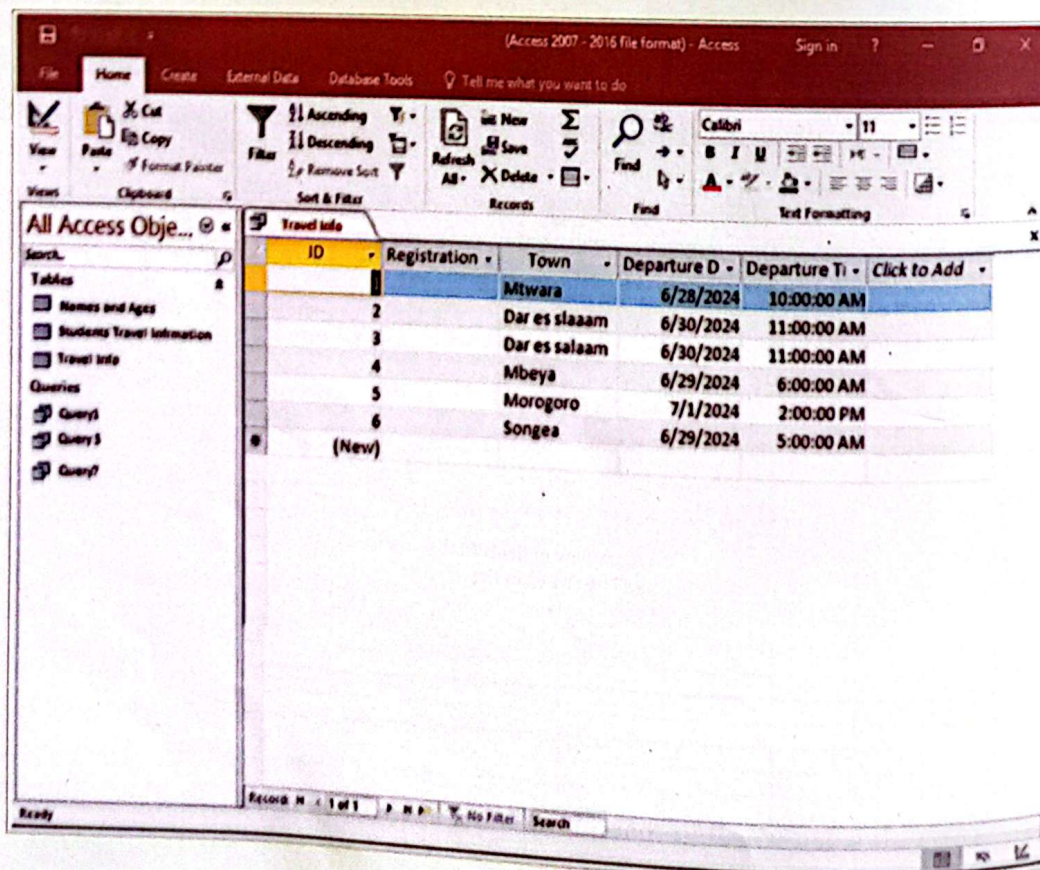


Figure 78: Data appended to a table

Note

1. When creating *Travel Info*, the field *ID* with data type **AutoNumber** was created. The values in the *ID* field were therefore being automatically updated as new records were being appended to the table.
2. When appending data to *Travel Info*, there was no *Registration* field in the source table which resulted into the *Registration* field in *Travel Info* to remain empty.

Creating an UPDATE Query

The UPDATE query is used for modifying existing records in a table. There is no creation of new records, instead, the query simply goes to the specified records and changes the value of a specified field. Note that any field whose data type is **AutoNumber** cannot be updated.

The creation of an UPDATE query follows the same procedure as you previously saw with the APPEND query in the sense that a basic SELECT query is created first and thereafter converted to an UPDATE query. You have an opportunity to view the results of the query once you create it but before you run it. Follow the steps in Activity 36 to update records in a table.

Activity 36**Creating an UPDATE query****Steps**

1. Create a SELECT query.
2. Click on the **Design Tools** tab and select **Update**. The query will change from a SELECT query to an UPDATE query. You will notice one more row labeled **Update to**, added to the fields' description at the bottom of the screen as shown in Figure 79.
3. Click **Run** in the **Home** tab. A dialog box will appear where you can select the table in which to update the records. In Figure 79, *Students Travel Information* was selected and it can be seen as an inset.
4. Once *Students Travel Information* appears, select fields to update. In Figure 79, the *Guardian* field was chosen. In this field, the records should be updated to "Parent" as shown in the **Update to** box.

Note two things:

- (a) "Parent" is written in quotation marks because it is a record of text data type.
- (b). In the **Criteria** box, there is text reading "Mother" Or "Father". This text means that only records with values "Mother" or "Father" should be changed

6. Click **Yes**.
7. Open the modified table and observe the changes. Figure 82, shows *Names and Ages* before, and after deletion.

ID	Surname	First Name	Age	Click to Add
1	Mtemi	Zawadi	15	
2	Tembo	Kulwa	14	
3	Ngurumo	Juma	17	
4	Mwembe	Baraka	16	
5	Mtama	Neema	15	
6	Mponda	Fadhili	16	
* (New) Before deletion				

ID	Surname	First Name	Age	Click to Add
1	Mtemi	Zawadi	15	
2	Tembo	Kulwa	14	
	#Deleted	#Deleted	#Deleted	
	#Deleted	#Deleted	#Deleted	
5	Mtama	Neema	15	
	#Deleted	#Deleted	#Deleted	
* (New) After deletion, before saving				

ID	Surname	First Name	Age	Click to Add
1	Mtemi	Zawadi	15	
2	Tembo	Kulwa	14	
5	Mtama	Neema	15	
* (New) Specified records deleted				

Figure 82: A table with deleted records

Exercise 10

1. Create a parameter query as described in Activity 33, specifying the *Age* to be 16, or the guardian not to be a parent.
2. You are tasked to manage a student database that contains the following information in a table named *Students*: *StudentID* (**Primary Key**), *FirstName*, *LastName*, *Gender*, *Age*, *Course*, *HomeCity* and *FavoriteSubject*.
 - (a) Create a database and populate the *Students* table with records obtained by surveying 100 school mates.
 - (b) Extract useful insights from the data by performing the following tasks:
 - (i) Create a **SELECT** query to display only the students whose

- favorite subject is "Computer Applications".
- (ii) Create a query to find students aged more than 16 years.
 - (iii) Modify the previous query to show only the *FirstName*, *LastName*, *Age*, and *FavoriteSubject* fields.
 - (iv) Use a parameter query to allow the user to search for students from a specific city. (**Hint:** Use [Enter City Name:] as the parameter.)
 - (v) Sort the results of any query to show the youngest students at the top.
3. How can you save a query for future use in MS Access?
 4. Discuss in groups, to determine what the APPEND query could be useful for.
 5. Repeat the steps in Activity 37 by deleting those records in the *Guardian* field (in the previously created table *Students Travel Information*) that are not "Parent".
 6. Repeat the steps in Activity 43 by replacing those records in the *Town* field (in the previously created table *Students Travel Information*) that are not "Dar es Salaam" with the word "Upcountry".

Element 4: Creating forms

By the end of this element you will be able to create **Bound Forms** and **Unbound Forms**. Moreover, you will be able to define and distinguish between **Bound Forms** and **Unbound Forms**. The competencies developed in this element will enable you to create user friendly interfaces through which to interact with your databases.

Defining database forms and their types

A form is a user interface that can be used to interact with a database. It is the graphical user interface that is used for, alternatively, populating tables and writing queries. You can therefore use forms to view, add, erase, or modify data in the database.

There are different ways in which forms can be used in a database. Forms can either be tied to an object or used for all objects. **Bound Forms** are linked to only one object, such as a table or a query whereas **Unbound Forms** cater to more than one object.

Just like with all the other database objects, forms can be created either directly (by clicking **Create** then **Form**); through the **Design View** (by clicking **Create** then **Form Design**), as well as through a wizard (by clicking **Create** then **Form Wizard**). In the activities below you will create forms of different types using different methods.

Creating Bound Forms

There are three different types of bound forms depending on how the records are displayed:

Activity 40

Creating a Split Form

Steps

1. Open the object for which you want to create a form. In Figure 85, *Students Travel Information* is opened.
2. Click on the **Create** tab and then click **More Forms**. A dropout menu will appear. Choose **Split Form**. A form will be created with the same name as the object. In Figure 85, the form is called *Students Travel Information*.
3. Click on the **Form View** in the **Home** tab to start adding the new record. In Figure 85 record number 7 is getting created.
4. Save your form.

6 records showing in a split form

Adding a new record

Registration	Surname	First Name	Town	Departure D	Departure Ti	Guardian
201	Mtemi	Zawadi	Mtwara	6/28/2024	10:00:00 AM	Parent
202	Tembo	Kulwa	Dar es salaam	6/30/2024	11:00:00 AM	Grandfather
203	Ngurumo	Juma	Dar es salaam	6/30/2024	11:00:00 AM	Parent
204	Mwembe	Baraka	Mbeya	6/29/2024	6:00:00 AM	Parent
205	Mtama	Neema	Morogoro	7/1/2024	2:00:00 PM	Parent
206	Mponda	Fadhili	Songea	6/29/2024	3:00:00 AM	Aunt
207	Kitulo	Rehemu				

Figure 85: Creating a Split Form

Creating unbound forms

The most important type of unbound forms are the *navigation forms*. These assist in organizing the different objects in the database for easy access. For example, you can put together all forms and queries that refer to a particular table. Follow the steps in Activity 41 to create a navigation form for the *Form Two Students* database.

Activity 41

Creating a navigation form

Steps:

Preparing objects

1. Open the *Form Two Students* database.
2. Open the *Students Travel Information* table and create a form with the same name.
3. Create two queries and name them *Identification* and *Home*. *Identification* is a SELECT query to display *Registration* and *First Name*, whereas *Home* is a SELECT query to display *First Name* and *Town*.
4. Create two forms, one for each of the two queries created in step (3). Remember that to create a form for a query, the query has to be in **Datasheet View**. Then name the forms *Identification* and *Home* like their respective queries.
5. Open the *Names and Ages* table and create a form with the same name.
6. Create a SELECT query named *Ages* displaying *ID* and *Age*.
7. Proceed to also create a corresponding form for the *Ages* query.

Creating the navigation form

1. In the **Forms** group in the **Create** tab, click on **Navigation**. A dropdown menu will appear with options on how to organize the navigation form. Select **Horizontal Tabs and Vertical Tabs, Left**.
2. A navigation form will appear ready for objects to be added. In the first horizontal tab, type the name *All Data*.
3. Drag the form named *Students Travel Information* and drop it on the first vertical tab.
4. Repeat dragging and dropping the forms *Identification* and *Home* below *Students Travel Information*.
5. Go to the next horizontal tab and click on **Add New**. Edit this tab's name to *Age Info* and press **Enter**. You will notice that the previously created vertical tabs disappear.
6. Proceed to add the forms *Names and Ages*, and *Ages* as the current vertical tabs.
7. Save your form, which should be similar to that shown in Figure 86.

Activity 42

Creating a table report

Steps:

1. Select a table for which you want to print a report. In Figure 88, *Table3* was chosen.
2. Open the table in the **Datasheet View**.
3. At the **Home** tab, click **Create** then **Report**.
4. The report will open in the **Report View** which is similar to the **Print View** in Figure 88.
5. Change the view to the **Design View** and attempt to adjust the widths of the columns in the report table for a more pleasant-looking report. The **Design View** in the example of Figure 88 is shown as the insert in the red box. You can also adjust the column widths in the **Layout View** shown in the insert in the blue box in Figure 88.
6. Once you are satisfied with how the table looks you can click on the **Print View** and save your report.

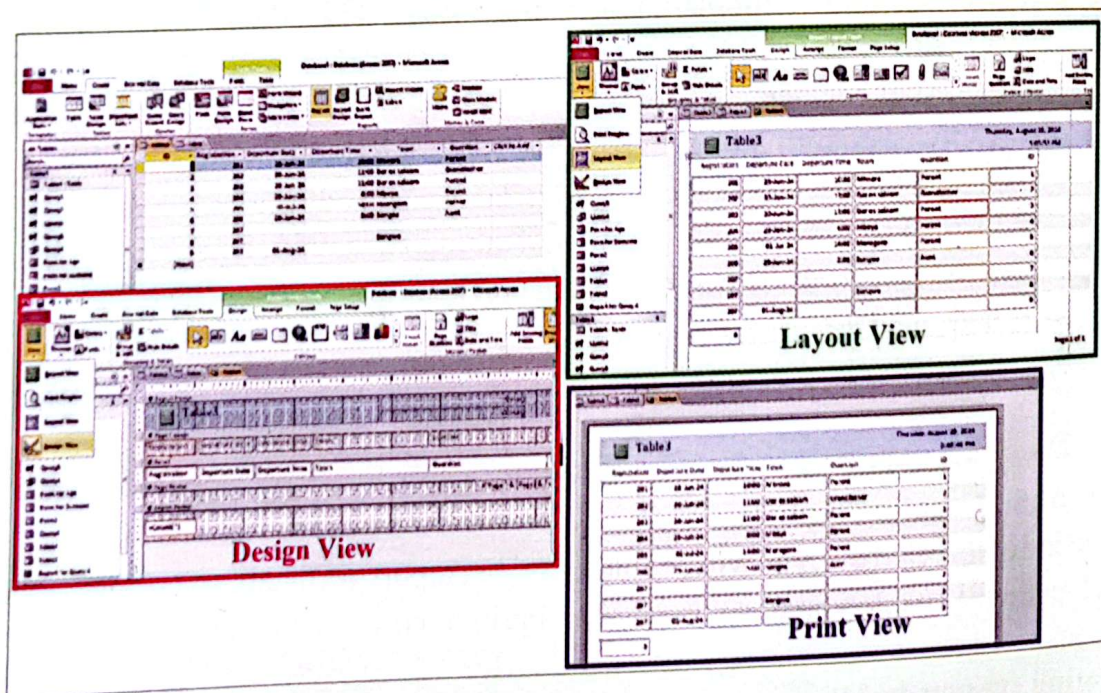


Figure 88: Multiple views after creating a Report

Exercise 12

1. You are tasked to manage a *Students* database and you need to generate reports for the school administration. The administration requests a report showing student performance by course, including student name, course, GPA, and city. Additionally, they want the report to display the total number of students

in each course. The *Students* table contains the following fields: *StudentID* (**Primary Key**), *FirstName*, *LastName*, *Gender*, *Age*, *Course*, *City* and, *GPA*. Perform the following tasks:

- (a) Create a report based on the *Students* table that shows the following fields: *FirstName*, *LastName*, *Course*, *GPA*, and, *City*.
 - (b) Group the report by *Course* so all students in the same course are listed together.
2. Search through the internet to learn about other types of database reports.

Unit 3 : Presentation applications

This unit consists of six elements, namely, opening and closing a presentation application, navigating the presentation application window, creating slides and adding content directly or from external files; designing and formatting slides, working with transitions, animations, slide shows, and saving and printing slides. Competencies developed in this unit will enable you to create a presentation, apply a design theme, and animate, and print presentations using MS PowerPoint.

Element 1: Opening and closing a presentation application

By the end of this element, you will be able to open and close an MS PowerPoint application. You will also be able to describe presentations and distinguish between different presentation applications. The competencies developed in this element will enable you to launch as well as exit from presentation applications.

Introduction to presentations

Presentation entails the act of showing your work, idea, or product that you have crafted or designed to others. Before the introduction of computers, people used to show and share their ideas and works through speech, writing, drawings on pieces of paper or sculpture carving.

The invention of the computer came with a huge revolution as it enabled ideas, and work to be presented through computer software. There are many presentation software packages in the market. Some are commercial, whereas others are open source and can be freely downloaded from the Internet. Some of the common presentation applications in the market include Microsoft PowerPoint, LibreOffice Impress, SoftMaker Presentations, Adobe Acrobat and Google Slides.

In this unit, you will be using Microsoft PowerPoint. MS PowerPoint is a presentation software that allows the user to create presentations containing different types of content. Each slide can be edited and formatted separately or cohesively as a group. This presentation application is used to create attractive visual aids that complement oral presentations.

Element 2: Navigating a presentation application

By the end of this element, you will be able to identify different features of MS PowerPoint and locate the commands to use. The competencies developed will enable you to navigate a window of any presentation application and use its different features to perform desired tasks.

Familiarizing with the MS PowerPoint window

In Element 1, you learned about presentation applications and learned how to open MS PowerPoint. In this element, you will learn more about the MS PowerPoint window. In MS PowerPoint, like in the other office applications, the commands are organized and placed in the ribbon which contains tabs, groups, and commands as shown in Figure 93.

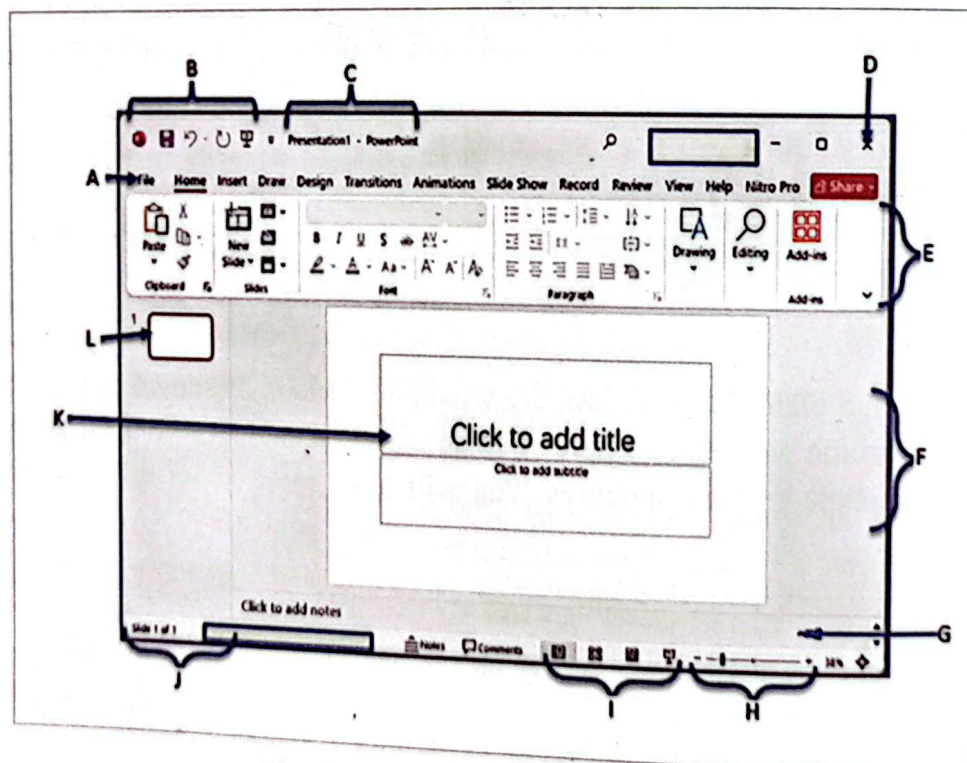


Figure 93: Parts of the MS PowerPoint window

File menu (A): Contains commands for basic operation commands such as **File**, **Home**, **Insert**, **Draw**, **Design**, **Animations**, **Slide show**, **Record**, **Review**, **View**, and **Help**.

Quick access toolbar (B): Contains frequently used commands such as **Save** and **Undo**. You can add more commands as well by customizing the quick access toolbar.

Title bar (C): Displays the name of the presentation you are working on and the name of the application, **PowerPoint** in this case.

Close button (D): Used for closing the current presentation and exiting MS PowerPoint.

Ribbon (E): The ribbon is the large section that appears near the top of the MS PowerPoint window. It contains commands to perform different tasks when preparing a presentation.

Slide pane (F): Displays the slide you are currently working on.

Notes pane (G): Used for typing any notes you want to use during a presentation.

Zoom slider (H): Used for zooming the slides in or out within the window.

View buttons (I): Used to quickly switch between **Normal**, **Slide Sorter**, **Reading**, and **Slide Show** views.

Status bar (J): Displays messages and feedback on the current state of MS PowerPoint.

Slide area (K): This is the current slide.

Outline tab (L): Focuses on the content of your presentation rather than its appearance. Use the **Outline** tab when you want to add large amounts of text to a presentation.

Navigating the MS PowerPoint window

Now that you have the basic knowledge of the MS PowerPoint window and the function of some of the tabs and commands, the next step is for you to familiarize yourself with the commands that you will use to create your presentations. Before you start creating presentations, you need to learn how to move around in MS PowerPoint. This section shows you several ways to navigate through your presentations.

Scroll bars: These are the most basic ways to navigate in MS PowerPoint. The vertical scroll bar is located on the right side of the window and is used to move up and down in the presentation window. The horizontal scroll bar is located at the bottom of the slide pane and is used to move left and right when a slide doesn't fit entirely in the window. Figure 94 shows how to navigate the presentation using scroll bars and the slide tab.

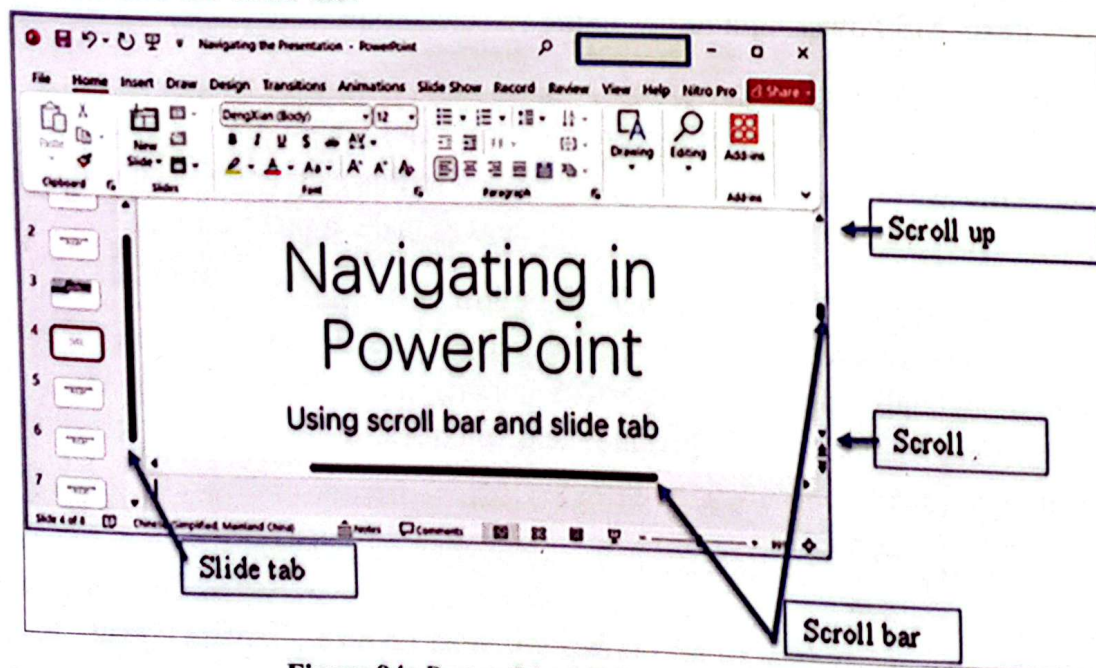


Figure 94: Parts of the MS PowerPoint window

Click and drag a scroll bar to move quickly around a presentation or click on the small arrows at the top/bottom of the vertical scroll bar and the left/right of the horizontal scroll bar to move up or down one slide at a time; provided that the current slide fits entirely in the slide pane.

Navigation keystrokes: You can also use keyboard shortcuts, or navigation keystrokes, to move around in a presentation. Table 5 shows how to navigate MS PowerPoint using keyboard shortcuts.

Table 5: Keyboard shortcuts

Keyboard shortcut	Action to presentation
Home	Move to the beginning of a line
End	Move to the end of the line
Page Up	Move to the previous slide
Page Down	Move to the next slide
Ctrl + Home	Move to the beginning of the
Ctrl+ End	Move to the end of a presentation

Slides tab: You can use the **Slides** tab in the outline pane to quickly jump to a specific slide in a presentation. On the **Slides** tab in the outline pane, click the slide you want to navigate to. MS PowerPoint jumps to the selected slide.

Element 3: Creating a presentation

By the end of this element, you will be able to create a new presentation and add content to the slides. The competencies developed in this element will enable you to create slides and add appropriate content to them to make a presentation.

Creating a new presentation in MS PowerPoint

After you have prepared your content and opened MS PowerPoint, you can start creating slides and adding content. Slides contain the information you intend to present to your audience. This includes text, pictures, tables, videos, and charts. Information is usually presented in different slide layouts.

Creating a new slide: There are several slide layouts, as shown in Figure 95. You can create a new presentation, such as the one that appears when you open MS PowerPoint, or you can create a new presentation based on a template layout.

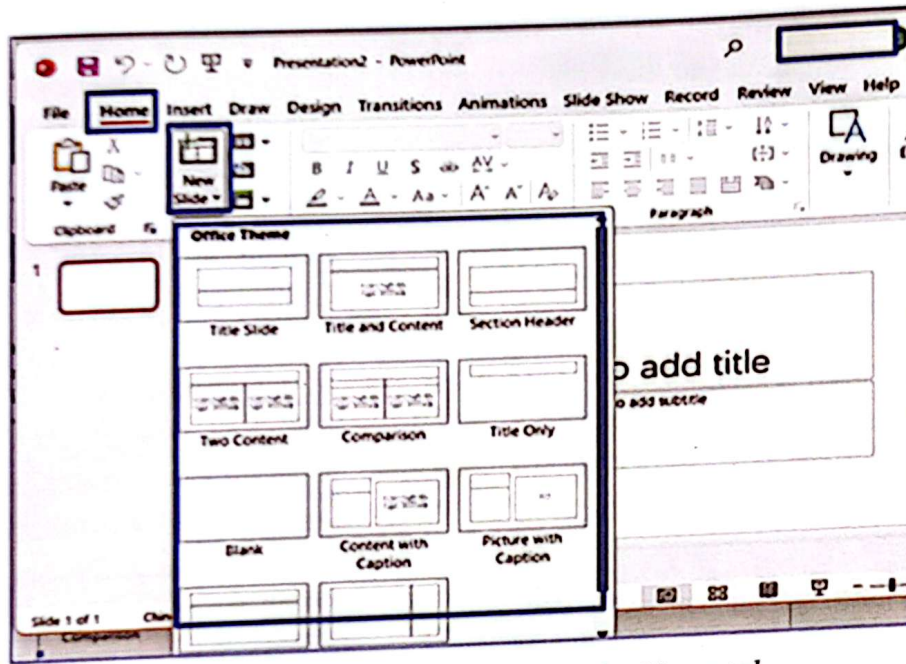


Figure 95: Creating slides from the Home tab

From the Home tab: To create new slides, click **Home** in the menu tab, select **New** in the ribbon, and then select the layout you want. To add more slides, double-click on the **New Slide** tab, and new slides will appear below existing slides.

Using keyboard shortcuts: Another way of creating slides is by using a keyboard short. Press **Ctrl + M** to add slides as shown in Figure 96. When preparing slides, you need to select the type of layout based on the nature of the contents you want to put on a slide. For example, if your content is a two-column text, you may prefer a **Two Content** layout, instead of a **Title and Content** layout.

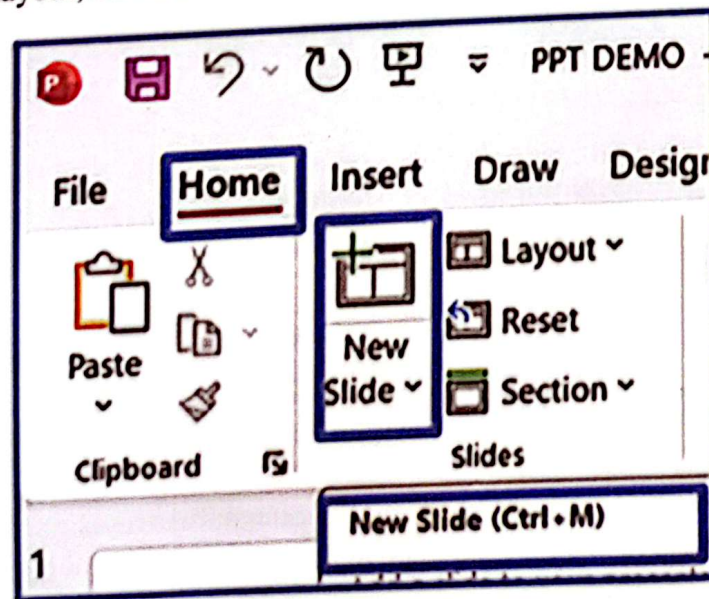


Figure 96: Creating slides using the control key

Deleting a slide: If you have created a slide and realize that you don't want it anymore, you can delete the slide by right-clicking on it and selecting **Delete** as shown in Figure 97.

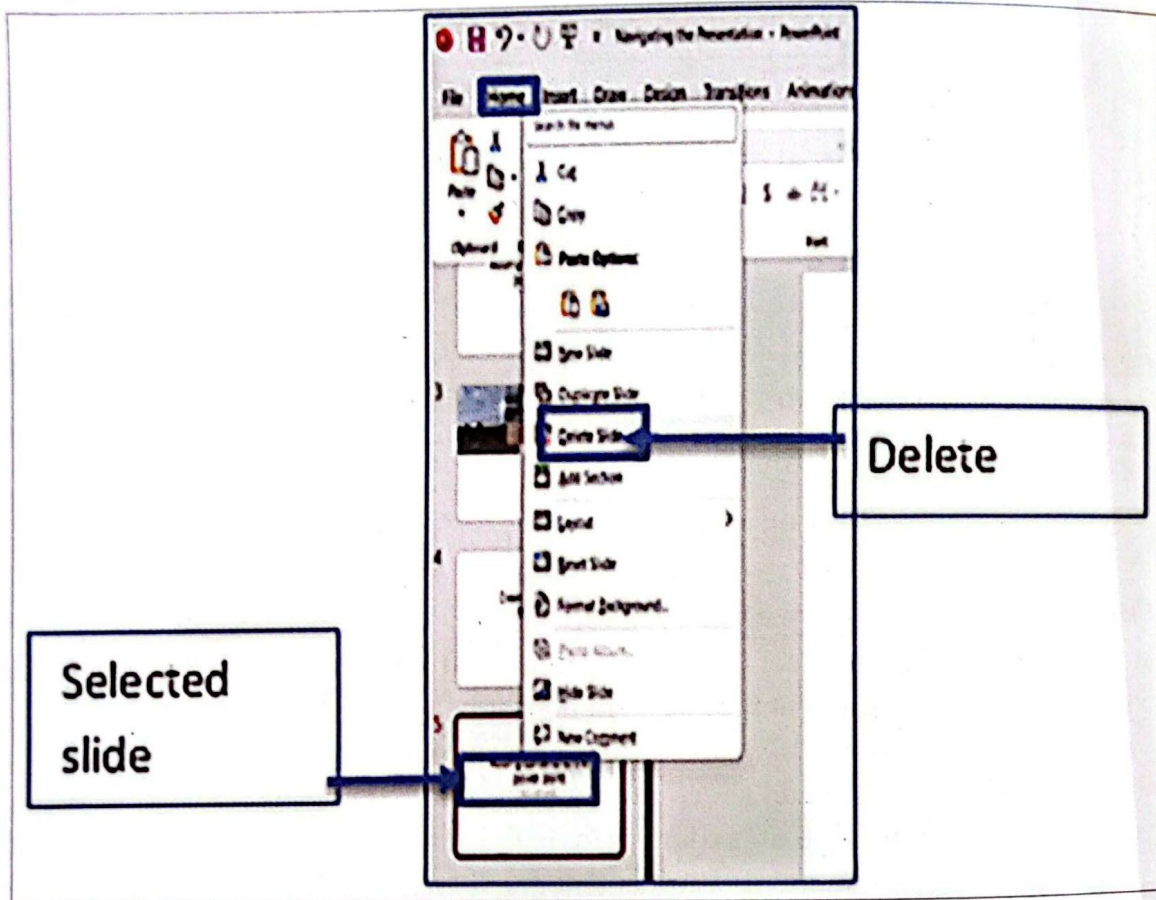


Figure 97: Deleting an unwanted slide

Activity 43 guides you to create a new presentation in MS PowerPoint.

Activity 43

Creating a new presentation in MS PowerPoint

Steps

1. Click **New Slide** on the **Home** tab.
2. Select the **Title Slide** layout; the slide view will be opened as shown in Figure 98.
3. Type the title and subtitle of your presentation.

By default, when you start a new presentation, the **Title Slide** layout is displayed first, prompting you to click to add a title and a subtitle, as shown in Figure 98. The **Title Slide** layout allows you to type a title and a subtitle only. You can add more slides as you wish, depending on the length and type of content in your presentation.



Figure 98: Creating title and subtitle of a presentation

Inserting a new slide and adding contents

Whenever you start a new presentation, it will contain one slide with the **Title Slide** layout. You can insert as many slides as you need with a variety of layouts. Follow the steps in Activity 44 to insert a new slide.

Activity 44

Inserting a new slide

Steps

1. Click on the **Home** tab.
2. On the **Slides** group, click on **New Slide**; the office theme layout will appear.
3. Choose the desired layout; in this case, click on the **Two Content** layout.
The window will look similar to the one in Figure 99.
4. Type the title of your slide.
5. Add content to your slide, (click on the words "Click to add text" and start typing)
6. To add a slide of a different layout, click on **New Slide**.
7. Click on the layout you want to use for the new slide.

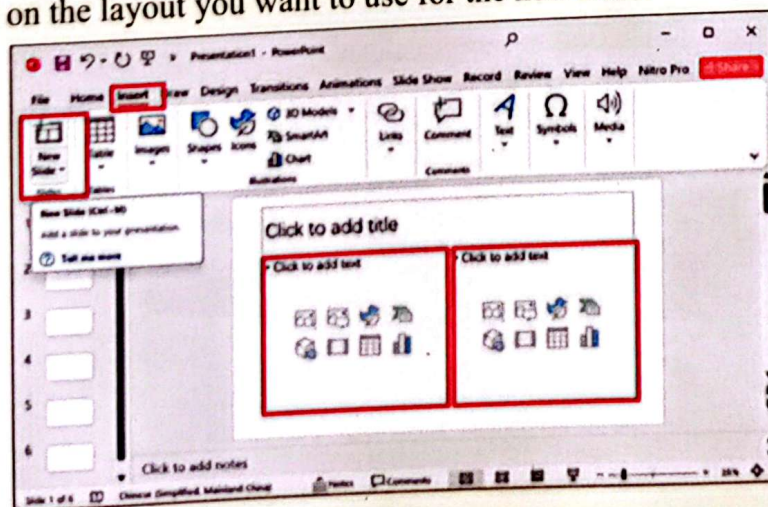


Figure 99: Two Content layout

Adding tables and charts to a presentation

Adding a table: Tables are used to present data in rows and columns. Usually, columns and rows have labels or names that make it easier for the reader to refer to the data in each table cell. MS PowerPoint allows the use of tables to present your data. This can be done by selecting the **Table** icon in a slide pane and specifying the number of rows and columns, or using the **Insert Table** command to create a table. The steps in Activity 45 should guide you on how to add a table to your presentation.

Activity 45

Adding a table to a presentation

Steps:

From the Insert command in the ribbon

1. Click on the **Insert** tab.
2. On the **Insert** tab, click the arrow for table insertion.
3. Specify the number of rows and columns and a table will be inserted.
4. Click **OK**.

Within a newly created, empty slide

1. Insert a slide with the **Title and Content** layout.
2. On the slide, click the **Insert Table** icon. A dialog box will pop up.
3. On the **Insert Table** dialog box, specify the number of rows and columns (see Figure 100)
4. Click **OK**.

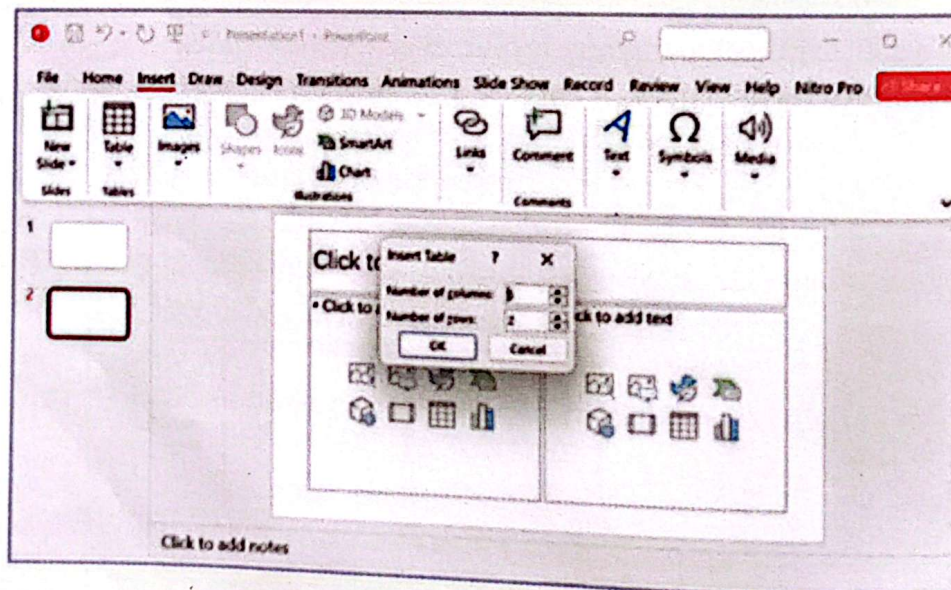


Figure 100: Adding a table to a presentation

Adding a chart: Charts are graphical representations of data. Charts include bars, lines, or columns that you can use to understand different trends or compare values. Charts created in MS PowerPoint can easily be modified to different forms. The procedure in Activity 46 will enable you to add a chart to your MS PowerPoint presentation.

Activity 46

Adding a chart to a presentation

Steps

1. Click on the **Insert** tab.
2. Click on the **Chart** icon. A dialog box will pop up.
3. On the **Chart** dialog box, choose the type of chart you want to insert.
4. Click **OK**.

Or

1. Insert a slide with the **Title and Content** layout.
2. On the slide, click on the **Insert Chart** icon. A dialog box will pop up.
3. Choose the type of chart you want to insert as shown in Figure 101.
4. Click **OK**.



Figure 101: Adding a chart to a presentation

Inserting images

MS PowerPoint comes with an option of inserting images which are in your computer or an external storage location. The steps in Activity 47 show you how to add an image to your MS PowerPoint presentation.

Activity 47

Inserting images

Steps

1. Click on the **Insert** tab.
2. On the **Insert** tab, click on the **Picture** icon.
3. On the **Insert Picture** dialog box, choose **This Device**. MS PowerPoint asks you whether to "Insert picture from your computer" or "From other computers you are connected to". (See Figure 102). Click on **This Device**.
4. Select the image you want to insert from your device as shown in Figure 103(a).
5. Click **Insert**, and the image will appear as shown in Figure 103(b).

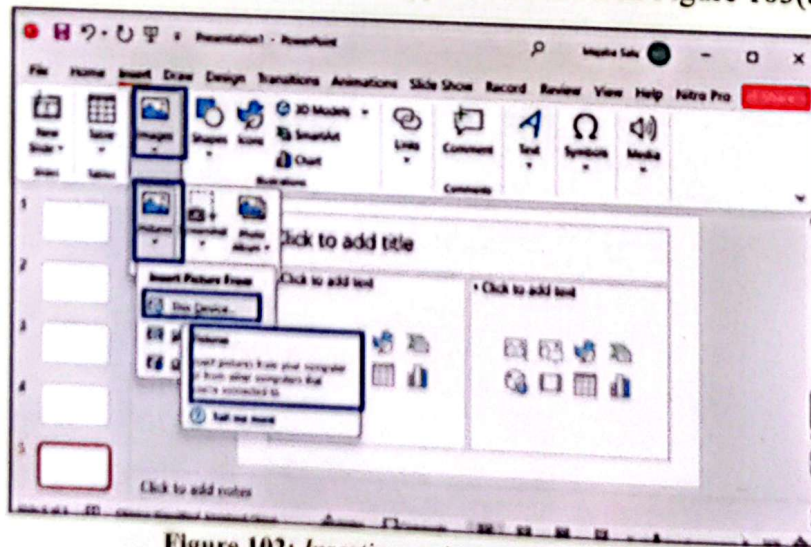


Figure 102: Inserting an image from a device

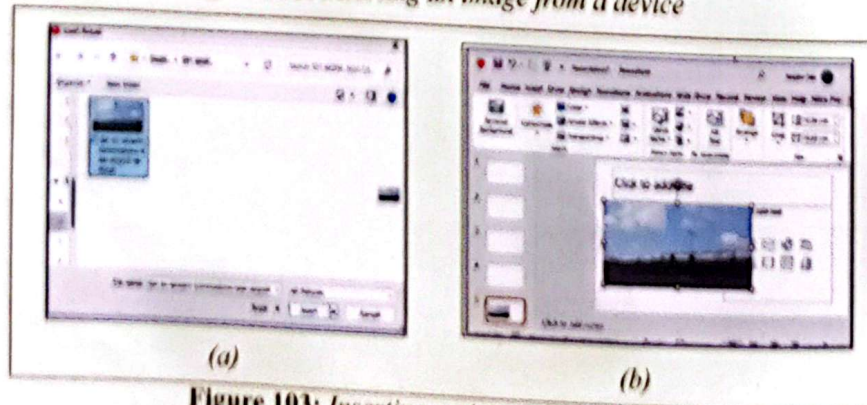


Figure 103: Inserting a picture from devices

Exercise 13

1. Create a presentation with 6 slides that you will use to introduce yourself as follows:
 - (a) The first slide should have the **Title and Subtitle** layout where the title is your full name and the subtitle is "Interesting Facts and Figures"
 - (b) The other 5 slides should look as depicted in Figure 104.

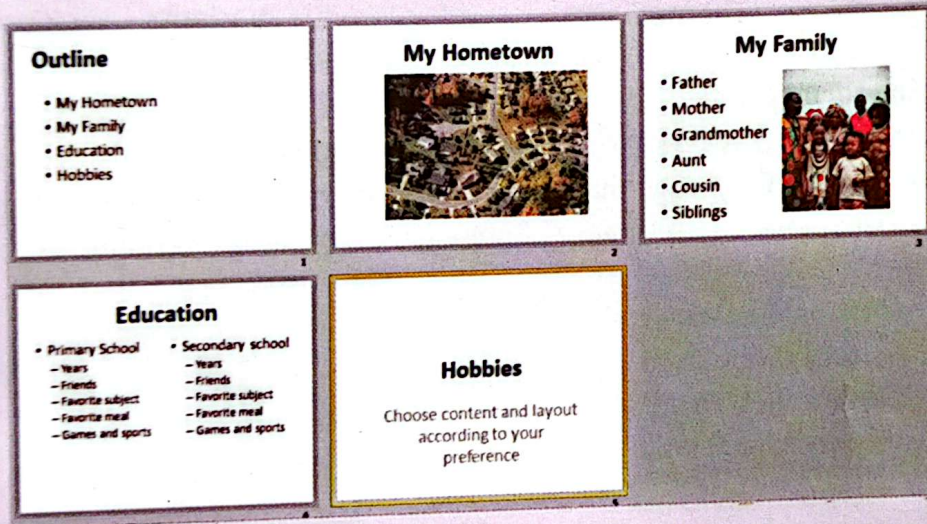


Figure 104: Presentation layouts

- (c) What layouts have you used?
2. Prepare another presentation describing your current school to guests.

Element 4: Customizing the appearance of slides in a presentation

By the end of this element, you will be able to choose and apply the setup of the slides, change the theme of a presentation and, change the slide background. The competencies you develop will enable you to change the slides to the style and color of your choice.

Designing slides

In MS PowerPoint, slides are designed through the **Design** tab. The **Design** tab has a ribbon that contains commands to allow you to customize various aspects of your presentation. These commands are categorized into three groups: **Themes**, **Variants** and **Customize**, as shown in Figure 105.

The **Themes** commands group enables you to change the look and feel (overall appearance) of your presentation.

Variants allow you to modify the font of the presentation or the effects applied to the presentation elements, as well as the presentation background.

The **Customize** group allows you to change the slide orientation from landscape to portrait and vice versa.

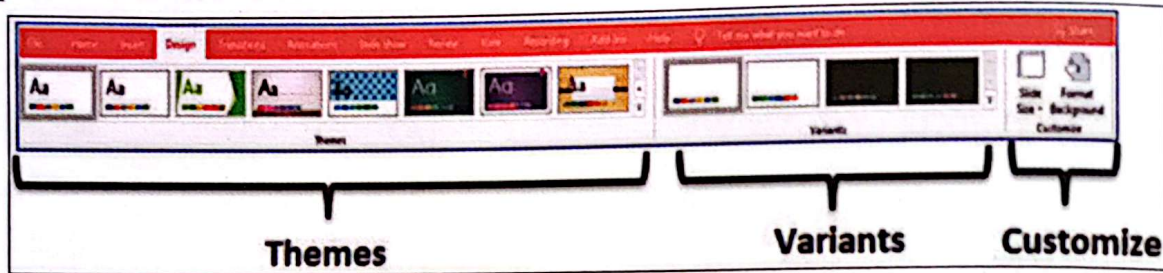


Figure 105: Design ribbon

Applying themes

Changing a theme: A theme is a predefined set of colors, fonts, and effects that may be used to instantly change the look and feel of your entire presentation. It is the overall visual look and scheme of a presentation in MS PowerPoint. Here are the steps to change the theme:

1. Click on the **Design** tab.
2. Select a theme from the available options.
3. Double-click on the selected theme

Follow the procedure in Activity 48 to change the theme of your slides.

Activity 48

Changing the presentation theme

Steps:

1. On the **Design** ribbon, click the **More** dropdown arrow: a window with all the available themes will appear (see Figure 106).
2. Select the desired theme and it will be applied to your slides.

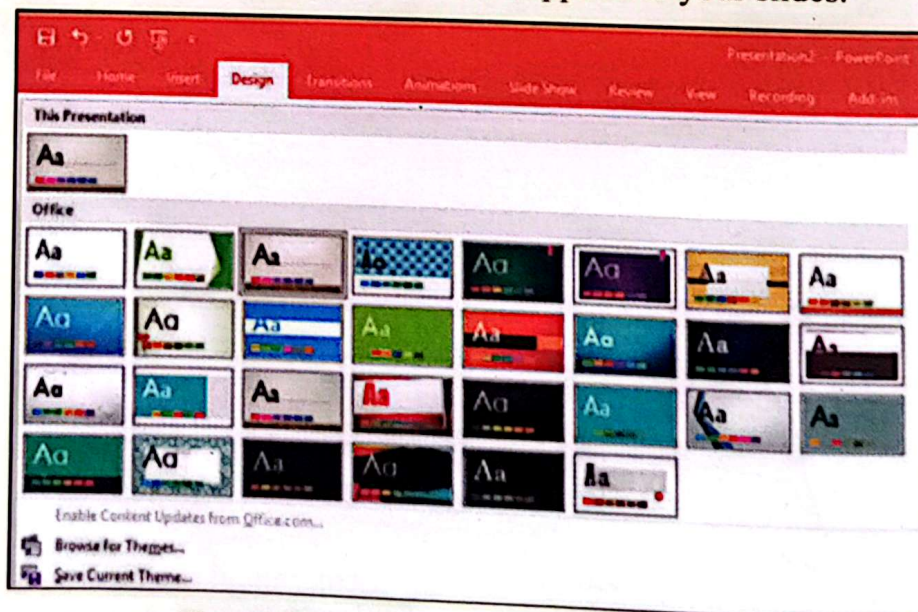


Figure 106: Applying a theme to a presentation

Changing the background of a slide: Choosing an appropriate background for a presentation is very important, it is the first thing your audience is going to notice. This section will show you how to apply a background to a presentation.

Applying a preset background: The easiest way to apply a background to a presentation is to use one of MS PowerPoint's preset backgrounds. To do this, follow these steps:

1. Click the **Design** tab on the ribbon and click **Background Styles** in the **Background** group. The **Background Styles** gallery will appear.
2. Click the background you want to apply. The selected background will be applied to the presentation as shown in Figure 107.

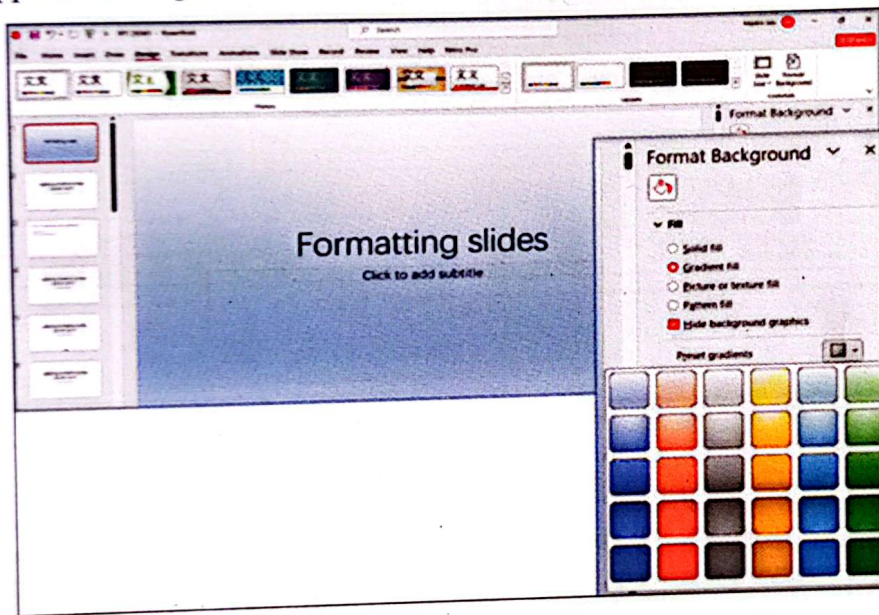


Figure 107: Background formatting

Formatting slide background: By default, all slides in your presentation use a white background. It is easy to change the background style for some or all of your slides. Examples of backgrounds you can use are **Solid Fill**, **Gradient Fill**, **Pattern Fill**, and **Picture Fill**. Follow the steps in Activity 49 to practice how to change the slide background.

Activity 49

Changing the slide background

Steps

1. On the **Design** ribbon, click the **Format Background** command. The **Format Background** pane will appear on the right (see Figure 108).
2. Select the desired fill option.
3. Click **Apply to All** to apply the selected background style to all slides in your presentation.

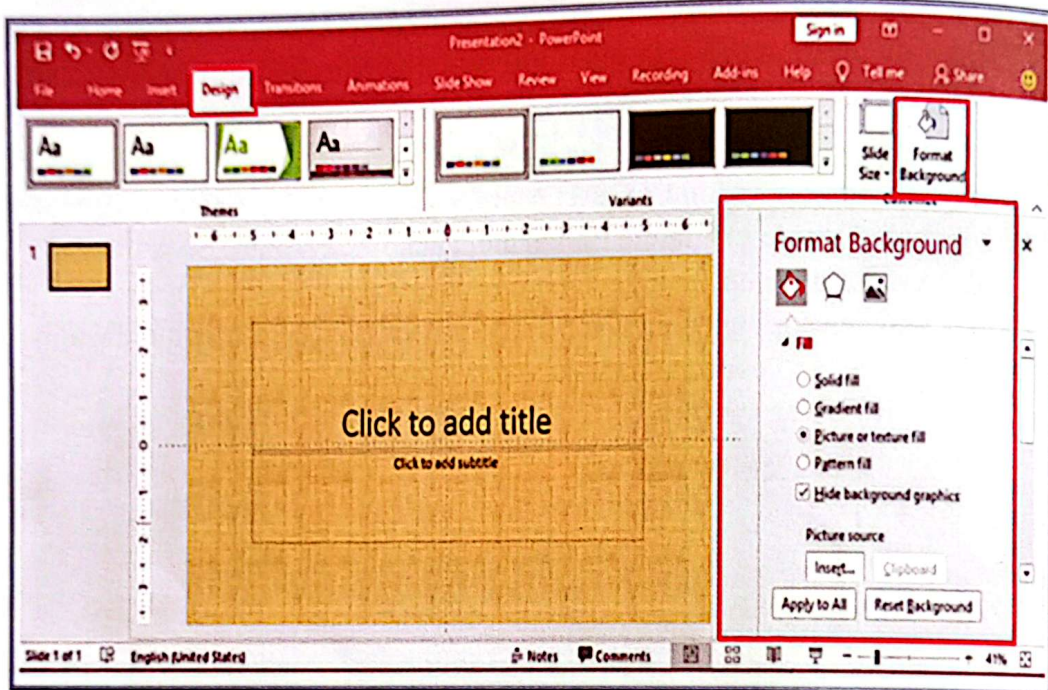


Figure 108: Formatting slide background

Exercise 14

1. Create a poster like the one shown in Figure 109 starting from a blank slide.

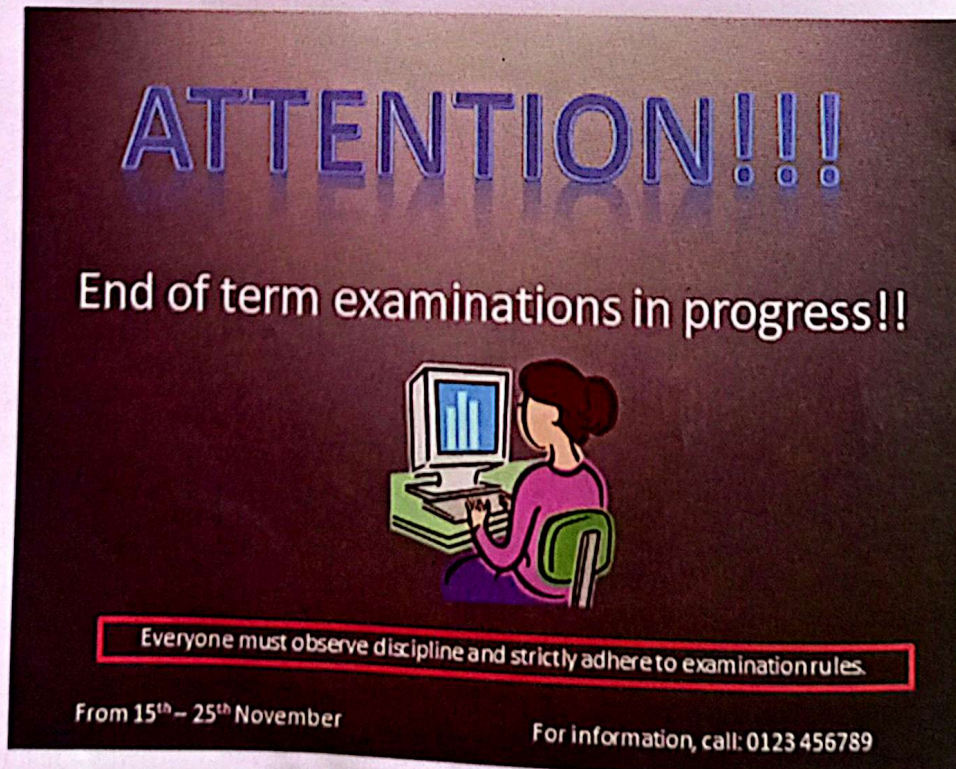


Figure 109: A poster slide

Element 5: Working with transitions, animations, and slide shows

By the end of this element, you will be able to apply transitions and animations to your presentations. The competencies developed will enable you to apply transitions, and animations, and run a slide show of your presentation.

Applying transitions

Transitions refer to effects applied when moving from one slide to another while presenting. There are many transition options available in the **Transitions** tab of MS PowerPoint. These transitions are divided into three categories, namely, **Subtle**, **Exciting**, and **Dynamic Content**, as shown in Figure 110.

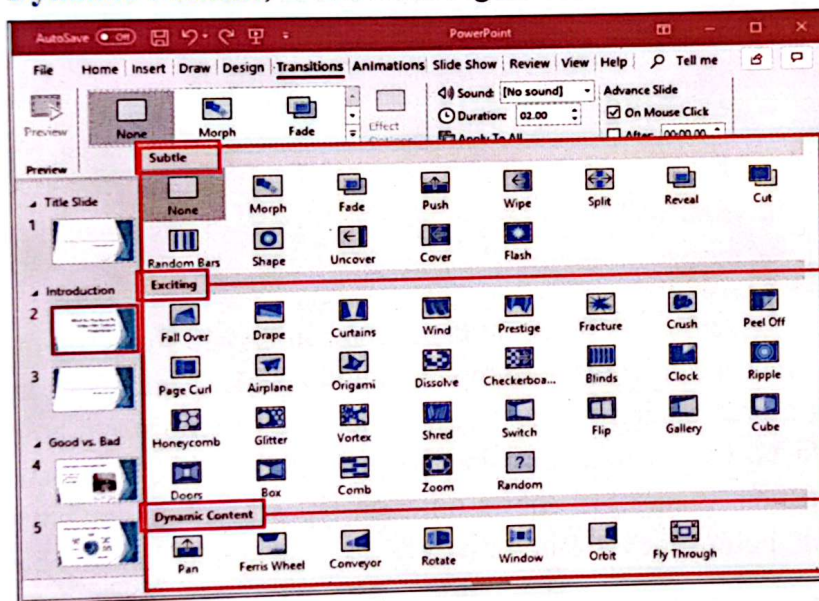


Figure 110: Categories of transitions in presentations

Note: Transitions can help you to automatically move from one slide to the next, without clicking anywhere. The steps in Activity 50 will guide you on how to apply transitions in your presentation.

Activity 50

Applying transitions

Steps

1. Select the slide to which you want to apply a transition.
2. Click on the **Transitions** tab.
3. On the **Transitions** tab, choose the required transition (see an example in Figure 111).
4. Click on the selected transition to apply the effect.
5. Click on **More** to explore more types of transitions.
6. Click the **Apply to All** button to apply the transition to all slides.

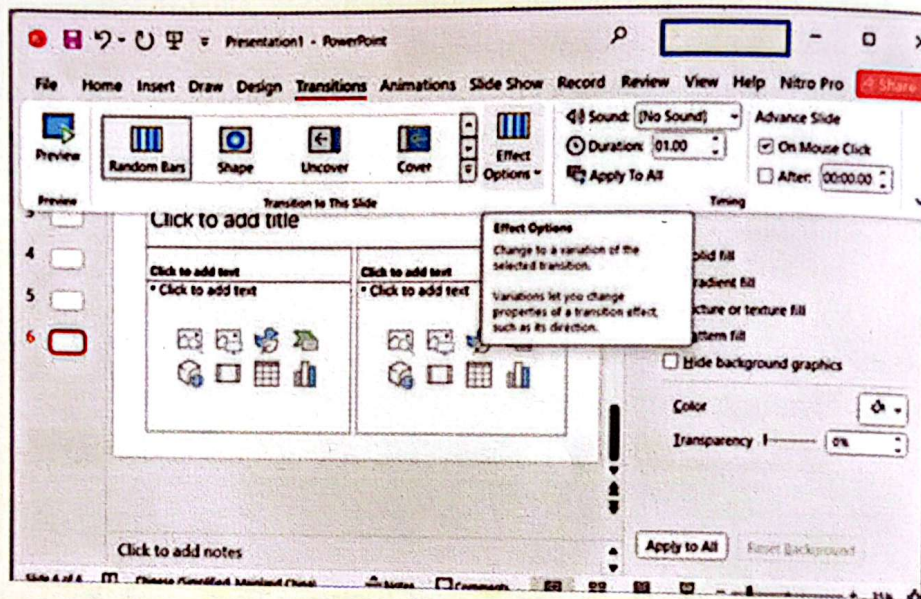


Figure 111: Available categories of transitions

Applying animations

Animations make objects move on the screen. In an MS PowerPoint presentation, text and graphics can be made to move around a slide. Animations are very useful in making a presentation more dynamic and help to emphasize points. However, you should be very careful in using animations because too much of them can be a distraction. Figure 112 shows different types of animations available in MS PowerPoint. Follow the steps in Activity 51 to apply animations to objects in a slide.

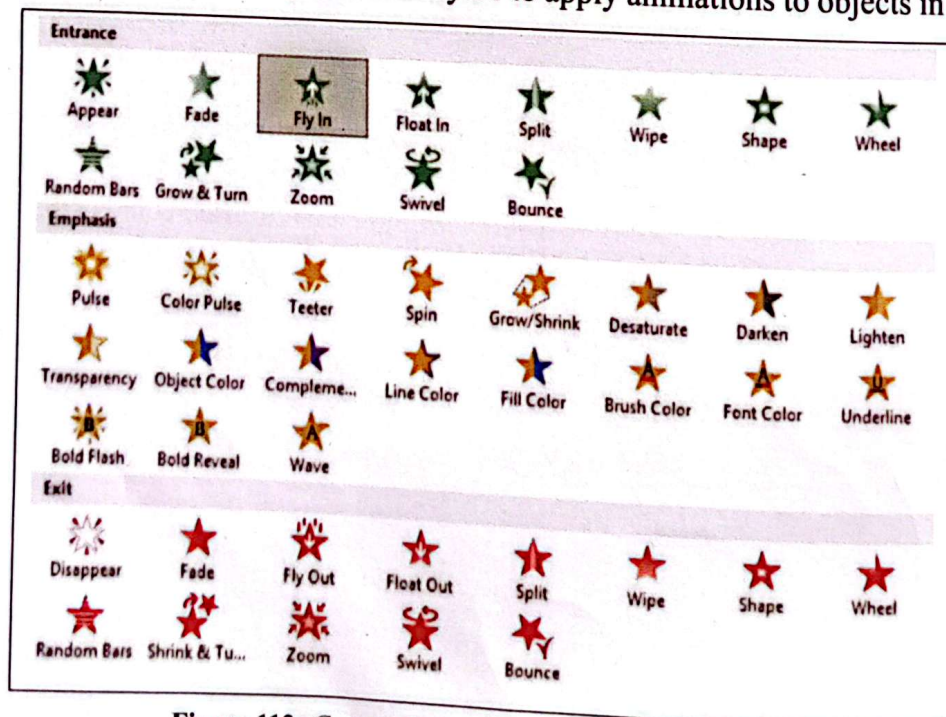


Figure 112: Categories of animation in MS PowerPoint

Activity 51

Using animations in a presentation

Steps

1. Select an object you want to animate.
2. Click on the **Animations** tab.
3. On the **Animations** ribbon, choose the animation style you want to use as shown in Figure 113.
4. In the **Timing** group, use the **Start**, **Duration** and **Delay** options to set up when, how and for how long, the animation will play.
5. You can apply more than one animation on a single object by using the **Add Animation** command in the **Advanced Animation** group.
6. Click on **Preview** in the **Preview** group to see how the animation will play during the presentation.

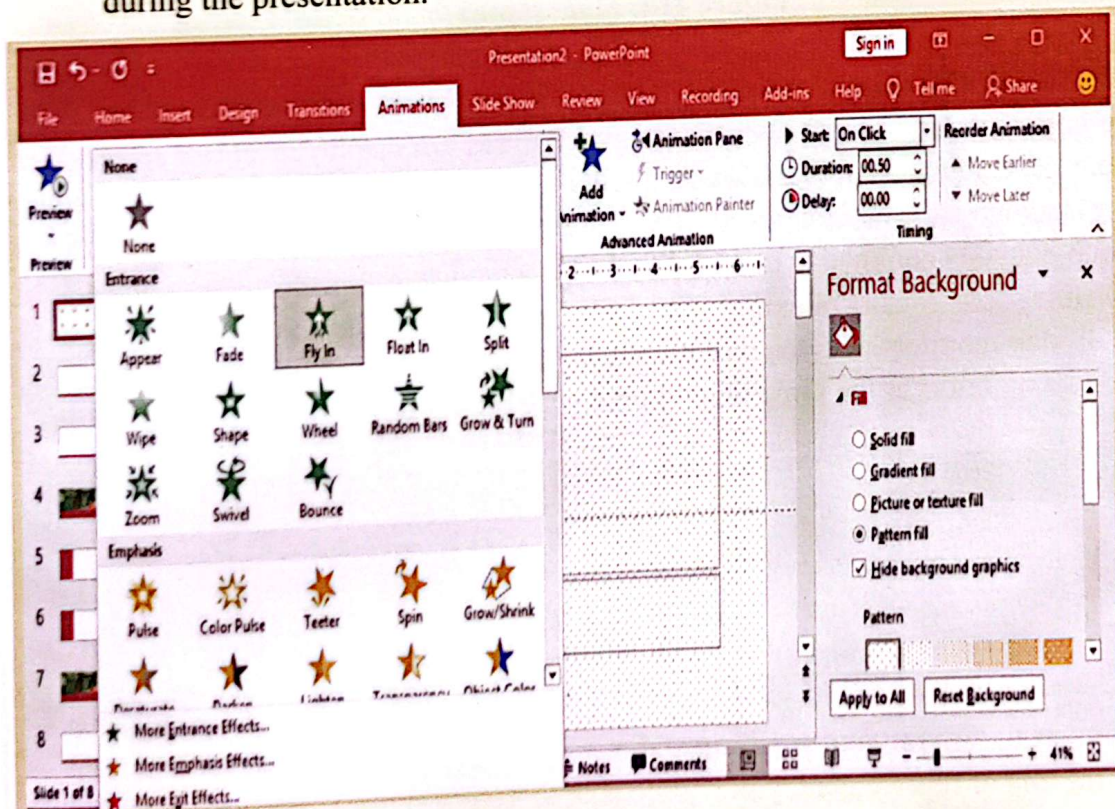


Figure 113: Animation style options

Creating slide shows

A slide show is a display of slides, in sequence, in such a way that they occupy the entire computer screen during a presentation. The **Slide Show** tab comes with different commands in three groups, which are **Start Slide Show**, **Set Up**, and **Monitors**, as shown in Figure 114.

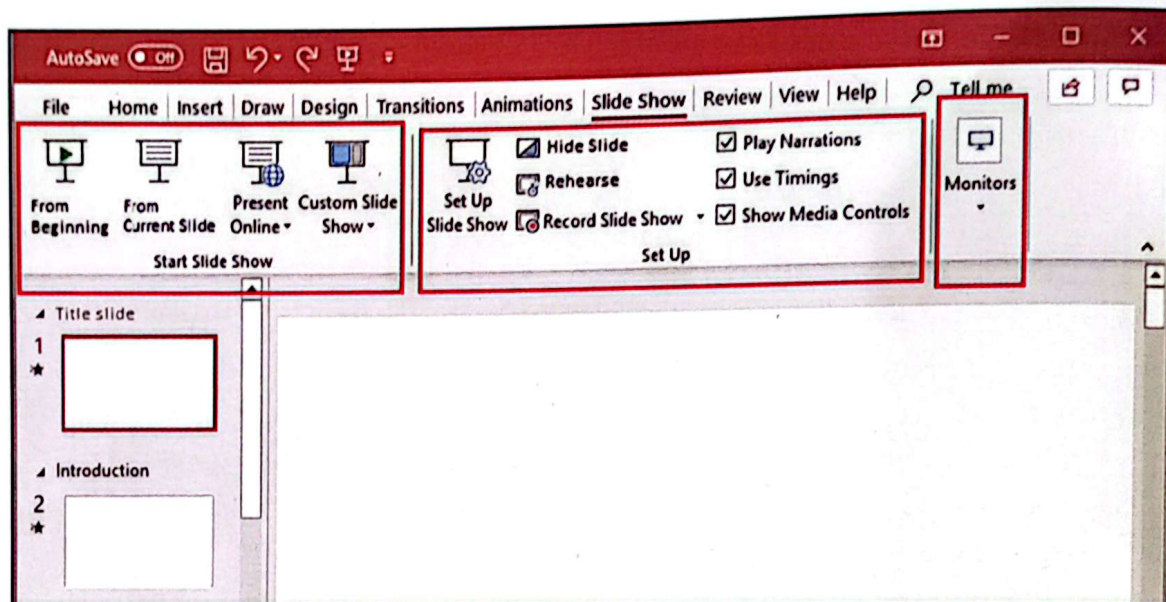


Figure 114: Slide show ribbon

The **Start Slide Show** tab contains commands for displaying your slides in a presentation mode. In the slide show mode, slides are displayed in full screen. For example, commands in the **Start Slide Show** group enable you to start a slide show from the first slide or from the slide you are currently working on. Next, the **Set-Up** group contains commands that enable you to practice your presentation and set up the slide show. Meanwhile, the commands from the **Monitors** group are used to set up display monitors that you will use during the presentation. For example, you can use two monitors at the same time to give your presentation.

Exercise 15

Using the presentation you prepared in Question 1 of Exercise 14.

1. Apply a transition of your choice to all the slides.
2. Apply animations to all the photos in your presentation.

Element 6: Saving and printing slides

By the end of this element, you will be able to save and print presentations as slides or handouts. The competencies developed will enable you to share your presentations in hard copy.

Saving a presentation

Once you have created and designed a presentation or made changes to it, you need to save it as you may want to use it in the future. To save a newly created presentation, follow the steps outlined in Activity 52.

Activity 52

Saving a presentation

Steps

1. Click the **Save** button on the quick access toolbar. The **Save As** dialog box will appear.
2. Alternatively, press **Ctrl + S**; or you can also click the **File** tab and select **Save**. (See Figure 115)
3. You can also specify the drive and/or folder where you want to save your presentation in the **Save As** dialog box where you can choose different locations in your computer.
4. You can also choose to save your presentation in a format different from the default **.pptx** in MS PowerPoint. For instance, you can select the portable document format (**.pdf**) as shown in Figure 116.

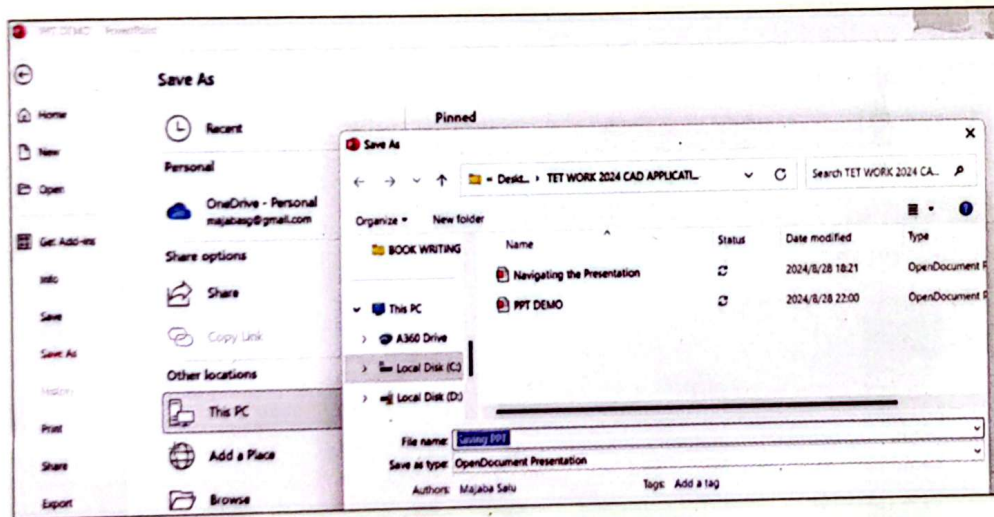


Figure 115: Saving a presentation

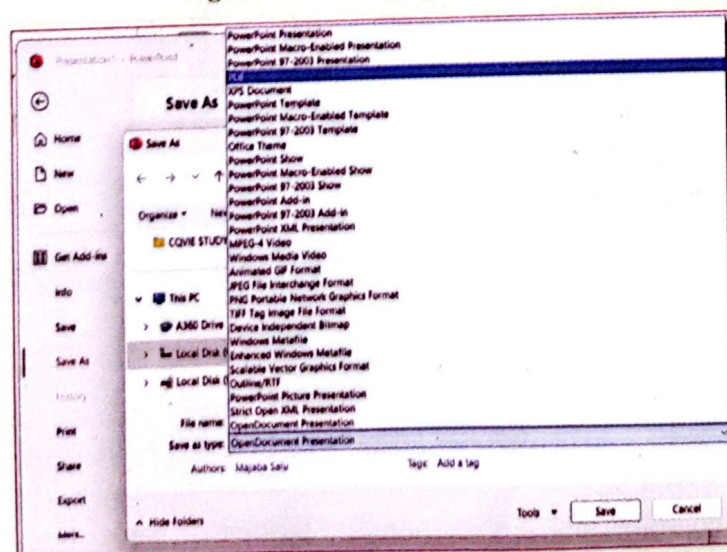


Figure 116: Saving a presentation

Printing a presentation

Several options are available for printing a presentation, depending on the purpose. For example, a custom version of a presentation can be printed to help the audience follow your presentation. Printed presentations can also serve as handouts, which the audience can also use for taking notes. Print settings are applied using the printing pane, by performing page setup to specify what you want to print from the slides. MS PowerPoint has four different print layouts, as described next.

Full-page layout: In this layout, slides are printed in full. It is a layout that would be most useful if you need to review or edit a printed copy of your presentation. The steps in Activity 53 guide you to set up full-page slide printing.

Activity 53

Full-page slide printing

Steps

1. Click on the **File** tab.
2. Click on the **Print** tab; the printing set-up window will appear as shown in Figure 117.
3. In the **Settings** options, select **Print All Slides**.
4. Select **Full Page Slides** in the **Slides** option.
5. Click on the **Print** button.

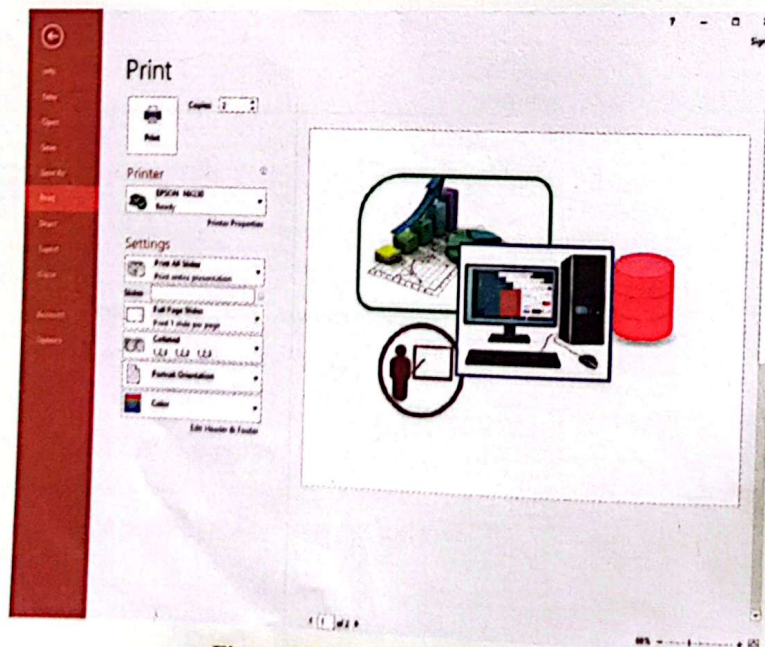


Figure 117: Printing full-page slides

Handouts: This layout prints the thumbnail versions of each slide, with optional spaces for notes. It is especially useful if you want to give your audience a physical

copy of the presentation at the time of presentation. The optional space allows the audience to write notes on each slide. Activity 54 guides you on how to print slides as handouts.

Activity 54

Printing slides as a handout

Steps:

1. Preview the presentation in the **Print** pane.
2. In the **Settings** options, select **Print a Handout**.
3. Print the handout version of the presentation, with three slides per page.

Figure 118 shows an example of a handout printout.

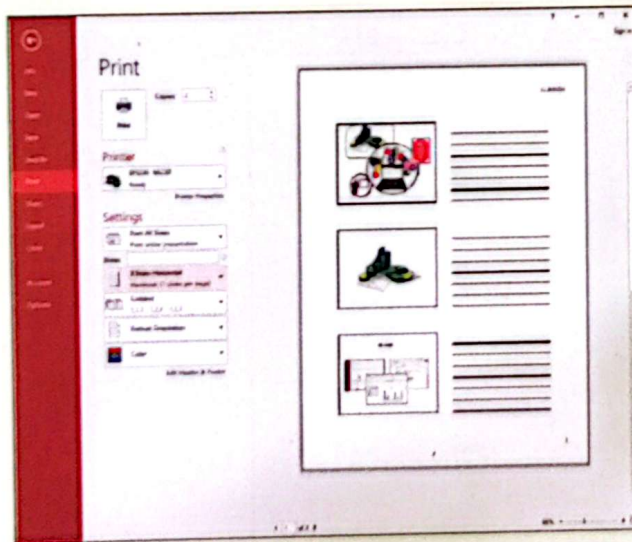


Figure 118: MS PowerPoint handout

Outline layout: This layout prints a text outline of a presentation. You could use this layout to review the organization of your presentation as you prepare to deliver your presentation. Activity 55 guides you on how to print an outline of your slides.

Activity 55

Printing an outline of a presentation

Steps:

1. Click on the **File** tab.
2. Click on **Print**.
3. In the setting and printing layout options, select **Print All Slides**.
4. Select **Outline** in **Slides** option; the printing set-up window will appear as shown in Figure 119.
5. Click **Print**.

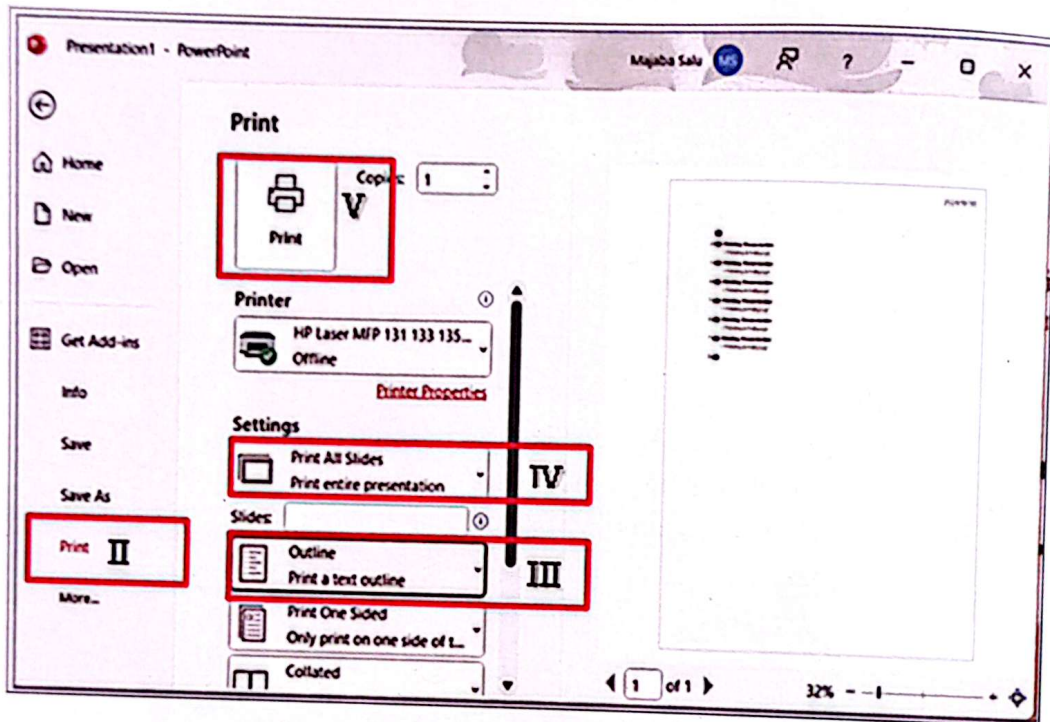


Figure 119: Printing a text outline

Exercise 16

1. Prepare an MS PowerPoint presentation with twenty-four slides and print all slides in handout format each with six slides, in total, you will print four pages only.
2. Select the first slide as the current page, Print it in layout mode- full-page.

Revision Exercises**Spreadsheet applications**

1. What is a spreadsheet?
2. What is a workbook?
3. Describe two methods that you can use to close an open workbook in MS Excel.
4. What are keyboard shortcuts? Give three examples of keyboard shortcuts that are used in MS Excel.
5. Describe at least five data types accepted in MS Excel.
6. What is "AutoFill" as it applies to MS Excel?
7. Tulia, a Form II student, attained the following scores in different subjects during the mid-term examinations: 94, 45, 67, 89, 82, 59, 58, 72, 51, and 90. Describe the different ways you can find her average score using MS Excel.
8. Assume that for the average score in Question 7, an average score of 50 and above would be considered a PASS, whereas one below 50 would be

considered a failure. Show a logical formula you would use to determine if Tulia passed or failed the mid-term exams.

9. Describe the different types of charts available for data visualization in MS Excel

Database applications

10. What is a database?
11. Mention 4 database objects. Briefly describe the 4 objects.
12. Define the following terms: a) Ribbon b) Navigation Pane.
13. What is a table in a database?
14. Describe the following items in a table: Field, Object, and Record.
15. Briefly describe the four main types of queries. Which, among the four, is described as the basic query?
16. What is the difference between the APPEND and the UPDATE queries?
17. Differentiate between a **Bound Form** and an **Unbound Form**.
18. Briefly describe the three types of bound forms.
19. What is a report in the context of databases?

Presentation applications

20. Mention different presentation applications that you know of.
21. How do you start MS PowerPoint?
22. Which tab can be used to change the background color of slides in a presentation?
23. Which function key on a keyboard is used to start a slide show view?
24. You have opened a saved MS PowerPoint presentation from your computer and made some changes. After the changes, you decide to close. What will happen to the presentation?
25. What is the keyboard shortcut for inserting a new slide?
26. What is the navigation keyboard for jumping to the end of a presentation?
27. You have created twenty slides and you discover that the tenth slide is wrong and you want to delete it. Which is the right way to delete that slide?
28. You have taken some photos of your classmates who were celebrating birthdays using your mobile phone. You want one photo to be inserted in the MS PowerPoint presentation. How would you insert the photo into the presentation?

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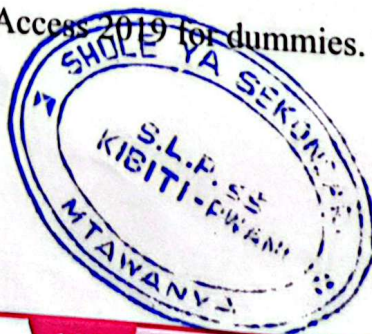
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