



Macro Programming

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Excel Object Model — Objects, Properties, and Methods

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What is the Excel Object Model?

- **Object Model = Hierarchy** that represents Excel.
- Everything in Excel is an **object** (workbooks, sheets, cells, charts).
- Objects can contain other objects.
- VBA manipulates Excel by working with objects.



Object Hierarchy Overview

- **Top Level:** Application (Excel itself).
- **Second Level:** Workbooks (each file).
- **Third Level:** Worksheets (tabs in a workbook).
- **Fourth Level:** Range (cells within a worksheet).

Example path: `Application` → `Workbooks("Sales.xlsx")` →
`Worksheets("Sheet1")` → `Range("A1")`



Key Excel Objects

1. **Application** — Excel program.
2. **Workbook** — An open Excel file.
3. **Worksheet** — A sheet inside a workbook.
4. **Range** — A cell or group of cells.
5. **Chart, PivotTable, etc.** — Specialized objects.



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Key Excel Objects

The Excel Object Model - Everything is an **Object**

The screenshot illustrates the Excel Object Model hierarchy with the following annotations:

- ← Application (Excel)
- ← Worksheets
- ← Pivot Tables
- ← Charts
- ← Ranges (Cells)
- ← Worksheets

The worksheet shown is 'Intro to Pivot Tables and Dashboards - Part 3.xlsx'. It contains a Pivot Table and a Chart.

Region	(All)
Row Labels	Sum of Revenue
Company D	\$67,181
Company H	\$50,198
Company BB	\$43,703
Company F	\$37,418
Company A	\$36,840
Grand Total	\$235,340

The chart is titled 'Top 5 Customers for 2014' and displays a horizontal bar chart with the following data:

Company	Revenue
Company D	\$67,181
Company H	\$50,198
Company BB	\$43,703
Company F	\$37,418
Company A	\$36,840



Properties of Objects

- **Properties of Objects:** Characteristics or attributes of an object.

Example:

```
Range("A1").Value = "Hello"
```

```
Range("A1").Font.Bold = True
```

`.Value` and `.Font.Bold` are **properties** of the Range object.

- Properties describe an object's current state (value, color, font, size).



Actions that objects can perform.

Example:

```
Range("A1").ClearContents
```

```
Range("B1").Copy Destination:=Range("C1")
```

- `.ClearContents` and `.Copy` are **methods**.

Methods make objects do something, like clear, copy, save, or calculate.



Working with the Application Object

```
Application.Caption = "My Custom Excel"
```

```
Application.Calculate
```

- `.Caption` (property) changes Excel window title.
- `.Calculate` (method) recalculates all formulas.

The Application object controls global Excel settings and actions.



Working with the Range Object

```
Range("A1").Value = 100
```

```
Range("A1:B3").Interior.Color = vbYellow
```

- `.Value` sets or retrieves data.
- `.Interior.Color` changes background color.

Explanation: The Range object is the most frequently used in VBA, representing one or more cells.



Object Variables

```
Dim ws As Worksheet
```

```
Set ws = Worksheets("Sheet1")
```

```
ws.Range("A1").Value = "Hello!"
```

Storing objects in variables makes code shorter and more efficient. Instead of repeating `Worksheets("Sheet1")`, you use `ws`.



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With...End With Statement

```
With Range("A1:B2")
```

```
.Font.Bold = True
```

```
.Interior.Color = vbGreen
```

```
.Value = "Done"
```

```
End With
```

With simplifies code by applying multiple property/method changes to the same object.



THANK YOU

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