



Macro Programming

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Dynamic Ranges and Named Ranges

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Named Ranges

- A **Named Range** is a user-defined name for a cell or range of cells.

- Instead of writing formulas with cell references (`=SUM(A2:A10)`), you can use names (`=SUM(Sales)`).

- Benefits:
 - Improves **readability** of formulas
 - Easy to **reuse** in multiple formulas
 - Reduces errors



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Named Ranges

Example:

- Define name **Sales** for **B2:B10**
- Formula: **=AVERAGE(Sales)** instead of **=AVERAGE(B2:B10)**



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Creating Named Ranges

Steps:

1. Select the cell range (e.g., B2 :B10).
2. Go to **Formulas** → **Define Name**.
3. Enter a name (e.g., Sales).
4. Click OK.

Alternative: Use the **Name Box** (left of formula bar).



Rules for Named Ranges

- Names must start with a **letter** (not a number).
- No spaces → use underscore (`_`) or camelCase.
- Cannot use cell references as names (e.g., `A1`).
- Names are **case-insensitive** (`Sales` = `SALES`).



Dynamic Ranges

- **Dynamic Ranges** automatically expand/shrink when data changes.
- Useful for:
 - Adding new sales rows without editing formulas
 - Auto-updating charts
 - PivotTables with live data



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Dynamic Ranges

Example Problem:

- Formula `=SUM(B2:B10)` will ignore values if you add new rows (B11, B12, ...).
- Solution → Use a **Dynamic Named Range**.



Creating Dynamic Ranges with Tables



- Convert data into an **Excel Table** (**Ctrl + T**).
- Tables automatically expand when new rows are added.
- Use **structured references** in formulas:
 - Example: `=SUM(SalesData[Total Sales])`
- Charts & PivotTables linked to the Table also update automatically.



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Creating Dynamic Ranges with Formulas

Using **OFFSET + COUNTA**:

- Formula:

```
=OFFSET($B$2, 0, 0, COUNTA($B:$B)-1, 1)
```

Meaning: Start at B2, count all filled cells in column B, return that range.

Using **INDEX**:

Formula:

```
=$B$2:INDEX($B:$B, COUNTA($B:$B))
```

- More efficient than OFFSET.



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Example

Month	Sales
Jan	2000
Feb	2500
Mar	3000



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Example

If April = 4000 is added:

- Normal formula `=SUM(B2:B4)` ignores it.
- Dynamic range `=SUM(Sales)` automatically includes April.



Dynamic Ranges in Charts

- Create a Named Range **SalesData** using OFFSET/INDEX.

- Insert a chart → Select Data → Use formula:

```
=Sheet1!SalesData
```

- When new data is added, the chart updates automatically.



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Applications

- Dashboards, Charts, PivotTables → auto-update when data grows.
- Cleaner formulas with better maintainability.



Summary

Named Ranges

- Assign a name to a cell or range (e.g., `Sales` for `B2:B10`).
- Makes formulas more **readable and reusable** (`=SUM(Sales)` vs `=SUM(B2:B10)`).

Dynamic Ranges

- Ranges that automatically **expand/shrink** when data changes.
- Prevents formulas/charts from breaking when new data is added.



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Summary

Ways to Create Dynamic Ranges

1. **Excel Tables** (best for beginners): Auto-expands with new rows; supports structured references.
 2. **Formulas** (advanced users):
 - **OFFSET + COUNTA**
 - **INDEX + COUNTA** (preferred, efficient).
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- Use meaningful names (**MonthlySales**, not **Data1**).
 - Prefer Tables for simplicity.
 - Use Name Manager to review & organize ranges.



THANK YOU

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