

LECTURE 6: CREATING AND EDITING DATA



*CEEN 4800/6965 - Special Topics
Geographic Information Systems and Hydrologic & Hydraulic Modeling
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OUTLINE

- ◆ **Section 6: Creating and Editing Data**
 - ◆ **Chapter 14: Building Geodatabases**
 - ◆ **Exercise 14a: Creating a personal geodatabase (Lab Exercise)**
 - ◆ **Exercise 14b: Creating feature classes (Homework)**
 - ◆ **Chapter 15: Creating Features**
 - ◆ **Exercise 15a: Drawing features (Lab Exercise)**
 - ◆ **Exercise 15b: Using feature construction tools (Homework)**
 - ◆ **Chapter 16: Editing Features and Attributes**
 - ◆ **Exercise 16a: Deleting and modifying features (Lab Exercise)**
 - ◆ **Exercise 16b: Splitting and merging features (Homework)**
 - ◆ **Exercise 16c: Editing feature attribute values (Homework)**

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ARCGIS GEODATABASE

- ◆ **Geodatabase = geographic database**
- ◆ **Stores both geographic and attribute data in the same RDBMS**
- ◆ **The term geodatabase refers to a storage format**
 - ◆ **File-based formats like shapefiles: store feature coordinate and attribute information in separate files**
 - ◆ **Geodatabase: Stores spatial features and their attributes in the same RDBMS file**

FIVE GEODATABASE TYPES

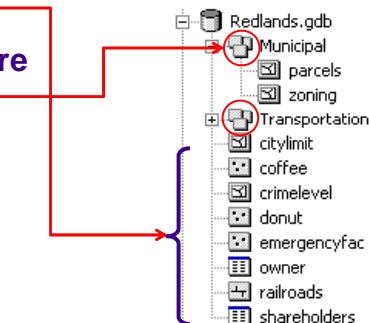
- ◆ **Personal (first three)**
 - ◆ For small projects
 - ◆ Only one user can edit at a given time
- ◆ **Multiuser (last two)**
 - ◆ For larger enterprise GIS applications and databases
 - ◆ Supports concurrent editing by multiple users; supports versioning
 - ◆ Requires ArcEditor or ArcInfo license
 - ◆ Requires a RDBMS software (e.g., Oracle or SQL Server)
 - ◆ Also requires ArcGIS Server software

Geodatabase Type	Available Through	DBMS Technology	Differentiating Characteristics
Personal geodatabase for MS Access	ArcView, ArcEditor, ArcInfo	Microsoft Access	1 editor 2 GB mdb file size limit
File geodatabase	ArcView, ArcEditor, ArcInfo	File structure	1 editor 1 TB per table size limit (default) No versions
Personal geodatabase	ArcEditor, ArcInfo	Microsoft SQL Server 2005 Express	1 editor 4 GB size limit per GDB 3 concurrent connections, Support for versions
Workgroup geodatabase	Workgroup level of ArcGIS Server	Microsoft SQL Server 2005 Express	Multi-user editing, 4 GB size limit per GDB Support for versions,
Geodatabase	Enterprise level of ArcGIS Server	IMS DB2, IBM Informix, Microsoft SQL Server 2000 or 2005, Oracle	Multi-user editing, Support for versions,

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Geodatabase data format

- ◆ **Stand-alone feature classes**
- ◆ **Feature datasets (group of feature classes)**

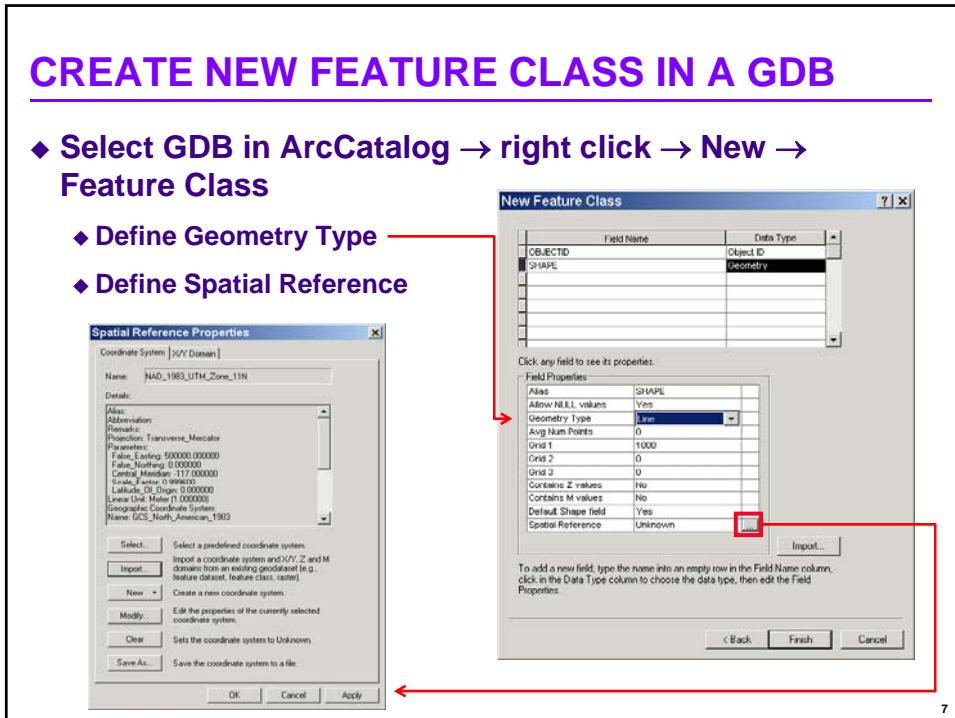


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CREATE NEW FEATURE CLASS IN A GDB

- ◆ Select GDB in ArcCatalog → right click → New → Feature Class

- ◆ Define Geometry Type
- ◆ Define Spatial Reference



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LAB EXERCISE

- ◆ **Exercise 14a:**
Creating a personal geodatabase
- ◆ **Note:** Before starting the exercise, copy exercise data folder (Chapter14) from the C:\GTKArcGIS folder to your personal drive, i.e., N: drive (YSU's student account server) or memory stick.



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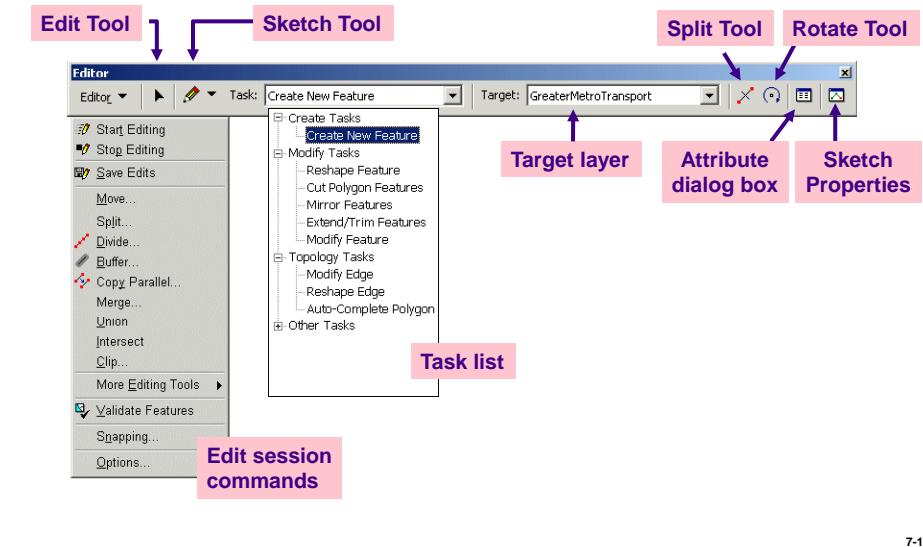
CREATING & EDITING FEATURES

EDITING OVERVIEW

- ◆ **Editing spatial data**
 - ◆ Navigating the Editor toolbar
 - ◆ Editing tools
 - ◆ Simple editing functions
 - ◆ Working with sketches
- ◆ **Editing attribute data**
 - ◆ Using the Attribute dialog on selected features
 - ◆ Editing attribute values

THE EDITOR TOOLBAR

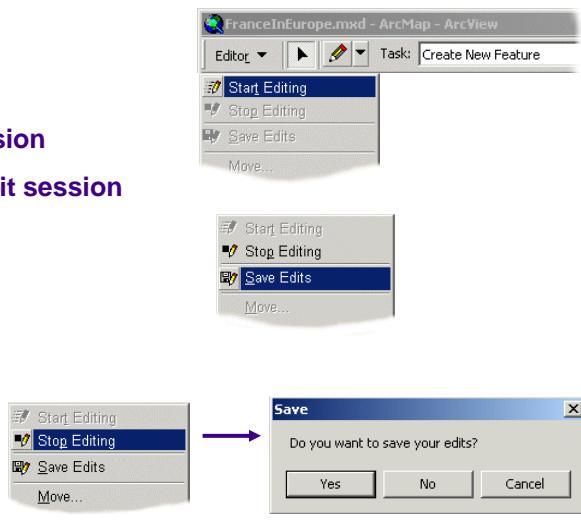
- ◆ All editing functions are controlled through the toolbar



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MANAGING EDIT SESSIONS

- ◆ Starting a session
- ◆ Saving edits
 - ◆ During the edit session
 - ◆ At the end of the edit session
- ◆ Ending a session



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SELECTING FEATURES

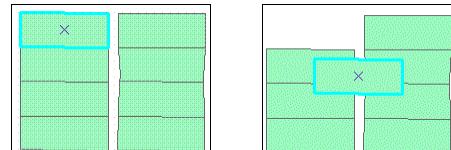
- ◆ Interactive method
 - ◆ Manual: Select features by clicking them with Edit tool
 - ◆ Graphic Method: Select features by drawing a shape (box, line, or area) (Lecture 5A)
- ◆ Query method
 - ◆ Selection menu: By Attribute, By Location (Lecture 5A)
- ◆ Choice of selectable layers from Selection menu (Lecture 5A)



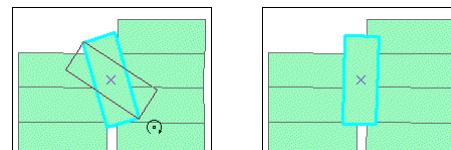
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SIMPLE EDITING FUNCTIONS

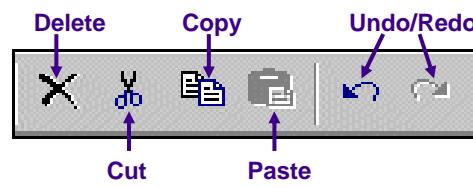
- ◆ Moving
 - ◆ Click and drag



- ◆ Rotating



- ◆ Others



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SKETCH TOOL

- ◆ Use to create, modify, reshape features



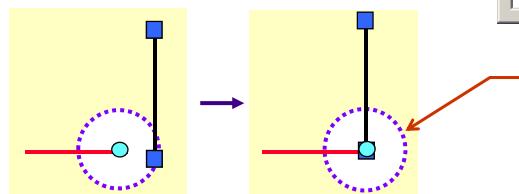
- ◆ Temporary graphic represents feature geometry
- ◆ Left mouse button adds vertices or points
 - ◆ Double-click or F2 key to finish sketch
 - ◆ Right-click to access context menu



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USING SNAPPING

- ◆ Snapping automatically moves your pointer to the location of a feature.
- ◆ Editor tool bar → Editor → Snapping
 - ◆ Snaps pointer to existing feature's edge, vertex, or endpoint



Snapping Tolerance: the distance the pointer must be to a feature before it snaps to that location.

Set through Options from the Editor menu.

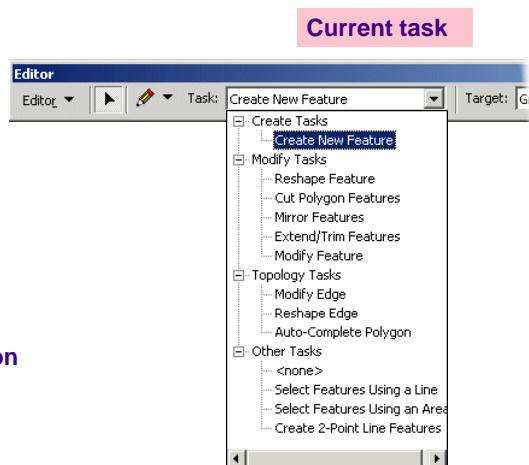
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EDIT TASKS

- ◆ Sketch tool works with the current task

- ◆ Task examples:

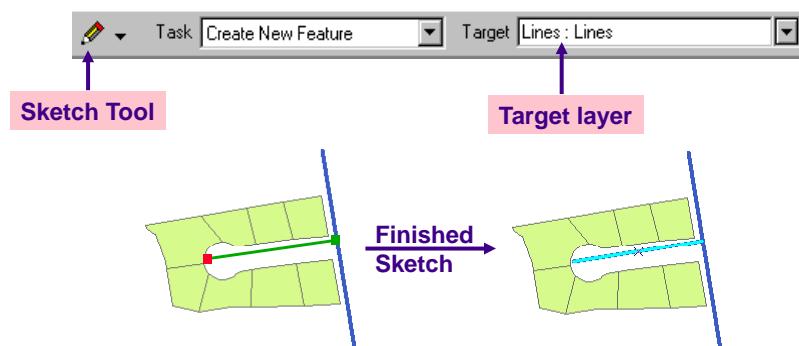
- ◆ Create New Feature
- ◆ Modify Feature
 - Reshape Feature
 - Extend/Trim Features
 - Cut Polygon Features
- ◆ Maintain topology
 - Auto-Complete Polygon



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CREATE NEW FEATURE TASK

- ◆ Sketch tool is used to add new features to the Target layer

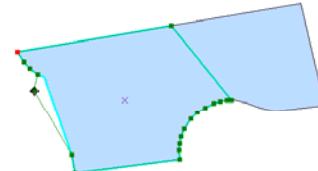


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MODIFY FEATURE AND RESHAPE FEATURE

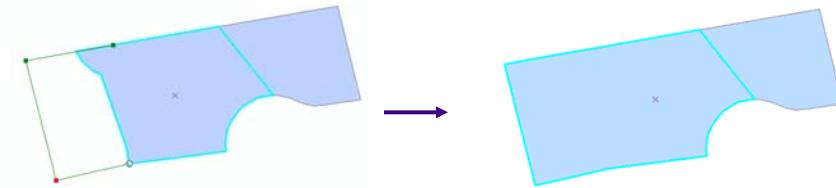
◆ Modify Feature Task

- ◆ Edit the vertices of an existing feature
- ◆ Modify one feature at a time
- ◆ Shortcut: Double-click with the Edit Tool



◆ Reshape Feature Task

- ◆ Feature takes the shape of the intersecting sketch



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EXTEND/TRIM FEATURES AND CUT POLYGON

◆ Extend/Trim Features

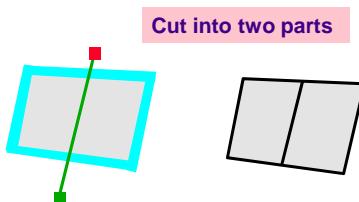


Extend to sketch



Trim to right of sketch

◆ Cut Polygon Features

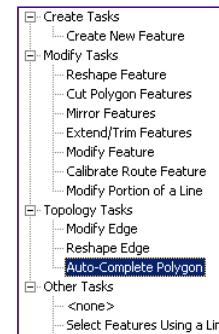
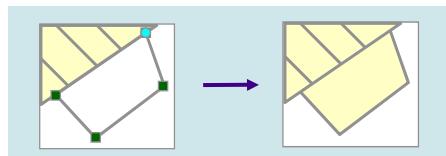


Cut into two parts

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AUTO-COMPLETE POLYGON

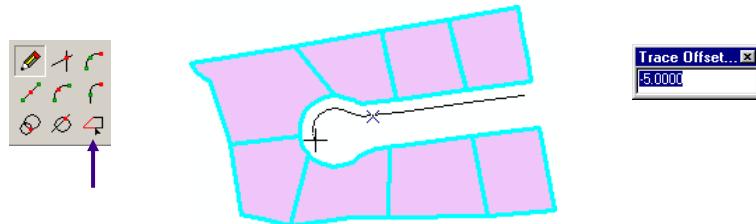
- ◆ Automatically maintain coincidence (topology)
 - ◆ Align new polygon with existing features
 - ◆ Avoid gaps or overlaps



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TRACE TOOL

- ◆ Trace along selected features
- ◆ Select features
- ◆ Click to start and stop the trace
- ◆ Press O to specify an offset



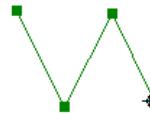
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SKETCH CONTEXT MENU

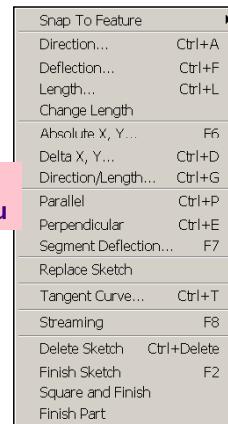
- ◆ Pops up with Right-click
- ◆ Context menu type depends on click location



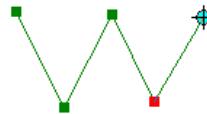
Sketch Tool context menu



When cursor is directly over last vertex



When cursor is away from last vertex



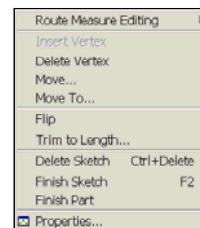
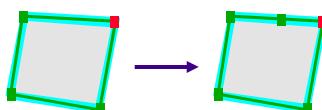
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MODIFYING EXISTING FEATURES

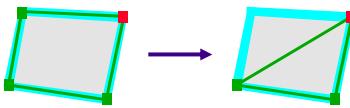
- ◆ Double-click feature to expose sketch elements

- ◆ Right click to show context menu

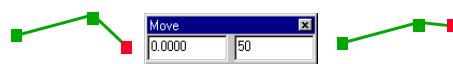
- ◆ Insert Vertex



- ◆ Delete Vertex



- ◆ Move vertices delta x,y (Move) or exact x,y (Move To)

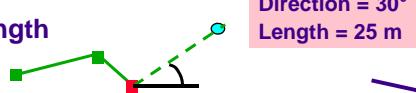


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CONTROL SKETCH ELEMENTS

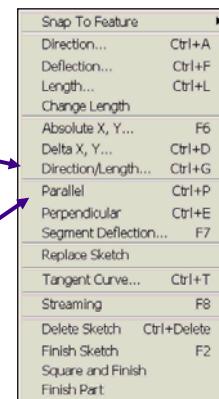
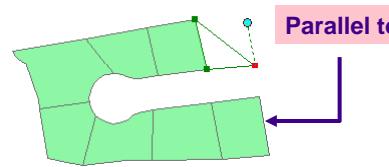
◆ Next sketch segment

◆ Direction/Length



◆ Directions based on existing features

◆ Parallel

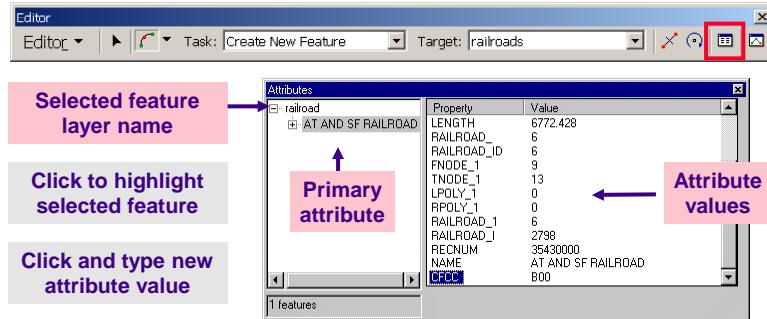


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EDITING
ATTRIBUTES & TABLES

EDITING ATTRIBUTE DATA

- ◆ Attribute dialog allows viewing and editing of selected feature attributes



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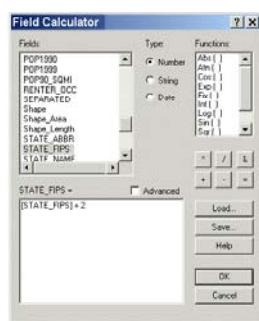
EDITING ATTRIBUTES ON AN OPEN TABLE

- ◆ Direct edits to a single cell
- ◆ Use the Field Calculator
 - ◆ Calculate field values for an open table
 - ◆ Simple calculations or advanced functions
 - ◆ In or out of an ArcMap edit session

Shape_Area	Acres
758.379835	
748.725684	<Null>
718.135263	<Null>
1293.154156	<Null>
843.254401	<Null>
793.558550	<Null>
1044.247779	<Null>
828.657892	

(of 8 Selected.)

Options



STATE_NAME	STATE_FIPS	DECIMALS	FORMAT
Washington	53		
Montana	30		
Maine	23		
North Dakota	36		
South Dakota	46		
Wyoming	56		
Wisconsin	55		
Idaho	16		

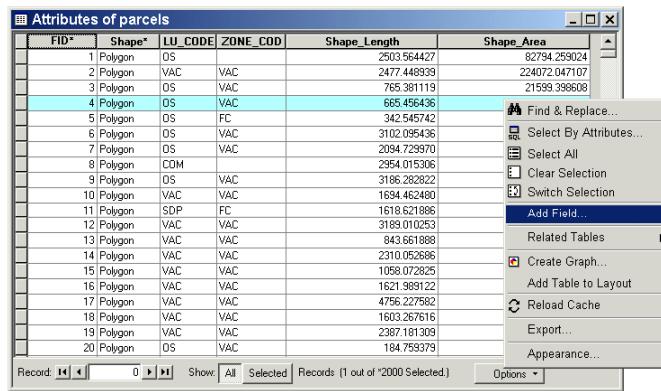
Record: 14 | 0 | Show: All | Selected | Records: (0 out of 51)

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ADDING TABLE FIELDS IN ARCMAP

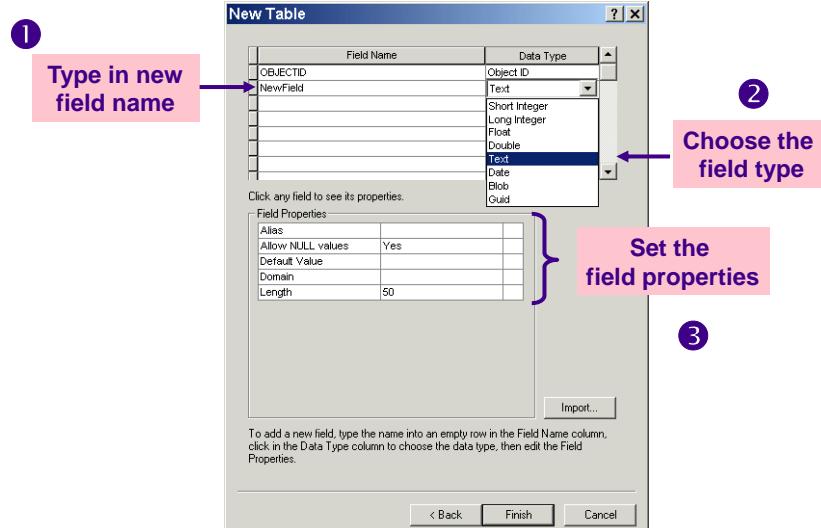
◆ Add fields (Change schema)

◆ Must be outside edit session



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ADDING TABLE FIELDS IN ARCCATALOG



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LAB EXERCISES



- ◆ **Exercise 15a: Drawing features**
- ◆ **Exercise 16a: Deleting and modifying features**
- ◆ **Note: Before starting the exercises, copy exercise data folders (Chapter15 and Chapter16) from the C:\GTKArcGIS folder to your N: drive (YSU's student account server) or memory stick.**

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HOMEWORK 4



- ◆ **Exercise 14b: Creating feature classes**
 - ◆ Q1. Complete Exercise 14b and submit a screenshot of “New Feature Class” window from Step 10 (shown on page 386).
- ◆ **Exercise 15b: Using feature construction tools**
 - ◆ Q2. Complete Exercise 15b . After completing Step 27, zoom to display the extents of both the newly added parcels. Submit a screenshot of the updated map.
 - ◆ **Extra Credit (10 extra points):** Instead of submitting a screenshot, print and submit the above map in landscape mode. Add the following elements to this map:
 - ◆ Your name
 - ◆ A map title
 - ◆ North arrow
 - ◆ Scale bar, and
 - ◆ YSU logo.

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HOMEWORK 4



◆ **Exercise 16b: Splitting and merging features**

- ◆ Q3. Complete Exercise 16b. After completing Step 21, zoom to display the extents of the three edited parcels (2707, 2855, 2861). Submit a screenshot of the updated map.

◆ **Exercise 16c: Editing feature attribute values**

- ◆ Q4. Complete Exercise 16c. After completing Step 13, repeat Steps 10 to 13 to accomplish the following:
 - ◆ Add a new field to the table called Hectares
 - ◆ Use Field Calculator to populate the Hectares field with parcel area in Hectares (Hint: 1 Hectare = 2.471 acres)
 - ◆ Submit a screenshot of the updated “Attributes of Parcels” table. The screenshot should show all the columns (including the Hectares column) and at least the first 10 rows of the table.