Macro Programming

Vignesh V
Department of Computer Applications
vigneshv@pes.edu

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Experiential Learning — Building & Testing UserForms + Error Handling (Breakpoints, Watches, Debugging)

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Why Test UserForms?

- UserForms involve user input — more prone to runtime errors.
- Testing ensures correct event triggers, data validation, and logical flow.
- Prevents crashes or wrong data entries.

Common UserForm Errors

Error Type	Cause	Example
Runtime Error	Invalid operation	Divide by zero
Type Mismatch	Wrong data type	Text entered for numeric input
Object Required	Missing reference	Control not named correctly
Out of Range	Invalid sheet or cell	Refers to deleted worksheet

Setting Breakpoints

- A **breakpoint** pauses code execution at a chosen line.
- Helps inspect variable values and control flow.

Steps:

1. Click the **left margin** beside a line or press **F9**.
2. Run the form — execution pauses at the breakpoint.
3. Press **F8** to step through.

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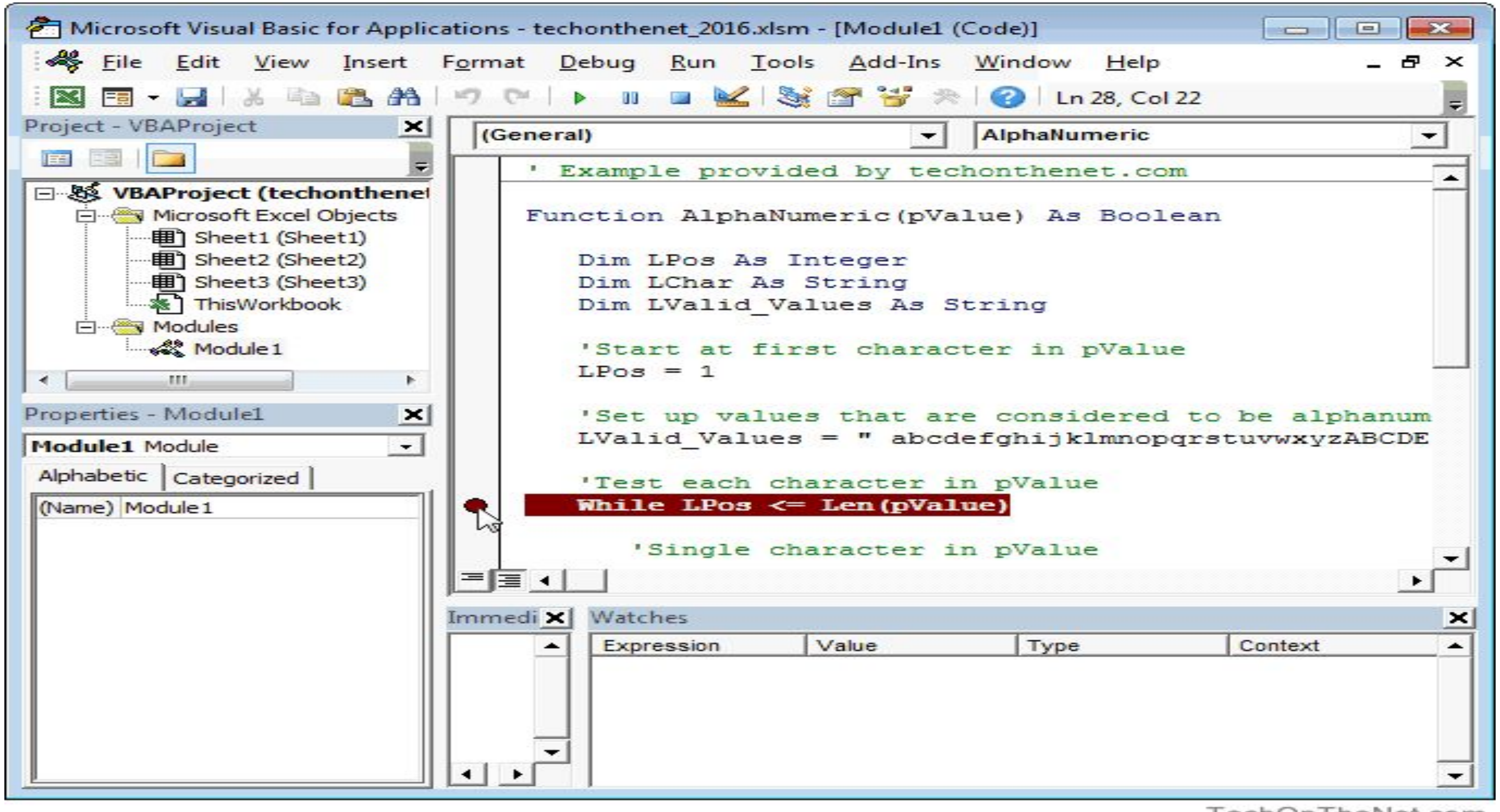
Setting Breakpoints



```
' Example provided by techonthenet.com

Function AlphaNumeric(pValue) As Boolean

   Dim LPos As Integer
   Dim LChar As String
   Dim LValid_Values As String

   'Start at first character in pValue
   LPos = 1

   'Set up values that are considered to be alphanum
   LValid_Values = " abcdefghijklmnopqrstuvwxyzABCDE

   'Test each character in pValue
   While LPos <= Len(pValue)

      'Single character in pValue
```

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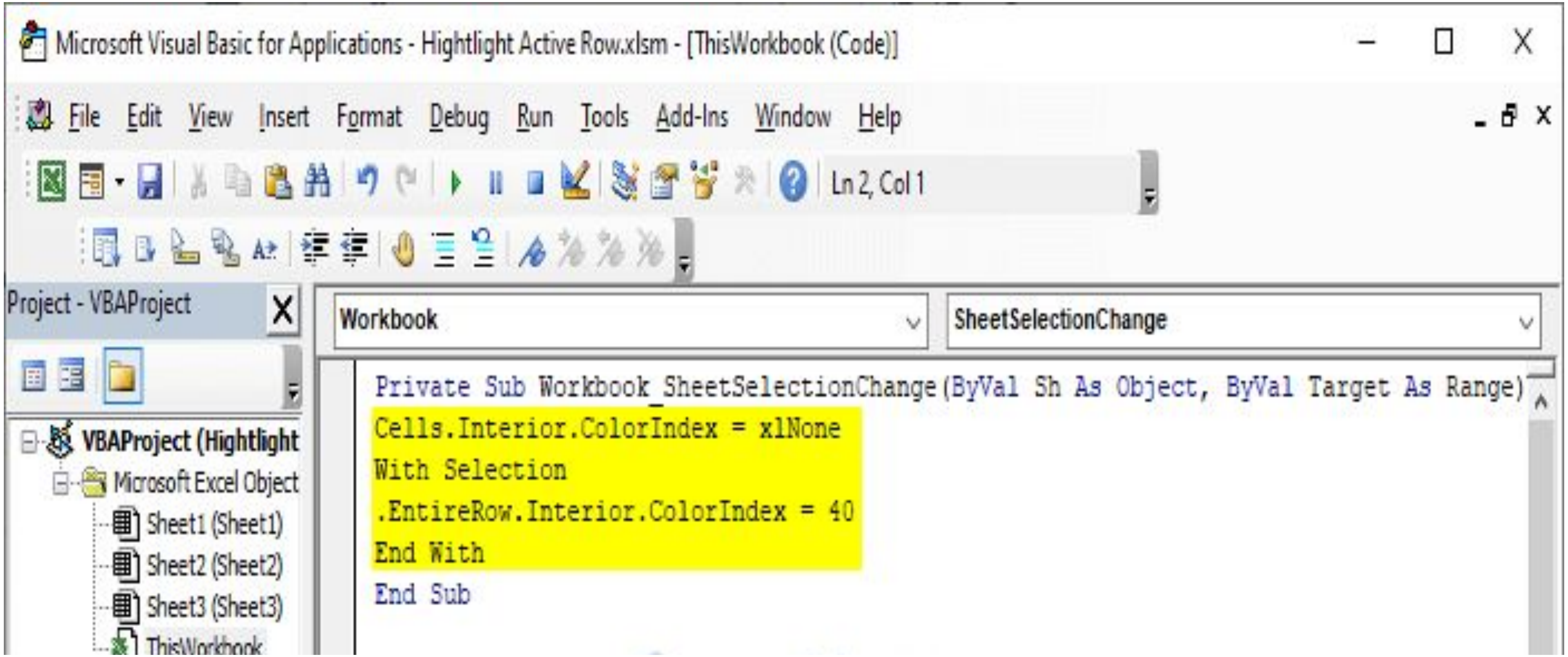
Using Step-Through Debugging

- Press **F8** to execute code **one line at a time**.
- Watch values change dynamically in the Locals or Immediate window.
- Great for isolating logic or loop errors.

Using Step-Through Debugging



```
Private Sub Workbook_SheetSelectionChange(ByVal Sh As Object, ByVal Target As Range)
Cells.Interior.ColorIndex = xlNone
With Selection
.EntireRow.Interior.ColorIndex = 40
End With
End Sub
```

The Immediate Window

Test snippets or print variable values in real time.

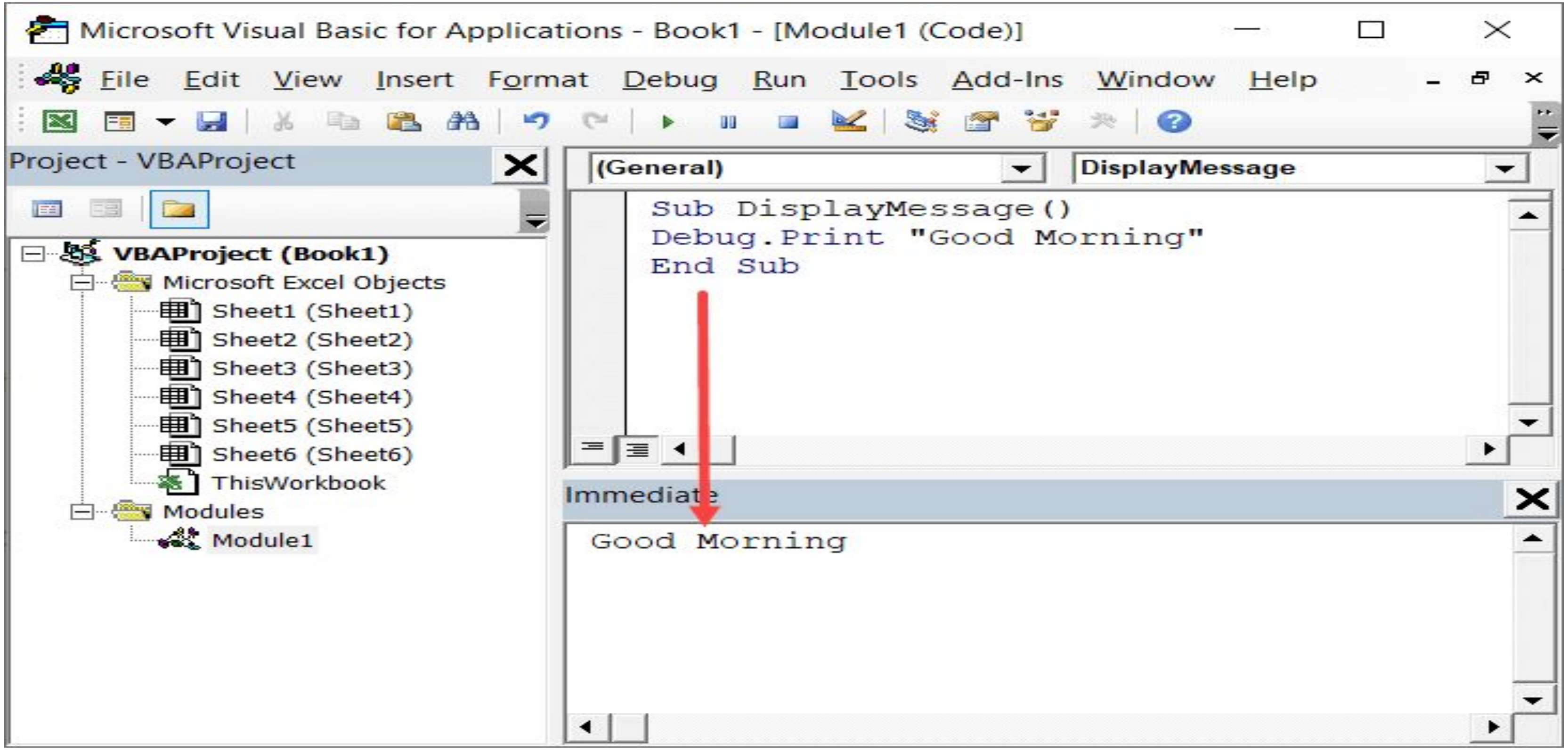
- **Example:**

```
? Me.txtName.Value
Debug.Print "Next Row: " & nextRow
```

Use Cases:

- Check form control values.
- Verify calculated results.
- Troubleshoot without stopping code.

The Immediate Window



```
Sub DisplayMessage()
Debug.Print "Good Morning"
End Sub
```

```
Good Morning
```

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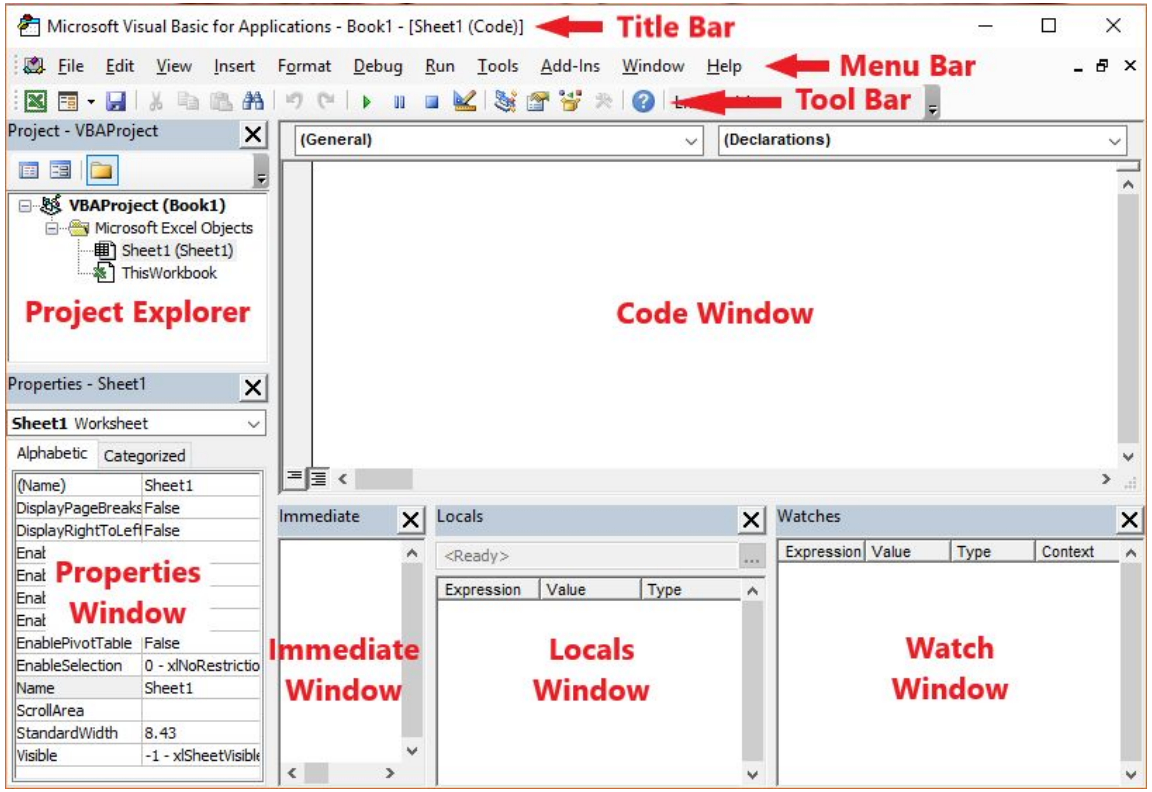
Watch and Locals Windows



(Name)	Sheet1
DisplayPageBreaks	False
DisplayRightToLeft	False
Enat	
Enat	
Enat	
Enat	
EnablePivotTable	False
EnableSelection	0 - xlNoRestrictio
Name	Sheet1
ScrollArea	
StandardWidth	8.43
Visible	-1 - xlSheetVisible

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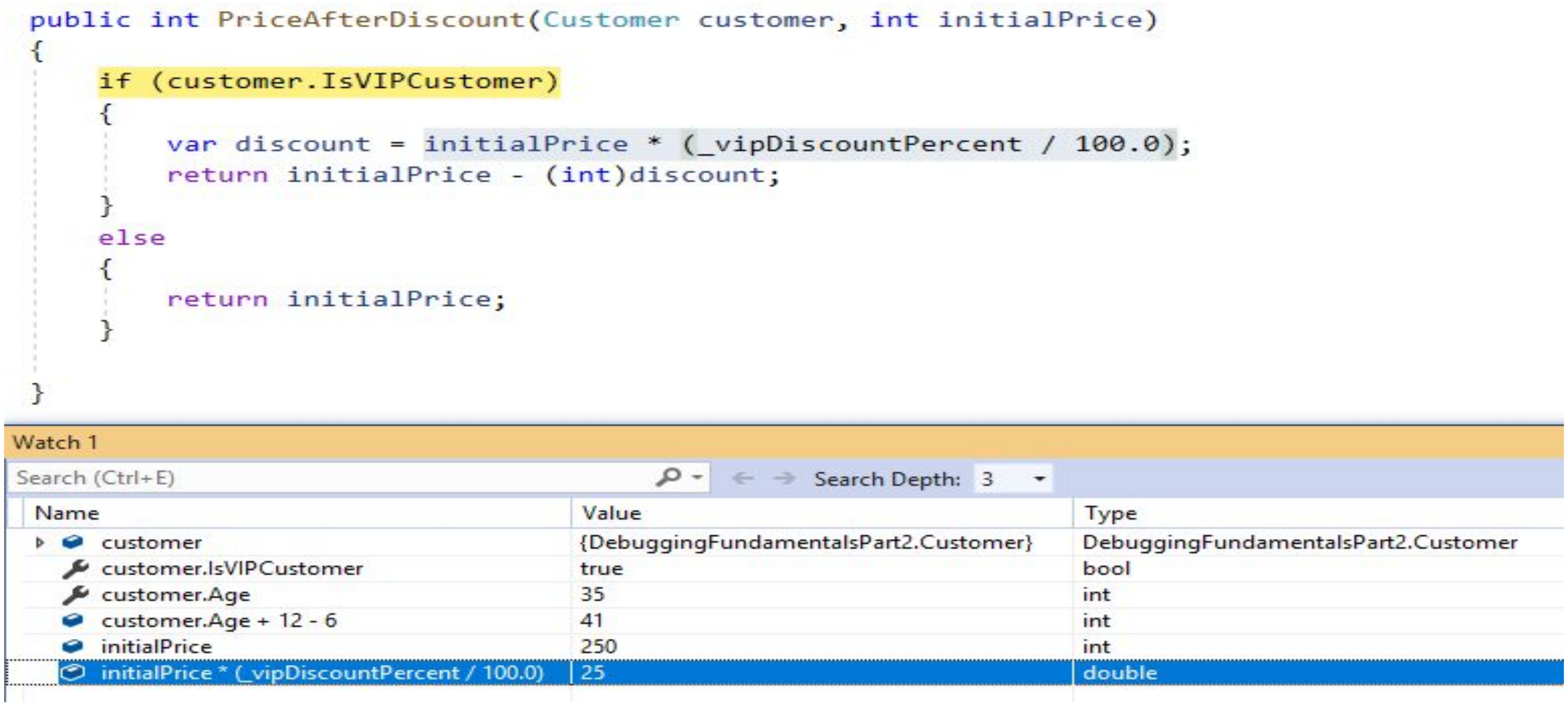
Watch and Locals Windows



```
public int PriceAfterDiscount(Customer customer, int initialPrice)
{
    if (customer.IsVIPCustomer)
    {
        var discount = initialPrice * (_vipDiscountPercent / 100.0);
        return initialPrice - (int)discount;
    }
    else
    {
        return initialPrice;
    }

}
```

Watch 1

Search (Ctrl+E) Search Depth: 3

Name	Value	Type
customer	{DebuggingFundamentalsPart2.Customer}	DebuggingFundamentalsPart2.Customer
customer.IsVIPCustomer	true	bool
customer.Age	35	int
customer.Age + 12 - 6	41	int
initialPrice	250	int
initialPrice * (_vipDiscountPercent / 100.0)	25	double

Error Handling

- Use structured error handling to manage unexpected errors.

```
On Error GoTo ErrHandler
' Code block
Exit Sub
ErrHandler:
    MsgBox "Error: " & Err.Description, vbCritical
```

Error Handling Example

```
Private Sub cmdSubmit_Click()
    On Error GoTo ErrHandler
    Dim age As Integer
    age = CInt(Me.txtAge.Value)
    MsgBox "Age: " & age
    Exit Sub
ErrHandler:
    MsgBox "Please enter a valid number!", vbCritical
End Sub
```

On Error Resume Next

Use only for non-critical errors.

```
On Error Resume Next

ws.Cells(1, 1).Value = Me.txtName.Value

On Error GoTo 0
```

- Skips over the error but should be used carefully — never for debugging suppression.

Experiential Task 1: Debug the Form

- Add intentional error (e.g., convert text to number).
- Insert breakpoints and step through code.
- Observe `Err.Description` output.

Experiential Task 2: Add Error Handling

Task:

1. Add a general error handler to your Submit button.
2. Display a meaningful error message if data is missing.
3. Log errors to a worksheet named “ErrorLog”.

Experiential Task 3: Watch Window Practice

Task:

1. Add a Watch for variable `nextRow`.
2. Run form and observe its value as data is entered.
3. Note how variable updates during execution.

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