Macro Programming

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Experiential Learning — Debugging VBA Code + Using Copilot to Automate Excel Tasks

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Types of VBA Errors

Error Type	Description	Example
Syntax Error	Breaks coding rules	`If x = 10 Then MsgBox "Hi"` (missing End If)
Runtime Error	Occurs while code runs	Dividing by zero, missing sheet
Logic Error	Code runs but gives wrong results	Incorrect formula or condition

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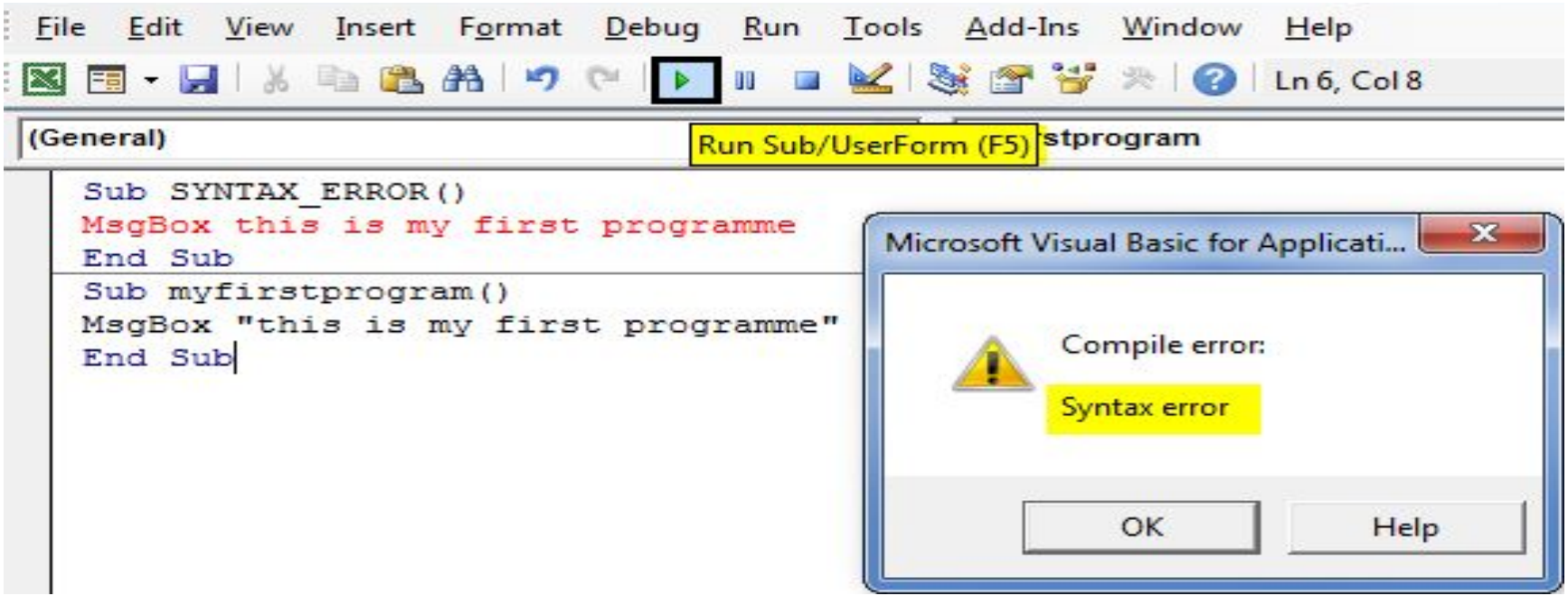
Types of VBA Errors



Experiential Task: Finding Syntax Errors

```
Sub SalesTotal()
Dim total as Double
For i = 1 To 10
total = total + Cells(i, 2).Value
MsgBox "Total Sales: " & total
End Sub
```

Expected Fix: Add `Next i`

Runtime Errors in VBA

Common runtime errors:

- Division by zero.
- Referring to an invalid worksheet or cell.
- Opening a missing file.

Runtime Errors in VBA

Example:

```
Sub ExampleRuntime()

    Dim result As Double

    result = 100 / 0
End Sub
```

Experiential Task: Handling Runtime Errors

Add structured error handling:

```
On Error GoTo ErrHandler
Dim result As Double
result = 100 / 0
Exit Sub
ErrHandler:
    MsgBox "An error occurred: " & Err.Description
```

Debugging Logic Errors

Logic errors are the hardest to find because VBA runs successfully but results are wrong.

```
Sub LogicErrorExample()
    Dim x As Integer, y As Integer
    x = 10
    y = 0
    Do Until x = 0
        y = y + x
        x = x - 2
    Loop
    MsgBox "Result: " & y
End Sub
```

Debugging Workflow

Debug systematically:

1. Reproduce the error.
2. Add breakpoints (F9).
3. Step through (F8).
4. Inspect variables (Immediate / Watch Window).
5. Fix and re-test.

Using Immediate Window

Use `?` to test variable values during runtime.

```
? x
? Cells(1, 1).Value
```

Use `Debug.Print` to log information.

```
Debug.Print "Loop count: " & i
```

Using Watch Window

Steps:

1. Right-click variable → “Add Watch.”
2. Choose “Watch Expression.”
3. Observe value changes in Watch Window.

Breakpoints & Step Execution

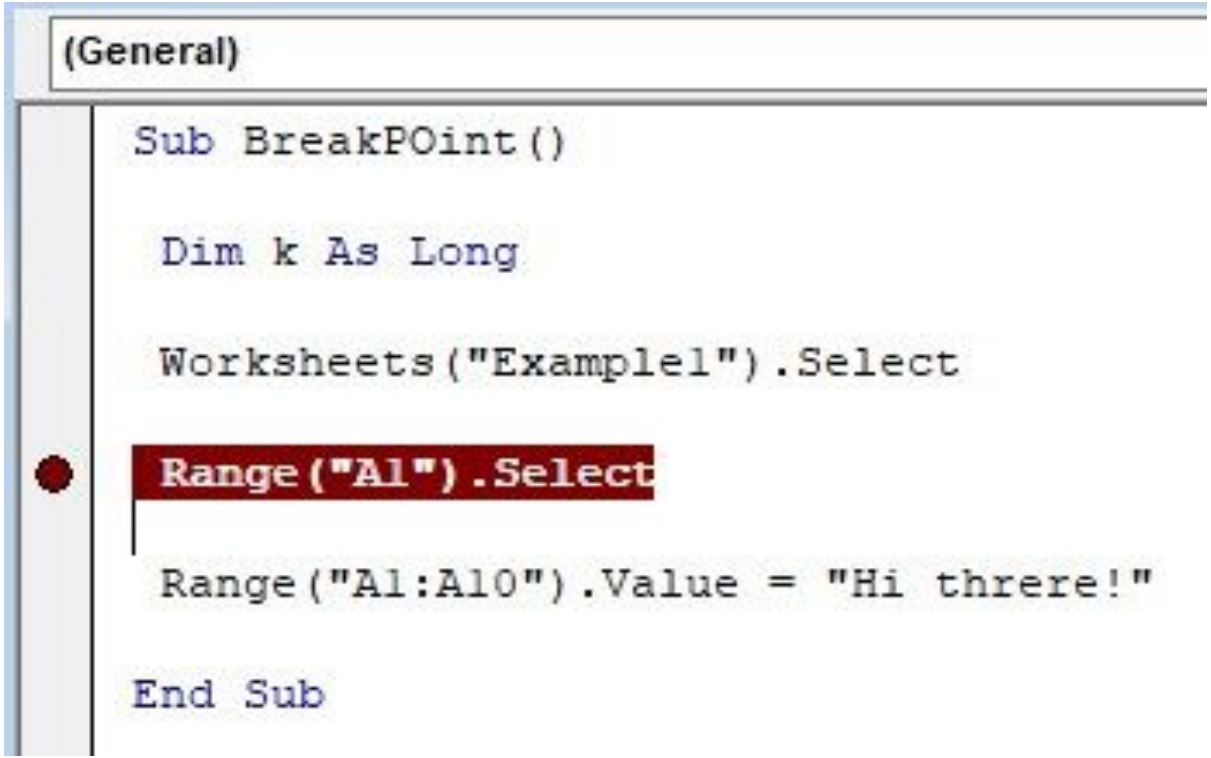
Press **F9** to set breakpoint.

Run code → execution pauses.

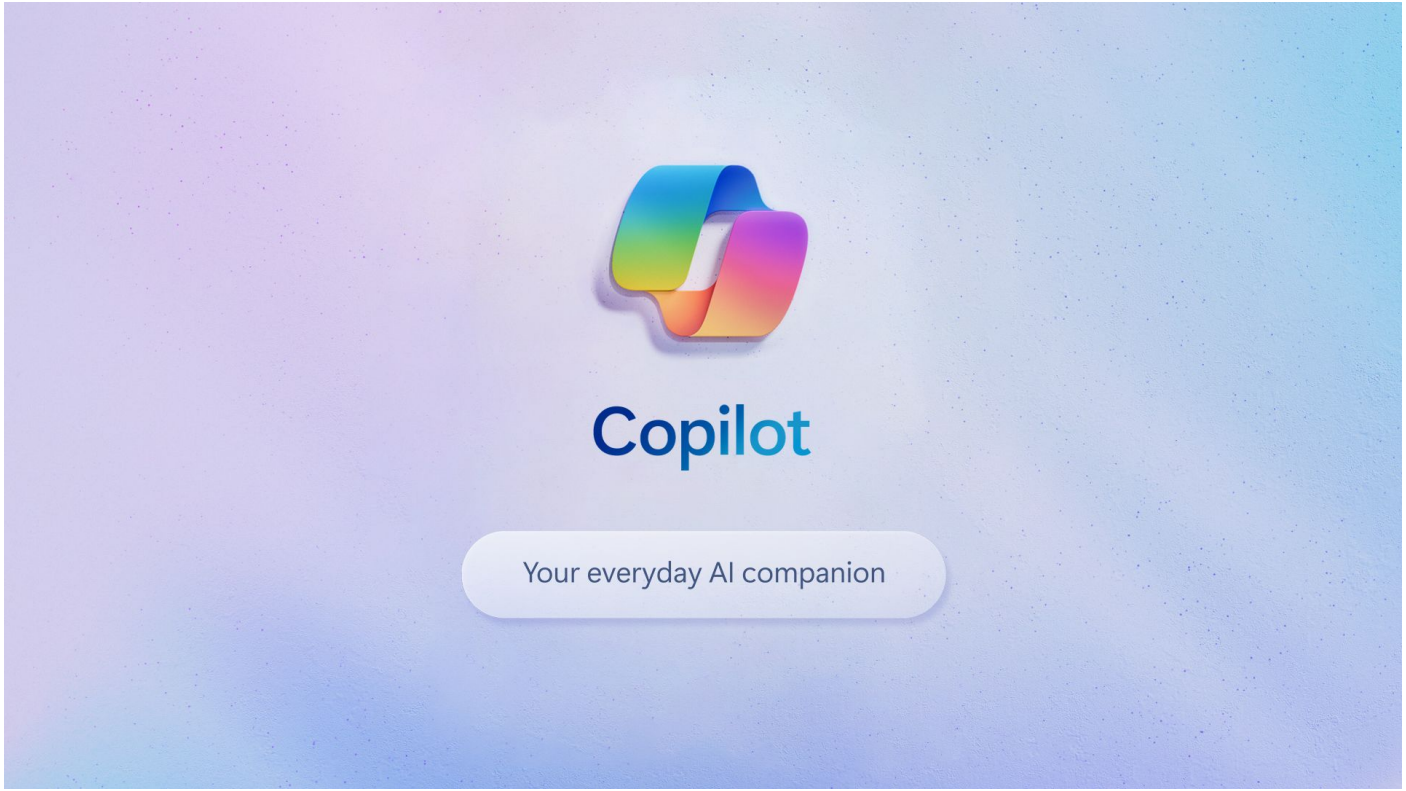
Press **F8** to go line by line.

Observe variable changes in Locals Window.

Breakpoints & Step Execution



Introducing Microsoft Copilot



Introducing Microsoft Copilot

Copilot is Microsoft's AI assistant that can help you:

- Generate VBA code snippets.
- Explain existing VBA logic.
- Suggest fixes for syntax or logic errors.
- Automate repetitive Excel tasks quickly.

Example: Using Copilot for VBA Help

Prompt Example:

“Write a VBA macro to highlight all cells with values greater than 500 in yellow.”

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