A Functional Field Calculator

Presented by Carrie Landgraf, GISP

Overview

- Introduction
- Review of Field Calculator
- Math Functions
  - Round
- Date Fields
- Text Field Functions
  - Character Case
  - Concatenate
  - Left, Right, Mid
  - Split
  - Replace
  - Combining Functions

Who Am I

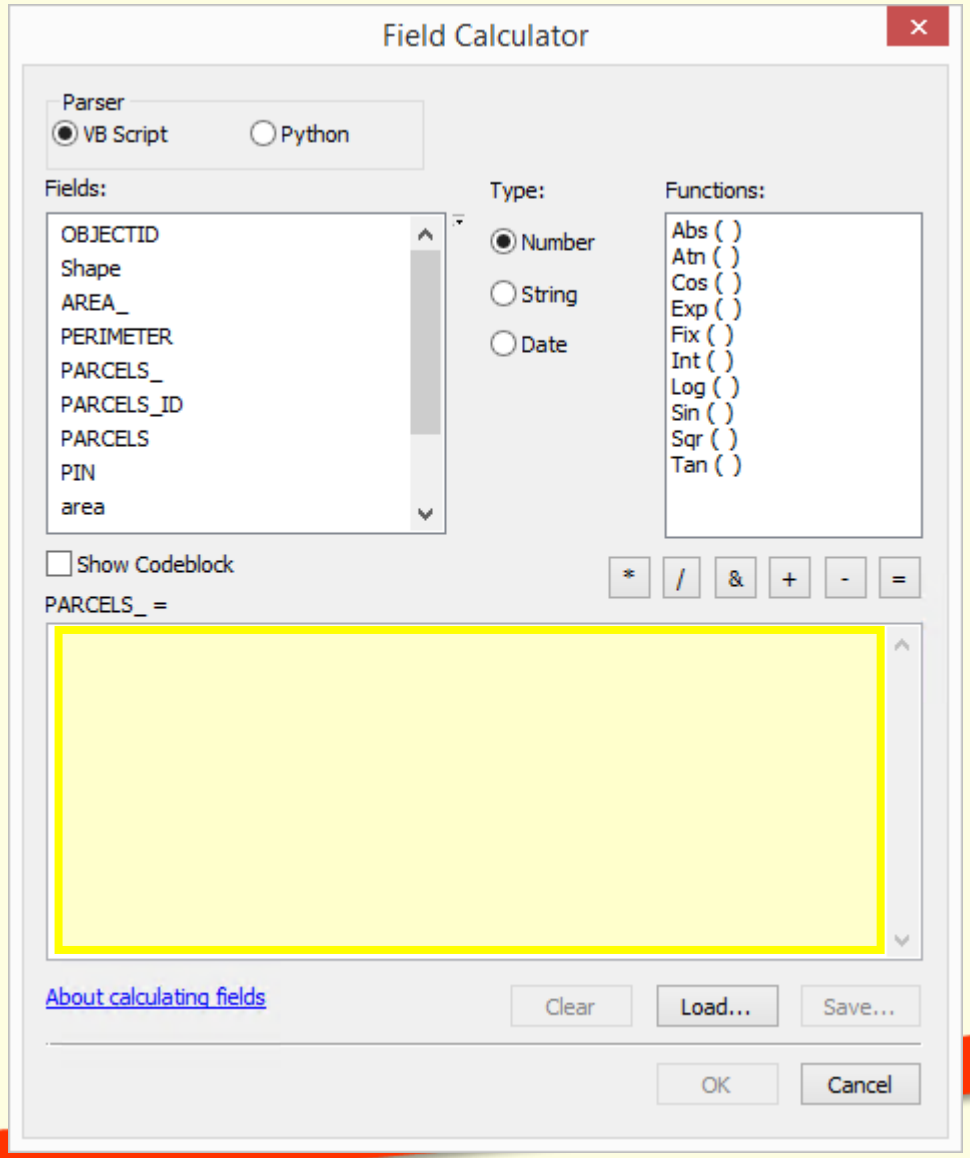
- Carrie Landgraf, GISP
  - 16+ years working with GIS professionally
  - Former Authorized Esri Instructor
  - GIS Manager at Garver

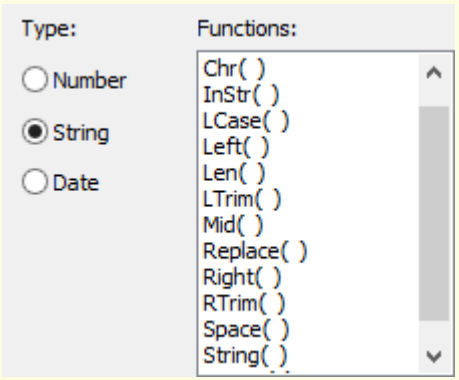
- The Field Calculator can still be my nemesis

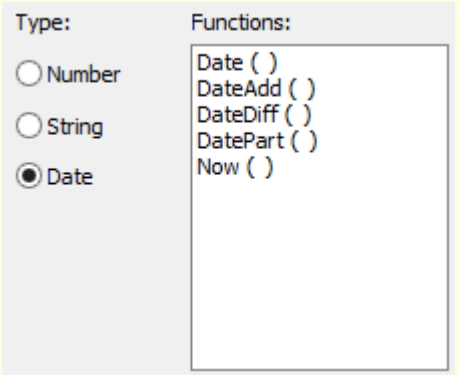
Types of Calculations

- Scripting Language (Parser)
  - Python
  - VBScript
- Field Data Types
  - Number
  - Date
  - Text

Field Calculator







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Mathematical Examples

- From Esri Help topic “Calculate Field examples”

Operator	Explanation	Example	Result
x + y	x plus y	1.5 + 2.5	4.0
x - y	x minus y	3.3 - 2.2	1.1
x * y	x times y	2.0 * 2.2	4.4
x / y	x divided by y	4.0 / 1.25	3.2
x // y	x divided by y (*floor division*)	4.0 / 1.25	3.0
x % y	x modulo y	8 % 3	2
-x	negative expression of x	x = 5 -x	-5
+x	x is unchanged	x = 5 +x	5
x ** y	x raised to the power of y	2 ** 3	8

Round Function

- Round a numeric value to the specified precision
- ROUND([FIELD_NAME], PRECISION)
  - 0 Precision means no decimal places

Round Function

Usage
765.432
89.567

ROUND TO WHOLE

ROUND([Usage], 0)

Result:

765

90

ROUND TO 1 DECIMAL

ROUND([Usage], 1)

Result:

765.4

89.6

Date Fields

- Dates are stored differently depending on the data type

- Shapefile or Coverage:

  yyyy-mm-dd

- Geodatabase

  yyyy-mm-dd hh:mm:ss AM or PM

Calculate Date

- How do you calculate a date field?
  - Use #

#9/20/2016#

Result:

9/20/2016

Case

- Convert characters in a text field to upper case or lower case
- UCASE([FIELD_NAME])
- LCASE([FIELD_NAME])

Case

First_Name
Jane

UPPER CASE

UCASE([First_Name])

Result:

JANE

LOWER CASE

LCASE([First_Name])

Result:

jane

Merge Field Values (Concatenate)

- Combine multiple fields into a single TEXT field
  - Use &
  - Use beginning and ending " to add other text, including spaces

ADDRESS	CITY	STATE	ZIP
123 Main St	Happyville	OK	98765

[Address] & ", " & [CITY] & " " & [STATE] & " " [ZIP]

Result:

123 Main St, Happyville OK 98765

Left, Right, Mid Functions

- Extract portions of a text field based on counting characters in the expression
- LEFT([FIELD_NAME], COUNT)
- RIGHT([FIELD_NAME], COUNT)
- MID([FIELD_NAME], START COUNT, COUNT)

Left Function

- How do you get from:

Full_Address
123 Main St, Happyville, OK, 98765

to:

Address
123 Main St

LEFT([Full_Address], 11)

Result:

123 Main St

Right Function

- How do you get from:

Full_Address
123 Main St, Happyville, OK, 98765

to:

Zip_Code
98765

Right([Full_Address], 5)

Result:

98765

Mid Function

- How do you get from:

Full_Address
123 Main St, Happyville, OK, 98765

to:

City
Happyville

Mid([Full_Address], 14, 10)

Result:

Happyville

Split Function

- Extract portions of a text field based on specified character(s)
- How do you get from:

Full_Name
Smith, Todd

to:

First_Name	Last_Name
Todd	Smith

Split Function

- SPLIT ([FIELD_NAME], “VALUE”)(COUNT)

Full_Name
Smith, Todd

EXTRACT FIRST NAME

SPLIT([Full_Name], “, ”)(1)

Result:

Todd

EXTRACT LAST NAME

SPLIT([Full_Name], “, ”)(0)

Result:

Smith

Split Function

- What if you just need the Zip Code?

Address
123 Main St, Happyville, OK, 98765

SPLIT([Address], “, ”)(3)

Result:

98765

Split Funtion

- What if you want all of the text after the City?

Address
123 Main St, Happyville, OK, 98765

SPLIT([Address], “, Happyville, ”)(1)

Result:

OK, 98765

Replace Function

- Replace part of a string with another string

- REPLACE([FIELD_NAME]), “FIND”, “REPLACE WITH”, START, COUNT)

Address
Happyville OK 98765

to:

Address
Happyville, OK 98765

Replace Function

Address
Happyville OK 98765

REPLACE([Address], " ", ", ")

Result:

Happyville, OK, 98765

REPLACE([Address], " ", ", ", 1, 1)

Result:

Happyville, OK 98765

Combine Functions

- Think about the order in which functions need to happen

- Examples
  - Replace and add text
  - Left and Split

Combine Functions (Example 1)

- How do you get from:

Address
321 State Ave Happyville

to:

Address
321 State Ave, Happyville OK 98765

Combine Functions (Example 1)

- Need to add a comma
- Need to add State and Zip Code

Address
321 State Ave Happyville

REPLACE([Address], “ Happyville”, “, Happyville”) & “ OK 98765”

Result:

321 State Ave, Happyville OK 98765

Combine Functions (Example 2)

- How do you get from:

Address
100 Main St Happyville 987651010

to:

Zip_Code
98765

Combine Functions (Example 2)

- Need to extract a portion of the string

Address
100 Main St Happyville 987651010

LEFT(SPLIT([Address], “Happyville “)(1)), 5)

Result:

987651010

Helpful Resources

- Esri Help Topics
  - Calculate Field examples
  - Supported SQL functions in ArcGIS Server
- URLs
  - http://www.smallsql.de/doc/sqlsyntax.html
  - http://geonet.esri.com

Questions?

Thank you!