

# Visual Programming with ArcGIS ModelBuilder

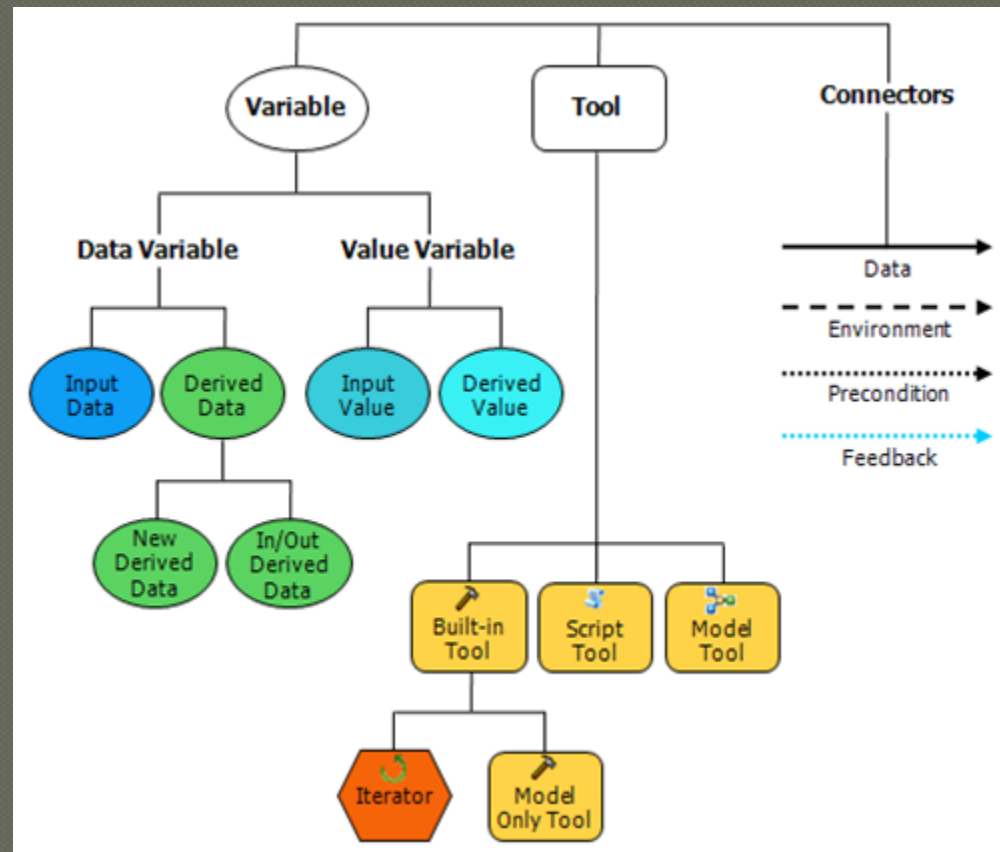
Bruce Godfrey  
GIS Librarian  
March 21, 2018

# What is ModelBuilder?

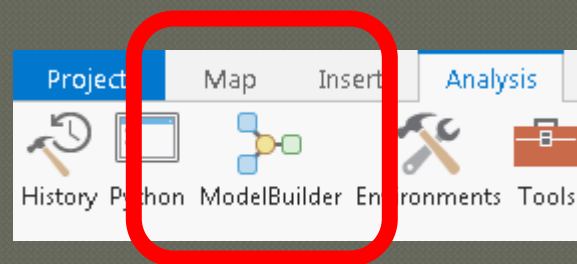
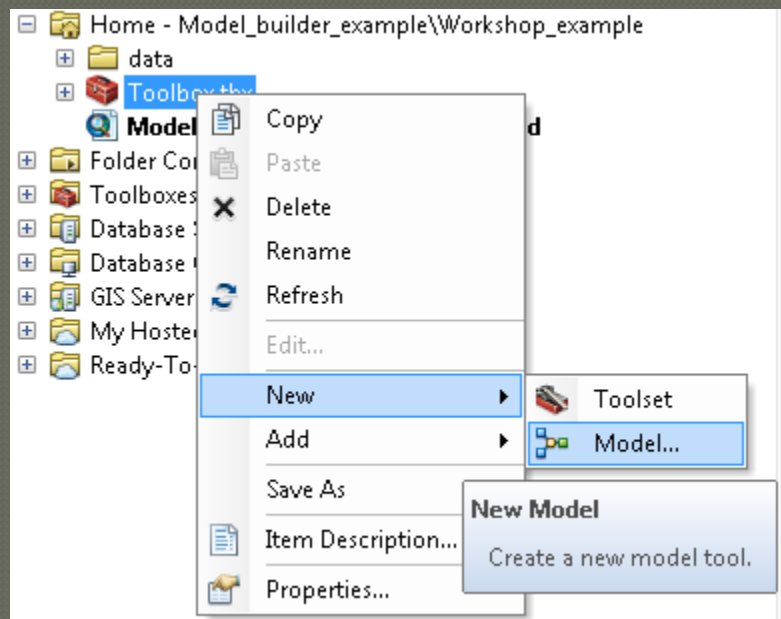
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- A built-in application in ArcGIS Desktop & ArcGIS Pro designed for creating reusable and sharable geoprocessing workflows
- It's visual programming tool – you drag-and-drop data and tool elements and connect them to form a workflow

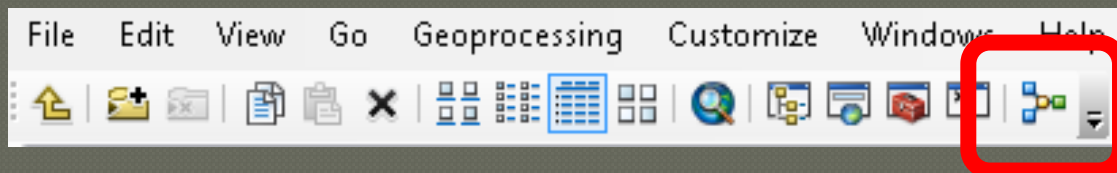
# Model Elements



# Creating a Model

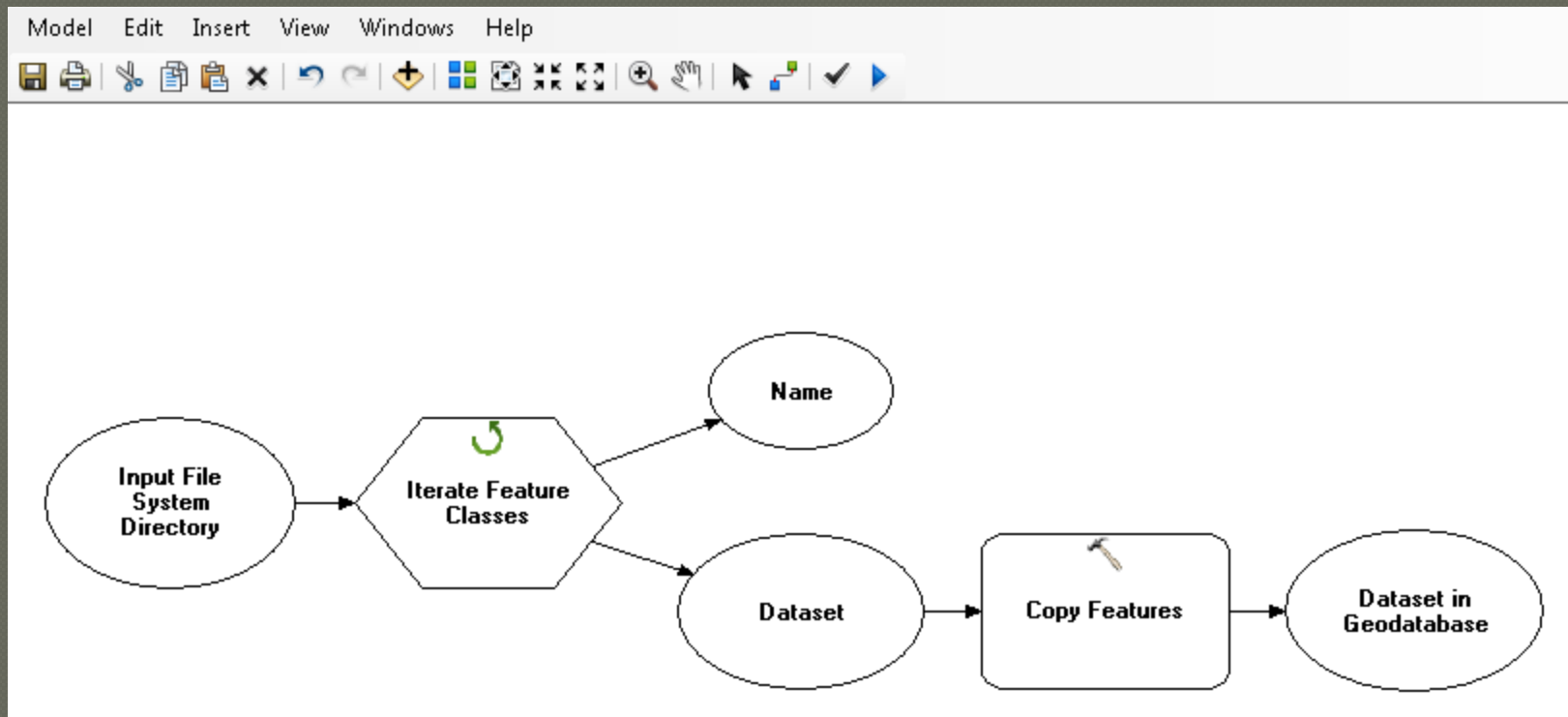


ArcGIS Pro



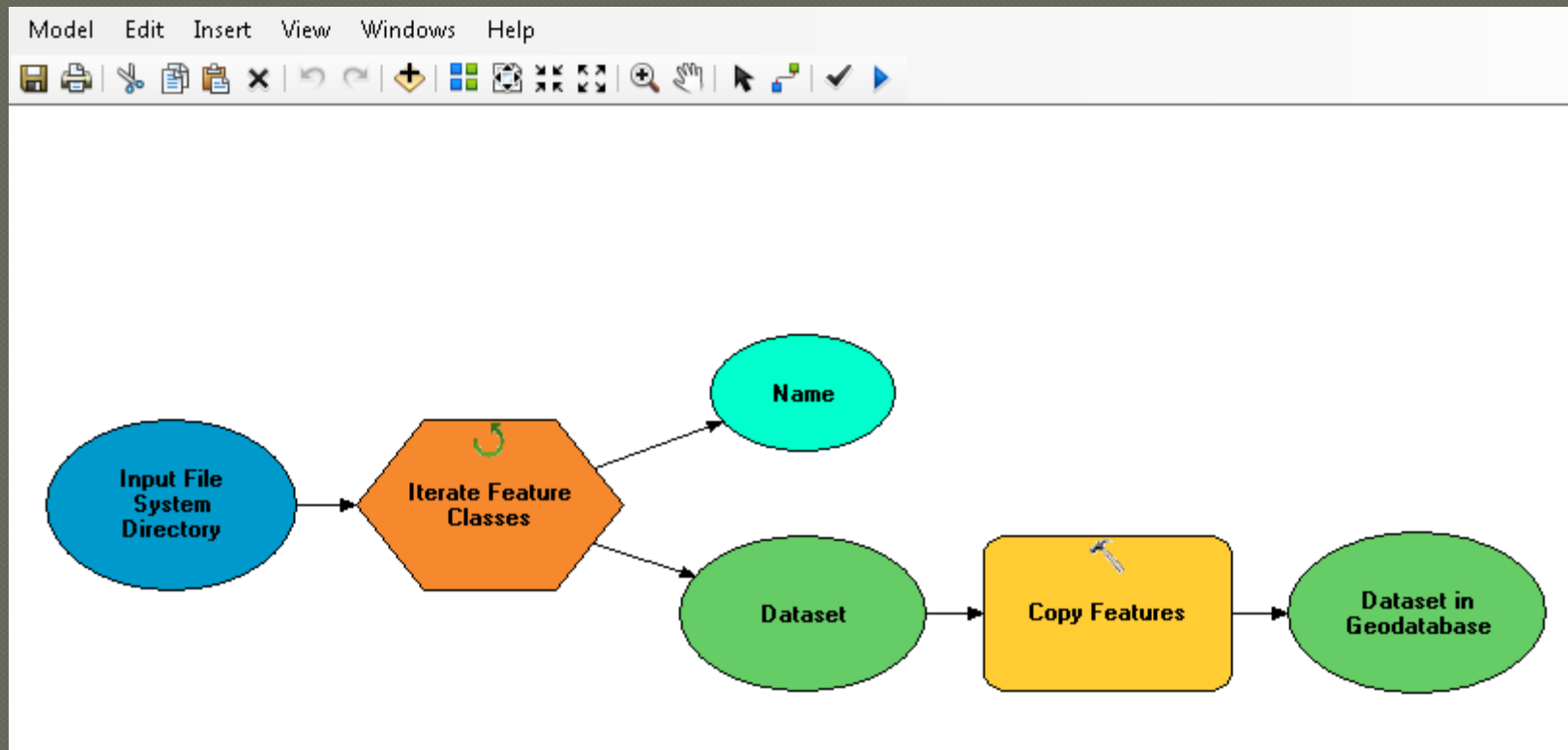
# Model Example & Model States

## Not Ready to Run



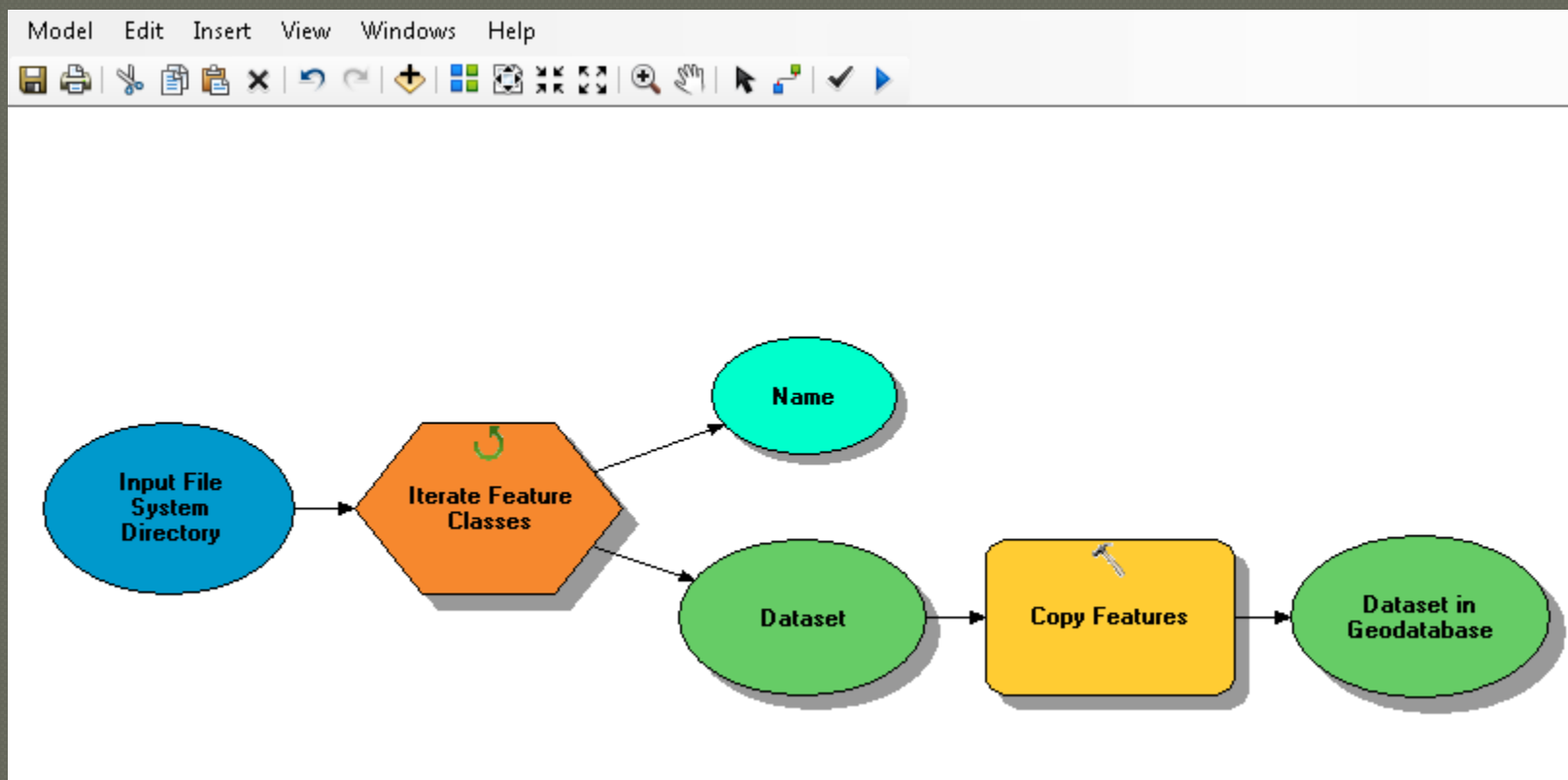
# Model Example & Model States

## Ready to Run



# Model Example & Model States

## Already Run



# Why Use ModelBuilder?

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- ◉ Automate geoprocessing workflows
  - Repeatability
- ◉ Visually represent workflows
- ◉ Run a complex succession of processes as one tool
- ◉ Share geoprocessing workflows with others
- ◉ Preserve institutional memory



# Exporting Models

## Exporting

- To graphic
- To python script

```
# -*- coding: utf-8 -*-
# -----
# model.py
# Created on: 2018-03-19 13:19:06.00000
# (generated by ArcGIS/ModelBuilder)
# Description:
# -----

# Import arcpy module
import arcpy

# Local variables:
v2016_30m_Cropland_Data_Layer = "2016 30m Cropland Data Layer"
Idaho_County_Boundaries = "D:\\gis_project_work\\model_builder_example\\arccgis\\countySelect = "in_memory\\countySelect"
countySelect_Dissolve = "C:\\Users\\bgodfrey\\Documents\\ArcGIS\\Default.gdb\\Cropland Data Layer_AOI = "D:\\gis_project_work\\model_builder_example\\arccgis\\Cropland Data Layer_IDTM83 = "D:\\gis_project_work\\model_builder_example\\arccdl_2016_aoi_idtm83_alfalfa = "D:\\gis_project_work\\model_builder_example\\ar

# Process: Select
arcpy.Select_analysis(Idaho_County_Boundaries, countySelect, "\\NAME\\ = 'BENE

# Process: Dissolve
arcpy.Dissolve_management(countySelect, countySelect_Dissolve, "DISTCAT", "",

# Process: Clip
arcpy.Clip_management(v2016_30m_Cropland_Data_Layer, "-1724218.95268598 220323

# Process: Project Raster
arcpy.ProjectRaster_management(Cropland_Data_Layer_AOI, Cropland_Data_Layer_ID

# Process: Extract by Attributes (Only Alfalfa)
arcpy.gp.ExtractByAttributes_sa(Cropland Data Layer IDTM83, "Class Name = 'Alf
```

# View A Model Report

## ● View

- Model report

### Model Report

*Generated on: Mon Mar 19 13:17:28 2018*

### Variables

✕ 2016 30m Cropland Data Layer  
✕ Idaho County Boundaries  
✕ countySelect  
✕ countySelect\_Dissolve  
✕ Cropland Data Layer AOI  
✕ Cropland Data Layer IDTM83  
✕ cdl\_2016\_aoi\_idtm83\_alfalfa

### Processes

✕ Select  
✕ Dissolve  
✕ Clip  
✕ Project Raster  
✕ Extract by Attributes (Only Alfalfa)

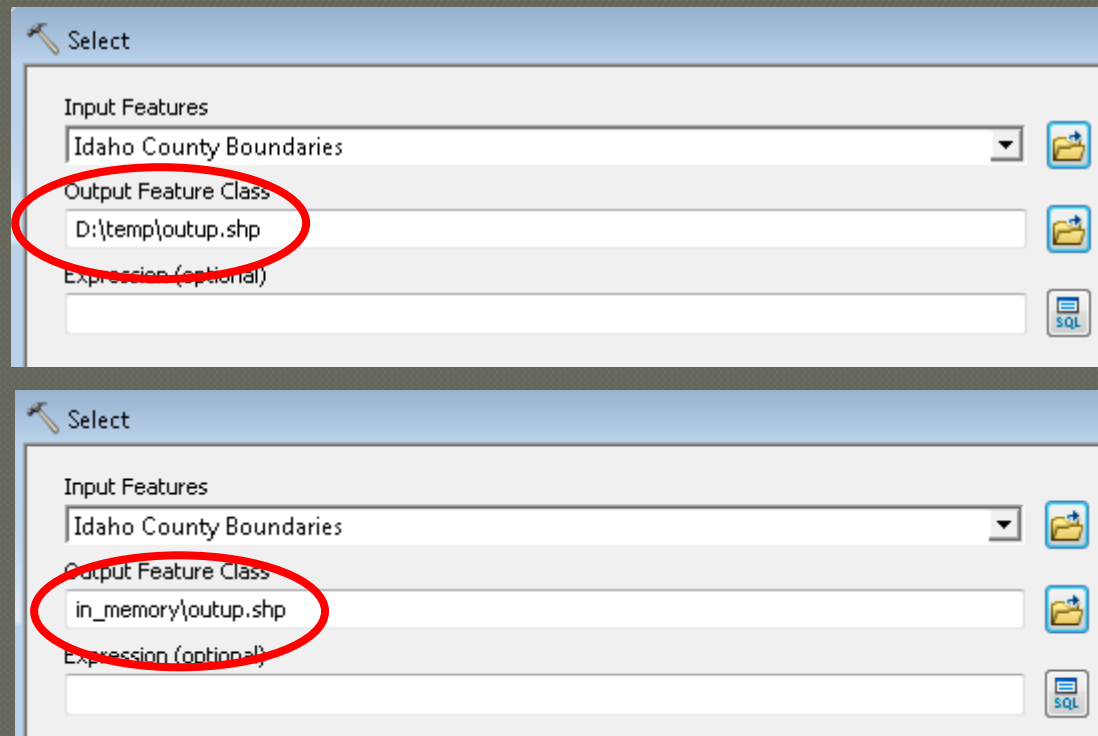
# Iterators

- Looping within a model

|                                                                                     |                   |
|-------------------------------------------------------------------------------------|-------------------|
|  | For               |
|  | While             |
|  | Feature Selection |
|  | Row Selection     |
|  | Field Value       |
|  | Multivalue        |
|  | Datasets          |
|  | Feature Classes   |
|  | Files             |
|  | Rasters           |
|  | Tables            |
|  | Workspaces        |

- <http://desktop.arcgis.com/en/arcmap/10.5/analyze/modelbuilder/a-quick-tour-of-using-iterators-for-iteration-looping-.htm>

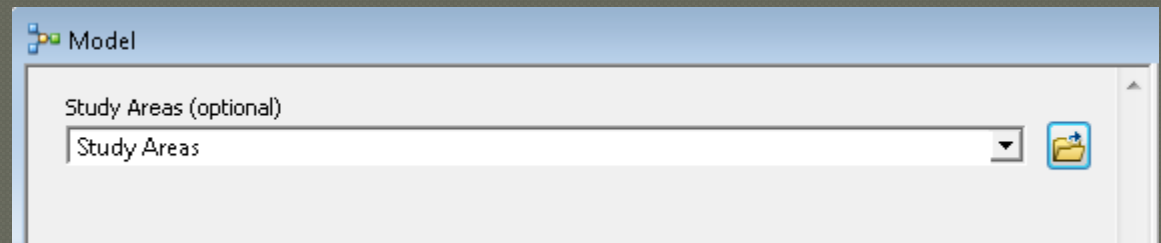
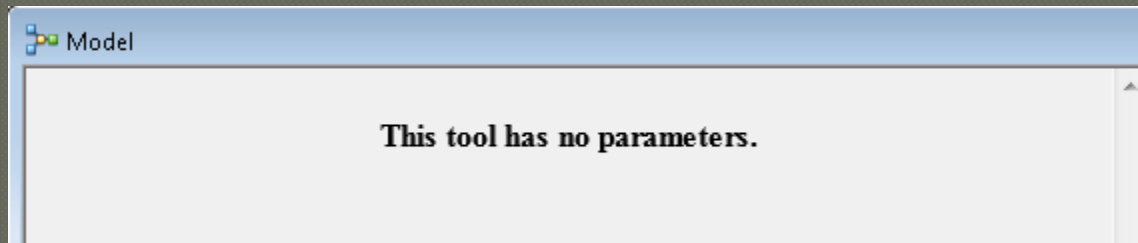
# In Memory Workspace



- <http://desktop.arcgis.com/en/arcmap/10.5/analyze/modelbuilder/the-in-memory-workspace.htm>

# Model Parameters

- If you (or intended users) need to be able to select a data variable (i.e. feature class) or value variable (i.e. SQL expression)



# Documenting Models

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- Similar approach to other items in ArcGIS
  - Right click the model in Catalog window
  - Click “Item Description”
  - Click the “Edit” button in window
- See “A quick tour of documenting tools and toolboxes”
  - <http://desktop.arcgis.com/en/arcmap/10.5/analyze/creating-tools/a-quick-tour-of-documenting-tools-and-toolboxes.htm>

# Sharing Models

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## ◉ Sharing geoprocessing workflows

- Geoprocessing package
- Geoprocessing service
- <http://desktop.arcgis.com/en/arcmap/10.3/analyze/sharing-workflows/a-quick-tour-of-sharing-geoprocessing-workflows.htm>

# Learning Opportunities

## ArcGIS Desktop

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### ● Building Models for GIS Analysis Using ArcGIS

- <https://www.esri.com/training/catalog/57630437851d31e02a43f219/building-models-for-gis-analysis-using-arcgis/>

### ● Creating Tools with ModelBuilder

- <http://desktop.arcgis.com/en/arcmap/10.5/analyze/modelbuilder/creating-tool-with-modelbuilder-tutorial.htm>



# Learning Opportunities

## ArcGIS Pro

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### ● Building Geoprocessing Models Using ArcGIS Pro

- <https://www.esri.com/training/catalog/57630433851d31e02a43eebc/building-geoprocessing-models-using-arcgis-pro/>

### ● ModelBuilder Tutorial

- <http://pro.arcgis.com/en/pro-app/help/analysis/geoprocessing/modelbuilder/modelbuilder-tutorial.htm>

# Let's Make a Model

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- Demonstration

# Contact Information

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