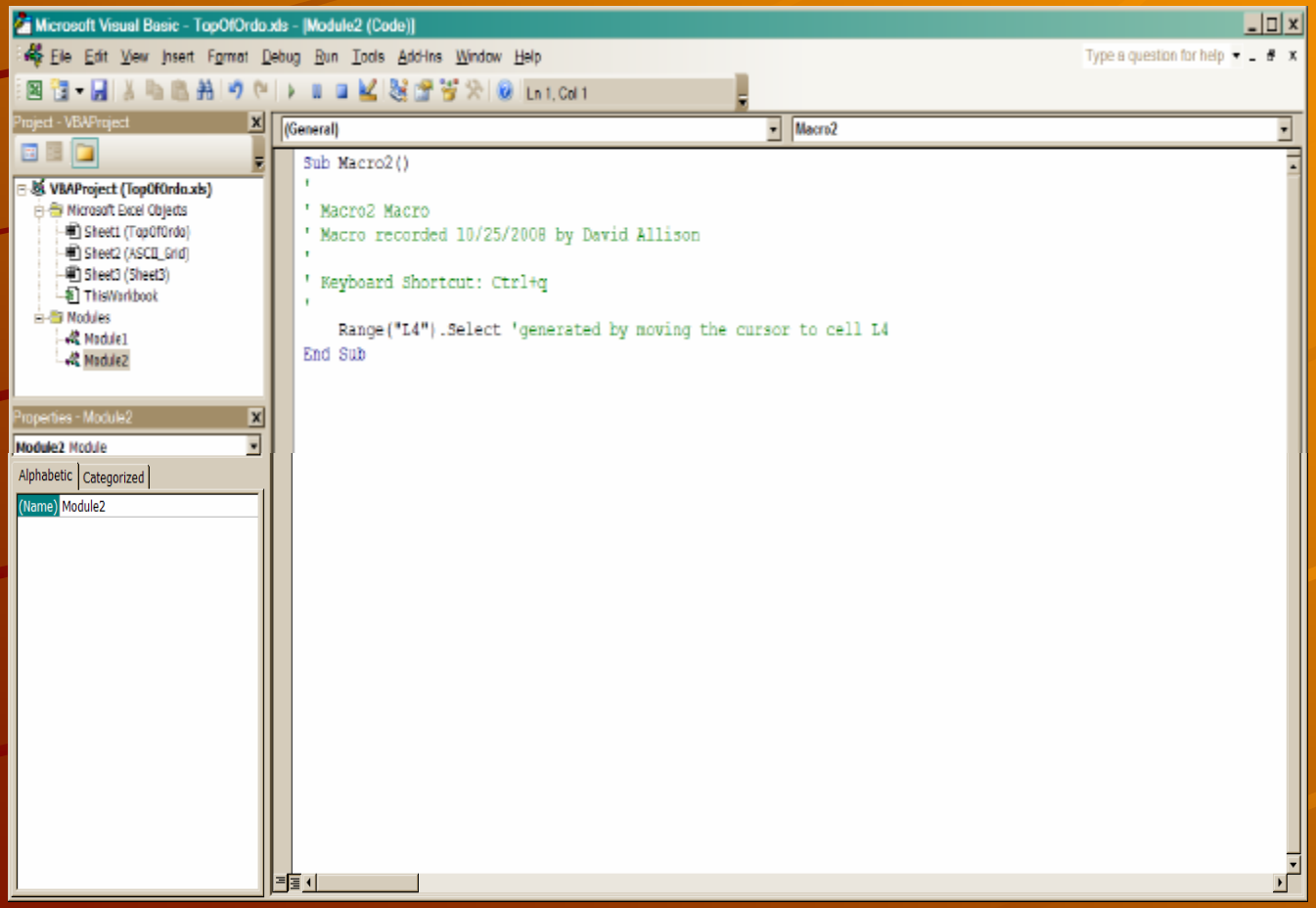
GIS and Programming with Visual Basic

Example: Trend Surface Analysis of a Subsurface Petroleum Reservoir

Visual Basic Editor

- Editor is invoked by creating a “macro” from within Excel
- “Tools” > “Macro” > “Record New Macro”
- Simply move the cursor to generate code and then stop recording
- Use “Tools” > “Macro” > “Visual Basic Editor” to enter VB editor

Example of Visual Basic Editor



- Note that "ctrl+q" activates the macro

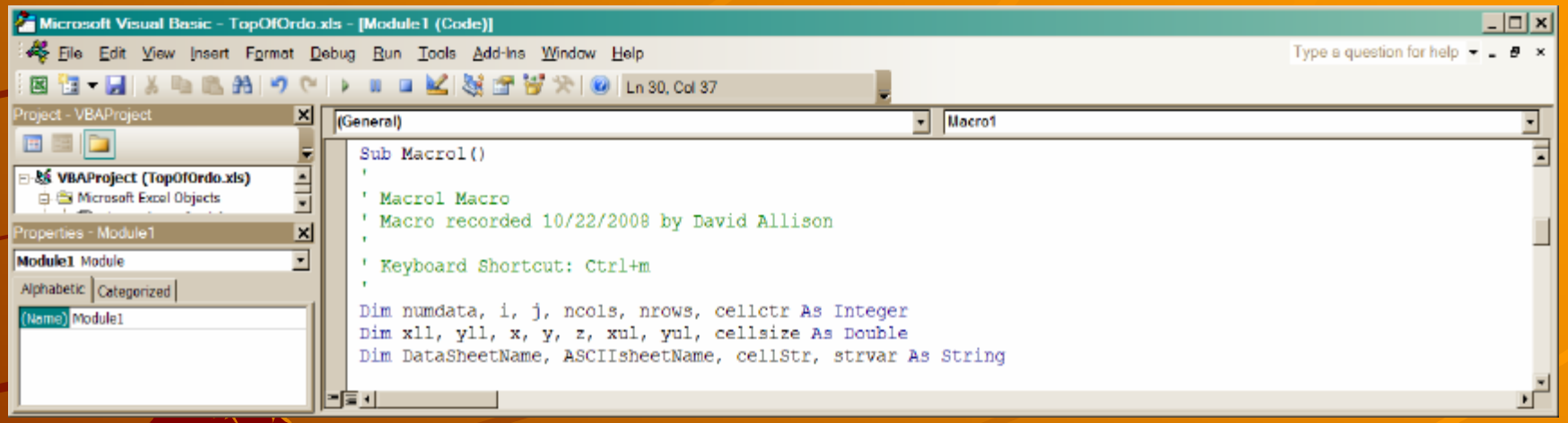
Visual Basic Concepts

- Constants: literal values
  - Integer: 2
  - Single, Double precision: 3.1416
  - String: “Trend Surface”
- Variables: a symbolic alphanumeric name that stores a value

Visual Basic Concepts: Declarations

- Declarations classify variables
  - Dim x, y, z as single
  - Dim strvar as string
  - Dim i, j as integer
- By convention variables that begin with i-n are declared as integer but that is not enforced by VB
- To avoid errors all variables used by a macro should be declared

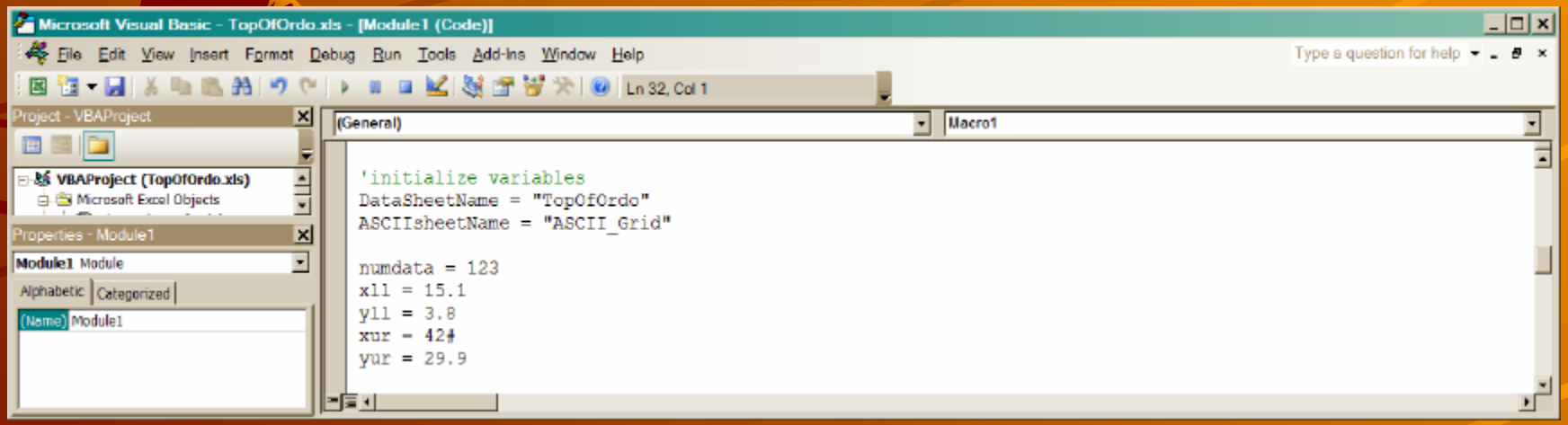
Visual Basic Declarations Example



- Integer, Double-precision and string variables are declared for use in the macro

Visual Basic: Assignment Statements

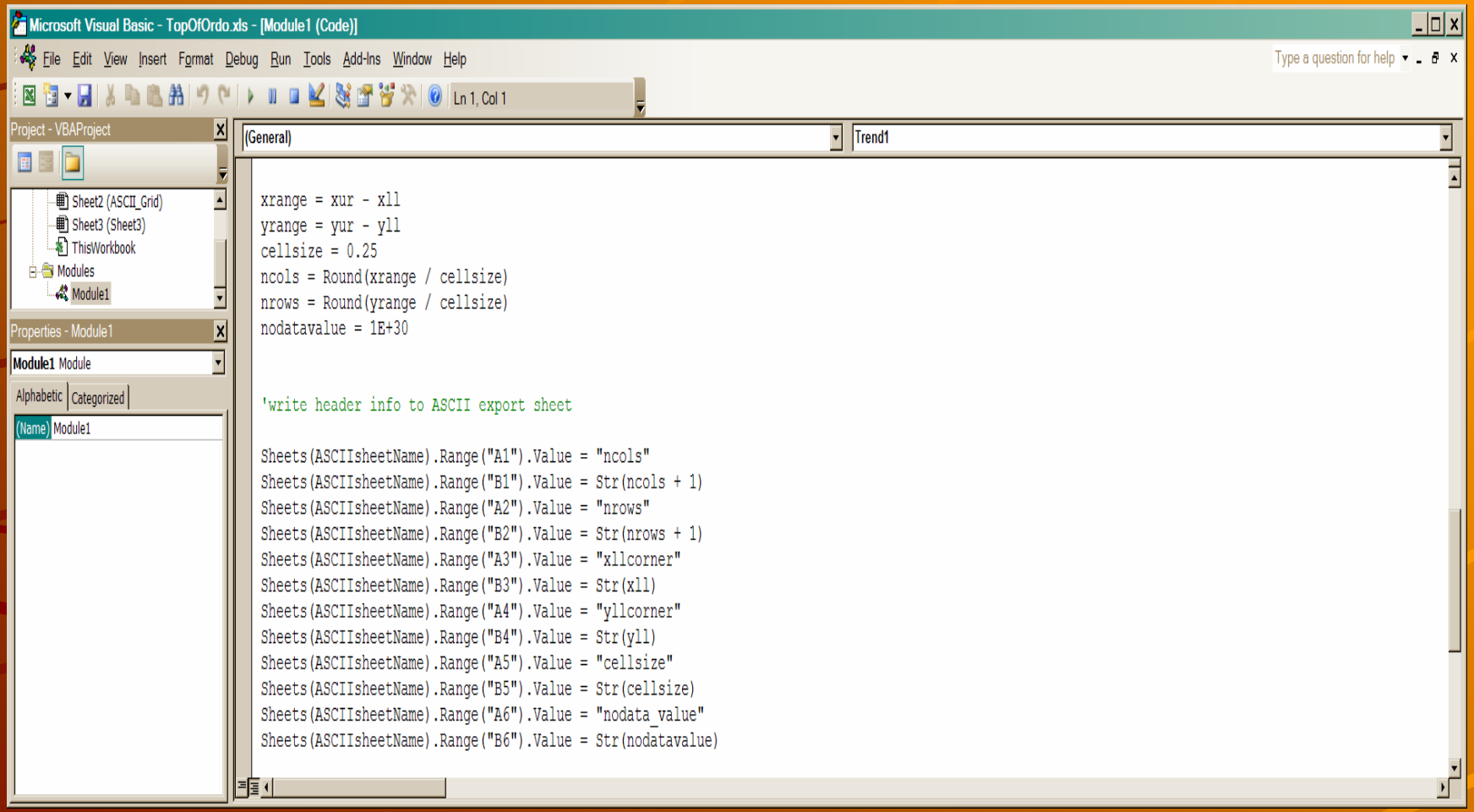
- Assignment statements are made with the "=" symbol. This stores the value to the right of the "=" into the variable to the left of the "=".



Visual Basic Operators

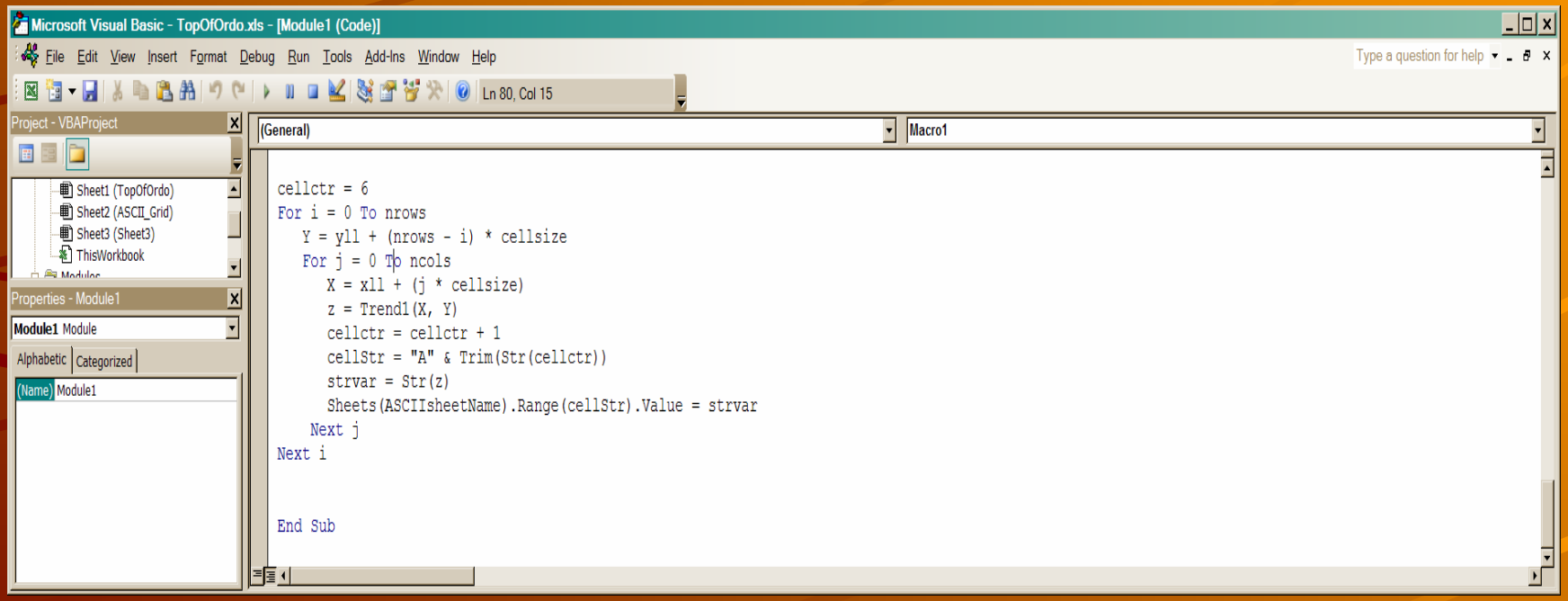
- Most operators are “numeric” – they operate on numbers to process calculations:
  - “+” addition
  - “-” subtraction
  - “*” multiplication
  - “/” division
  - “^” or “**” exponentiation
- Examples:
  - xrange = xur – xll
  - Area = x^2

Application of Statements



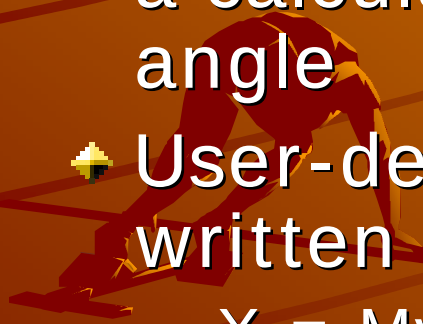
Visual Basic Statements

- For loop: processes one or more statements for a set number of cycles



Visual Basic: User-defined Functions

- Many intrinsic functions exist in programming languages such asVB:
  - X = Cos(y)
- A function takes an argument and returns a calculated value such as the cosine of an angle
- User-defined (explicit) functions are written by the user:
  - X = MyFunc(y)
  - The function “MyFunc” must be written by the programmer (i.e. it is not part of standard VB)



Visual Basic: Functions

Programming Notes

- The example used in this presentation was for a 1st order trend surface- the assignment will use a 3rd order trend surface
- To start a VB macro program use the Ctrl+{key} that you assigned to the macro
- If you have errors the VB system will usually mark the line where the error occured