

# Mastering Advanced Excel

With ChatGPT Integration

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*Learn Formulas and Functions,  
Advance Pivot Tables, Macros, VBA Coding,  
ChatGPT Integration with exercises*

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Ritu Arora



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**Dedicated to**

*My Beloved Father: Mr. Ramesh Dhingra  
A Guiding Light in My Excel Journey*

## About the Author

**Ritu Arora**, the dynamo of delight, with her contagious laughter, she shines so bright. Her training sessions are never a bore, she adds a touch of fun that leaves you wanting more. In the world of Excel and Power BI, she's a star, but it's her cheerful spirit that sets her apart by far!

She is a highly skilled and experienced Microsoft Certified Trainer specializing in Power BI, Excel, PowerPoint, G Suite, and ChatGPT. With over 20 years of corporate training experience, including international assignments, Ritu has successfully trained over 70000 individuals in corporates like DDFS, EY, RateGain, LG, IIMs, SMBC, Ericsson, HCL, Tata Advanced Systems, BPCL, Nestle, Citibank, Adidas, Hero Honda and so on. Her expertise, excellent communication skills, and ability to tailor training programs to specific needs have made her a sought-after corporate trainer.



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## Preface

Welcome to my book! In this comprehensive guide, we will explore the powerful trio of Excel, **Visual Basic for Applications (VBA)**, and ChatGPT. These tools combine the strength of data analysis, automation, and conversational AI to empower you in the realm of information processing and decision-making.

Throughout these pages, you will be provided with practical knowledge, hands-on examples, and step-by-step instructions to master Excel's data manipulation capabilities, unlock the potential of VBA for automation and customization, and delve into the world of ChatGPT for natural language interactions.

Whether you are a beginner seeking to understand the basics or an experienced user looking to enhance your skills, this book will serve as your roadmap to excel in these domains. It will guide you through the fundamentals of Excel, introduce you to the world of VBA programming, and show you how to integrate ChatGPT into your applications for dynamic and intelligent conversations.

By the end of this book, you will have the knowledge and confidence to leverage the combined power of Excel, VBA, and ChatGPT to streamline your workflows, automate repetitive tasks, and engage in intelligent data-driven conversations.

Join me on this exciting journey as we explore the endless possibilities of Excel, VBA, and ChatGPT. Let us unlock your potential and revolutionize your approach to data processing and analysis. Here is a brief look at the various chapters.

**Chapter 1: Overview of Excel 2021** – provides an overview of Microsoft Excel 2021. It introduces the new sleek interface and explores the different components of the Excel window. The chapter highlights the ability to save and share files online, along with the option to customize the ribbon and change default settings. It also covers formatting tables, using the paste special preview feature, and leveraging flash fills for efficient data entry. Additionally, the chapter touches upon the instant data analysis capabilities of Excel.

**Chapter 2: Cell References and Range** – focuses on cell references and range names. It explains the importance of using different types of references and introduces the various types of cell references available in Excel. The chapter also covers the concept of named ranges, which allows users to assign names to

specific cell ranges for easier referencing. The chapter concludes with an exercise to practice and reinforce the concepts learned.

**Chapter 3: Working with Formulas and Functions** – focuses on working with formulas and functions. It begins by explaining the use of formulas in worksheets and introduces the concept of array formulas. The chapter covers various functions available in Excel, including the IF function and its variations such as nested IF, IF with AND, IF with OR, and IF with NOT. It also covers lookup functions like VLOOKUP and HLOOKUP, and provides insights into making VLOOKUP dynamic. The chapter concludes with the usage of the INDEX and INDEX-MATCH functions. Through the exercises, readers can practice and reinforce their understanding of formulas and functions in Excel.

**Chapter 4: Data Validation** – explores the topic of data validation. It begins by explaining the importance of setting data validation rules to ensure the accuracy and integrity of data. The chapter covers various methods of data validation, including setting criteria for data entry, creating custom validation rules, and using predefined validation options. Through exercises, readers have the opportunity to practice implementing data validation techniques.

**Chapter 5: Protection** – covers protection. It explains how to protect a worksheet with passwords, protect a workbook, protect specific parts of a worksheet, and password protect a file. By following the instructions in this chapter, users can apply various levels of protection to their Excel files for enhanced security.

**Chapter 6: Sorting a Database** – focuses on sorting a database. It covers different methods of sorting, including simple sort, multilevel sort, and customized sorting. Sorting allows users to organize data in a desired order, making it easier to analyze and work with large sets of information. By understanding the techniques explained in this chapter, users can efficiently sort their data based on specific criteria.

**Chapter 7: Filtering a Database** – covers the topic of filtering a database. It explains how to use the Auto Filter feature to filter data based on specific criteria such as numbers, text, or dates. The chapter also introduces the concept of advanced filtering, which allows users to filter a list using more complex conditions.

Additionally, it explores the technique of filtering unique records. By applying the knowledge gained from this chapter, users can effectively filter and extract relevant data from their databases to meet their specific needs.

**Chapter 8: Subtotals and Data Consolidation** – focuses on subtotals and data consolidation. It explains how to use the Subtotal feature to display subtotal values at a single level or in a nested format. This allows users to summarize and analyze data effectively. The chapter also covers data consolidation, which involves combining data from multiple sources into a single worksheet. By mastering these techniques, users can easily organize and analyze their data, making it more manageable and meaningful.

**Chapter 9: Pivot Tables** – delves into Pivot Tables, a versatile tool for data analysis. It covers the creation and examination of PivotTables, including the use of recommended Pivot Tables for quick generation. The chapter demonstrates formatting options and the calculation of field percentages within PivotTable reports. It also explores advanced features like creating top/bottom reports, grouping items, and generating graphs using PivotTable data. Additional topics include the use of Slicer and Timeline for filtering, as well as Power View and Power Pivot for enhanced data analysis and modeling capabilities.

**Chapter 10: Conditional Formatting** – covers Conditional Formatting, including cell value-based and formula-based formatting, as well as Icon Sets. It explores advanced techniques such as using formulas with multiple conditions and applying conditional formulas across different sheets.

**Chapter 11: What-if-Analysis** – introduces the What-if-Analysis tools in Excel, including Goal Seek, Data Tables for projecting figures, and creating What-if Scenarios. It also covers merging scenarios from another worksheet and protecting scenarios for data integrity.

**Chapter 12: Working with Multiple Worksheets, Workbooks and Applications** – explores working with multiple worksheets, workbooks, and applications in Excel. It covers creating links between different worksheets and software, facilitating workgroup collaboration, merging workbooks, and tracking changes. It also discusses creating hyperlinks for easy navigation within the workbook.

**Chapter 13: Working with Charts** – focuses on working with charts in Excel. It covers creating charts using the Chart Tools, including titles and values in charts, and formatting them to enhance their appearance. The chapter also explores using chart templates for consistent chart design and provides recommendations for effective chart usage. Additionally, it introduces Sparklines, which are small charts embedded in cells, and explains how to customize their appearance and style. The chapter concludes with an exercise to practice the concepts learned.

**Chapter 14: Creating and Recording Macros in VBA** – explores the concept of macros in Excel, which are sets of instructions that automate repetitive tasks. It covers the process of creating macros, starting with recording a series of actions and defining the macro with a name and description. The chapter also introduces the concept of relative reference macros that adapt to different cell references. It explains how to stop the recording and concludes with instructions on running macros by either clicking a button or running them by their assigned names. Overall, this chapter provides a comprehensive overview of macros and their application in Excel.

**Chapter 15: Assigning Buttons to Macros** – focuses on creating menus or buttons in Excel to enhance user interaction and streamline workflow. It covers the process of modifying existing menus or buttons and creating custom buttons directly on Excel worksheets. The chapter also provides guidance on editing recorded macros to refine their functionality and appearance. Through practical exercises, readers can gain hands-on experience in creating and customizing menus and buttons to suit their specific needs.

**Chapter 16: Functions and Subroutines in VBA** – introduces the concepts of functions and subroutines in Excel's VBA programming. It explains the differences between the two and guides readers on writing code inside modules using the Visual Basic Editor. The chapter also covers branching techniques to control the flow of code execution within procedures.

**Chapter 17: Conditional Statements in VBA** – focuses on conditional programming in Excel's VBA. It explores the usage of Select Case statements and If...End If statements to control program flow based on different conditions. The chapter

provides examples and guidance on creating commercial-grade code with efficient and effective conditional logic.

**Chapter 18: Variables and Data Types in VBA** – introduces the concept of variables and constants in Excel’s VBA programming. It covers topics such as declaring variables and constants, understanding data types, and their usage in VBA code. The chapter also explores message box and input box functions for displaying messages and receiving user input. Additionally, it provides guidance on selecting and activating cells, rows, and columns, as well as working with sheets in VBA.

**Chapter 19: Looping Structures in VBA** – focuses on the concept of loops in Excel’s VBA programming. It explains the usage of loops to repeat actions in VBA code. The chapter covers the Do...Loop and For...Next loop statements, demonstrating their syntax and how they can be applied in different scenarios. Additionally, it discusses auto-executed macros, which are macros that automatically run when specific events occur. This chapter provides valuable insights into creating efficient and dynamic VBA code using looping structures.

**Chapter 20: Arrays and Collections in VBA** – introduces the concept of arrays and collections in Excel’s VBA programming. The chapter explains what arrays are and how they can be declared and used to store multiple values of the same data type. It covers topics such as array indexing, accessing array elements, and working with dynamic arrays. The chapter also explores collections, which are objects that can store multiple values of different data types. It provides insights into declaring and utilizing dynamic arrays and resizing them as needed.

**Chapter 21: Debugging and Error Handling in VBA** – focuses on managing errors and troubleshooting macros in VBA. It covers error handling techniques and methods for debugging VBA code to identify and resolve errors efficiently.

**Chapter 22: User Forms and User Input in VBA** – introduces the concept of user forms, which allow the creation of interactive interfaces in Excel. It explains how to design user forms, add controls like buttons and text boxes, and handle user input through event handling.

**Chapter 23: Advanced VBA Techniques and Best Practices** – provides insights into advanced VBA programming techniques and recommended practices. It includes code snippets for initializing control values, working with option buttons, creating custom menus, and emphasizes the importance of following best practices for efficient VBA programming.

**Chapter 24: Building Custom Add-ins with VBA** – explores the process of creating custom Add-ins in Excel using VBA. It covers how to protect Add-ins with passwords and explains the benefits of using Add-ins to extend Excel's functionality and streamline workflows.

**Chapter 25: ChatGPT with Excel** – provides best practices for integrating ChatGPT with Excel, specifically focusing on using ChatGPT to enhance tasks and communication within Excel. It covers effective content generation, email writing, and data analysis using ChatGPT. The chapter emphasizes data privacy and security while integrating ChatGPT with Excel and offers tips for efficient integration and workflow management.



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# Table of Contents

<b>1. Overview of Excel 2021 .....</b>	<b>1</b>
Introduction.....	1
Structure.....	2
Objectives.....	3
Components of the Excel window .....	3
Back stage view.....	4
Saving and sharing files online .....	5
Interacting with Excel.....	6
Working with default settings.....	7
Formatting of table.....	9
<i>Paste special preview</i> .....	9
<i>Flash fills</i> .....	9
Quick data analysis .....	10
Data mining .....	11
TAT saving technique .....	13
Conclusion .....	17
Exercise.....	17
<i>Answers</i> .....	17
<b>2. Cell References and Range .....</b>	<b>19</b>
Introduction.....	19
Structure.....	19
Objectives.....	19
Using different types of references.....	20
Types of Cell Reference .....	20
<i>Relative Cell Reference</i> .....	20
<i>Absolute Cell References</i> .....	21
<i>Mixed Cell Reference</i> .....	22
Named Range.....	24
<i>Creating a Named Range</i> .....	24
<i>Editing Named Ranges</i> .....	25
<i>Deleting Named Ranges</i> .....	26

---

Conclusion .....	26
Exercise.....	27
<b>3. Working with Formulas and Functions.....</b>	<b>29</b>
Introduction.....	29
Structure.....	29
Objectives.....	30
Using formulas in a worksheet.....	30
<i>Array formula</i> .....	30
Using functions.....	31
<i>IF function</i> .....	33
<i>Nested IF</i> .....	34
<i>IF with AND</i> .....	35
<i>IF with OR</i> .....	35
<i>IF with NOT</i> .....	36
Lookup functions.....	37
<i>V Lookup</i> .....	38
<i>H-lookup</i> .....	39
<i>Example of Vlookup with Range 0 (False):</i> .....	39
<i>Example of Vlookup with Range Non-Zero (True)</i> .....	40
Making V-Lookup Dynamic.....	40
<i>Using Column function in Vlookup</i> .....	41
<i>Using Match function in V-Lookup</i> .....	41
Index.....	43
<i>Index-Match</i> .....	43
Conclusion.....	44
Exercise.....	45
<b>4. Data Validation .....</b>	<b>47</b>
Introduction.....	47
Structure.....	47
Objectives.....	48
Trace Precedents.....	48
Trace Dependents.....	50
Setting Data Validation rules.....	51
Methods of Data Validation.....	52

---

<i>Creating a list</i> .....	52
Conclusion .....	54
Exercise.....	55
<b>5. Protection</b> .....	<b>57</b>
Introduction.....	57
Structure.....	57
Objectives.....	58
Employee information system.....	58
Protecting a worksheet by using passwords.....	59
Protecting a workbook .....	59
Protecting a part of a worksheet.....	60
Password protecting a file.....	61
Conclusion .....	62
Exercise.....	62
<b>6. Sorting a Database</b> .....	<b>65</b>
Introduction.....	65
Structure.....	65
Objectives.....	66
Definition of sorting .....	66
<i>Simple sort</i> .....	66
<i>Multilevel sort</i> .....	66
<i>Customized sort</i> .....	67
Conclusion .....	68
Exercise.....	68
<b>7. Filtering a Database</b> .....	<b>71</b>
Introduction.....	71
Structure.....	71
Objectives.....	72
Filters .....	72
<i>Auto filter</i> .....	72
<i>Number, text or date filters</i> .....	73
<i>Filtering a list using advanced filter</i> .....	76
Filtering unique records.....	77

---

Conclusion .....	77
Exercise.....	78
<b>8. Subtotals and Data Consolidation.....</b>	<b>79</b>
Introduction.....	79
Structure.....	79
Objectives.....	80
Subtotals .....	80
<i>Display Subtotal at Single Level.....</i>	<i>80</i>
<i>Displaying nested subtotal .....</i>	<i>81</i>
Consolidate data.....	82
<i>Example of consolidated data.....</i>	<i>86</i>
Conclusion .....	89
Exercise.....	89
<b>9. Pivot Tables .....</b>	<b>91</b>
Introduction.....	91
Structure.....	91
Objectives.....	92
Examining Pivot Tables.....	92
Recommended Pivot Table .....	94
Creating a Pivot Table.....	94
% of Grand Total .....	98
<i>Group items in a PivotTable .....</i>	<i>98</i>
<i>Grouping of Dates .....</i>	<i>99</i>
<i>Month Wise Report.....</i>	<i>100</i>
Create a graph using Pivot Data.....	100
<i>Weekly Report.....</i>	<i>102</i>
<i>Grouping of Numbers (Creating Slabs) .....</i>	<i>104</i>
Slicer.....	105
Timeline.....	107
Power View .....	108
Power Pivot .....	108
Benefits of Data Model.....	109
Creating pivot table using power pivot .....	109

---

Conclusion .....	110
Exercise.....	111
<b>10. Conditional Formatting.....</b>	<b>113</b>
Introduction.....	113
Structure.....	113
Objectives.....	114
Conditional Formatting .....	114
<i>Conditional formatting using cell values</i> <i>(column based conditional formatting).....</i>	<i>115</i>
<i>Conditional formatting using formula</i> <i>(record based conditional formatting).....</i>	<i>116</i>
Icon Set .....	117
Formula with multiple conditions .....	117
Conclusion .....	118
Exercise.....	118
<b>11. What-if-Analysis .....</b>	<b>121</b>
Introduction.....	121
Structure.....	121
Objectives.....	122
Goal seek .....	122
Using the Goal Seek command .....	122
Projecting figures using a data table .....	123
<i>One-variable data tables.....</i>	<i>123</i>
<i>Two-Variable Data Tables .....</i>	<i>124</i>
What-if-scenarios.....	125
Creating scenarios.....	125
<i>Create a scenario summary report .....</i>	<i>127</i>
<i>Delete a scenario .....</i>	<i>127</i>
<i>Display a scenario .....</i>	<i>127</i>
Merge scenarios from another worksheet.....	128
<i>Protecting scenarios.....</i>	<i>128</i>
Conclusion .....	129
Exercise.....	129

---

<b>12. Working with Multiple Worksheets, Workbooks and Applications .....</b>	<b>131</b>
Introduction.....	131
Structure.....	131
Objectives.....	132
Links between different worksheets.....	132
Creating links between different software .....	134
Auditing features .....	135
<i>Dependent and precedent cells</i> .....	135
Workgroup collaboration.....	135
<i>Sharing workbooks</i> .....	135
<i>Merging workbooks</i> .....	136
<i>Tracking changes</i> .....	136
Creating hyperlink .....	137
<i>Creating links to a different file</i> .....	138
Conclusion .....	139
Exercise.....	139
<b>13. Working with Charts.....</b>	<b>141</b>
Introduction.....	141
Structure.....	141
Objectives.....	142
Creating charts using chart tools .....	142
Chart designs .....	143
<i>Adding titles and values in charts using Chart Tools</i> .....	143
Formatting charts.....	144
<i>Charts for my data</i> .....	144
<i>Chart templates</i> .....	145
<i>Chart filter option</i> .....	145
<i>Waterfall Chart</i> .....	146
Recommendations .....	147
Sparklines .....	147
<i>Create a Sparkline</i> .....	148
<i>Customize Sparklines</i> .....	148
<i>Change the Style of Sparklines</i> .....	149

---

Conclusion .....	149
Exercise.....	149
<b>14. Creating and Recording Macros in VBA .....</b>	<b>151</b>
Introduction.....	151
Structure.....	151
Objectives.....	152
Introduction to VBA.....	152
<i>Uses of VBA</i> .....	152
Introduction to Macros .....	152
Creating a Macro.....	153
<i>Adding Developer tab on ribbon</i> .....	153
Recording a Macro.....	154
Defining a Macro.....	155
<i>Macro storage</i> .....	155
<i>Macro shortcut</i> .....	156
<i>Macro description</i> .....	156
Stop recording.....	156
Relative Reference Macro.....	157
<i>Scenario 1</i> .....	158
Running your macro.....	159
Running the Macro by name .....	159
<i>Scenario 2</i> .....	160
<i>Scenario 3</i> .....	160
Conclusion .....	161
Exercise.....	161
<b>15. Assigning Buttons to Macros .....</b>	<b>163</b>
Introduction.....	163
Structure.....	163
Objectives.....	164
Creating buttons on quick access Toolbar .....	164
Modifying menus or buttons .....	165
<i>Scenario 4</i> .....	165
Creating a button on Excel worksheet.....	168
<i>Scenario 5</i> .....	169



---

Editing the recorded macros.....	171
<i>Scenario 6</i> .....	171
<i>Scenario 7</i> .....	173
<i>Scenario 8</i> .....	175
Practice 1.....	176
Practice 2.....	177
Conclusion.....	177
Exercise.....	178
<b>16. Functions and Subroutines in VBA.....</b>	<b>179</b>
Introduction.....	179
Structure.....	179
Objectives.....	180
Writing procedures.....	180
Visual Basic Editor.....	181
<i>Project Explorer keyboard shortcuts</i> .....	183
Inserting modules.....	184
Writing code inside Modules.....	184
Sub Procedure.....	185
<i>Macro</i> .....	185
Function procedure.....	186
<i>Syntax to write functions</i> .....	187
<i>Scenario 9</i> .....	188
Branching a Procedure.....	188
<i>Scenario 10</i> .....	189
<i>Scenario 11</i> .....	189
<i>Scenario 12</i> .....	190
<i>Scenario 13</i> .....	191
<i>OR operator</i> .....	191
<i>Scenario 14</i> .....	191
<i>AND Operator</i> .....	191
Conclusion.....	192
Exercise.....	192
<b>17. Conditional Statements in VBA.....</b>	<b>193</b>
Introduction.....	193

---

Structure.....	193
Objectives.....	194
If...End If.....	194
Example.....	194
Select Case.....	195
<i>Example</i> .....	196
Select Case Vs. If ... End If.....	197
Conclusion.....	197
Exercise.....	197
<b>18. Variables and Data Types in VBA.....</b>	<b>199</b>
Introduction.....	199
Structure.....	199
Objectives.....	200
Variables and constants.....	200
<i>Variable</i> .....	200
<i>Constant</i> .....	200
Declaring variables and constants.....	201
Data types of variables and constants.....	201
<i>Using the option explicit statement</i> .....	202
Message box and input box.....	202
Selecting and activating cells.....	202
Selecting and activating rows and columns.....	203
Working with sheets.....	204
Working with Workbook.....	204
Working with application object.....	205
<i>Scenario 15</i> .....	205
<i>Scenario 16</i> .....	206
Conclusion.....	206
Exercise.....	207
<b>19. Looping Structures in VBA.....</b>	<b>209</b>
Introduction.....	209
Structure.....	209
Objectives.....	210
Using Loops (repeating action).....	210

---

<i>Choosing a Loop to use</i> .....	210
Using Do...Loop statements.....	210
<i>Repeating statements while a condition is true</i> .....	211
<i>Checking condition before you enter the loop</i> .....	211
<i>Checking condition after the loop has run at least once</i> .....	211
<i>Scenario 17</i> .....	211
Using For...Next statements .....	212
<i>Scenario 18</i> .....	213
Using For Each... Next statements .....	213
<i>Scenario 19</i> .....	214
<i>Scenario 20</i> .....	215
<i>Scenario 21</i> .....	216
<i>Scenario 22</i> .....	216
<i>Scenario 23</i> .....	218
<i>Scenario 24</i> .....	220
Auto-Executed Macros.....	220
<i>Practice 3</i> .....	221
<i>Practice 4</i> .....	221
<i>Scenario 25</i> .....	222
<i>Scenario 26</i> .....	223
<i>Solution 26</i> .....	223
<i>Scenario 27</i> .....	224
<i>Solution</i> .....	225
Conclusion .....	226
Exercise.....	226
<b>20. Arrays and Collections in VBA.....</b>	<b>227</b>
Introduction.....	227
Structure.....	227
Objectives.....	228
Arrays.....	228
Declaring the arrays.....	228
Using arrays .....	229
Array indexing.....	229
Declaring a dynamic array.....	230
Resizing a dynamic array .....	230

---

<i>Array example</i> .....	230
Conclusion .....	231
Exercise.....	231
<b>21. Debugging and Error Handling in VBA.....</b>	<b>233</b>
Introduction.....	233
Structure.....	233
Objectives.....	234
Errors .....	234
Error handling .....	234
<i>Scenario 28</i> .....	234
<i>Solution</i> .....	235
Error number .....	236
<i>Scenario 29</i> .....	236
Debugging the macro .....	237
Conclusion .....	239
Exercise.....	240
<b>22. User Forms and User Input in VBS .....</b>	<b>241</b>
Introduction.....	241
Structure.....	241
Objectives.....	242
User forms.....	242
Creating user forms .....	242
Adding other controls.....	243
Handling events for the control.....	244
<i>Scenario 30</i> .....	244
<i>Solution</i> .....	245
Conclusion .....	246
Exercise.....	247
<b>23. Advanced VBA Techniques and Best Practices .....</b>	<b>249</b>
Introduction.....	249
Structure.....	249
Objectives.....	250
Code to give initial values to the control .....	250

---

Code for option buttons .....	251
Code for Insert button .....	252
Code to show User Form .....	254
Add-ins .....	254
<i>Scenario 31</i> .....	254
<i>Solution</i> .....	254
Code for the Change Case form.....	255
Creating menu through code.....	258
Conclusion .....	259
Exercise.....	259
<b>24. Building Custom Add-ins with VBA .....</b>	<b>261</b>
Introduction.....	261
Structure.....	261
Objectives.....	261
Protecting your Add-ins with a password.....	262
Using Add-ins.....	263
Conclusion .....	264
Exercise.....	264
<b>25. ChatGPT with Excel.....</b>	<b>265</b>
Introduction.....	265
Structure.....	265
Objectives.....	265
Using ChatGPT with Excel .....	266
Conclusion .....	271
Exercise.....	272
<b>Index.....</b>	<b>273-278</b>



# CHAPTER 1

# Overview of Excel 2021

## Introduction

Excel 2021 is a subscription-based version of Microsoft Excel that is part of the Microsoft 365 suite of productivity tools. It is a cloud-based version of Excel that provides users with access to the latest features and updates. Here is an overview of some of the key features of Excel 2021:

- **Collaborative editing:** Excel 2021 allows multiple users to edit a spreadsheet simultaneously, making it easier for teams to work together on projects.
- **Cloud storage:** Excel 2021 files are stored in the cloud, which means that they can be accessed from anywhere with an internet connection.
- **Power Query:** Excel 2021 includes Power Query, a tool that allows users to connect to and import data from a variety of sources.
- **Dynamic arrays:** With dynamic arrays, users can perform calculations on a range of values and return multiple results in a single cell.
- **Artificial intelligence:** Excel 2021 includes AI-powered features that can analyze data and provide insights, such as the Ideas feature, which suggests charts, graphs, and other visualizations.

- **New chart types:** Excel 2021 includes new chart types, such as the funnel chart and the map chart, which allow users to display data in new and interesting ways.
- **Improved data analysis:** Excel 2021 includes new data analysis tools, such as the Data Types feature, which allows users to convert raw data into structured data that can be used in calculations and analysis.

MS Excel is a spreadsheet software, which is a tool used to record data, support to make plot and analyse the entered data. This is a powerful tool with numerous features that supports you to keep a budget, or to create invoice of sales, maintain a training log. You can store the details of your products or services enquiries and it has lots of other applications in business.

As in the previous version, this version has a set of menus at the top of window known as the Ribbon and all the Excel commands are present in that. A document of excel is known as a Workbook and each Workbook is divided into a set of rows and columns and a intersection of this tabular structure is known as the Cell. Data is entered into cells, also all operations over the spreadsheet are applied to the cells. MS excel is having a set of tools by which we can do the formatting, analysis and also create charts.

## Structure

In this chapter, we will go over the following topics:

- Components of the Excel window
- Back stage view
- Saving and sharing files online
- Interacting with Excel
- Working with default settings
- Formatting of table
  - Paste Special preview
  - Flash fills
- Quick Data analysis
- Data Mining
- TAT saving technique



## Objectives

After studying this chapter, the reader should be able to understand the new layout of MS Excel, figure out how to change the default settings of MS Excel, understand the Excel tool in general, and identify the different types of references, as well as the Named Ranges.

## Components of the Excel window

Figure 1.1 shows the Excel window:

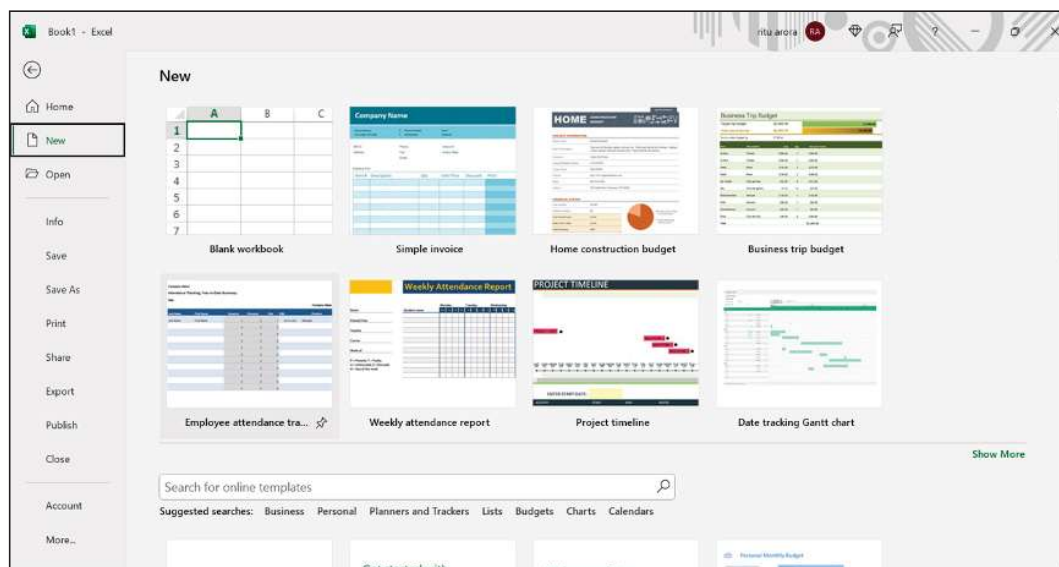


Figure 1.1: Excel Welcome window

When you open Excel by clicking its shortcut, a unique landing page known as the Welcome page appears. This welcome page offers you various sample spreadsheets for you, such as movie lists, personal budgeting, trend, analysis and more. Most importantly, it offers the Blank worksheet option, by which we can open a blank spreadsheet and enter the data according to our requirement. The Welcome Window of Excel is shown in Figure 1.1.

This window also has a search online template search textbox. Using this, you can synchronize yourself with online office templates library.

When you double click the Blank window option, a blank spreadsheet opens, as shown in Figure 1.2:

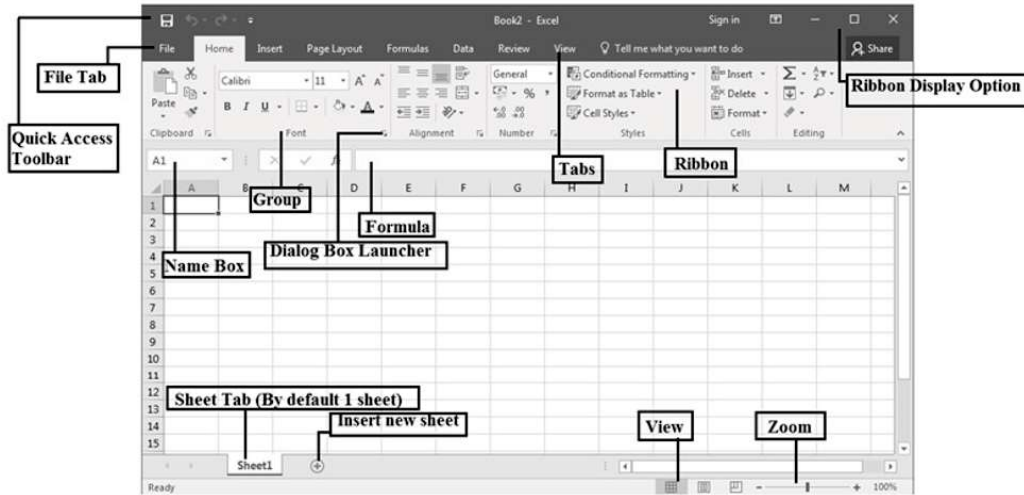


Figure 1.2: Various Components of an Excel 2016 Window

## Back stage view

In the back stage view, you manage your documents and the data related to them. Here, you can create, save, send, inspect documents for hidden metadata or personal information. The **File** tab replaces the MS office button and the File menu used in the earlier releases of MS Office. *Figure 1.3* features the various options available in the Backstage view:

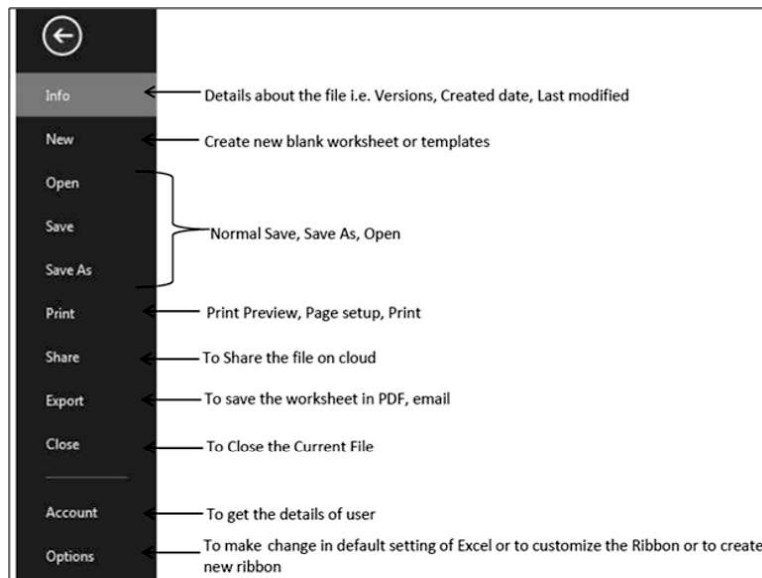


Figure 1.3: Options Available in the Backstage View