Business Analytics with Excel

Formatting, Conditional Formatting, and Important Functions

Learning Objectives

By the end of this lesson, you will be able to:

- Discuss how to use custom formatting to format number and date values
- Illustrate the use of conditional formatting in excel
- Execute logical operations through logical functions
- Find the position and value of required fields using lookup and reference functions
- Classify various statistical functions

A Day in the Life of a Business Analyst

Your company has the monthly sales data of the last ten years and wants a report on which salespeople are doing well and highlight that data. As the data analytics professional of the company, your goal is to consolidate the data required into a single Excel database. This data is scattered in different sheets for different years and regions.

You are also required to analyze the data statistically and report on different criteria.

In this lesson, you will learn a few concepts to achieve the joining data in different files and to format the sales based on some conditions.

DATA AND
ARTIFICIAL INTELLIGENCE

Formatting

Formatting and Functions

Formatting helps format the data using different techniques, making the data easy to read and analyze.

Conditional formatting helps the users to apply formatting to specific cells so that the data makes more sense.

The formatting technique applies to the worksheet to help the users present the data efficiently.

Conditional Formatting

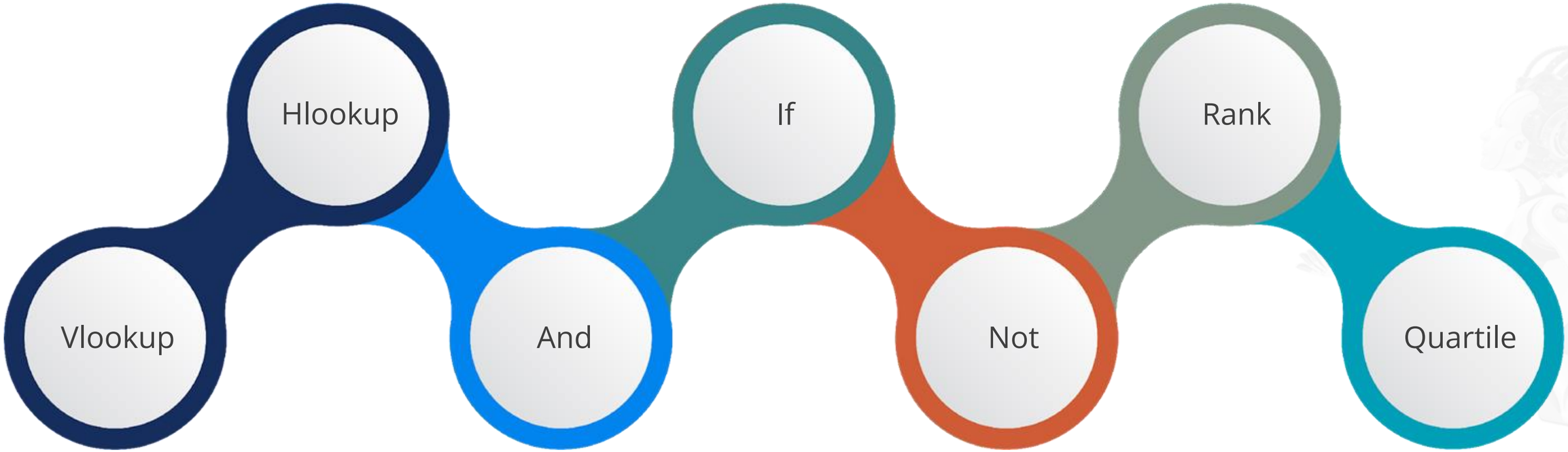
Conditional formatting helps add patterns and trends to the raw information using different colors, icons, and formulas.

Salesman	Sales	
John	$	7,350
Rob	$	5,000
Harry	$	16,680
Martin	$	11,000
Sean	$	5,000
David	$	16,680
Kara	$	25,000
Jonathan	$	7,350
Marry	$	20,955
Nick	$	6,885

Salesman	Sales	
John	↑$	21,000
Rob	↑$	17,172
Harry	↑$	16,680
Martin	↓$	4,246
Sean	↑$	15,430
David	↑$	20,000
Kara	↓$	4,683
Jonathan	↑$	12,026
Marry	↑$	20,955
Nick	→$	6,885

Functions in Excel

Excel provides many logical, statistical, and mathematical functions such as:



Functions in Excel

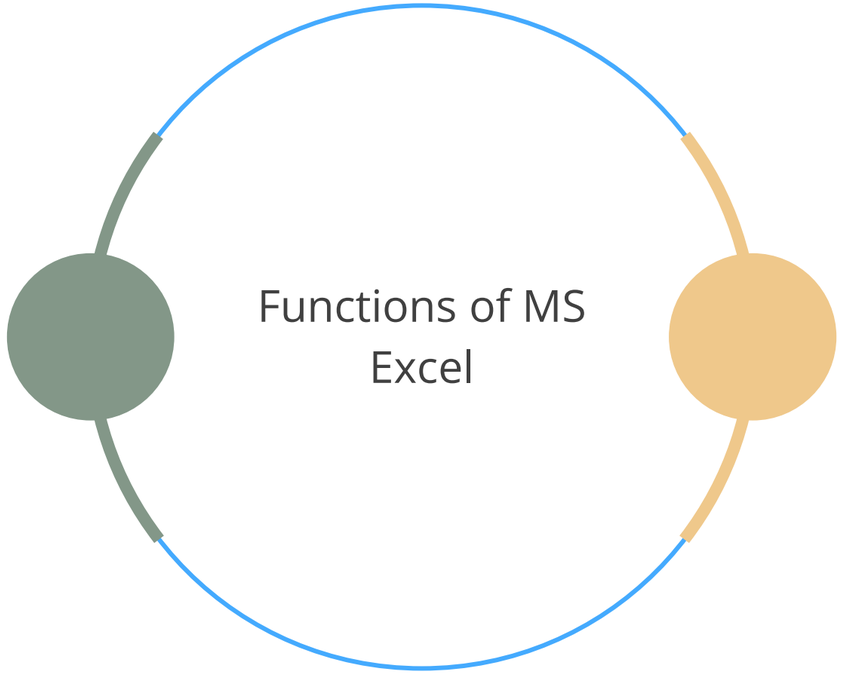
The statistical and mathematical functions help the users to:

Manage data and perform descriptive statistical analysis

Perform calculations ranging from basic to complex scenarios

Formulas

Excel offers a wide range of important formulas that help perform many common tasks.



DATA AND
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Custom Formatting

Assisted Practice: Perform Custom Formatting - Numbers

Problem statement:

Demonstrate how to use custom formatting to format large numbers.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Set conditional formatting on the number column

ASSISTED PRACTICE

Assisted Practice: Perform Custom Formatting - Dates

Problem statement:

Demonstrate how to use custom formatting to format dates.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Apply conditional formatting on the Date column

ASSISTED PRACTICE

DATA AND
ARTIFICIAL INTELLIGENCE

Conditional Formatting

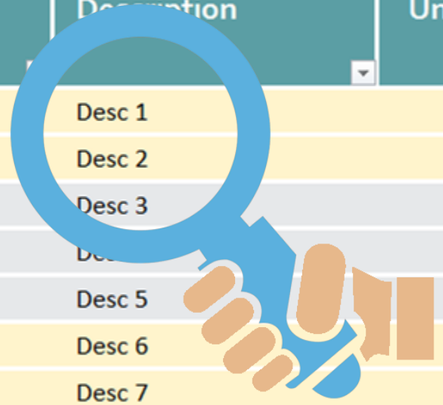
Need for Conditional Formatting

A worksheet may contain thousands of rows of data.

Inventory List

Inventory ID	Name	Description	Unit Price	Quantity in Stock	Inventory Value	Reorder Level	Reorder Time in Days	Q R
IN0001	Item 1	Desc 1	$51.00	25	$1,275.00	29	13	
IN0002	Item 2	Desc 2	$93.00	132	$12,276.00	231	4	
IN0003	Item 3	Desc 3	$57.00	151	$8,607.00	114	11	
IN0004	Item 4	Desc 4	$19.00	186	$3,534.00	158	6	
IN0005	Item 5	Desc 5	$75.00	62	$4,650.00	39	12	
IN0006	Item 6	Desc 6	$11.00	5	$55.00	9	13	
IN0007	Item 7	Desc 7	$56.00	58	$3,248.00	109	7	
IN0008	Item 8	Desc 8	$38.00	101	$3,838.00	162	3	
IN0009	Item 9	Desc 9	$59.00	122	$7,198.00	82	3	

Inventory List



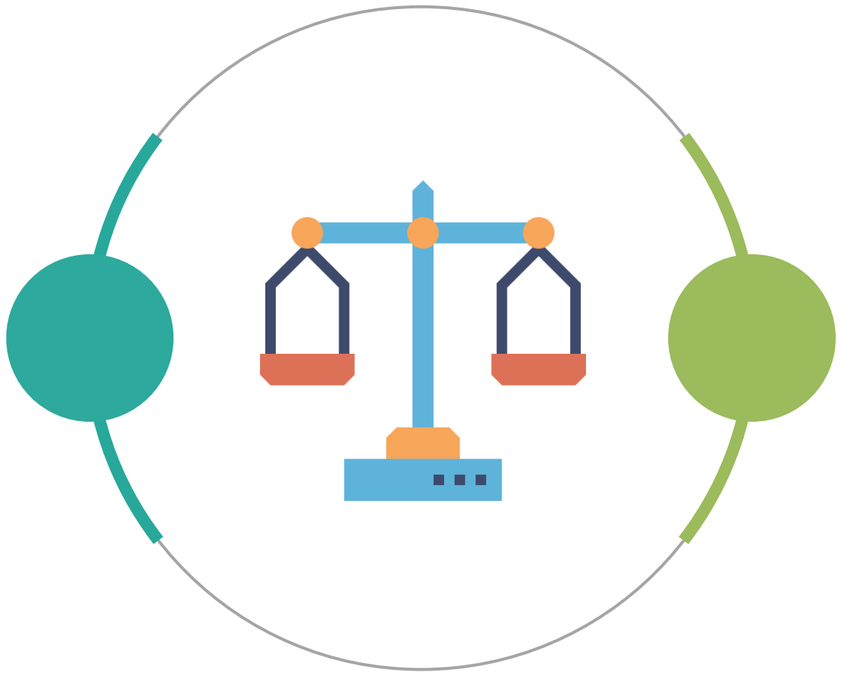
It would be difficult to discern patterns and trends by only examining the raw information.

Conditional Formatting

- It helps visualize data and makes worksheets easier to understand.
- It quickly highlights important information in a spreadsheet by using colors, icons, and data bars.
- It changes the appearance of one or more cells when the cell value meets certain conditions.

Conditional Formatting: Example

If the value is greater than $5000, color the cell yellow.



It is easier to discover which cells have values larger than $5000 by using this rule.

Assisted Practice: Perform Conditional Formatting Highlight Duplicate Values

Problem statement:

Demonstrate how to use conditional formatting to highlight duplicate values.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

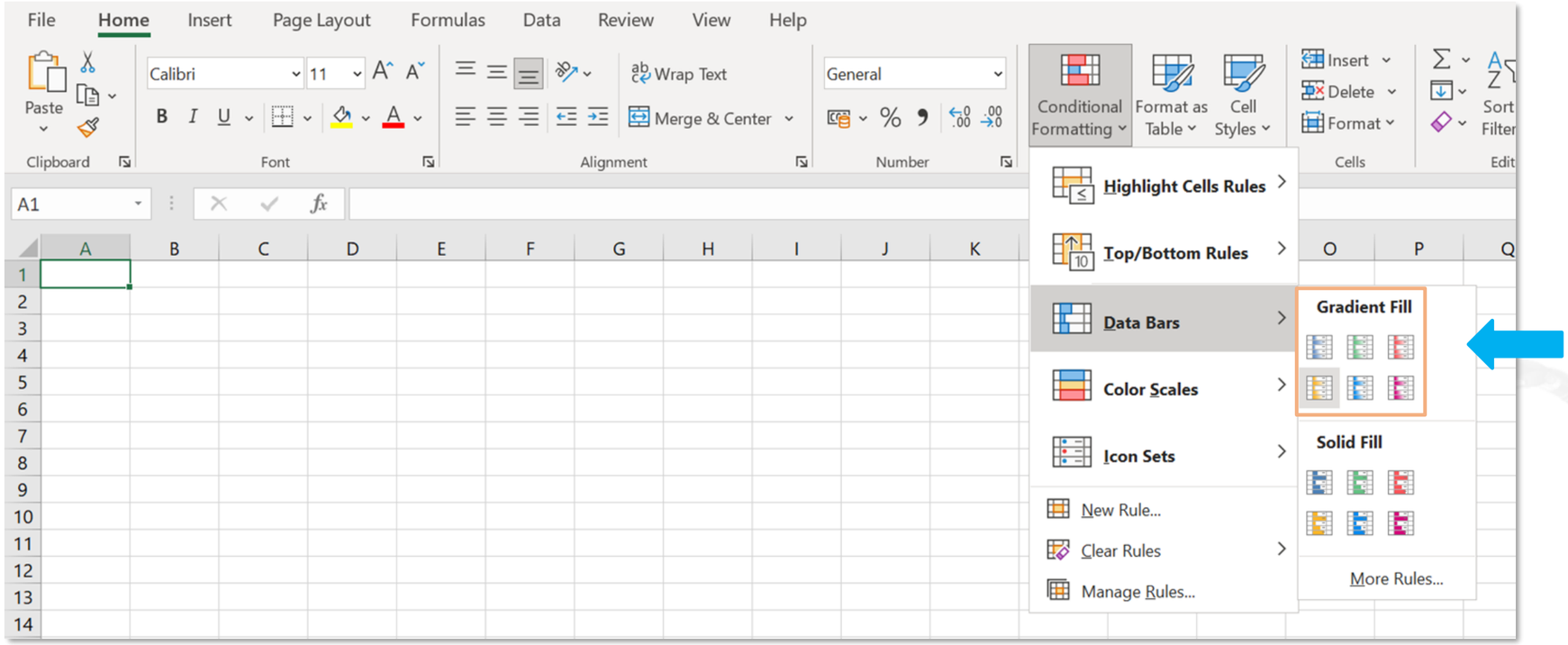
Step 1: Open the Excel file

Step 2: Apply conditional formatting on the Date column

ASSISTED PRACTICE

Conditional Formatting: Presets

Excel provides predefined styles to apply conditional formatting to the data.



Conditional Formatting: Preset Styles

The following are the predefined Excel styles:

Data Bars

These are horizontal bars added to each cell.

Salesperson	May	June	July
Albertson, Kathy	$3,947.00	$557.00	$3,863.00
Allenson, Carol	$4,411.00	$1,042.00	$9,355.00
Altman, Zoey	$2,521.00	$3,072.00	$6,702.00
Bittiman, William	$4,752.00	$3,755.00	$4,415.00
Brennan, Michael	$4,964.00	$3,152.00	$11,601.00
Carlson, David	$2,327.00	$4,056.00	$3,726.00
Collman, Harry	$3,967.00	$4,906.00	$9,007.00
Counts, Elizabeth	$4,670.00	$521.00	$4,505.00
David, Chloe	$3,379.00	$3,428.00	$3,973.00
Davis, William	$5,363.00	$1,562.00	$2,945.00
Dumlao, Richard	$3,275.00	$2,779.00	$7,549.00
Farmer, Kim	$3,860.00	$3,470.00	$3,862.00
Ferguson, Elizabeth	$4,685.00	$1,913.00	$4,596.00
Flores, Tia	$4,052.00	$2,883.00	$2,142.00
Ford, Victor	$5,541.00	$4,931.00	$8,283.00

Color Scales

These change the color of each cell based on its value.

Salesperson	May	June	July
Albertson, Kathy	$3,947.00	$557.00	$3,863.00
Allenson, Carol	$4,411.00	$1,042.00	$9,355.00
Altman, Zoey	$2,521.00	$3,072.00	$6,702.00
Bittiman, William	$4,752.00	$3,755.00	$4,415.00
Brennan, Michael	$4,964.00	$3,152.00	$11,601.00
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Farmer, Kim	$3,860.00	$3,470.00	$3,862.00
Ferguson, Elizabeth	$4,685.00	$1,913.00	$4,596.00
Flores, Tia	$4,052.00	$2,883.00	$2,142.00
Ford, Victor	$5,541.00	$4,931.00	$8,283.00

Icon Sets

These add a specific icon to each cell based on its value.

Salesperson	May	June	July
Albertson, Kathy	$3,947.00	$557.00	$3,863.00
Allenson, Carol	$4,411.00	$1,042.00	$9,355.00
Altman, Zoey	$2,521.00	$3,072.00	$6,702.00
Bittiman, William	$4,752.00	$3,755.00	$4,415.00
Brennan, Michael	$4,964.00	$3,152.00	$11,601.00
Carlson, David	$2,327.00	$4,056.00	$3,726.00
Collman, Harry	$3,967.00	$4,906.00	$9,007.00
Counts, Elizabeth	$4,670.00	$521.00	$4,505.00
David, Chloe	$3,379.00	$3,428.00	$3,973.00
Davis, William	$5,363.00	$1,562.00	$2,945.00
Dumlao, Richard	$3,275.00	$2,779.00	$7,549.00
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Flores, Tia	$4,052.00	$2,883.00	$2,142.00
Ford, Victor	$5,541.00	$4,931.00	$8,283.00

Assisted Practice: Perform Conditional Formatting

Use Icon Set Rules

Problem statement:

Demonstrate how Icon Sets Rules are used.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Apply conditional formatting on the Date column

ASSISTED PRACTICE

Assisted Practice: Perform Conditional Formatting Use Formulas

Problem statement:

Demonstrate how to apply conditional formatting rules with the help of formulas.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Set conditional formatting on Date column

ASSISTED PRACTICE

DATA AND
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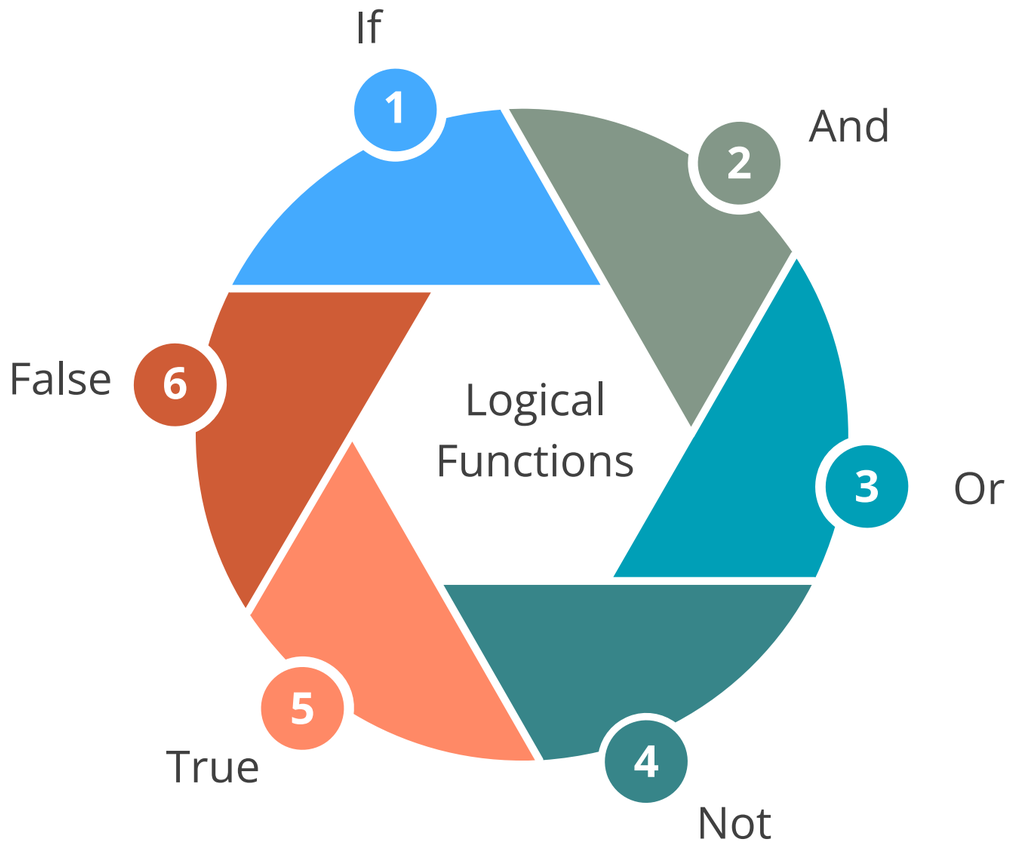
Logical Functions

Logical Functions: Introduction

Logical functions evaluate a cell or cells for criteria and return a Boolean value as True or False.



Assisted Practice: How to use Logical Functions

Problem statement:

Demonstrate how to use Logical Functions in Excel.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Add columns with logical functions in Excel

ASSISTED PRACTICE

DATA AND
ARTIFICIAL INTELLIGENCE

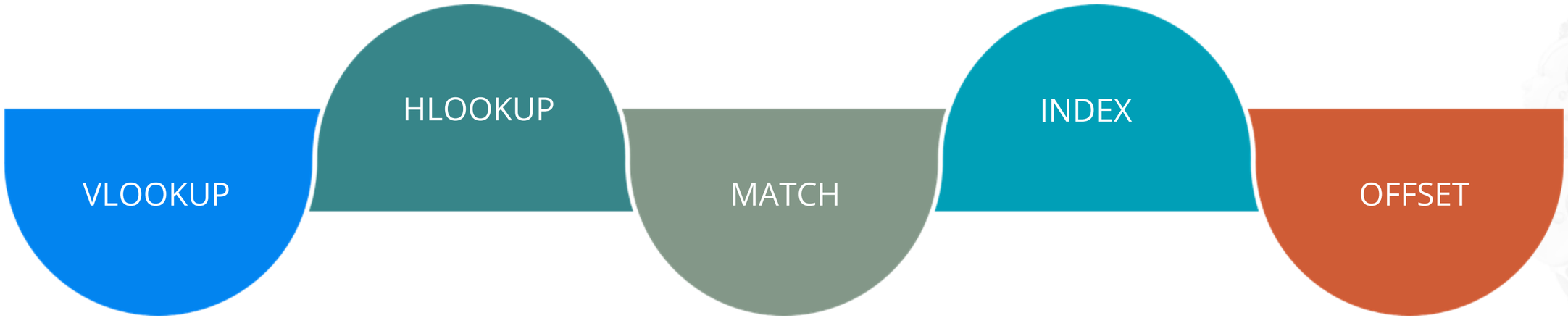
Lookup and Reference Functions

Need for Lookup and Reference Functions

- To look in a single row or column and find a value from the same position in a second row or column
- Lookup & Reference functions help you to work with arrays of data and are particularly useful when you need to cross-reference between different data sets
- They perform tasks such as providing information about a range, returning the location of a given address or value, or looking up specific values

Lookup and Reference Functions: Examples

The following are the examples of lookup and reference functions:



Lookup Functions

The VLOOKUP function lets the user search for specific information in the current worksheet.

If the table is in horizontal format and the user wants to search for specific information, then the HLOOKUP function is used.

Assisted Practice: How to use VLOOKUP Function

Problem statement:

Demonstrate how to use the VLOOKUP Function in Excel.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Use VLOOKUP in Excel

ASSISTED PRACTICE

Assisted Practice: How to use HLOOKUP Function

Problem statement:

Demonstrate how to use the HLOOKUP Function in Excel.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Use HLOOKUP in Excel

ASSISTED PRACTICE

Reference Functions: Types

The following are the types of reference functions:

INDEX Function

It returns a value from a specific position in a specific column in a list.

OFFSET Function

It returns a reference to a range that is a specific number of rows and columns from another range or cell.

MATCH Function

It searches for a specified value or item in a single-dimensional array and then returns the relative position of that item in the array.

Assisted Practice: How to use MATCH Function

Problem statement:

Demonstrate how to use MATCH Function in Excel.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Use MATCH in Excel

ASSISTED PRACTICE

Assisted Practice: How to use INDEX and OFFSET Function

Problem statement:

Demonstrate how to use INDEX and OFFSET Function in Excel.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Use INDEX function in Excel

ASSISTED PRACTICE

DATA AND
ARTIFICIAL INTELLIGENCE

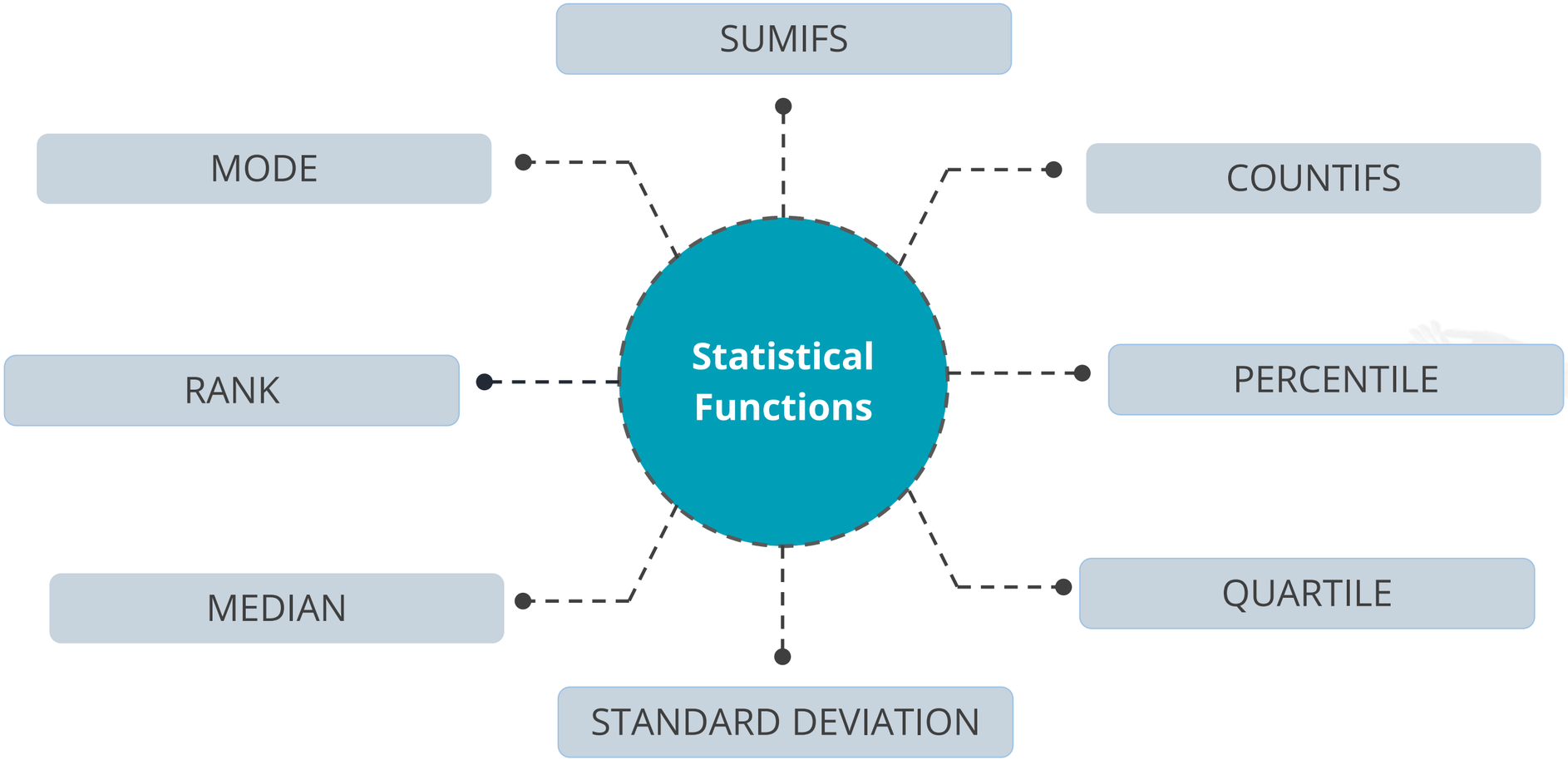
Statistical Functions

Statistical Functions: Introduction

Statistical functions enable users to perform calculations ranging from basic functions to more composite distribution and tests.

Statistical Functions: Types

The following are the types of statistical functions:



Statistical Functions

SUMIFS Function

It calculates the sum of cells based on certain criteria.

COUNTIFS Function

It counts the number of cells in a given range when certain criteria are met.

Assisted Practice: How to use SUMIFS Function

Problem statement:

Demonstrate how to use SUMIFS Function in Excel.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Using SUMIFS function in Excel

ASSISTED PRACTICE

Assisted Practice: How to use COUNTIFS Function

Problem statement:

Demonstrate how to use COUNTIFS Function in Excel.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Using COUNTIFS function in Excel

ASSISTED PRACTICE

Assisted Practice: How to use PERCENTILE and QUARTILE Function

Problem statement:

Demonstrate how to use PERCENTILE and QUARTILE Function in Excel.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Using PERCENTILE function in Excel

Step 3: Using QUARTILE function in Excel

ASSISTED PRACTICE

Statistical Functions

STDEV Function	It is a function to calculate sample standard deviations (STDEV). Standard deviation determines how dispersed the data is from the mean.
MEDIAN Function	It returns the mid-value from the range.
RANK Function	It compares a number to the rest of the numbers in a list in any order and returns the number's rank concerning other values in the list.

Assisted Practice: How to use STDEV, MEDIAN and RANK Function

Problem statement:

Demonstrate how to use STDEV, MEDIAN, and RANK Functions in Excel.

ASSISTED PRACTICE

Assisted Practice Guidelines

Steps to follow:

Step 1: Open the Excel file

Step 2: Using STDEV function in Excel

Step 3: Using MEDIAN function in Excel

Step 4: Using RANK function in Excel

ASSISTED PRACTICE

Key Takeaways

- Custom formatting allows creating custom formats.
- Conditional formatting highlights important information in a spreadsheet by using colors, icons, and data bars.
- Logical functions evaluate a cell or cells for certain criteria and return a Boolean value as True or False.
- The VLOOKUP and HLOOKUP functions search for specific information in the current worksheet.

Key Takeaways

- The Reference Functions INDEX, MATCH, and OFFSET return the relative position and value in a single-dimensional array.
- SUMIFS and COUNTIFS functions perform count and sum based on one or more criteria.
- Excel has built-in statistical functions that help to manage data and perform descriptive statistical analysis.

Knowledge Check

Knowledge Check

1

When an Excel function has more than one argument, _____ separate the arguments in the formula bar.

A. Periods

B. Commas

C. Colons

D. Semicolons

Knowledge Check

1

When an Excel function has more than one argument, _____ separate the arguments in the formula bar.

A. Periods

B. Commas

C. Colons

D. Semicolons

The correct answer is **B**

When an Excel function has more than one argument, commas(,) separate the arguments in the formula bar.

Knowledge Check

2

In an Excel worksheet, what would result from =AVERAGE(A1:A3) if A1=20, A2=20 and A3=50?

A. 40

B. 30

C. 20

D. 60

Knowledge Check

2

In an Excel worksheet, what would result from =AVERAGE(A1:A3) if A1=20, A2=20 and A3=50?

A. 40

B. 30

C. 20

D. 60

The correct answer is **B**

=AVERAGE(A1:A3) would give a result of 30((20 + 20 + 50) / 3).

Knowledge Check 3

Which category in the Format Cells dialog box enables you to convert a large number format into short readable format?

A. Custom

B. Date

C. Special

D. Text

Knowledge Check 3

Which category in the Format Cells dialog box enables you to convert a large number format into short readable format?

A. Custom

B. Date

C. Special

D. Text

The correct answer is **A**

The Format Cells dialog box contains category named “Custom” that enables you to convert a large number format into short readable format.

Knowledge Check

4

If we have duplicate value in lookup__range, then VLOOKUP will return_____ .

A. The last occurrence

B. Many occurrences

C. The sum of all invoice amounts

D. The first occurrence

Knowledge Check

4

If we have duplicate value in lookup__range, then VLOOKUP will return _____ .

A. The last occurrence

B. Many occurrences

C. The sum of all invoice amounts

D. The first occurrence

The correct answer is **D**

If we have duplicate value in lookup_range, then VLOOKUP function will return the first occurrence.

Knowledge Check

5

Which of the following is NOT an argument of the IF function in an Excel worksheet?

A. Logical_test

B. Value_if_false

C. Array_range

D. Value_if_true

Knowledge Check

5

Which of the following is NOT an argument of the IF function in an Excel worksheet?

A. Logical_test

B. Value_if_false

C. Array_range

D. Value_if_true

The correct answer is **C**

Array range is NOT an argument of the IF function in an Excel worksheet.

Knowledge Check

6

Which function is used to make sure that all conditions are true before showing a TRUE answer?

A. =VLOOKUP()

B. =OR()

C. =AND()

D. =IF()

Knowledge Check

6

Which function is used to make sure that all conditions are true before showing a TRUE answer?

A. =VLOOKUP()

B. =OR()

C. =AND()

D. =IF()

The correct answer is **C**

The AND function returns TRUE only if all the conditions are true.

Knowledge Check 7

Which of the following formulas contains the correct syntax (formula arguments) for the VLOOKUP function?

A. =VLOOKUP(lookupvalue, table_array, col_index_num, range_lookup)

B. =VLOOKUP(table_array, lookup_value, col_index_num, range_lookup)

C. =VLOOKUP(lookup_value, table_array, col_index_num, value)

D. =VLOOKUP(lookup_value, table_array, value, range_lookup)

Knowledge Check 7

Which of the following formulas contains the correct syntax (formula arguments) for the VLOOKUP function?

A. =VLOOKUP(lookupvalue, table_array, col_index_num, range_lookup)

B. =VLOOKUP(table_array, lookup_value, col_index_num, range_lookup)

C. =VLOOKUP(lookup_value, table_array, col_index_num, value)

D. =VLOOKUP(lookup_value, table_array, value, range_lookup)

The correct answer is **A**

The correct syntax is =VLOOKUP(lookupvalue, table_array, col_index_num, range_lookup) for the VLOOKUP function.