The CEDRA Corporation's

COMMAND OF THE MONTH

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FEATURED COMMAND

Assigning Attributes to Features
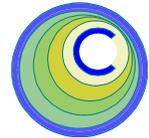
Application Description

A simplified description of a GIS is that you have *graphics* (points, lines, polygons and annotation) and *data* (attributes). In the ArcView® GIS and ArcGIS® world we use the word *features* rather than *graphics*, since graphics in these environments can not have data associated with them.

To create features you do not have to use your imagination very much to visualize the many, many, geometric ways of establishing features (line through two points, circular arc through three points and so forth). However, data on the other hand, is not so clear cut. The question becomes how does one easily and efficiently assign data to one or many features.

The CEDRA Solution

To address the application of assigning attributes, CEDRA users have three different solutions available to them.

The *first* is the CEDRA-DataEditor software, which is available for both ArcView GIS and ArcGIS users. This software is a powerful tool for assigning and maintaining attributes on a feature by feature basis.

Shown in Figure 1 are the tools provided in the CEDRA-DataEditor software for ArcGIS users. The February 2005 issue of Command of the Month discusses this software in detail. The reader is referred to that issue for more information. If the reader is not familiar with the capabilities of this software, it is highly

Edit Feature

Reload Themes.txt

Set Working Directory

Delete Feature
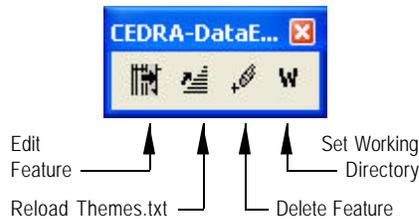
Figure 1
{CEDRA-DataEditor-Tools} Toolbar

recommended that this issue be read. This month's issue of Command of the Month will concentrate on the other two solutions.

The *second* solution which the user can utilize is the [EditFeature] command. This solution is specific for ArcGIS users and is available by activating the CEDRA-EditFeature-Tools toolbar as shown in Figure 2.

> ***Command Of The Month bulletin***
>
> *This month's issue discusses the available tools for assigning attribute values to one or more selected features.*

This solution is a simplified alternative to the CEDRA-DataEditor software and offers the user the ability to assign and edit attributes on a feature by feature basis.

The *third* solution is comprised of the [Sequential IDs] and [Assign Attribute] commands, which are available in the CEDRA-Skeletonization-Tools toolbar as shown in Figure 3. This solution is also specific for ArcGIS users.

Figure 2
{CEDRA-EditFeature-Tools} Toolbar
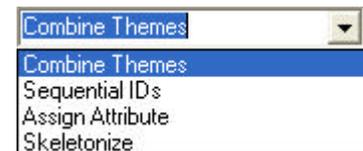
Figure 3
{CEDRA-Skeletonization-Tools} Toolbar

These commands offer the user the ability to compute and assign attribute values to one or more selected features. As such, attributes can be assigned on a mass feature basis.

Presented below is a description of the use and application of the [EditFeature], [Sequential IDs] and [Assign Attribute] commands.

Edit Feature - Overview

The intent of the [EditFeature] command is to provide the user the ability to select a feature, displaying the attributes currently assigned to the feature in a multi-input dialog box. The name of the attribute or field serves as the label in the dialog box.

If the attribute has been assigned an alias, the name of the alias will appear as the label. The attributes are displayed in groups of 10 with the ability to advance or go back to previous groups.
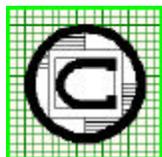
As the multi-input dialog boxes are displayed, the user can: (a) simply view the values or (b) modify the values, which appear in the dialog box. The order of the attributes, which are displayed, reflect the order in which the attributes were established during the creation of the database (the layer's attribute table).

Edit Feature - Operation

Once the command has been activated, perform the following:

1. Make a pick in the map area to select the feature to be processed.

2. As shown in Figure 4, click at the:

Figure 4
Feature Selection Confirmation Query

- *Cancel* button to terminate the command, the
- *No* button to reject the feature selection and indicate that the command should search for another feature within the proximity of the pick made in Step 1, or the
- *Yes* button to confirm the feature selection and continue with the processing.

3. Upon confirmation of the feature selection, a multi-input dialog box similar to that of Figure 5 will appear. At this point, review the val-

Figure 5
Initial Multi-Input Dialog Box

ues displayed in the multi-input dialog box and make any modifications, if any. At which point, click the:
- *BACK* button to return to the previous multi-input dialog box that was displayed. The
- *Cancel* button to terminate the command, saving any edits which have been made to this point, or the
- *OK* button to apply the values appearing in the dialog box to the feature. At this point, the command will either terminate or display another multi-input dialog, as shown in Figure 6, if there are more attributes associated with the feature, at which point, Step 3 repeats.
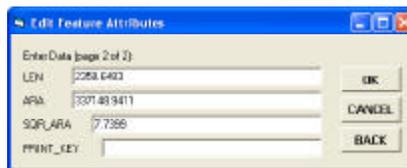
Figure 6
Subsequent Multi-Input Dialog Box

Upon completion of its processing the command remains active so that another feature can be selected for editing.

If the user wishes to undo the edits, which were applied to the feature, the {Edit} [Undo Edit Feature] command can be selected.

Sequential IDs - Overview

The intent of the [Sequential IDs] command is to compute a sequential attribute value given an initial value and a desired incremental value.

In addition, the user has the ability to specify:

(a) the formatting of the sequential attribute value,
(b) a prefix, which is to appear before the sequential attribute value,
(c) a suffix, which is to appear after the sequential attribute value,
(d) a graphic polyline element indicating the order of the feature processing, and

(e) the field or attribute, which is to contain the sequential attribute value.

The attribute or field which is to contain the sequential attribute value can be of string or numeric type. Note, if the field is of numeric type, the user should include a prefix or suffix, only if, the prefix or suffix represents a numeric value.

To use this command the user activates or selects the appropriate layer in the Table of Contents prior to activating this command. Upon activation, the command displays a multi-input dialog box from which the user can specify the appropriate information.

The default order of feature processing is based upon the object ID (OID) of the feature. To override this processing order, the user can define a graphic polyline element. Under this scenario, the order of the vertices comprising the graphic element will dictate the order of feature processing. The command takes the polyline's vertices and determines which feature corresponds to the specific vertex. Furthermore, this element must be created and selected prior to activating the command.

The [Sequential IDs] command will process the selected features in the active layer. If there are no selected features, all features in the active layer will be processed.

Sequential IDs - Operation

Once the command has been activated, the following steps can be performed:

1a. If the command does not find an active layer in the Table of Contents, click at the *OK* button of Figure 7 to acknowledge the error message. Activate a layer in the Table of Contents and reactivate the command.

1b. If the command finds more than one active layer in the Table of Contents, click at the *OK* button of

Figure 7
Sequential IDs Error Message
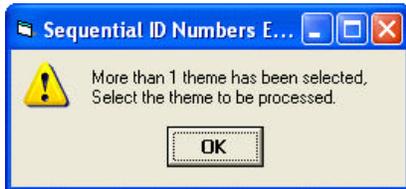
Figure 8
Sequential IDs Error Message

Figure 8 to acknowledge the error message. Activate a single layer in the Table of Contents and reactivate the command.

At this point, the command checks to see if there is a selected graphic polyline element or not. As such there are two modes in how this command will function.

A.   No Selected Graphic Polyline

2a. Once a single active layer has been found, the multi-input dialog box of Figure 9 will appear.
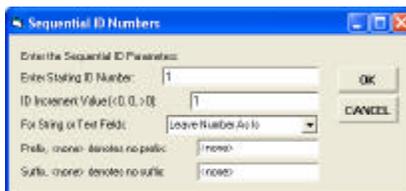
Figure 9
Sequential IDs Multi-Input Dialog Box

Figure 10 identifies the choices the user has in controlling the formatting of the computed sequential attribute value.
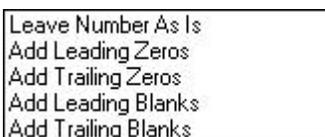
Figure 10
Available Formatting Options

Once the appropriate information has been specified, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to continue with the processing.

3a. Once the base information has been defined, the user is able to indicate which attribute (field) is to contain the computed sequential attribute value. Shown in Figure 11 is the choice list from which the user can make the appropriate attribute selection.

Note that the first choice in the list is the Create the SEQ_ID field option. The user should select this option when none of the existing attributes, associated with the layer, is to be used. Under this mode, a new field called SEQ_ID will be created of long Integer type.

Figure 11
Attribute Specification Choice List

Once the appropriate field has been identified, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to continue with the processing.

Upon confirmation to continue the processing, the command builds an ascending ordered list of OIDs (either for the selected features or all features, if there are no selected features).

The first feature in the list will be assigned the Starting ID Number (formatted as specified by the user's responses entered in Figure 9), while the subsequent features in the list will have the incremental value added in.

Note that the incremental value can be negative, zero or greater than zero. In addition, it is possible for the prefix and/or suffix parameters to contain leading and/or trailing blanks (space characters).

An example of using a prefix. such as AB-, and a suffix, -CD, in conjunction with adding leading zeros would be: AB-0015-CD. Note that, in adding leading or trailing zeros, the command will add as many zeros as required in order to satisfy the field width.

As the command processes the features, a progress bar in the status bar area will appear indicating the percent of completion. Once the command has finished a message in the status bar area will appear stating how many features were processed.

B.   Selected Graphic Polyline

When the [Sequential IDs] command detects a selected graphic polyline element, the command assumes that the user wishes to change the feature processing order by using the order of the vertices that comprise the selected graphic polyline element.

Shown in Figure 12 is a selected graphic polyline element. The order of the vertices comprising the graphic are identified as 1 through 12. Using the vertices, an ascending list of OIDs is developed by determining which feature is selected by a specific vertex. If a specific vertex does not select a feature or selects more than one, an appropriate error message is displayed, see Figures 13 and 14. Note that the shape of the selected graphic polyline can be irregular (the polyline can cross itself).

Under this mode of operation, an additional parameter is added to the multi-input dialog box of Figure 9, see Figure 15. The user has the option to use or not use the selected graphic polyline element by selecting the Yes or No option from the choice list box.

2b. Once a single active layer has been found, the multi-input dialog box of Figure 15 will appear.

Figure 13
Sequential IDs Error Message

Figure 14
Sequential IDs Error Message
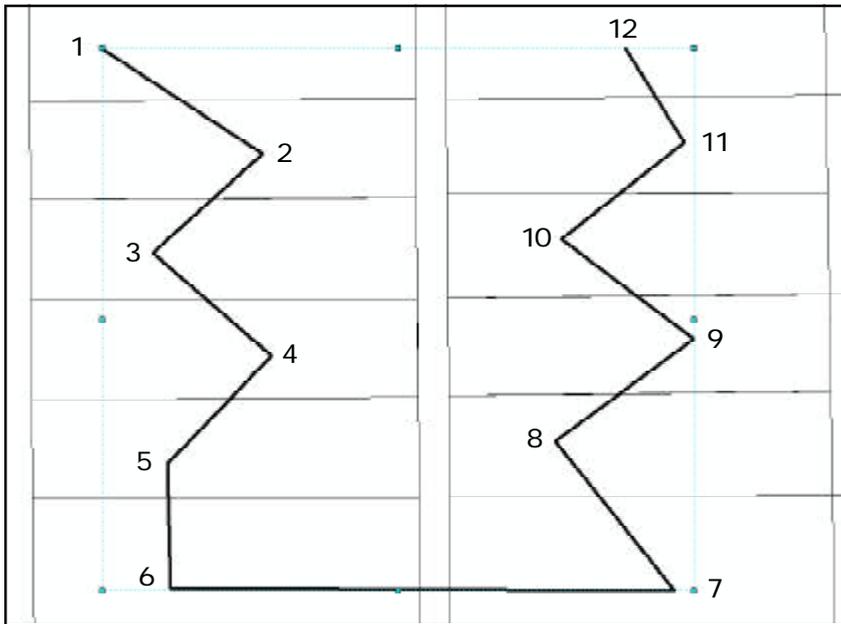
Figure 12 - Polyline Vertices controlling Feature Processing Order
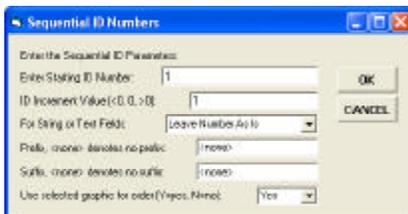
Figure 15
Sequential IDs Multi-Input Dialog Box

Figure 10 identifies the choices the user has in controlling the formatting of the computed sequential attribute value.

Once the appropriate information has been specified, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to continue with the processing.

3b. Once the base information has been defined, the user is able to indicate which attribute (field) is to contain the computed sequential attribute value. Shown in Figure 11 is the choice list from which the user can make the appropriate attribute selection.

Note that the first choice in the list is the Create the SEQ_ID field option.

The user should select this option when none of the existing attributes, associated with the layer, is to be used. Under this mode, a new field called SEQ_ID will be created of long integer type.

Once the appropriate field has been identified, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to continue with the processing.

Upon confirmation to continue the processing, the command builds a list of OIDs (either for the selected features or all features, if there are no selected features) using the order of the vertices comprising the selected graphic polyline element.

The first feature in the list will be assigned the Starting ID Number (formatted as specified by the user's responses entered in Figure 15), while the subsequent features in the list will have the incremental value added in.

Note that the incremental value can be negative, zero or greater than zero. In addition, it is possible for the prefix and/or suffix parameters to contain leading and/or trailing blanks (space characters).

As the command processes the features, a progress bar in the status bar area will appear indicating the percent of completion. Once the command has finished a message in the status bar area will appear stating how many features were processed.

Assign Attribute - Overview

The intent of the [Assign Attribute] command is to provide a simple mechanism for assigning a common attribute value to one or many features.

The common attribute value can be specified in one of the following forms:

(a) explicitly entered,
(b) selected from a list of unique attribute values or
(c) values from another attribute.

To use this command the user activates or selects the appropriate layer in the Table of Contents prior to activating this command. Upon activation, the command displays a multi-input dialog box from which the user specifies:

(a) the attribute or field to be populated, and

(b) the common attribute value.

In addition, the command provides the ability to display a list of the unique attribute values, if so desired. As such, the user can see what current values have been assigned for a specific attribute.

Assign Attribute - Operation

1a. If the command does not find an active layer in the Table of Contents, click at the *OK* button of Figure 16 to acknowledge the error message. Activate a layer in the Table of Contents and reactivate the command.

Figure 16
Assign Attribute Error Message

1b. If the command finds more than one active layer in the Table of Contents, click at the *OK* button of Figure 17 to acknowledge the error message. Activate a single layer in the Table of Contents and reactivate the command.

Figure 17
Assign Attribute Error Message

2. Once a single active layer has been found, the multi-input dialog box of Figure 18 will appear.

Upon inspection of the multi-input dialog box note the following:

Figure 18
Assign Attribute Dialog Box

● The first data line item enables the user to specify the attribute or field to be populated. The attributes are listed alphabetically.

● The second data line item enables the user to specify the common attribute value to be assigned to the attribute identified in the first data line item.

● The third data line item enables the user to indicate if a list of the unique attribute values is to be displayed for the attribute identified in the first data line item.

Once the user has entered the appropriate information in the multi-input dialog box, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to continue with the processing.

Depending upon how the user responds to the third data line item, the command will operate in one or two modes.

A.   No Unique Attribute Values

Under this mode of operation, the user has entered No in response to the third data line item. As such, the command will use the value specified in the second data line item and assign it to the selected features or all features in the active layer, if no features have been selected.

Note, if the user wishes to use the values, which appear in another field, the user should specify in the second data line item the name of the appropriate field enclosed in square brackets, [ ]. For example, an entry of [AREA] denotes

that the values of the attribute AREA are to be used as the common attribute value.

In addition, note that values which are to be stored in fields of Date type should not have the double-quote character, ", included. For example, entries such as: 2006-12-08 or 12-08-2006 would represent valid date entries.

As the command processes the features, a progress bar in the status bar area will appear indicating the percent of completion. Once the command has finished a message in the status bar area will appear stating how many features were assigned the common attribute value.

B.   Unique Attribute Values

Under this mode of operation, the user has entered Yes in response to the third data line item. As such, the command will generate a list of the unique attribute values currently assigned for the attribute identified in the first data line item. A new multi-input dialog box, similar to that shown in Figure 19, will appear.
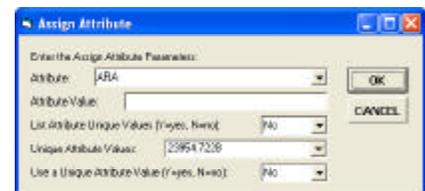
Figure 19
Unique Attribute Values Choice List

2. Upon inspection of the multi-input dialog box note the following:

● The first data line item enables the user to specify the attribute or field to be populated. The attributes are listed alphabetically.

● The second data line item enables the user to specify the common attribute value to be assigned to the attribute identified in the first data line item.

● The third data line item enables the user to indicate if a list of the unique attribute values is to be displayed for the attribute identified in the first data line item.

● The fourth data line item contains a list of the unique attribute values.

● The fifth data line item enables the user to indicate if the unique value appearing in the fourth data line item is to be used as the common attribute value.

Once the user has entered the appropriate information in the multi-input dialog box, click at the:
● *Cancel* button to terminate the command, or the
● *OK* button to continue with the processing.

Depending upon how the user responds to the third and fifth data line items, the command will:

(a) assign the common attribute value as specified in the second data line item (No in the third and fifth data line items),
(b) generate a list of unique attribute values for the attribute specified in the first data line item (Yes in the third data line item, the response in the fifth data line item is ignored). At which point a new multi-input dialog box similar to Figure 19 will appear, or
(c) assign the unique attribute value as specified in the fourth data line item (Yes in the fifth data line item).

Under conditions a and c described above, as the command processes the features, a progress bar in the status bar area will appear indicating the percent of completion. Once the command has finished a message in the status bar area will appear stating how many features were assigned the common attribute value.

Summary

The [EditFeature], [Sequential IDs] and [Assign Attribute] commands offer the user a number of different ways of assigning and/or editing attribute data. We feel that these commands offer the user an attractive alternative to using conventional ArcView GIS or ArcGIS functionality. Readers should feel free to submit any suggestions or comments regarding these commands.

If you have a request for Command Of The Month, feel free to phone, fax or e-mail your request to The CEDRA Corporation.