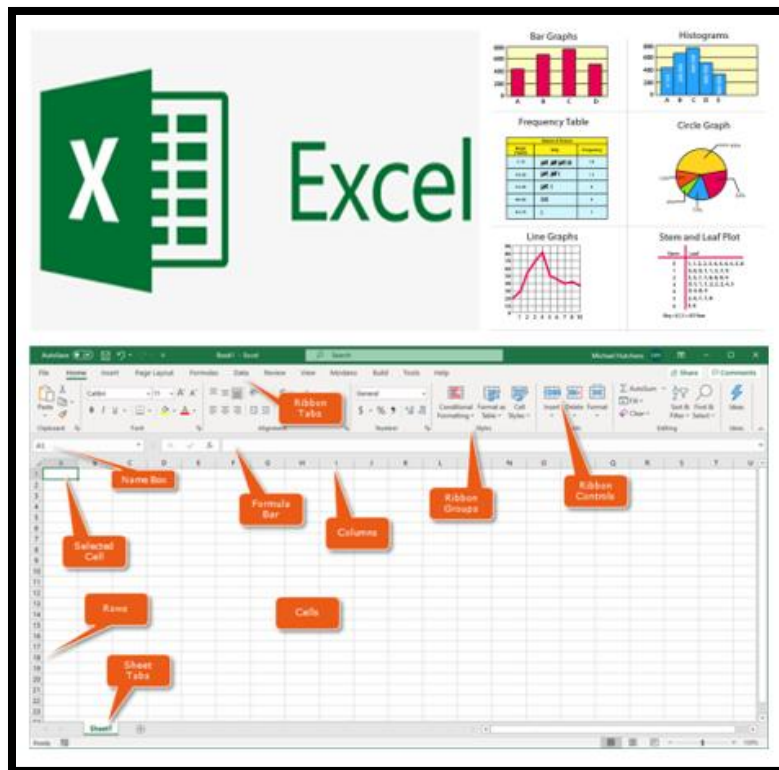


Rural Land Administration

Level - III

Based on March 2022, Version II Occupational
Standard



Module Title: - Advanced Spreadsheets Development

LG Code: AGR RLA3 M09 LO (1-6) LG (23-28)

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Table of Contents

Introduction to the Module	2
LO #1-Develop a linked spreadsheet solution	3
Instruction Sheet 1	3
Information Sheet 1	5
Operation Sheet -1	23
LAP TEST-1	25
LO #2-Automate and standardize spreadsheet operation	26
Instruction sheet 2	26
Information Sheet 2	27
Operation Sheet-2.....	33
LAP TEST-2	34
LO #3-Use Advanced spreadsheet.....	35
Instruction Sheet 3.....	35
Information Sheet 3	37
Operation Sheet -3.....	43
LAP TEST-3	47
Operation Sheet-3.....	48
LAP TEST-2	50
LO #4-Represent numerical data in graphic form	51
Instruction Sheet 4.....	51
Information Sheet 4	52
LO #5-Maintain Required Data	59
Instruction Sheet 5	59
Information Sheet 5	60
LO #6-Complete documentation.....	67
Instruction Sheet 6.....	67
Information Sheet 6	68
Reference Materials	72

Introduction to the Module

In the field of land administration, spreadsheet is a valuable tool because it allows land administrators to manage, analyze, and report on large amounts of data related to land ownership, transfers, transactions, and valuation. Taking this in to consideration, this module is designed to meet the industry requirement under the rural land administration occupational standard. It covers the knowledge, skills and attitudes required to correctly operate spreadsheet applications and perform basic operations.

LG #23

LO #1-Develop a linked spreadsheet solution

Instruction Sheet 1

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Introduction to the basic concepts of spreadsheets.
- Determining and analyzing task specification for spreadsheet.
- Utilizing software functions and formulas by spreadsheet design to meet identified requirements.
- Linking spreadsheets in accordance with software procedures.
- Formatting cells and assigning data attributes with relative and/or absolute cell references used in accordance with the task specifications.
- Testing formulae to confirm output meets task.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Determine and analyze task specification for spreadsheet
- Utilize software functions and formulas by spreadsheet design to meet identified requirements
- Link spreadsheets in accordance with software procedures.
- Format cells and assigning data attributes with relative and/or absolute cell references used in accordance with the task specifications.
- Test formulae to confirm output meets task

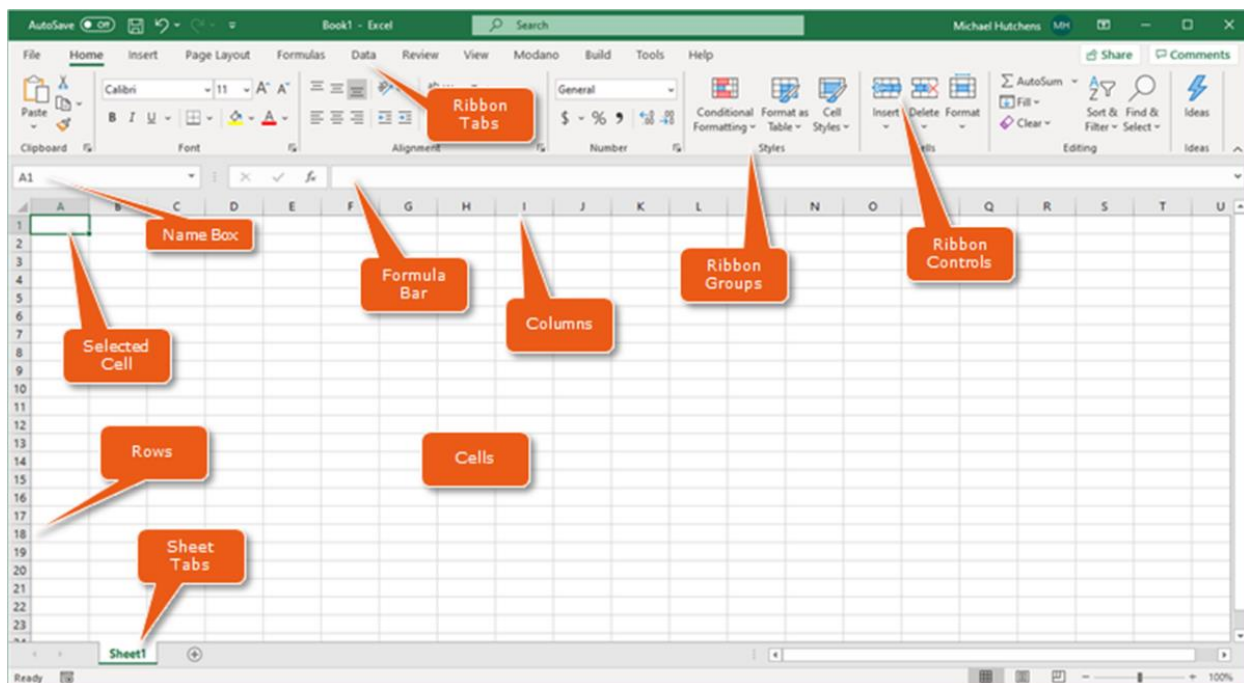
Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information sheets.
4. Accomplish the self-checks.
5. Perform operation sheets.
6. Do the “LAP test”.

Information Sheet 1

1.1. Basic concepts of spreadsheets

A spreadsheet is a computer program that can capture, display and manipulate data arranged in rows and columns. Spreadsheets are one of the most popular tools available with personal computers. A spreadsheet is generally designed to hold numerical data and short text strings. In a spreadsheet program, spaces that hold items of data are called spreadsheet cells. These can be renamed to better reflect the data they hold and can be cross-referenced through row numbers and column letters. A single spreadsheet can be used as a worksheet to compile data for a purpose, or multiple sheets can be combined to create an entire workbook. Each column or row cell references a value and is labeled according to its placement (for example: A1, A2, A3). Data can be exported as a CSV file and imported into other software or vice versa.



1.1.1. Common spreadsheet applications

Some commonly used spreadsheet software programs today:

- **Microsoft Excel** as part of the Microsoft Office suite and cloud-based subscription service Microsoft 365 (formally Office 365). It is available for Windows, macOS, Android and iOS.

- **Google Sheets:** Part of Google's web-based application suite, Google Workspace. Google Sheets is free and also available as a desktop application for Google Chrome OS and assorted mobile OSes, such as Android and iOS.
- **Apache Open Office Calc:** For Linux, macOS and Windows, ports of the free Apache Open Office are also available for other OSes. It was first released in 2012, but its roots go back to 2002.
- **LibreOffice Calc:** Full-featured spreadsheet app that is a part of the free LibreOffice suite. LibreOffice and Apache Open office trace their roots to the same codebase, hence the same name for their spreadsheet application.
- **Thinkfree Office:** A free full productivity suite with a spreadsheet specifically designed to provide a consistent experience across different devices. A version is available online with cloud storage.

1.1.2. Advanced spreadsheet

Advanced spreadsheet includes the ability to analyze and manipulate data, create complex formulas and functions, and use advanced features such as macros, pivot tables, and data validation. Here are some examples of advanced spreadsheet skills:

- **Data Analysis:** Advanced spreadsheet users can use functions such as VLOOKUP, HLOOKUP, and INDEX/MATCH to analyze and manipulate large datasets. They can also use tools such as filters, sorting, and conditional formatting to identify trends and patterns in the data.
- **Formulas and Functions:** Advanced users can create complex formulas and functions using logical operators, text functions, and date and time functions. They can also use array formulas to perform calculations on multiple cells at once.
- **Pivot Tables:** Pivot tables are a powerful tool for summarizing and analyzing large datasets. Advanced users can create pivot tables to quickly analyze data and create custom reports.
- **Macros:** Macros are a way to automate repetitive tasks in a spreadsheet. Advanced users can create, edit, and run macros using Visual Basic for Applications (VBA) code to automate complex processes.
- **Data Validation:** Data validation is a way to ensure that data entered into a spreadsheet is accurate and consistent. Advanced users can use data validation to create drop-down lists,

restrict data entry to certain formats, and create error messages to alert users of incorrect data.

- **Charts and Graphs:** Advanced users can create complex charts and graphs using features such as trendlines, data labels, and secondary axes. They can also create dynamic charts that update automatically as new data is added.
- **Collaborative Features:** Advanced users can use collaborative features such as sharing and co-authoring to work on spreadsheets with others in real-time. They can also use version control to track changes and revert to previous versions of a spreadsheet.
- **Customized Templates:** Advanced users can create customized templates that include pre-defined formulas, formatting, and charts. These templates can be used to speed up the process of creating new spreadsheets and ensure consistency across projects.
- **External Data Sources:** Advanced users can import data from external sources such as databases, websites, and other spreadsheets. They can also use web scraping tools to extract data from online sources.

By developing advanced spreadsheet skills, users can become more efficient and effective in their work, and can use spreadsheets to solve complex problems and make informed decisions. There are many online resources and tutorials available to help users improve their advanced spreadsheet skills, including advanced courses, user forums, and video tutorials.

1.2.Task specification for spreadsheet

In the context of spreadsheets, task specification might involve defining the specific calculations or analyses that need to be performed, identifying the data sources and formats, and specifying any constraints or limitations that need to be considered. It may also involve designing the layout or structure of the spreadsheet, specifying the formulas and calculations that need to be used, and identifying any automation or other functionality that needs to be implemented. Determining and analyzing task specifications for a spreadsheet involves understanding the specific task that needs to be performed and identifying the key requirements and constraints that must be considered. Here are some steps that can help with this process:

1. **Identify the purpose of the spreadsheet:** The first step is to determine the purpose of the spreadsheet and the task it is intended to perform. This might involve analyzing the input data, defining the desired output, and understanding the specific calculations or analyses that need to be performed.

2. Define the scope of the task: Once the purpose is clear, the next step is to define the scope of the task. This may involve specifying the range of data that needs to be analyzed, the specific calculations or formulas that need to be used, and any constraints or limitations that need to be considered.
3. Identify the data requirements: The next step is to identify the specific data requirements for the task. This might involve determining the type of data that needs to be analyzed, the format in which it is stored, and any data cleaning or preprocessing that needs to be performed.
4. Create a design: Once the data requirements are clear, the next step is to create a design for the spreadsheet. This might involve designing the layout of the spreadsheet, specifying the formulas and calculations that need to be used, and identifying any macros or other automation that needs to be implemented.
5. Test and validate the spreadsheet: Once the design is complete, the next step is to test and validate the spreadsheet. This may involve entering sample data and verifying that the calculations and analyses are accurate and produce the desired results. It may also involve identifying and resolving any errors or issues that arise during testing.
6. Refine and optimize the spreadsheet: After testing and validation, the final step is to refine and optimize the spreadsheet. This may involve improving the layout or design, optimizing the calculations or formulas, and adding any additional functionality or automation that may be required.

Overall, the process of determining and analyzing task specifications for a spreadsheet involves a careful consideration of the purpose, scope, data requirements, and design of the spreadsheet. By following these steps, it is possible to create a spreadsheet that is accurate, efficient, and effective in performing the desired task.

1.2.1. Data entry, storage, output, reporting and presentation requirements

To develop an effective spreadsheet solution, it is crucial to identify and understand the organizational and task requirements related to data entry, storage, output, reporting, and presentation. Let's explore each aspect in more detail:

1. Data Entry Requirements:
 - Identify the specific data that needs to be entered into the spreadsheet.

- Determine the format and structure of the data to ensure consistency and accuracy.

Example: In the case of a land administration program, data entry requirements may include property details such as address, owner information, land size, zoning restrictions, and transaction records.

2. Data Storage Requirements:

- Determine how and where the data should be stored for easy access and retrieval.
- Consider security measures and backup procedures to safeguard the data.

Example: The land administration program may require storing data in a centralized database or a cloud-based storage system. Regular backups should be implemented to prevent data loss.

3. Output Requirements:

- Identify the desired outputs or results that the spreadsheet should produce.
- Determine the format and layout of the outputs to meet the intended purpose.

Example: The land administration program may need to generate reports such as property ownership certificates, transaction histories, or statistical analyses based on specific criteria.

4. Reporting Requirements:

- Determine the reporting needs and specifications for the spreadsheet solution.
- Identify the data elements and formatting requirements for effective reporting.

Example: The land administration program may require generating summary reports that include property details, ownership information, and transaction records in a clear and concise format.

5. Presentation Requirements:

- Determine how the data and information should be presented to the end-users.
- Consider the visual design, formatting, and usability aspects for optimal user experience.

Example: The land administration program should present data in a user-friendly interface with clear headings, appropriate fonts, colors, and logical navigation to enhance readability and ease of use.

6. Compliance and Regulatory Requirements:

- Identify any specific compliance or regulatory requirements that need to be adhered to.

- b. Consider privacy laws, data protection regulations, and any industry-specific standards.

Example: The land administration program may need to comply with data privacy regulations, ensuring that sensitive information is securely stored and accessible only to authorized individuals.

1.3.Utilizing software functions and formulae by spreadsheet design

1.3.1. Spreadsheet design

Spreadsheet design is the process of creating a structured and organized spreadsheet that can effectively store, manage, and analyze data. Spreadsheet design involves a range of considerations, including the purpose of the spreadsheet, the type and format of the data that will be stored, the intended users of the spreadsheet, and the types of calculations or analysis that will be performed on the data. The design of a spreadsheet typically involves the following steps:

1. Defining the purpose: This might involve identifying the specific task or function that the spreadsheet will perform, such as budgeting, data analysis, or project management.
2. Identifying the data requirements: Identifying the types of data, such as numeric data, text data, or dates, and determining the format in which the data needs to be stored.
3. Organizing the data: Once the data requirements are clear, the next step is to organize the data in a logical and structured manner. This might involve creating tables, using headers and sub headers, and grouping data into categories or sections.
4. Applying formatting: This might involve applying different fonts, colors, and cell borders to make the data more visually appealing and easier to navigate.
5. Implementing functions and formulae: Functions and formulae are a powerful feature of spreadsheet software that allow users to perform complex calculations, automate repetitive tasks, and analyze large amounts of data in a more efficient manner.
6. Testing and refining: Once the spreadsheet is designed, it is important to test and refine the spreadsheet to ensure that it is functioning as intended and is meeting the specific needs of the user. This might involve running test scenarios, checking for errors, and making adjustments as needed.

1.3.2. Functions and formulae in spreadsheet

Functions in a spreadsheet are pre-built formulas or calculations that allow users to perform a variety of mathematical, logical, and statistical operations on data within a spreadsheet. Some common examples of functions in a spreadsheet include: SUM, AVERAGE, MAX, MIN, COUNT, IF, VLOOKUP, CONCATENATE, DATE and TIME. Formulae in a spreadsheet are user-defined calculations that allow users to perform customized operations on data within a spreadsheet. Formulae are created by using mathematical operators, such as +, -, /, *, and others, along with cell references and functions. Formulae are used to perform a wide range of calculations and operations in a spreadsheet, including basic arithmetic, statistical analysis, financial calculations, data manipulation, and more.

Therefore, utilizing software functions and formulae is a key aspect of spreadsheet design, as it allows users to perform complex calculations, automate repetitive tasks, and analyze large amounts of data in a more efficient and accurate manner. Here are some ways that software functions and formulae can be utilized in spreadsheet design:

- **Mathematical functions:** Spreadsheet software such as Microsoft Excel and Google Sheets offer a wide range of mathematical functions, such as SUM, AVERAGE, MAX, MIN, and COUNT. These functions can be used to perform basic arithmetic operations, calculate statistical measures, and aggregate data.
- **Lookup functions:** Lookup functions, such as VLOOKUP and HLOOKUP in Excel, allow users to search for specific data in a table and retrieve related information. These functions are useful for tasks such as data cleaning, data validation, and analyzing data across multiple tables.
- **Conditional functions:** Conditional functions, such as IF, SUMIF, and COUNTIF, allow users to apply specific calculations or operations to data that meets certain criteria. These functions are useful for tasks such as filtering data, calculating subtotals, and analyzing data based on specific conditions.
- **Date and time functions:** Spreadsheet software also offer a variety of date and time functions, such as TODAY, YEAR, MONTH, DAY, HOUR, and MINUTE. These functions can be used to perform calculations involving dates and times, such as calculating the age of a person or the time difference between two dates.

- **Array formulas:** Array formulas are advanced formulas that allow users to perform calculations on multiple cells or ranges of data at once. These formulas can be used to perform complex calculations, such as matrix multiplication and array sorting.
- **Macros:** Macros are a type of automation that allow users to automate repetitive tasks or perform complex operations with a single click. Macros can be created using visual basic for applications (VBA) programming language in Excel, or by using Google Apps Script in Google Sheets.

By utilizing these software functions and formulae in spreadsheet design, users can create more efficient, accurate, and effective spreadsheets that can perform complex calculations, automate repetitive tasks, and analyze large amounts of data in a more streamlined and organized manner.

1.3.3. Basic Excel Formulas

Since you're now able to insert your preferred formulas and function correctly, let's check some fundamental Excel functions to get you started.

1. **SUM:** The **SUM function** is the first must-know formula in Excel. It usually aggregates values from a selection of columns or rows from your selected range.

=SUM(*number1*, [number2], ...)

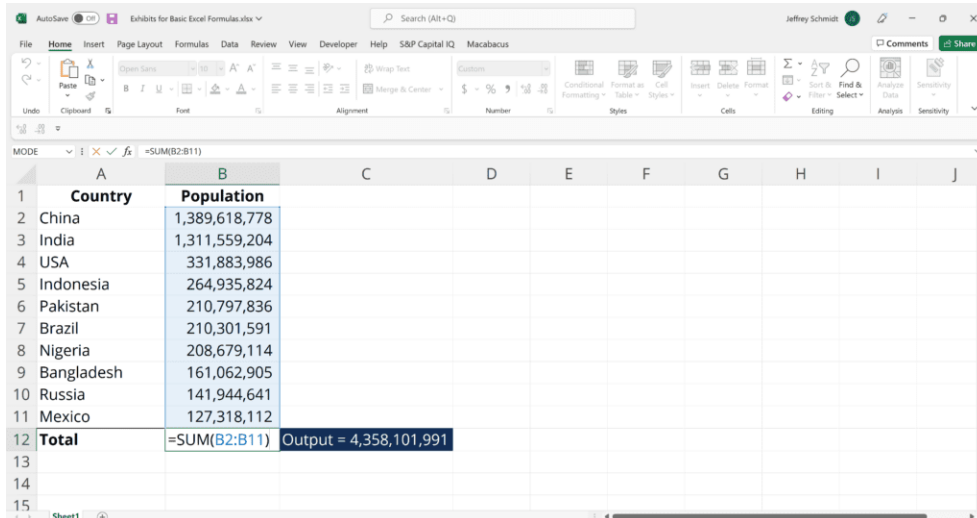
Example:

=SUM(B2:G2) – A simple selection that sums the values of a row.

=SUM(A2:A8) – A simple selection that sums the values of a column.

=SUM(A2:A7, A9, A12:A15) – A sophisticated collection that sums values from range A2 to A7, skips A8, adds A9, jumps A10 and A11, then finally adds from A12 to A15.

=SUM(A2:A8)/20 – Shows you can also turn your function into a formula.



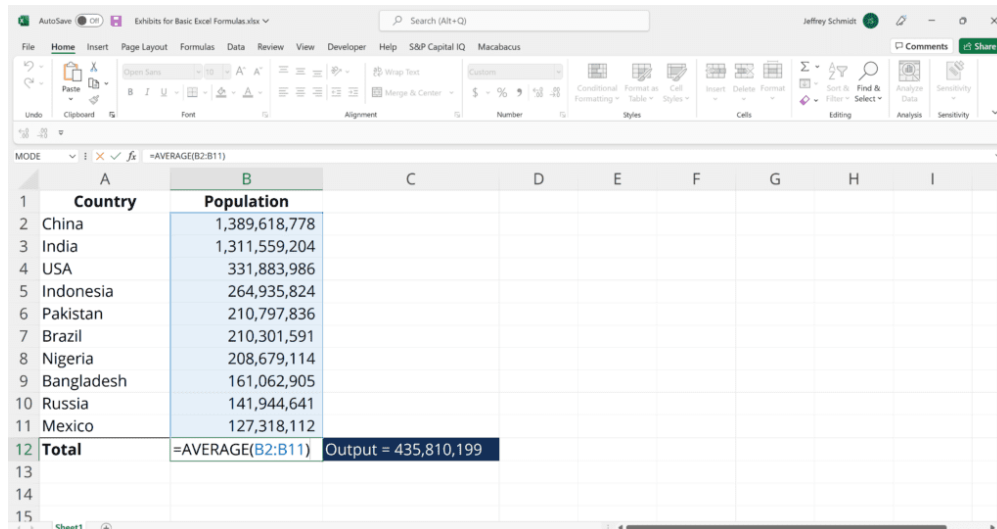
Country	Population
China	1,389,618,778
India	1,311,559,204
USA	331,883,986
Indonesia	264,935,824
Pakistan	210,797,836
Brazil	210,301,591
Nigeria	208,679,114
Bangladesh	161,062,905
Russia	141,944,641
Mexico	127,318,112
Total	=SUM(B2:B11)

2. AVERAGE: The **AVERAGE** function should remind you of simple averages of data, such as the average number of shareholders in a given shareholding pool.

=AVERAGE(number1, [number2], ...)

Example:

=AVERAGE(B2:B11) – Shows a simple average, also similar to (SUM(B2:B11)/10)



Country	Population
China	1,389,618,778
India	1,311,559,204
USA	331,883,986
Indonesia	264,935,824
Pakistan	210,797,836
Brazil	210,301,591
Nigeria	208,679,114
Bangladesh	161,062,905
Russia	141,944,641
Mexico	127,318,112
Total	=AVERAGE(B2:B11)

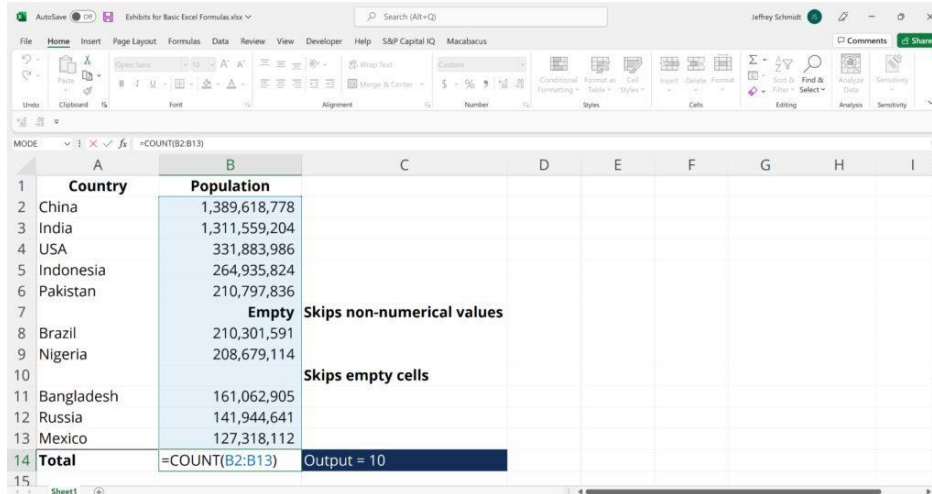
3. COUNT: The **COUNT** function counts all cells in a given range that contain only numeric values.

=COUNT(value1, [value2], ...)

Example:

COUNT(A:A) – Counts all values that are numerical in A column. However, you must adjust the range inside the formula to count rows.

COUNT(A1:C1) – Now it can count rows.



The screenshot shows an Excel spreadsheet with the following data:

Country	Population
China	1,389,618,778
India	1,311,559,204
USA	331,883,986
Indonesia	264,935,824
Pakistan	210,797,836
Empty	
Brazil	210,301,591
Nigeria	208,679,114
Bangladesh	161,062,905
Russia	141,944,641
Mexico	127,318,112
Total	=COUNT(B2:B13)

Annotations in the image:

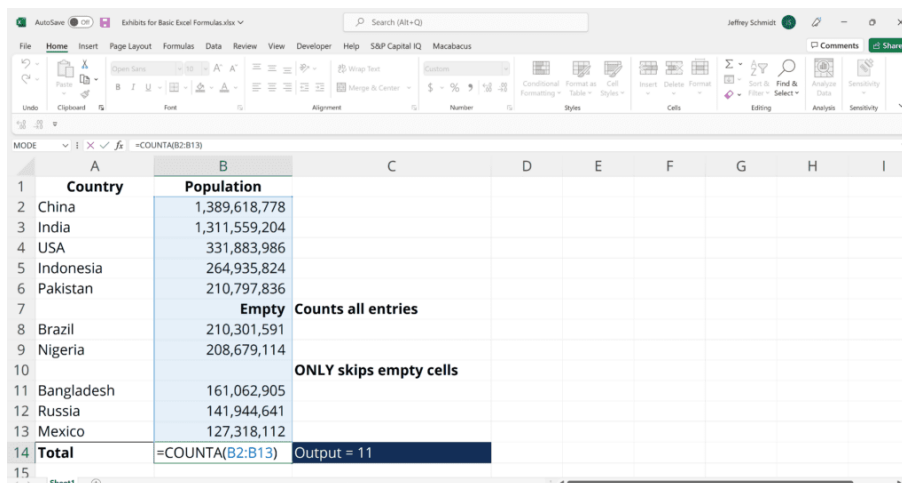
- "Skips non-numerical values" points to the empty cell in row 7.
- "Skips empty cells" points to the empty cell in row 10.
- "Output = 10" is shown in cell C14.

4. COUNTA: Like the COUNT function, **COUNTA** counts all cells in a given range. However, it counts all cells regardless of type. That is, unlike COUNT that only counts numerics, it also counts dates, times, strings, logical values, errors, empty string, or text.

=COUNTA(value1, [value2], ...)

Example:

COUNTA(C2:C13) – Counts rows 2 to 13 in column C regardless of type. However, like COUNT, you can't use the same formula to count rows. You must make an adjustment to the selection inside the brackets – for example, COUNTA(C2:H2) will count columns C to H



The screenshot shows the same Excel spreadsheet as before, but with the formula in cell C14 changed to =COUNTA(B2:B13). The output is now 11.

Country	Population
China	1,389,618,778
India	1,311,559,204
USA	331,883,986
Indonesia	264,935,824
Pakistan	210,797,836
Empty	
Brazil	210,301,591
Nigeria	208,679,114
Bangladesh	161,062,905
Russia	141,944,641
Mexico	127,318,112
Total	=COUNTA(B2:B13)

Annotations in the image:

- "Counts all entries" points to the empty cell in row 7.
- "ONLY skips empty cells" points to the empty cell in row 10.
- "Output = 11" is shown in cell C14.

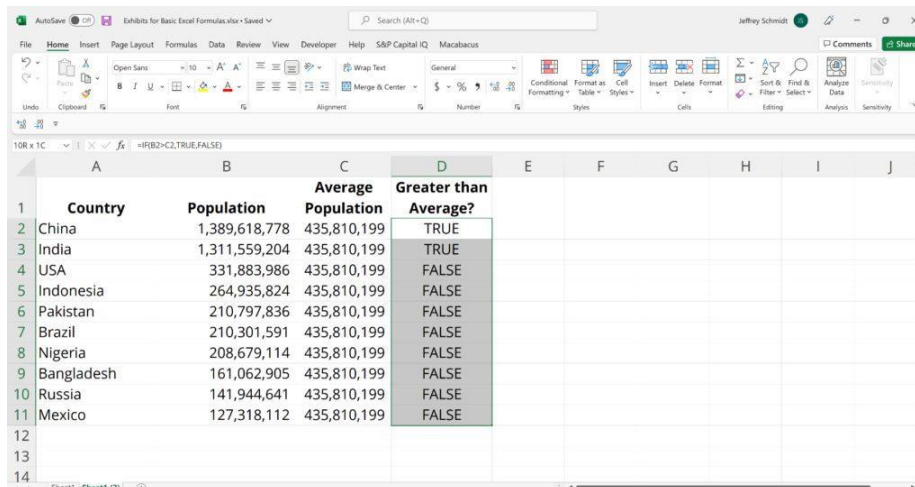
5. IF: The **IF function** is often used when you want to sort your data according to a given logic. The best part of the IF formula is that you can embed formulas and functions in it.

=IF(logical_test, [value_if_true], [value_if_false])

Example:

=IF(C2<D3,“TRUE”,“FALSE”) – Checks if the value at C3 is less than the value at D3. If the logic is true, let the cell value be TRUE, otherwise, FALSE

=IF(SUM(C1:C10) > SUM(D1:D10), SUM(C1:C10), SUM(D1:D10)) – An example of a complex IF statement. First, it sums C1 to C10 and D1 to D10, then it compares the sum. If the sum of C1 to C10 is greater than the sum of D1 to D10, then it makes the value of a cell equal to the sum of C1 to C10.



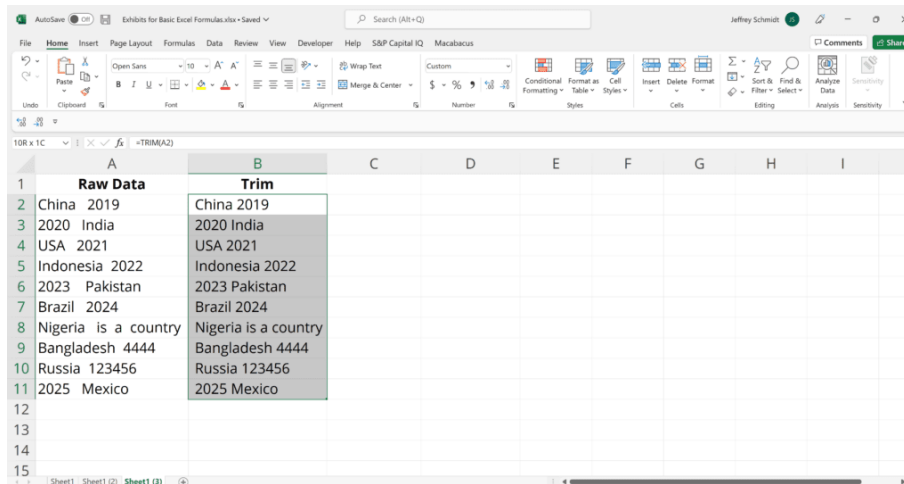
	A	B	C	D
	Country	Population	Average Population	Greater than Average?
1				
2	China	1,389,618,778	435,810,199	TRUE
3	India	1,311,559,204	435,810,199	TRUE
4	USA	331,883,986	435,810,199	FALSE
5	Indonesia	264,935,824	435,810,199	FALSE
6	Pakistan	210,797,836	435,810,199	FALSE
7	Brazil	210,301,591	435,810,199	FALSE
8	Nigeria	208,679,114	435,810,199	FALSE
9	Bangladesh	161,062,905	435,810,199	FALSE
10	Russia	141,944,641	435,810,199	FALSE
11	Mexico	127,318,112	435,810,199	FALSE
12				
13				
14				

6. TRIM: The **TRIM function** makes sure your functions do not return errors due to extra spaces in your data. It ensures that all empty spaces are eliminated. Unlike other functions that can operate on a range of cells, TRIM only operates on a single cell. Therefore, it comes with the downside of adding duplicated data to your spreadsheet.

=TRIM(text)

Example:

TRIM(A2) – Removes empty spaces in the value in cell A2.



7. MAX & MIN: The **MAX** and **MIN** functions help in finding the maximum number and the minimum number in a range of values.

=MIN(number1, [number2], ...)

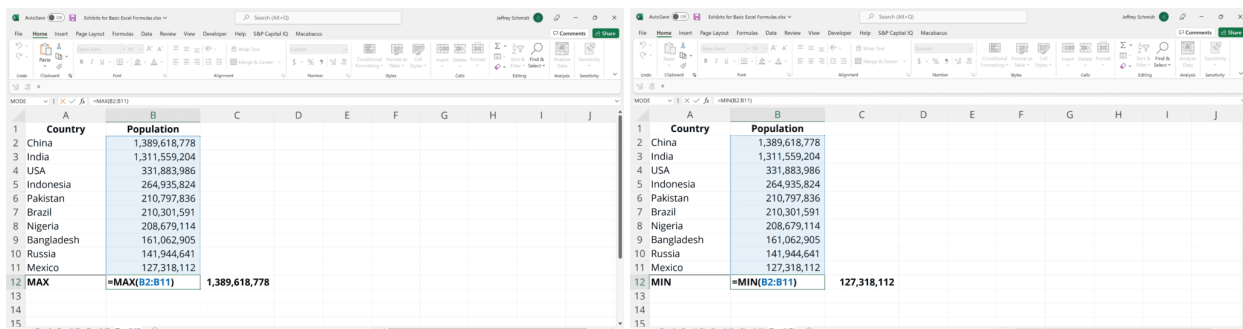
Example:

=MIN(B2:C11) – Finds the minimum number between column B from B2 and column C from C2 to row 11 in both columns B and C.

=MAX(number1, [number2], ...)

Example:

=MAX(B2:C11) – Similarly, it finds the maximum number between column B from B2 and column C from C2 to row 11 in both columns B and C.



1.4. Linking spreadsheets in accordance with software procedures

The process of displaying or using data that resides in another cell, perhaps even in another workbook, is known as data linking. Excel enables you to link the data in your worksheet with

data in other sheets, other workbooks and even other applications. Links between worksheets and workbooks can be created in Excel by including workbook and worksheet names, as well as the cell reference, within a formula. An internal link refers to one within the same file, while an external link refers to a link with another file. The cells referenced by a link are known as the source data. When source data changes, the linked cells will also change.

Linking data allows you to input data from one worksheet into another worksheet in such a way that it will change if the original data is changed. This can be used to prevent your spreadsheet from needing to hold multiple copies of the same data. For example, maintaining one master price list and linking any other spreadsheet that needs that same information to it. This helps maintain data accuracy as only one spreadsheet needs to be updated for price changes. It is an excellent way to make it very simple to create a summary of up-to-date data. This becomes especially important when multiple people are working on the same spreadsheet. If the data inputs are not logically presented and organized, it is impossible for someone else to update the spreadsheet accurately. There are two methods to link data with. Before we start, here is what a sheet of the source data in excel looks like:

The advantages of linking data in excel

- linking data from one worksheet to another worksheet ensures that the core data is entered or calculated only once and then shared with other files
- you can develop a large system using smaller, more manageable worksheets and workbooks
- linked workbooks do not all need to be open for the links to be updated, freeing memory for other activities
- separate modules can be created and managed by different people

1.5.Formatting Cells and assigning data attributes

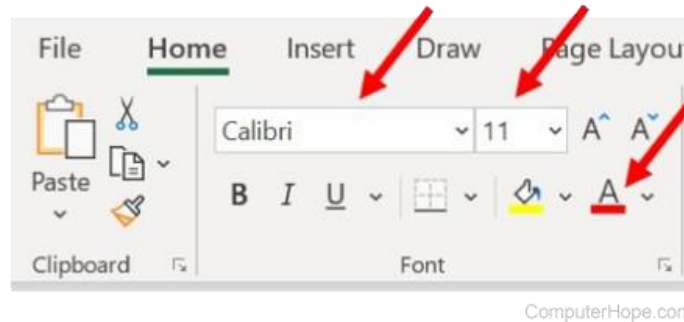
5.1.1. Formatting Cells

Formatting cells in a spreadsheet refers to changing the appearance of the cells to make them more visually appealing or to highlight certain data. This can include changing the font, font size, font color, background color, borders, and alignment of the text within the cell. Formatting cells can help to make the data in the spreadsheet easier to read and understand. For example, you might use bold or italicized text to emphasize important information, or use different colors to

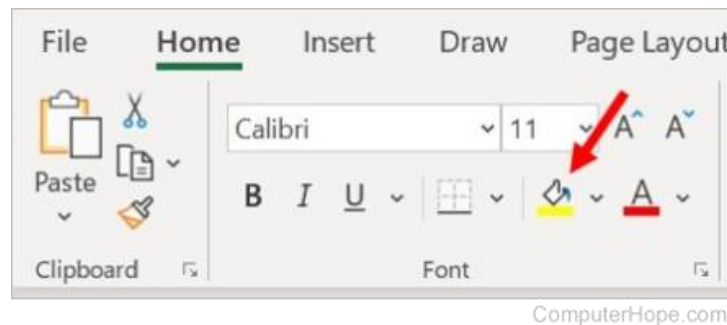
distinguish between different types of data. You might also use borders to create a table or grid-like structure to organize the data.

Some common formatting options in spreadsheet software include:

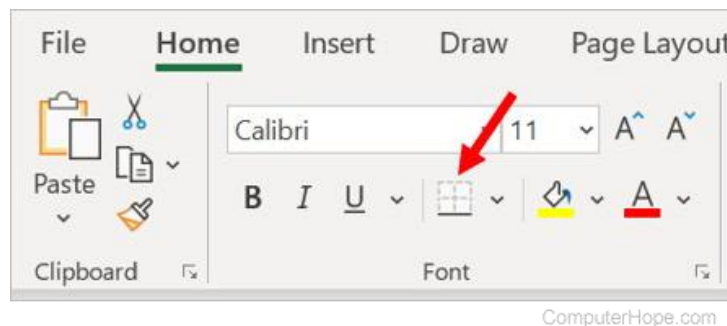
- **Font:** Changing the font type, size, and color of the text within a cell.



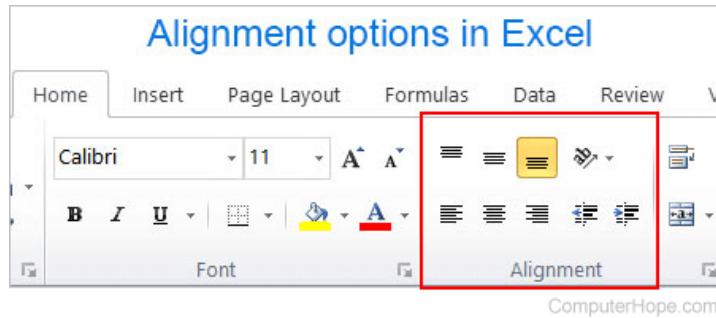
- **Background color:** Changing the color of the cell background to make it stand out or to group similar data together



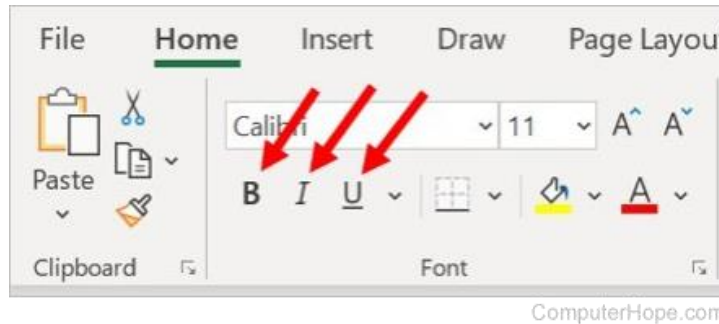
- **Borders:** Adding borders around cells or groups of cells to create a table or to separate different sections of data



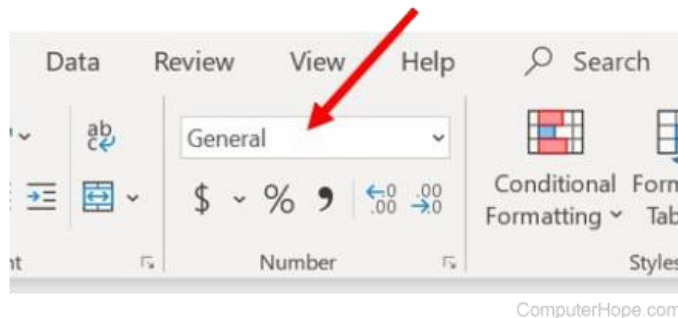
- **Alignment:** Changing the horizontal or vertical alignment of the text within a cell to make it easier to read or to fit more text within a cell



- Set data to be bold, italic, or underlined in a cell



- Change the data type for a cell



Overall, formatting cells in a spreadsheet can help to make the data more visually appealing and easier to understand, which can be especially important when working with large amounts of data.

5.2.2. Assigning data attributes

Data attributes in a spreadsheet refer to the characteristics or properties of the data that is stored in the cells. These attributes can include things like the data type, format, and validation rules. Here are some common data attributes that can be assigned to cells in a spreadsheet:

- Data type: This refers to the type of data that is stored in the cell, such as text, number, date, or time.

- **Format:** This refers to the way that the data is displayed in the cell, such as currency, percentage, or scientific notation.
- **Validation rules:** This refers to the rules that are applied to the data in the cell to ensure that it meets certain criteria, such as being within a certain range of values or being a valid email address.
- **Conditional formatting:** This refers to the formatting that is applied to the cell based on certain conditions, such as highlighting cells that contain a certain value or changing the font color based on the value in the cell.

Assigning data attributes to cells in a spreadsheet can help to ensure that the data is accurate, consistent, and easy to read and understand. It can also help to prevent errors and make it easier to analyze and manipulate the data in the spreadsheet. In a spreadsheet, data attributes can be assigned to cells or ranges of cells using a variety of methods depending on the software being used. Here are some general steps to assign data attributes in a spreadsheet:

1. Select the cell or range of cells that you want to assign data attributes to.
2. Look for the "Format" or "Cell" options in the menu bar or ribbon of your spreadsheet software.
3. Click on the "Format" or "Cell" option to open the formatting options.
4. Look for the "Data" or "Number" tab in the formatting options.
5. Choose the data attribute that you want to assign to the selected cells, such as "Currency", "Date", "Percentage", or "Text".
6. Adjust the settings for the data attribute as needed, such as the number of decimal places or the date format.
7. Click "OK" or "Apply" to assign the data attribute to the selected cells.

1.6. Testing formulae to confirm output meets task

Testing formulae is an important step in spreadsheet design to confirm that the output meets the task requirements and the data is accurate. Here are some steps to follow when testing formulae in a spreadsheet:

1. **Check the formula:** The first step is to check the formula to ensure that it is correct and performing the intended calculation or operation. This may involve checking the syntax

of the formula, ensuring that the correct cell references and functions are being used, and double-checking any constants or values used in the formula.

2. Test with sample data: Once the formula is checked, the next step is to test it with sample data to confirm that the output meets the task requirements. This may involve creating a sample data set with known values and testing the formula to ensure that it produces the expected result.
3. Test with edge cases: In addition to testing with sample data, it is also important to test the formula with edge cases to ensure that it can handle unexpected or extreme values. For example, testing the formula with zero values, negative values, or extremely large or small values can help to identify any errors or limitations in the formula.
4. Check for errors: While testing the formula, it is important to check for any errors or inconsistencies in the output. This may involve checking for errors in the formula itself, as well as any errors that may have occurred during the data entry or manipulation process.
5. Refine and retest: If any errors or issues are identified during testing, it is important to refine the formula and retest it to ensure that it is working correctly. This may involve adjusting the formula syntax, changing the input data, or using a different approach altogether.

By following these steps, users can ensure that the formulae in their spreadsheet are accurate, efficient, and producing the intended output. Testing formulae is an important aspect of spreadsheet design, as it can help to identify errors or issues before the spreadsheet is used for critical tasks or decision-making.

Self-check 1	Written test
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Name..... ID Date.....

Directions: Answer all the questions listed below.

Test I: Choose the best answer (4 point)

- The process of displaying or using data that resides in another cell, perhaps even in another workbook, is known as_____.
 A. Data linking
 B. Data specification
 C. Formulas
 D. Functions
- _____ refers to the type of data that is stored in the cell, such as text, number, date, or time.
 A. Data type
 B. Format
 C. Validation rules
 D. Conditional formatting
- _____in a spreadsheet refers to changing the appearance of the cells to make them more visually appealing or to highlight certain data.
 A. Formatting cells
 B. Identifying tools
 C. Spreadsheet
 D. Google sheets
- Some commonly used spreadsheet software programs today:
 A. Microsoft Excel
 B. Google Sheets
 C. Apache Open Office Calc
 D. LibreOffice Calc
 E. Thinkfree Office
 F. All

Test II: Short Answer Questions

- Define spreadsheet.
- What are the advantages of linking data in spreadsheet?
- List the steps to test formulae in a spreadsheet and confirm that the output meets the task requirements.
- What is task specification in spreadsheet development?
- What are the two basic ways to perform calculations in Excel?

You can ask you teacher for the copy of the correct answers.

Operation Sheet -1

1.1 Procedure of collecting and presenting spreadsheet data and creating graphs

A. Tools and equipments required

- I. Computer
- II. Spreadsheet Software
- III. Data Collection Tools: surveys questionnaires, data analysis software
- IV. Internet Access
- V. Graphing Software
- VI. Projector
- VII. External Data Storage
- VIII. Reference Materials

B. Procedures

The procedures for collecting and presenting spreadsheet data and creating graphs are as follows:

1. Collecting Data
 - Determine the purpose of the spreadsheet and the type of data needed to achieve that purpose
 - Collect the necessary data from reliable sources (e.g. surveys, databases, web scraping)
 - Organize the data into meaningful categories and format it for use in a spreadsheet
2. Entering Data into a Spreadsheet
 - Open a new or existing spreadsheet in software such as Microsoft Excel or Google Sheets
 - Select an appropriate data type for each column (e.g. date, number, text)
 - Enter the data into the appropriate cells, taking care to ensure accuracy and completeness
 - Use data validation to prevent errors and ensure consistency
3. Analyzing Data
 - Use formulas and functions to analyze the data (e.g. SUM, AVERAGE, COUNTIF)
 - Sort and filter the data to identify trends and patterns
 - Use conditional formatting to highlight important data points
4. Creating Graphs
 - Select the data range to be used in the graph
 - Choose an appropriate graph type to represent the data (e.g. bar, line, pie)

- Customize the graph with titles, labels, and formatting options
 - Use trendlines and other analysis tools to identify patterns and trends
5. Presenting Data and Graphs
- Use clear and concise language to explain the purpose and findings of the data and graphs
 - Include appropriate labels and titles to ensure clarity and understanding
 - Use color and formatting to draw attention to important data points
 - Provide references to the sources of the data, including any relevant citations or footnotes.

LAP TEST-1	Performance Test
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Name.....ID.....

Date.....

Time started: Time finished:.....

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **1** hour. The project is expected from each student to do it.

Task-1: Collect relevant spreadsheet data

Task-2: Enter data into a spreadsheet

Task-3: Analyze data

Task-4: Create graphs

Task-5: Present data and graphs

.

LG #24

LO #2-Automate and standardize spreadsheet operation

Instruction sheet 2

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Evaluating tasks to identify those where automation would increase efficiency.
- Creating, using and editing **Macros** to fulfill the requirements of the task and automate spreadsheet operation.
- Developing, editing and using **Templates** to ensure consistency of design and layout for forms and reports in accordance with organizational requirements.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Evaluate tasks to identify those where automation would increase efficiency.
- Create, use and edit **Macros** to fulfill the requirements of the task and automate spreadsheet operation.
- Develop, edit and use **Templates** to ensure consistency of design and layout for forms and reports in accordance with organizational requirements.

Learning Instructions:

- Read the specific objectives of this Learning Guide.
- Follow the instructions described below.
- Read the information written in the information Sheets
- Accomplish the Self-checks
- Perform Operation Sheets
- Do the “LAP test”

Information Sheet 2

2.1. Identifying tasks for automation

Automation in a spreadsheet refers to the process of using tools and techniques to automate repetitive, time-consuming, and error-prone tasks in a spreadsheet. This can include tasks such as data entry, calculations, sorting and filtering, report generation, data analysis, and more. By automating tasks in a spreadsheet, you can save time, reduce errors, and increase productivity. This can be especially useful for tasks that are performed frequently or require a lot of manual effort. There are several ways to automate tasks in a spreadsheet, including:

- **Formulas and functions:** Using built-in formulas and functions to perform calculations, manipulate data, and perform other tasks.
- **Macros:** Recording a series of actions and then playing them back to automate a task.
- **Add-ins:** Installing add-ins that provide additional functionality and automation capabilities.
- **Scripts:** Writing scripts in a programming language such as VBA (Visual Basic for Applications) to automate tasks.

Here is a more comprehensive list of tasks that can be automated in a spreadsheet: Data entry, Data cleaning, Calculations, Sorting and filtering, Chart creation, Report generation, Data analysis, Data validation, Data import and export, Email notifications, Conditional formatting, Pivot tables, Lookup and reference functions, Text manipulation, and Date and time functions.

To identify tasks for automation in a spreadsheet, you can follow these steps:

1. **Identify repetitive tasks:** Look for tasks that are performed repeatedly, such as data entry, formatting, or calculations.
2. **Identify time-consuming tasks:** Look for tasks that take a lot of time to complete, such as sorting or filtering large amounts of data.
3. **Identify error-prone tasks:** Look for tasks that are prone to errors, such as copying and pasting data or manually calculating formulas.
4. **Identify tasks with complex logic:** Look for tasks that require complex logic or multiple steps to complete, such as creating reports or analyzing data.

5. Identify tasks with high volume: Look for tasks that involve a large volume of data, such as importing or exporting data.
6. Identify tasks with a high level of accuracy: Look for tasks that require a high level of accuracy, such as financial calculations or data analysis.

Once you have identified the tasks that are suitable for automation, you can use spreadsheet functions, macros, or add-ins to automate these tasks. This can help to save time, reduce errors, and improve the accuracy and efficiency of your work.

2.2.Creating, using and editing Macros and automate spreadsheet operation

If you have tasks in Microsoft Excel that you do repeatedly, you can record a macro to automate those tasks. A macro is an action or a set of actions that you can run as many times as you want. In computer programming, a macro (short for "macro instruction"; from Greek μακρο- 'long, large') is a rule or pattern that specifies how a certain input should be mapped to a replacement output. Macros in a spreadsheet are a set of recorded actions that can be played back to automate repetitive tasks. A macro is essentially a script that automates a series of steps in a spreadsheet, such as formatting cells, entering data, or performing calculations.

Advantages of Macros

- Increased productivity – Macros can automate repetitive tasks, allowing users to complete tasks more quickly and efficiently.
- Enhanced accuracy – Macros can reduce the risk of errors by consistently following a set of predetermined steps.
- Customization – Macros can be customized to fit the specific needs of a user or organization, allowing for greater flexibility and control.
- Ease of use – Macros can be created and edited using simple commands, making them accessible to users of all skill levels.
- Compatibility – Macros can be used across a range of applications and devices, making them a versatile tool for productivity.

Disadvantages of Macros

- Security risks – Macros can be used to spread malware or execute malicious code, posing a risk to the security of a device or network.

- Complexity – Advanced macros may be complex and require specialized knowledge or programming skills to create and maintain.
- Compatibility issues – Macros may not be compatible with all devices or applications, limiting their utility.
- Dependence – Relying heavily on macros can make users less proficient in performing tasks manually, potentially hindering their ability to adapt to new situations.
- Limited functionality – Macros are limited to performing predetermined tasks and may not be able to handle unexpected or complex situations.

Creating Macros: To create a macro, you can use the macro recorder tool in your spreadsheet software. This tool records your actions as you perform them in the spreadsheet, and then saves them as a macro that can be played back later. Once you have created a macro, you can assign it to a button or keyboard shortcut, making it easy to run the macro whenever you need to perform the task it automates. Macros can be very useful for automating repetitive tasks in a spreadsheet, such as formatting reports, updating data, or generating charts. They can save you time and reduce the risk of errors, as well as make it easier to perform complex tasks that would be difficult or time-consuming to do manually.

To create a macro in a spreadsheet, follow these general steps:

1. Open the spreadsheet software and navigate to the Developer tab (if it's not visible, you may need to enable it in the program's settings).
2. Click on the "Record Macro" button to start recording your actions.
3. Give your macro a name and choose where to store it (e.g. in the current workbook or in a personal macro workbook).
4. Perform the actions you want to automate in the spreadsheet. The macro recorder will record each step you take.
5. When you're finished, click on the "Stop Recording" button to stop the macro recorder.
6. Test your macro by running it and making sure it performs the desired actions.
7. Assign the macro to a button or keyboard shortcut so you can easily run it in the future.

Note that the specific steps for creating a macro may vary depending on the spreadsheet software you're using. It's also important to keep in mind that macros can potentially be a security risk, so

it's important to only enable macros from trusted sources and to be cautious when running macros from unknown sources.

After you create a macro, you can edit it to make minor changes to the way it works. Suppose that every month, you create a report for your accounting manager. You want to format the names of the customers with overdue accounts in red, and also apply bold formatting. You can create and then run a macro that quickly applies these formatting changes to the cells you select. Macros are a set of instructions that can be recorded and played back in order to automate repetitive tasks. They are commonly used in software applications such as Microsoft Excel and Word. Macros offer many advantages to those who choose to use them. They reduce the possibility of human error that increases with many, repetitive keystrokes and tasks. Macros reduce the amount of time that must be spent performing basic computing tasks, freeing users up for more complex problem-solving and idea-generating activities. They also make complex computations easier to perform.

Using Macros: One of the benefits of macros is that they are easy to create, store and use. Macros record your keystrokes while you work. You can even assign a keyboard button to a macro so that common functions like formatting cells for text, adding formulas to spreadsheets, assigning rows to a target and formatting information into matched columns and rows.

Editing Macros: Making changes to a macro is as easy as setting one up. Macros aren't static. Once you record them, you can easily alter them to more effectively suit your needs. After you record a macro, you can view, change and correct errors in the code Microsoft wrote for it in Microsoft's Visual Basic Editor. Microsoft offers plenty of in-program help to guide beginners through the process of macro code editing. You'll quickly learn how to copy macros from one spreadsheet to another, share macros between workbooks with multiple users and much more.

2.3.Developing, editing and using Templates and layout for forms and reports

Templates in a spreadsheet are pre-designed spreadsheets that can be used as a starting point for creating new spreadsheets. They are designed to save time and effort by providing a pre-formatted structure that can be customized to meet specific needs. Templates can be used for a variety of purposes, such as budgeting, project management, inventory tracking, and more. They typically include pre-built formulas, formatting, and layout that can be easily modified to fit the user's needs. Most spreadsheet software comes with a variety of pre-built templates that can be

accessed from the program's template library. Users can also create their own templates by saving a customized spreadsheet as a template for future use. Using templates in a spreadsheet can save time and effort by providing a pre-built structure that can be easily customized to meet specific needs. They can also help ensure consistency and accuracy in data entry and analysis.

Once you've created a template, it will require only minor tweaks to suit your current purposes and therefore can be applied to different scenarios and reused time and time again. Excel templates can also help you create consistent and attractive documents that will impress your colleagues or supervisors and make you look your best. Templates are especially valuable for frequently used document types such as Excel calendars, budget planners, invoices, inventories and dashboards. What can be better than grabbing a ready-to-use spreadsheet that already has the look and feel you want and can be easily tailored for your needs?

Developing, editing, and using templates is an effective way to ensure consistency of design and layout in your documents. Here are some notes to keep in mind when working with templates:

- Develop a clear understanding of your document's purpose and audience before creating a template. This will help you determine the appropriate design and layout elements to include.
- Use a consistent color scheme, font, and formatting throughout the template to create a cohesive look and feel.
- Include placeholders for text and images to make it easy to add content to the template.
- Consider using styles to apply consistent formatting to headings, paragraphs, and other elements in the document.
- Test the template thoroughly to ensure that it works as intended and that all elements are properly formatted.
- Edit the template as needed to make improvements or to accommodate changes in your document's requirements.
- Save the template in a location where it can be easily accessed and shared with others who need to use it.
- Train others on how to use the template to ensure that everyone is using it correctly and consistently.

Self-check 2	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Choose the best answer (4 point)

- _____ in a spreadsheet refers to the process of using tools and techniques to automate repetitive, time-consuming, and error-prone tasks in a spreadsheet.
 - Automation
 - Macros
 - Formulas and functions
 - Customization
- Which one of the following is **not** ways to automate tasks in a spreadsheet?
 - Formulas and functions
 - Macros
 - Add-ins
 - Data cleaning
- One of the following is **not** the tasks that can be automated in a spreadsheet?
 - Data entry and Calculations
 - Sorting and filtering
 - Report generation
 - Data import and export
- _____ is an action or a set of actions that you can run as many times as you want.
 - Macro
 - Spreadsheet
 - Database
 - Data manipulation
- Advantages of Macros may **not** include;
 - Increased productivity
 - Security risks
 - Ease of use
 - Compatibility

Test II: Short Answer Questions

- List of tasks that can be automated in a spreadsheet
- To identify tasks for automation in a spreadsheet, you can follow these steps:
- What are the advantages and disadvantages of Macros?
- What are Templates in a spreadsheet?

You can ask you teacher for the copy of the correct answers.

Operation Sheet-2

2.1 Techniques/Procedures/Methods of creating, using and editing Macros

A. Tools and equipments: The tools and equipment required for creating, using, and editing macros in a spreadsheet are as follows:

- Spreadsheet Software
- Developer Tab
- Visual Basic Editor
- Macro Recorder and Editor
- Keyboard
- Mouse
- Reference Materials

B. Procedures/Steps/Techniques: Here are the procedures for creating, using, and editing macros:

Creating Macros:

1. Open the spreadsheet software and navigate to the Developer tab.
2. Click on the Record Macro button to begin recording the macro.
3. Perform the actions you wish to automate as the macro is being recorded. For example, if you frequently format certain cells in a specific way, you can format those cells during the macro recording process.
4. Click on the Stop Recording button when you are finished recording the macro.

Using Macros:

1. Navigate to the location in the spreadsheet where you wish to use the macro.
2. Click on the Macros button on the Developer tab.
3. Select the macro you wish to use, and click on the Run button.
4. The macro will then perform the recorded actions automatically.

Editing Macros:

1. Click on the Macros button on the Developer tab and select the macro you wish to edit.
2. Click on the Edit button to open the macro in the Visual Basic Editor.
3. Make the necessary changes to the macro code in the editor.
4. Click on the Save button to save the changes to the macro.

LAP TEST-2	Performance Test
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Name.....ID.....

Date.....

Time started: Time finished:.....

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **1** hour. The project is expected from each student to do it.

Task-1: Create Macros

Task-2: Use Macros

Task-3: Edite Macros

LG #25

LO #3-Use Advanced spreadsheet

Instruction Sheet 3

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Entering, checking and amending data in accordance with organizational and task requirements.
- Importing / exporting data between compatible spreadsheets and host documents adjusted in accordance with software and system procedures.
- Using manuals, user documentation and on-line help to overcome problems with spreadsheet design and production.
- Previewing, adjusting and printing spreadsheet is in accordance with organizational and task requirements.
- Naming and storing spreadsheet in accordance with organizational requirements and the application exited without data loss/damage.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Enter, check and amend data in accordance with organizational and task requirements.
- Import / export data between compatible spreadsheets and host documents adjusted in accordance with software and system procedures.
- Use manuals, user documentation and on-line help to overcome problems with spreadsheet design and production.
- Preview, adjust and print spreadsheet is in accordance with organizational and task requirements.
- Name and store spreadsheet in accordance with organizational requirements and the application exited without data loss/damage.

Learning Instructions:

- Read the specific objectives of this Learning Guide.
- Follow the instructions described below.
- Read the information written in the information Sheets
- Accomplish the Self-checks
- Perform Operation Sheets
- Do the “LAP test”

Information Sheet 3

3.1.Entering, checking and amending data

Entering, checking, and amending data in a spreadsheet are the basic tasks involved in working with spreadsheet software. These tasks involve:

- **Entering data:** This involves inputting data into the cells of a spreadsheet. This can be done by typing the data directly into the cells or by copying and pasting data from other sources. To enter data in a spreadsheet, click on the cell where you want to enter the data and start typing. You can also copy and paste data from other sources.
- **Checking data:** This involves verifying the accuracy of the data entered into the spreadsheet. This can be done by using built-in functions like SUM, AVERAGE, and COUNT to check the accuracy of the data. Once you have entered data in a spreadsheet, it is important to check it for accuracy. You can use built-in functions like SUM, AVERAGE, and COUNT to check the accuracy of your data.
- **Amending data:** This involves making changes to the data entered into the spreadsheet. This can be done by clicking on the cell containing the data to be changed and typing in the correct data. If you find errors in your data, you can amend it by clicking on the cell containing the error and typing in the correct data. You can also use the undo function to revert to a previous version of the spreadsheet.
- **Formatting data:** Formatting data in a spreadsheet involves changing the appearance of the data to make it more readable. You can change the font, color, and size of the text, as well as add borders and shading to cells.
- **Sorting data:** Sorting data in a spreadsheet involves arranging the data in a specific order. You can sort data in ascending or descending order based on a specific column.
- **Filtering data:** Filtering data in a spreadsheet involves displaying only the data that meets specific criteria. You can filter data based on a specific column or multiple columns.

These tasks in a spreadsheet, users can create accurate and reliable data sets that can be used for a variety of purposes, such as budgeting, financial analysis, and project management. These tasks are essential for ensuring the accuracy and reliability of the data in a spreadsheet.

3.2.Importing / exporting data in spreadsheets and host documents

Importing and exporting data in spreadsheets and host documents refers to the process of transferring data between different software applications or file formats. This process is commonly used to move data from a spreadsheet to another application or vice versa. Importing data involves bringing information from an external source into a spreadsheet or host document, while exporting data involves saving information from a spreadsheet or host document to an external file format. For example, a user may need to import data from an external database into a spreadsheet for analysis and manipulation. Alternatively, a user may need to export data from a spreadsheet into a word processing document or presentation for reporting purposes.

Importing and exporting data can be done in a variety of file formats, including CSV, TXT, XML, HTML, and others. The choice of file format depends on the software applications involved and the specific requirements of the data transfer. The ability to import and export data is a key feature of spreadsheet software and is essential for sharing and collaborating on data with others. By importing and exporting data, users can integrate data from different sources, analyze and manipulate data more effectively, and create accurate and meaningful reports.

3.3.Using manuals, user documentation and on-line help

Using manuals, user documentation, and online help can be very helpful when encountering problems with spreadsheet design and production. Here are some tips on how to effectively use these resources:

- **Manuals:** Most spreadsheet software come with a user manual that provides step-by-step instructions on how to use the software and its features. The manual can be a great resource for learning how to use the software and its functions. When encountering problems with spreadsheet design or production, consult the manual to understand the software features and how they work.
- **User documentation:** In addition to the manual, most spreadsheet software also offers user documentation such as help files, FAQs, and tutorials. These resources can be accessed from within the software and offer detailed information on specific features and functions. When encountering a problem, search the user documentation for relevant information and instructions on how to resolve the issue.

- Online help: Many spreadsheet software providers offer online help resources, such as forums, support pages, and knowledge bases. These resources are often very helpful when encountering problems with spreadsheet design and production. Search the online help resources for answers to common questions and issues, or ask for help from other users or support staff.
- Use search engines: When encountering a problem, use search engines to find solutions to similar issues that other users have faced. Search for specific error messages or issues, and include the name of the spreadsheet software in the search query. The search results may offer advice, solutions, or workarounds to help resolve the issue.
- Experiment and test: Another helpful approach when encountering problems with spreadsheet design or production is to experiment and test different solutions. Try different approaches to see which one works best, and test the spreadsheet with different data sets to ensure that it is functioning correctly. This can help to identify errors or issues and find solutions that work best for the specific task at hand.

To use these resources effectively, it is important to identify the specific problem or issue that needs to be addressed. Once the problem has been identified, the appropriate resource can be used to find a solution. For example, if a user is having trouble formatting a spreadsheet, they may consult the manual or user documentation to learn how to format cells or use the online help to troubleshoot the issue. Overall, using manuals, user documentation, online help, and experimentation can be very helpful when encountering problems with spreadsheet design and production. By using these resources effectively, users can overcome common issues and create spreadsheets that are accurate, efficient, and effective for their specific needs.

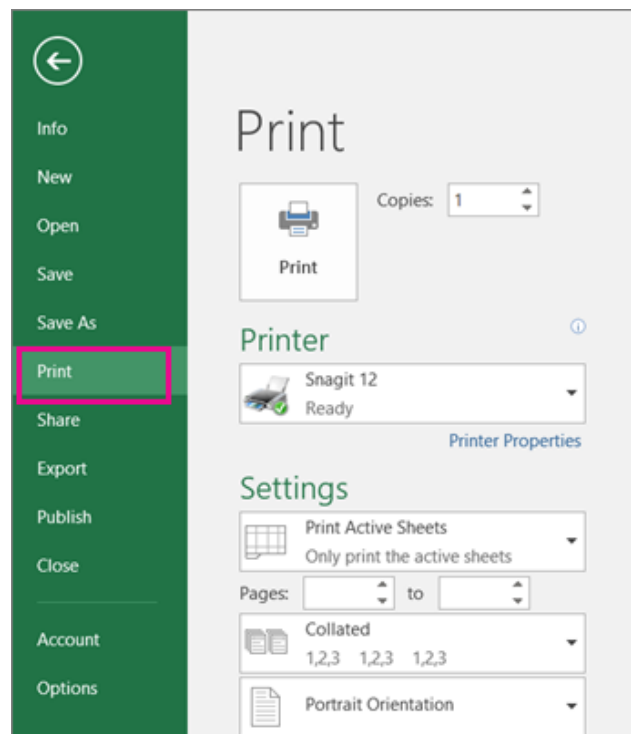
3.4. Previewing, adjusting and printing spreadsheet

Before printing a spreadsheet, it is a good idea to preview it to ensure that it looks the way you want it to. Print preview is a feature in printing settings that displays the actual sample of how the document you are printing will look on paper. It helps you adjust all the printing settings correctly so the print is accurate and contains all the content you need without distortions, cuts, or lost formatting. Most spreadsheet software includes a preview option that allows you to see how the spreadsheet will look when printed. This can help you identify any formatting issues or errors that need to be corrected before printing. Previewing prints in spreadsheets is equally useful, if not even more. Spreadsheets are much more tricky, considering that they tend to be

richer in contents, don't have pre-defined borders and structure, and accurate scaling needs to be done together with other adjustments to keep the contents compact but readable. The print preview only displays the document on the screen, and it does not print. In other terms, it only shows us the format in which it will print the copy.

When you select one or more sheets and then click File > Print, you'll see a preview of how the data will appear on the printout.

1. Select the worksheet(s) you want to preview.
2. Click **File**, and then click **Print** to display the Preview window and printing options.



Once you have previewed the spreadsheet, you may need to make adjustments to ensure that it prints correctly. This may involve adjusting the margins, scaling the spreadsheet to fit on a single page, or adjusting the orientation of the page (portrait or landscape).

Once you are satisfied with the preview and have made any necessary adjustments, you can print the spreadsheet. Most spreadsheet software includes a print option that allows you to select the printer, number of copies, and other printing options.

When printing a spreadsheet, it is important to consider the following:

- Page setup: Make sure that the page setup is correct, including the paper size, orientation, and margins.

- **Print area:** If you only want to print a specific area of the spreadsheet, you can select the print area before printing.
- **Formatting:** Make sure that the formatting of the spreadsheet is correct, including font size, color, and alignment.
- **Preview:** Always preview the spreadsheet before printing to ensure that it looks the way you want it to.

By following these steps, you can preview, adjust, and print your spreadsheet to ensure that it looks professional and is easy to read.

3.5.Naming and storing spreadsheet

Naming and storing a spreadsheet is an important part of organizing and managing your files. Here are some points to follow when naming and storing a spreadsheet:

- **Choose a descriptive name:** When naming your spreadsheet, choose a name that accurately describes the content of the file. This will make it easier to find and identify the file later on.
- **Use a consistent naming convention:** To make it easier to organize and find your files, use a consistent naming convention for all of your spreadsheets. For example, you could use a naming convention that includes the date, project name, and version number.
- **Save the file in the appropriate location:** When saving your spreadsheet, make sure to save it in the appropriate location. This could be a specific folder on your computer or a cloud-based storage service like Google Drive or Dropbox.
- **Backup your files:** To ensure that you don't lose your files in case of a computer crash or other issue, it's important to backup your files regularly. This could involve saving a copy of your spreadsheet to an external hard drive or using a cloud-based backup service.

By following these steps, you can ensure that your spreadsheets are organized, easy to find, and backed up in case of an emergency.

Self-check 3	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Choose the best answer (4 point)

2. _____ involves inputting data into the cells of a spreadsheet.
 - A. Entering data
 - B. Checking data
 - C. Amending data
 - D. All
3. _____ This involves making changes to the data entered into the spreadsheet.
 - A. Entering data
 - B. Checking data
 - C. Amending data
 - D. All
4. Are typically provided by the software vendor and contain detailed information about the software's features and functions.
 - A. Manuals
 - B. User documentation
 - C. Online help
 - D. None
5. Is a feature in printing settings that displays the actual sample of how the document you are printing will look on paper.
 - A. Print preview
 - B. Adjusting
 - C. Printing spreadsheet
 - D. None
6. When printing a spreadsheet, it is important to consider the following:
 - A. Page setup
 - B. Print area
 - C. Formatting
 - D. Preview
7. Points to follow when naming and storing a spreadsheet are:
 - A. Choose a descriptive name
 - B. Use a consistent naming convention
 - C. Save the file
 - D. Backup your files

Note: Satisfactory point =20 and above

Unsatisfactory points = below 20

You can ask you teacher for the copy of the correct answers

Operation Sheet -3

3.1.Procedures of Importing/exporting data in spreadsheets and host documents

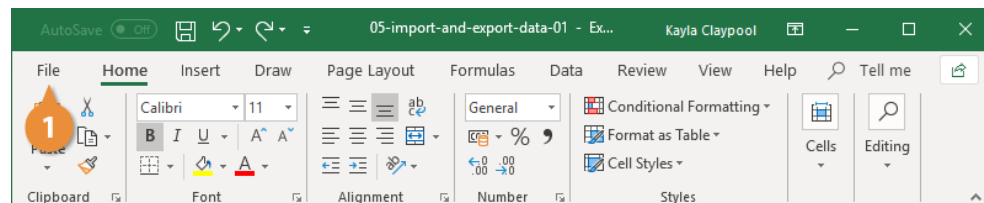
A. Tools and equipments: The tools and equipment required for importing and exporting data in spreadsheets and host documents include:

- i. Spreadsheet Software: such as Microsoft Excel, Google Sheets, or Apple Numbers
- ii. Host Document Software: Microsoft Word, Google Docs, or Apple Pages
- iii. Export/Import Formats: include CSV, TXT, XML, and HTML.
- iv. Data Sources:
- v. Internet Connection
- vi. Third-Party Tools

B. Procedures/Steps/Techniques

Exporting Data: When you have data that needs to be transferred to another system, export it from Excel in a format that can be interpreted by other programs, such as a text or CSV file.

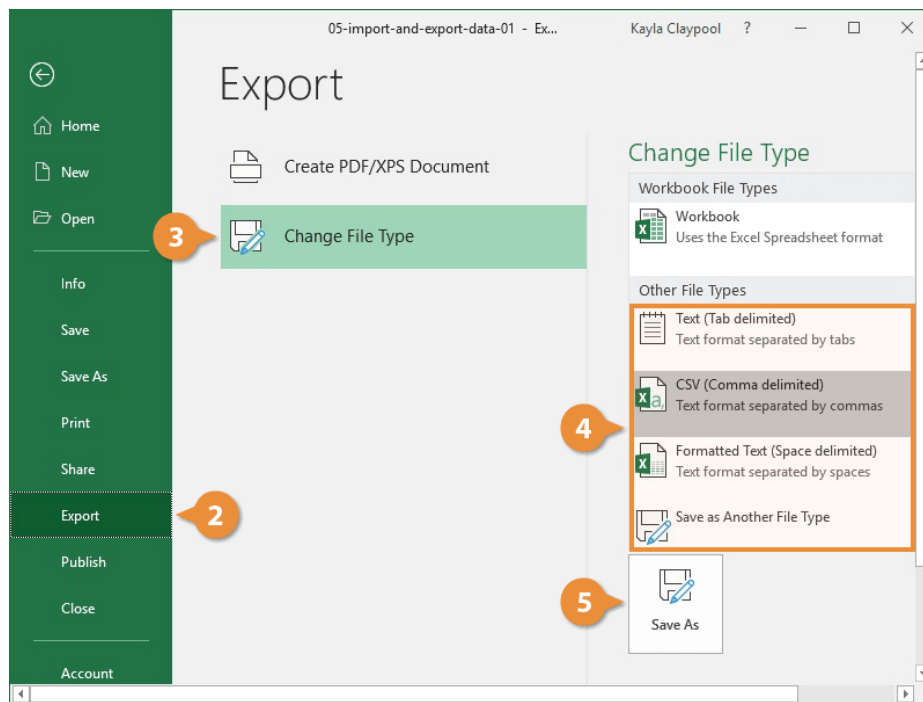
1. Click the **File** tab.



2. At the left, click Export.
3. Click the Change File Type.
4. Under Other File Types, select a file type.
 - Text (Tab delimited): The cell data will be separated by a tab.
 - CSV (Comma delimited): The cell data will be separated by a comma.
 - Formatted Text (space delimited): The cell data will be separated by a space.
 - Save as Another File Type: Select a different file type when the Save As dialog box appears.

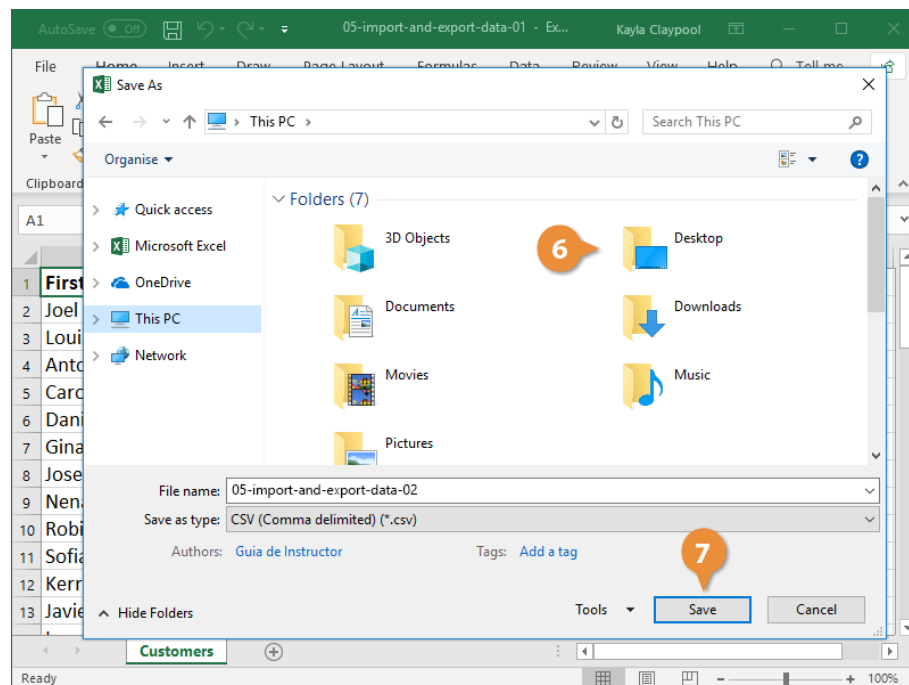
Tip: The file type you select will depend on what type of file is required by the program that will consume the exported data.

5. Click Save As



6. Specify where you want to save the file.

7. Click Save.



A dialog box appears stating that some of the workbook features may be lost.

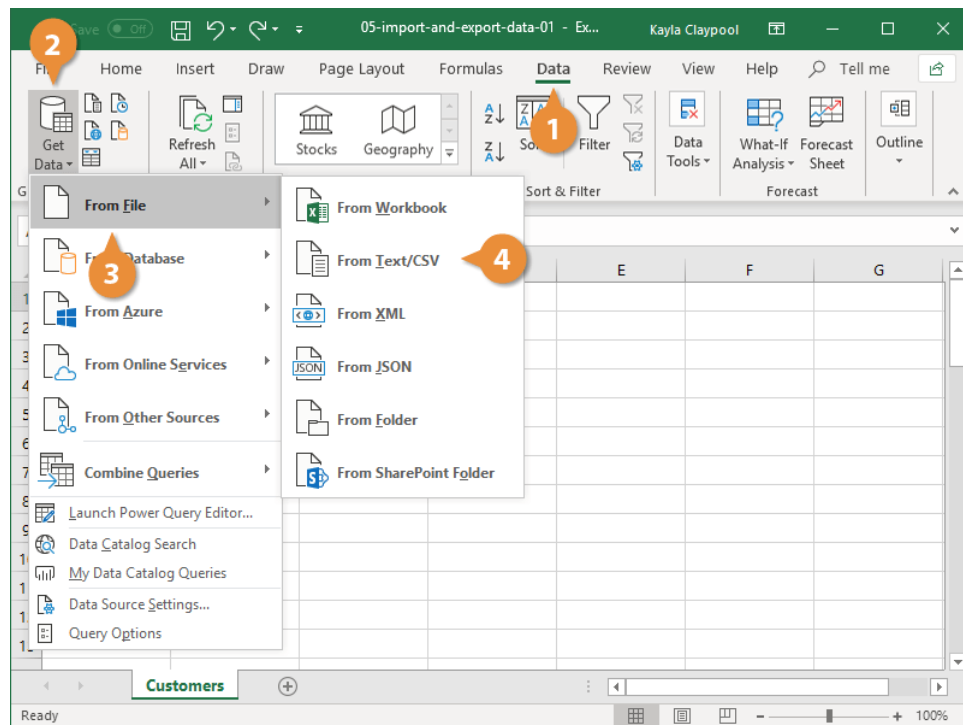
8. Click Yes.

Importing Data: Excel can import data from external data sources including other files, databases, or web pages.

1. Click the Data tab on the Ribbon..
2. Click the Get Data button.

Tip: Some data sources may require special security access, and the connection process can often be very complex. Enlist the help of your organization’s technical support staff for assistance.

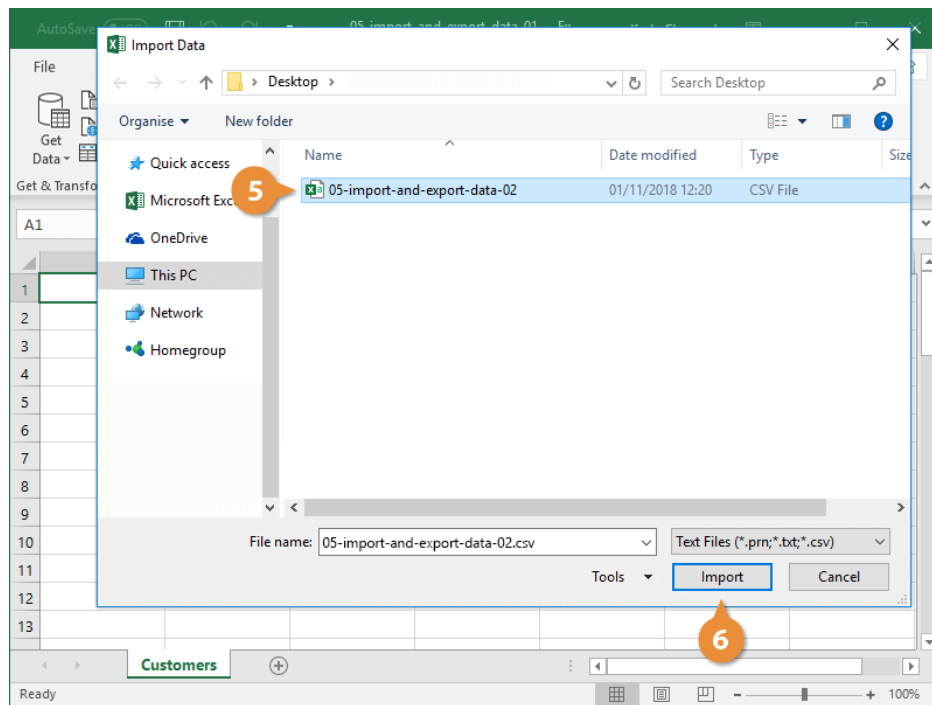
3. Select From File.
4. Select From Text/CSV.



If you have data to import from Access, the web, or another source, select one of those options in the Get External Data group instead.

5. Select the file you want to import.
6. Click **Import**.

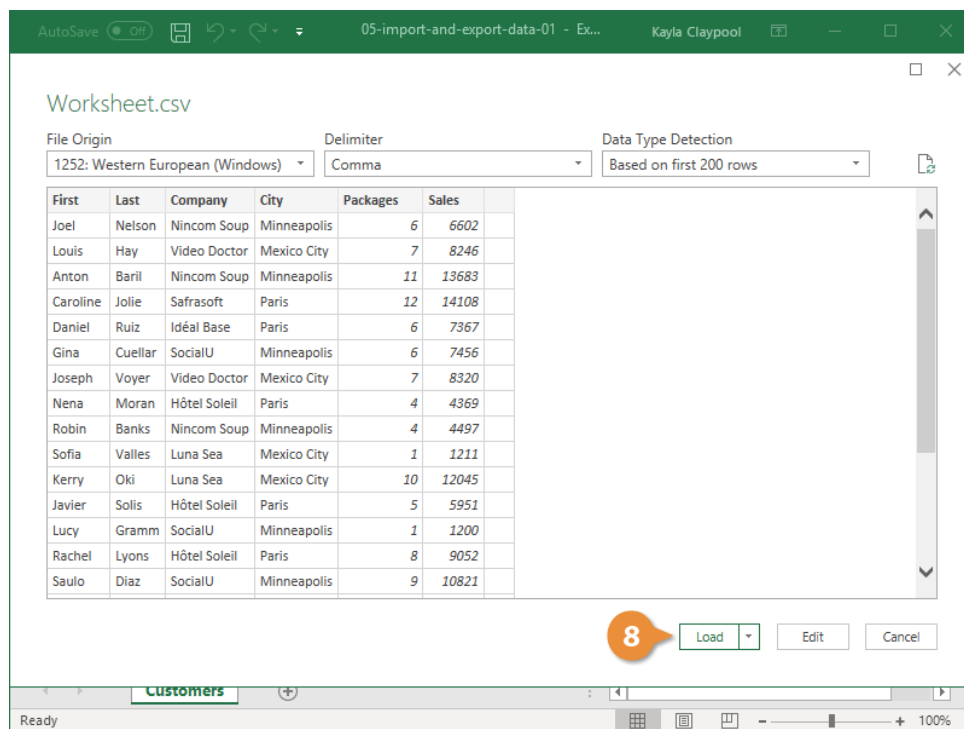
If, while importing external data, a security notice appears saying that it is connecting to an external source that may not be safe, click **OK**.



7. Verify the preview looks correct.

Because we've specified the data is separated by commas, the delimiter is already set. If you need to change it, it can be done from this menu.

8. Click **Load**.



LAP TEST-3	Performance Test
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Name.....ID.....

Date.....

Time started: Time finished:.....

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **1** hour. The project is expected from each student to do it.

Task-1: Import data

Task-2: Export data

Operation Sheet-3

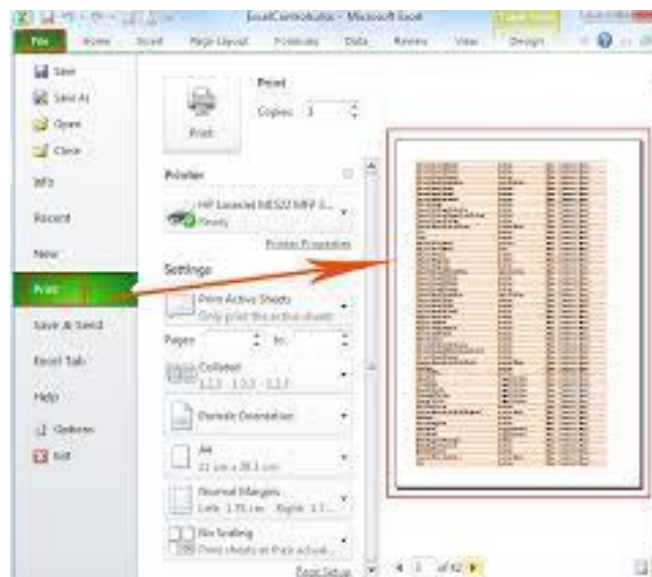
3.2. Techniques/Procedures/Methods of previewing, adjusting and printing spreadsheet

A. Tools and equipments: The tools and equipment required for previewing, adjusting, and printing a spreadsheet in a spreadsheet are as follows:

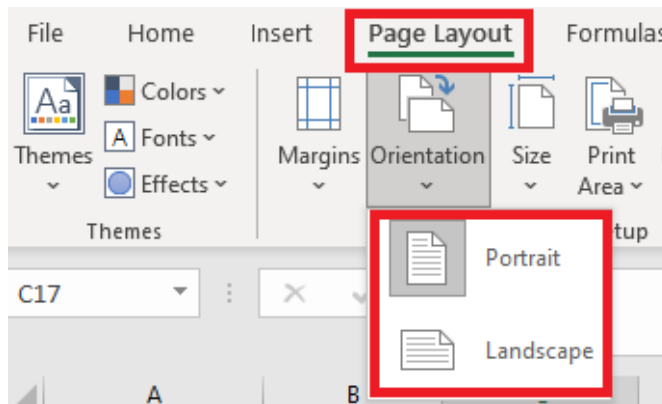
- Computer
- Spreadsheet software: Microsoft Excel, Google Sheets, or Apple Numbers
- Printer
- Printer driver
- Paper
- Ink or toner
- Print preview feature
- Page layout tools
- Print options
- Internet connectivity
- Scanner
- Backup storage

B. Procedures/Steps/Techniques: Here are the general procedures and methods for previewing, adjusting, and printing a spreadsheet:

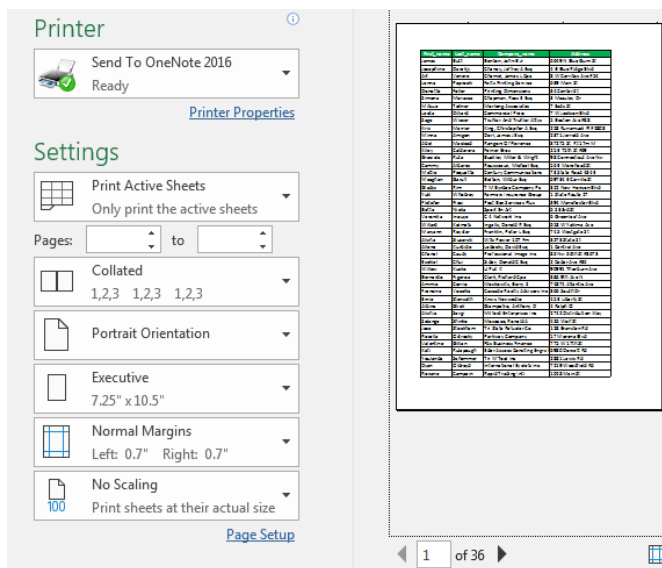
1. Previewing the Spreadsheet



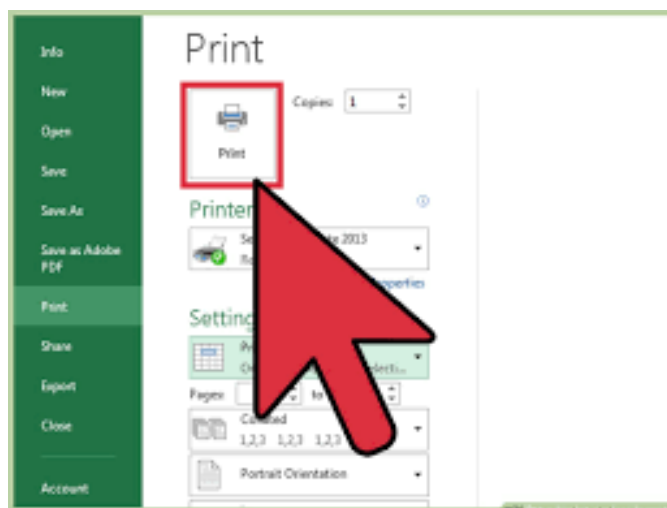
2. Adjusting the Page Layout



3. Setting Print Options



4. Printing the Spreadsheet



5. Check the Printed Output

LAP TEST-2	Performance Test
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Name.....ID.....

Date.....

Time started: Time finished:.....

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **1** hour. The project is expected from each student to do it.

Task-1: Preview the Spreadsheet

Task-2: Adjust the Page Layout

Task-3: Set Print Options

Task-4: Print the Spreadsheet

Task-5: Check the Printed Output

LG #26

LO #4-Represent numerical data in graphic form

Instruction Sheet 4

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Determining style of graph to meet specified requirements and spreadsheet data is manipulated if necessary to suit graph requirements.
- Creating graphs with labels and titles from numerical data contained in a spreadsheet file.
- Saving, viewing and printing graph within designated timelines.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Determine style of graph to meet specified requirements and spreadsheet data is manipulated if necessary to suit graph requirements.
- Create graphs with labels and titles from numerical data contained in a spreadsheet file.
- Save, view and print graph within designated timelines.

Learning Instructions:

- Read the specific objectives of this Learning Guide.
- Follow the instructions described below.
- Read the information written in the information Sheets
- Accomplish the Self-checks

Information Sheet 4

4.1. Determining style of graph and manipulating spreadsheet data

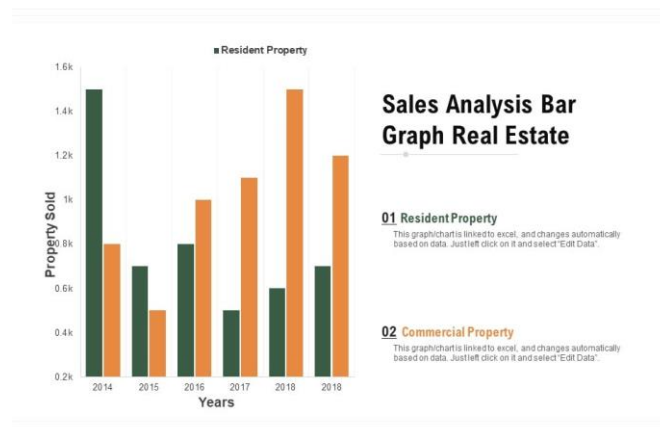
4.1.1. Determining style of graph

Determining the style of graph to use depends on the type of data you are presenting and the message you want to convey. Here are some common types of graphs and when to use them:

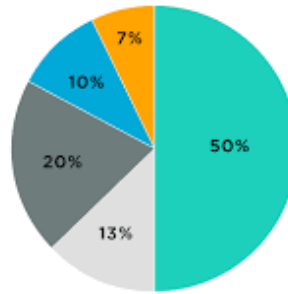
- Line graph: A line graph is used to show trends over time. It is useful for showing how a variable change over a period of time, such as stock prices or temperature changes.



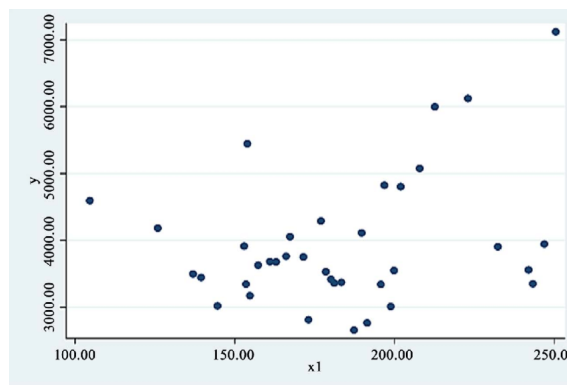
- Bar graph: A bar graph is used to compare different categories of data. It is useful for showing how different variables compare to each other, such as sales figures for different products.



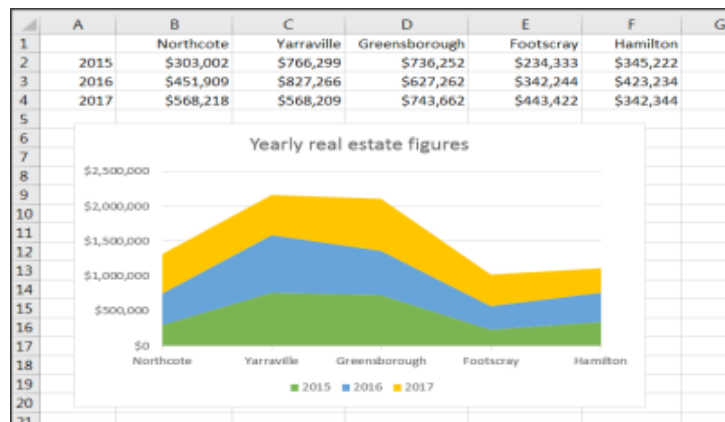
- Pie chart: A pie chart is used to show how a whole is divided into parts. It is useful for showing the relative sizes of different categories, such as the percentage of a budget spent on different expenses.



- Scatter plot: A scatter plot is used to show the relationship between two variables. It is useful for showing how two variables are related to each other, such as the relationship between height and weight.



- Area chart:** Area charts can be used to demonstrate changes over time. For instance, they may be used to compare changes to sales over the past 12 months. The following example shows how yearly real estate sales figures vary for different outlets.



When choosing a graph style, it's important to consider the type of data you are presenting and the message you want to convey. By selecting the appropriate graph style, you can ensure that your data is presented in a clear and effective way.

4.1.2. Manipulating spreadsheet data

Data Manipulation refers to the process of modifying, transforming, and restructuring data to make it more useful for a specific purpose. It is the process of organizing or arranging data in order to make it easier to interpret. It involves various operations such as filtering, sorting, aggregating, joining, and cleaning data. It is an important step in data analysis and is used to extract insights and information from raw data. It involves using software tools and programming languages to transform data into a format that is suitable for analysis, visualization, and reporting. Some common operations for manipulating spreadsheet data include:

1. Sorting: Arranging data in a specific order based on one or more columns. This can be useful for identifying trends or patterns in the data.
2. Filtering: Selecting specific data based on certain criteria, such as values within a certain range or specific text strings. This can help to isolate specific subsets of data for analysis.
3. Pivot tables: Creating summary tables that display aggregated data based on specific criteria. This can be useful for summarizing large amounts of data and identifying trends or patterns.
4. Formulas and functions: Performing calculations on the data based on specific conditions or criteria. This can be useful for performing complex calculations or analyzing data based on specific rules or conditions.
5. Charting: Creating visual representations of the data in the form of charts or graphs. This can help to identify trends or patterns in the data and communicate findings to others.

To manipulate spreadsheet data, it is important to have a solid understanding of the spreadsheet software being used, as well as the specific operations and functions that are available. Many spreadsheet programs, such as Microsoft Excel or Google Sheets, offer a wide range of built-in tools and functions for manipulating data. Additionally, there are many online resources and tutorials available that can help users learn more about manipulating spreadsheet data and using specific tools and functions.

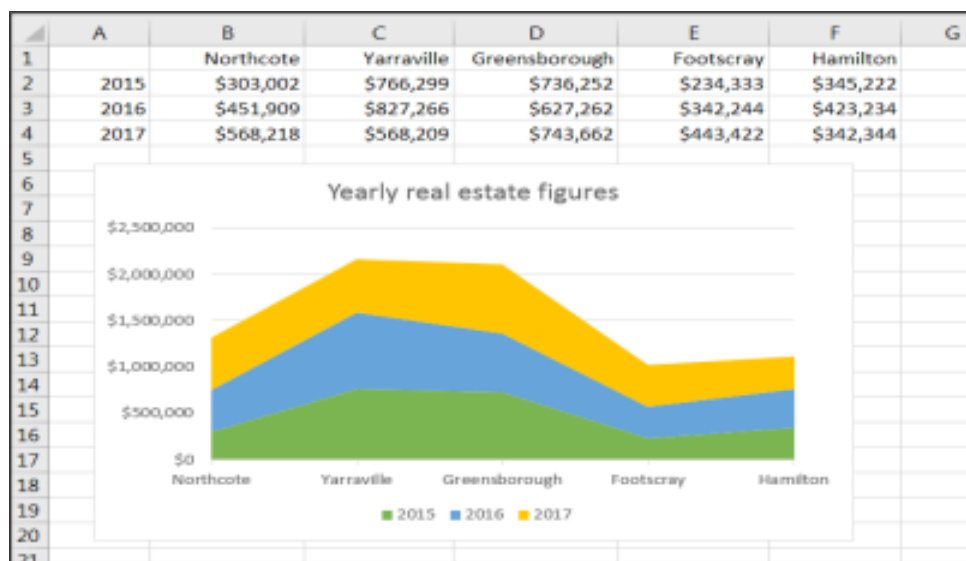
4.2. Creating graphs and titles from numerical data

Here are the general steps to create graphs with labels and titles from numerical data contained in a spreadsheet file:

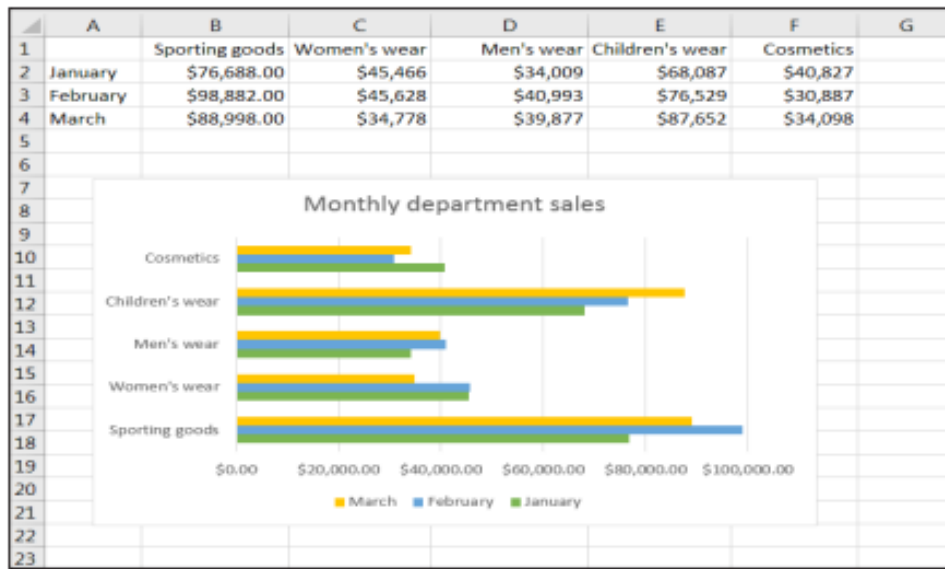
1. Open the spreadsheet file: Open the spreadsheet file that contains the numerical data that you want to visualize as a graph.
2. Select the data: Select the numerical data that you want to use to create the graph. This can be done by clicking and dragging over the cells that contain the data.
3. Insert the graph: In Excel, go to the "Insert" tab and choose the chart type you want to use from the chart options. In Google Sheets, go to the "Chart" tab and choose the chart type you want to use from the chart options.
4. Customize the graph: Customize the graph as desired by adding titles, labels, and legends. You can also adjust the axis scales and formatting to make the graph easier to read.
5. Save and export the graph: Save the graph and export it as an image file, such as a PNG or JPEG, so that you can share it with others.

Overall, creating graphs with labels and titles from numerical data contained in a spreadsheet file involves selecting the data, inserting the graph, customizing it, and saving and exporting the graph as an image file. By following these steps, you can create effective and informative graphs that help to visualize numerical data in a meaningful way.

A. Area chart

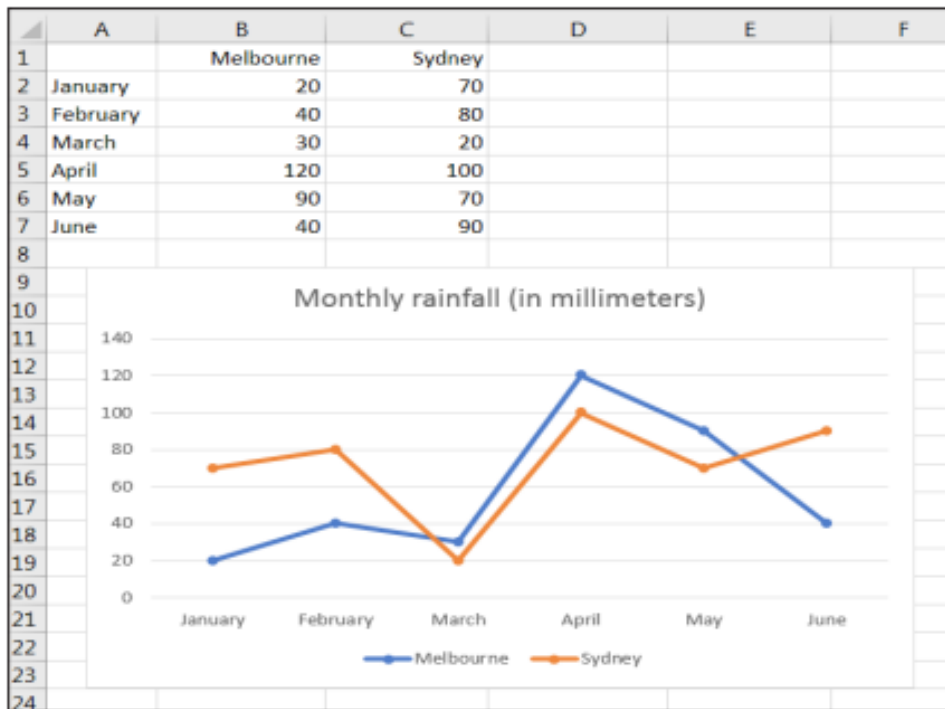


B. Bar charts



If you prefer the 3D look for your pie chart, choose 3D when making your chart selection.

C. Line chart



If you have selected the chart object, the data will not be displayed in print preview, only the chart. Excel assumes that if you have selected the chart, that is all you want to print. If you want to preview both the data and the chart, ensure the worksheet is active and not just the chart. If the chart is a separate sheet in the workbook and not an object with data, to preview the chart you

will need to select the worksheet that it is contained in. The default option for print preview is to preview only the current worksheet in view. If you want to view the entire workbook, you need to select all worksheets. To do this, hold down the Ctrl key and click on each worksheet before viewing print preview. Be careful if you are selecting multiple worksheets. If you have a number of worksheets active at one time, any data that you alter and input will be repeated on all of the selected worksheets. To deactivate multiple selected worksheets, simply click on one worksheet, which will become the active worksheet.

4.3.Saving, viewing and printing graphs

Saving, viewing, and printing a graph can be done using the software or tool you used to create the graph. Here are some general steps you can follow:

Saving a graph:

1. Click on the "File" menu and select "Save" or "Save As".
2. Choose the location where you want to save the graph.
3. Give the graph a descriptive name and select the file format you want to save it in (e.g. PNG, JPEG, PDF, etc.).
4. Click "Save" to save the graph.

Viewing a graph:

1. Open the file where the graph is saved.
2. Double-click on the file to open it in the software or tool you used to create the graph.
3. The graph should be displayed on the screen.

Printing a graph:

1. Click on the "File" menu and select "Print".
2. Choose the printer you want to use and select any printing options you want to use (e.g. color or black and white, paper size, etc.).
3. Click "Print" to print the graph.

Note that the specific steps for saving, viewing, and printing a graph may vary depending on the software or tool you used to create the graph.

Self-check 4	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Choose the best answer (4 point)

6. Which one of the following is used to show the relationship between two variables?
 - A. Scatter plot
 - B. Pie chart
 - C. Line graph
 - D. Area chart
7. _____ involves performing various operations on the data in a spreadsheet to analyze, organize, or transform it.
 - A. Manipulating spreadsheet
8. Some common operations for manipulating spreadsheet data include:
 - A. Sorting
 - B. Filtering
 - C. Pivot tables
 - D. Formulas and functions
 - E. Charting

Test II: Short Answer Questions

1. Define data manipulation
2. What are the different styles of graphs?

You can ask you teacher for the copy of the correct answers.

LG #27

LO #5-Maintain Required Data

Instruction Sheet 5

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Checking formats based on organizational quality standard.
- Reviewing data clearing based on organizational quality standard
- Approving the data.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Check formats based on organizational quality standard.
- Review data clearing based on organizational quality standard
- Approve the data.

Learning Instructions:

- Read the specific objectives of this Learning Guide.
- Follow the instructions described below.
- Read the information written in the information Sheets
- Accomplish the Self-checks

Information Sheet 5

5.1. Checking spreadsheets formats

Formats in a spreadsheet refer to the way data is displayed in cells. Formatting can be used to make data easier to read and understand, and to highlight important information. Here are some common formats used in spreadsheets:

- **Number format:** Number formats tell your spreadsheet exactly what type of data you're using, like percentages (%), currency (\$), times, dates, and so on.
- **Date format:** This format is used to display dates in a specific way, such as with the month spelled out or with the year displayed in two digits or four digits. DD/MM/YY, YY/MM/DD, Month D, Yr, M/D/YY.
- **Text format:** This format is used to display text in a cell, such as a label or a title. Some common text formats include: Font (such as Arial, Times New Roman), Size, Color, Style, Alignment and Wrap Text.
- **Percentage format:** This format is used to display numbers as percentages, such as when showing the percentage of sales for a particular product. Some of the most common types of percentage format include: Percentage with no decimal places, Percentage with one decimal place, Percentage with two decimal places, Accounting percentage, Fraction, and Scientific notation.
- **Conditional formatting:** This format is used to highlight cells that meet certain criteria, such as cells that contain a certain value or cells that are above or below a certain threshold. There are several types of conditional formatting that can be applied to cells, including: Highlight Cells Rules, data bars, color scales, icon sets and Conditional Formatting based on formulas.
- **Color format:** This format is used to change the color of cells, such as to highlight important information or to make data easier to read. Here are some of the most common color formats: RGB, Hexadecimal, CMYK, HSL and Grayscale.


By using different formats in a spreadsheet, you can make data more visually appealing and easier to understand.

Checking formats based on organizational quality standards involves ensuring that the formats used in a spreadsheet meet the requirements and guidelines set by the organization. Here are some steps you can follow to check formats based on organizational quality standards:

- Review the organizational quality standards: Check the guidelines and requirements set by the organization for formatting in spreadsheets. This may include guidelines for font size, font type, color schemes, and other formatting elements.
- Check the spreadsheet formats: Review the formats used in the spreadsheet to ensure they meet the organizational quality standards. This may involve checking the font size, font type, color schemes, and other formatting elements to ensure they are consistent with the organizational guidelines.
- Make necessary changes: If the formats used in the spreadsheet do not meet the organizational quality standards, make the necessary changes to bring them into compliance. This may involve changing font sizes, font types, color schemes, and other formatting elements to meet the organizational guidelines.
- Test the spreadsheet: Once the necessary changes have been made, test the spreadsheet to ensure that it meets the organizational quality standards. This may involve reviewing the spreadsheet with other team members or stakeholders to ensure that it is easy to read and understand.

By checking formats based on organizational quality standards, you can ensure that your spreadsheet meets the requirements and guidelines set by the organization, and that it is easy to read and understand for all stakeholders.

Excel allows you to set certain cells to accept only a certain data format that you specify. You can prompt the user with guidelines about the proper way to enter their data. You can even specify that data must fall in a certain data range if you wish. When data entered does not match your specifications, Excel will display an Error Alert that will prompt the user to try again with the correct format.

Time In	10:00 a.m.	Total Hours		Total Hours		Total Hours	
Time Out	<div> Incorrect Time Format <div>×</div> <div>  Time should be entered in the following format: 12:00 AM </div> <div> <input type="button" value="Retry"/> <input type="button" value="Cancel"/> <input type="button" value="Help"/> </div> </div>						
Time In							

5.2.Reviewing data clearing

When using data, most people agree that your insights and analysis are only as good as the data you are using. Essentially, garbage data in is garbage analysis out. Data cleaning, also referred to as data cleansing and data scrubbing, is one of the most important steps for your organization if you want to create a culture around quality data decision-making.

Data cleaning is the process of fixing or removing incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset. When combining multiple data sources, there are many opportunities for data to be duplicated or mislabeled. If data is incorrect, outcomes and algorithms are unreliable, even though they may look correct. There is no one absolute way to prescribe the exact steps in the data cleaning process because the processes will vary from dataset to dataset. But it is crucial to establish a template for your data cleaning process so you know you are doing it the right way every time.

While the techniques used for data cleaning may vary according to the types of data your company stores, you can follow these basic steps to map out a framework for your organization.

Step 1: Remove duplicate or irrelevant observations: Remove unwanted observations from your dataset, including duplicate observations or irrelevant observations. Duplicate observations will happen most often during data collection. When you combine data sets from multiple places, scrape data, or receive data from clients or multiple departments, there are opportunities to create duplicate data. De-duplication is one of the largest areas to be considered in this process. Irrelevant observations are when you notice observations that do not fit into the specific problem you are trying to analyze. For example, if you want to analyze data regarding millennial customers, but your dataset includes older generations, you might remove those irrelevant

observations. This can make analysis more efficient and minimize distraction from your primary target-as well as creating a more manageable and more performant dataset.

Step 2: Fix structural errors: Structural errors are when you measure or transfer data and notice strange naming conventions, typos, or incorrect capitalization. These inconsistencies can cause mislabeled categories or classes. For example, you may find “N/A” and “Not Applicable” both appear, but they should be analyzed as the same category.

Step 3: Filter unwanted outliers: Often, there will be one-off observations where, at a glance, they do not appear to fit within the data you are analyzing. If you have a legitimate reason to remove an outlier, like improper data-entry, doing so will help the performance of the data you are working with. However, sometimes it is the appearance of an outlier that will prove a theory you are working on. Remember: just because an outlier exists, doesn’t mean it is incorrect. This step is needed to determine the validity of that number. If an outlier proves to be irrelevant for analysis or is a mistake, consider removing it.

Step 4: Handle missing data: You can’t ignore missing data because many algorithms will not accept missing values. There are a couple of ways to deal with missing data. Neither is optimal, but both can be considered.

- As a first option, you can drop observations that have missing values, but doing this will drop or lose information, so be mindful of this before you remove it.
- As a second option, you can input missing values based on other observations; again, there is an opportunity to lose integrity of the data because you may be operating from assumptions and not actual observations.
- As a third option, you might alter the way the data is used to effectively navigate null values.

Step 5: Validate and QA: At the end of the data cleaning process, you should be able to answer these questions as a part of basic validation:

- Does the data make sense?
- Does the data follow the appropriate rules for its field?
- Does it prove or disprove your working theory, or bring any insight to light?

- Can you find trends in the data to help you form your next theory?
- If not, is that because of a data quality issue?

False conclusions because of incorrect or “dirty” data can inform poor business strategy and decision-making. False conclusions can lead to an embarrassing moment in a reporting meeting when you realize your data doesn’t stand up to scrutiny. Before you get there, it is important to create a culture of quality data in your organization. To do this, you should document the tools you might use to create this culture and what data quality means to you.

Characteristics of quality data

- **Validity.** The degree to which your data conforms to defined business rules or constraints.
- **Accuracy.** Ensure your data is close to the true values.
- **Completeness.** The degree to which all required data is known.
- **Consistency.** Ensure your data is consistent within the same dataset and/or across multiple data sets.
- **Uniformity.** The degree to which the data is specified using the same unit of measure.

Advantages and benefits of data cleaning

Having clean data will ultimately increase overall productivity and allow for the highest quality information in your decision-making. Benefits include:

- Removal of errors when multiple sources of data are at play.
- Fewer errors make for happier clients and less-frustrated employees.
- Ability to map the different functions and what your data is intended to do.
- Monitoring errors and better reporting to see where errors are coming from, making it easier to fix incorrect or corrupt data for future applications.
- Using tools for data cleaning will make for more efficient business practices and quicker decision-making.

5.3.Approving the data

Approving spreadsheet data involves verifying that the data in the spreadsheet is accurate, complete, and meets the requirements of the organization. Here are some points you can follow to approve spreadsheet data:

- **Review the data:** Take a close look at the data in the spreadsheet to ensure that it is complete and accurate. Check for any missing or incorrect data, and make sure that all calculations are correct.
- **Verify the sources:** Check the sources of the data to ensure that they are reliable and trustworthy. If necessary, verify the data with the original sources to ensure that it is accurate.
- **Check for consistency:** Ensure that the data is consistent throughout the spreadsheet. Check that the formatting, units of measurement, and other details are consistent across all cells and sheets.
- **Review the formulas:** Check the formulas used in the spreadsheet to ensure that they are correct and up-to-date. Make sure that all formulas are working correctly and that they are using the correct data.
- **Test the spreadsheet:** Test the spreadsheet by running simulations or scenarios to ensure that it is working as expected. This can help you identify any errors or issues that need to be addressed.
- **Get approval:** Once you are satisfied that the data in the spreadsheet is accurate and complete, get approval from the relevant stakeholders or team members. This may involve sharing the spreadsheet with others and getting their feedback and approval.

By following these steps, you can ensure that the data in your spreadsheet is accurate, complete, and meets the requirements of the organization. This can help you make informed decisions based on reliable data.

Self-check 5	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Choose the best answer (4 point)

- _____ in a spreadsheet refer to the way data is displayed in cells.
 - Formats
 - Value
 - Rows
 - Columns
- Which format is used to change the color of cells, such as to highlight important information or to make data easier to read.
 - Color format
 - Percentage format
 - Number format
 - Text format
- _____ is the process of fixing or removing incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset.
 - Data cleaning
 - Data entry
 - Data output
 - Data formats
- One of the following is not characteristics of quality data
 - Validity
 - Accuracy
 - Completeness
 - Inconsistency
- Some points you can follow to approve spreadsheet data are
 - Review the data
 - Verify the sources
 - Check for consistency
 - Review the formulas

Test II: Short Answer Questions

- What is data cleaning?
- List the major spreadsheet data format?

You can ask you teacher for the copy of the correct answers.

LG 28

LO #6-Complete documentation

Instruction Sheet 6

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Recording information on quality and other indicators of service performance.
- Recording all service processes and outcomes.
- Preparing and compiling report

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Record information on quality and other indicators of service performance.
- Record all service processes and outcomes.
- Prepare and compile report

Learning Instructions:

- Read the specific objectives of this Learning Guide.
- Follow the instructions described below.
- Read the information written in the information Sheets
- Accomplish the Self-checks

Information Sheet 6

6.1. Recording information on quality

Recording information on quality and other indicators of service performance is an important part of monitoring and improving service delivery. Here are some steps you can follow to record this information:

- Identify the indicators: Identify the quality and other indicators that are important for measuring service performance. These may include customer satisfaction, response time, error rates, and other metrics that are relevant to your organization.
- Define the metrics: Define the metrics for each indicator, including how they will be measured and what data will be collected. This may involve setting up data collection systems, such as surveys, feedback forms, or automated tracking tools.
- Collect the data: Collect the data on a regular basis, according to the defined metrics. This may involve setting up automated data collection systems or manually collecting data from various sources.
- Record the data: Record the data in a spreadsheet or database, using a consistent format and structure. This will make it easier to analyze and report on the data over time.
- Analyze the data: Analyze the data to identify trends, patterns, and areas for improvement. This may involve using statistical analysis tools or visualizations to help you understand the data.
- Report on the data: Report on the data to stakeholders, such as management, staff, or customers. This may involve creating dashboards, reports, or presentations that summarize the data and highlight key insights.

By following these steps, you can record information on quality and other indicators of service performance, and use this information to monitor and improve service delivery over time.

6.2. Recording service processes and outcomes

Recording all service processes and outcomes in a spreadsheet can help you keep track of important information and identify areas for improvement. Here are some steps you can follow to record this information:

- **Identify the processes and outcomes:** Identify the service processes and outcomes that are important for your organization. This may include customer interactions, service requests, response times, and other metrics that are relevant to your business.
- **Define the data fields:** Define the data fields that you will use to record the information in the spreadsheet. This may include fields for customer name, service request type, date and time of service, and other relevant information.
- **Set up the spreadsheet:** Set up the spreadsheet with the defined data fields, using a consistent format and structure. This will make it easier to record and analyze the data over time.
- **Record the data:** Record the data in the spreadsheet on a regular basis, using a consistent process. This may involve manually entering data or using automated data collection tools.
- **Analyze the data:** Analyze the data in the spreadsheet to identify trends, patterns, and areas for improvement. This may involve using statistical analysis tools or visualizations to help you understand the data.
- **Use the data to improve service delivery:** Use the insights gained from the data to improve service delivery processes and outcomes. This may involve making changes to service delivery processes, training staff, or implementing new technologies.

By following these steps, you can record all service processes and outcomes in a spreadsheet, and use this information to monitor and improve service delivery over time.

6.3.Preparing and compiling report

Preparing and compiling a report in a spreadsheet can help you present information in a clear and organized way. Here are some steps you can follow to prepare and compile a report in a spreadsheet:

- **Define the purpose of the report:** Define the purpose of the report and the audience it is intended for. This will help you determine what information to include and how to present it.
- **Identify the data sources:** Identify the data sources that you will use to compile the report. This may include data from spreadsheets, databases, or other sources.

- **Organize the data:** Organize the data in the spreadsheet, using a consistent format and structure. This will make it easier to analyze and present the data in the report.
- **Analyze the data:** Analyze the data in the spreadsheet to identify trends, patterns, and insights. This may involve using statistical analysis tools or visualizations to help you understand the data.
- **Create the report:** Create the report in the spreadsheet, using charts, tables, and other visual aids to present the data in a clear and organized way. Make sure to include a summary of the key findings and recommendations for improvement.
- **Review and revise the report:** Review and revise the report to ensure that it is accurate, complete, and meets the needs of the intended audience. This may involve getting feedback from stakeholders or making changes based on new information.

By following these steps, you can prepare and compile a report in a spreadsheet that presents information in a clear and organized way, and provides insights and recommendations for improvement.

Self-check 6	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Test I: Short Answer Questions

3. What are the steps you can follow to record information on quality?
4. What are the steps for Recording service processes and outcomes?

You can ask you teacher for the copy of the correct answers.

Reference Materials

Books

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