The CEDRA Corporation's

COMMAND OF THE MONTH

A monthly information bulletin   **June 2011**
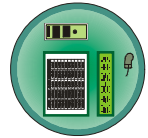
Application Description

During one of our projects we came across the need to be able to transfer information from a feature in one layer to a feature in another layer. Now this application came up when we were using the CEDRA-DataEditor software to assign attribute values.

For those who are not familiar with the CEDRA-DataEditor software, it is a software package that facilitates the entry and maintenance of attribute data for a feature. The user defines which layers and what attributes in a layer are to be displayed to the user for editing. Multiple layers can be defined and there is no limit to the number of attributes that can be processed. Once a feature is selected by the user, the software uses the above information to display a custom dialog box containing the user-specified attributes.

What we needed in this particular project was the ability to have the CEDRA-DataEditor, once a feature was selected, extract certain information from a feature in another layer based upon a spatial search and use this information as default data for the selected feature.

We decided that if we have this need, chances are others may have the exact same need as well.

The CEDRA Solution

To address the above application, we decided to modify the CEDRA-DataEditor software to allow the user the ability to specify in the Theme At-

tribute Data File: (a) the name of a layer to be searched, (b) a search tolerance value and (c) a transfer equation whose result is to be used as the displayed value. To accomplish this, a new command was added to the software.

The Theme Attribute Data File

At the core of the CEDRA-DataEditor software is the Theme Attribute Data File, which is an ASCII based text file called *themes.txt*. This file can be prepared with any text editor software and saved in the **ArcView**® GIS or **ArcGIS**® project folder.

> ***Command Of The Month bulletin***
>
> *This month's issue addresses the TRANSFER command, which has been added to the CEDRA-DataEditor software.*

To invoke the CEDRA-DataEditor, the user selects the left-most tool in the CEDRA-DataEditor-Tools toolbar of Figure 1, after which, a "pick" in the map area is made to select the point, line or polygon feature to be edited.

If more than one feature can be found at the "pick", confirmation of the feature will be required. Once a feature has been identified for processing, the software builds a dialog box on-the-fly and displays it to the user. The *themes.txt* file is used to build the dialog box and can be modified at any time during an ArcMap session.

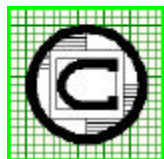**Figure 1**
CEDRA-DataEditor-Tools Toolbar

To reload the *themes.txt* file, the user clicks at the second tool from the left in said toolbar, see Figure 1. Any modifications to the *themes.txt* file will be reflected the next time a feature is processed.

Within the *themes.txt* file will be a series of keywords which enable the user to specify the layer and its attributes that are to be displayed. For example:

```
THEME
L_0pg
CNT
Feature Count:
LST
Line Style:
CNTY_NAME
County Name:
END
```

In the above example, the keywords THEME and END denote the start and end of a layer definition. The L_0pg text below the THEME keyword denotes the name of the layer being defined.

Below the name of the layer are the names of the attributes to be displayed (shown in red) and the attribute label (shown in green) which is to appear on the left side of the dialog box. The attribute label is a text string that describes the attribute being displayed.

So that, for the above example, when a feature from the L_0pg layer is selected, the CEDRA-DataEditor software would display a multi-input dialog box containing three data fields. The labels for each of the three parameters would be Feature Count:, Line Style: and County Name:, respectively.

Obviously, the above example is very simplistic but it gives the reader a feel for the structure of the *themes.txt* file.

Note, if more than one layer is to appear in the *themes.txt* file, the user would simply include another block of text similar to that shown in the example but with another layer name and most likely different attribute names.

The New Command of the CEDRA-DataEditor

The structure of the *themes.txt* file remains the same as before the modification. However, the following new keyword command has been added:

TRANSFER

This keyword command should be introduced below the label for an attribute in the *themes.txt* file.

Building upon the example previously discussed, assume for the CNTY_NAME attribute in the layer L_0pg we wish to use as the value, the value of the **Name** attribute for the feature closest to the selected feature in the layer, **aLayer**. Furthermore, in performing the spatial search, we will use as a tolerance, the value of **5.0** feet. Note that the tolerance value is specified in terms of the display units.

       THEME
       L_0pg
       CNT
       Feature Count:
       LST
       Line Style:
       CNTY_NAME
       County Name:
       TRANSFER aLayer 5.0 Name
       END

The Structure and Use of the New Command

The structure of the keyword command is as follows:

```
TRANSFER        Lay Tol Equ
```

where:
- Lay   denotes the name of the layer to be searched.
- Tol   denotes the spatial tolerance value to be used in the search. This value is in terms of the display units.
- Equ   denotes the transfer equation to be evaluated and whose result is to be used as the displayed value.

Note that at least one space must separate the command and each of its parameters from each other.

The syntax of the transfer equation is identical to that used by the ATTRIBUTE_EQUATION keyword.

In performing the spatial search, the TRANSFER command is able to process point, line and polygon features.

When a nonzero spatial tolerance value is specified, the program creates a buffer using this value about the selected feature. This buffered shape is then used in the spatial search.

A zero spatial tolerance value results in the shape of the selected feature being used in the spatial search. When a polyline or polygon feature is processed and a zero spatial tolerance value has been specified, the program uses the coordinates of the pick that was made to select the polyline or polygon feature in the spatial search.

Notes

a.   Shown in Table 1 are a list of the available CEDRA-DataEditor keywords

b.   Table 2 contains samples of certain CEDRA-DataEditor keywords.

```
NLINES
SECONDS
NCOLUMNS
COLUMNWIDTH
COLUMNITEMS
COLUMNHEADING
SUBCOLUMNS
SUBCOLUMNSTART
SUBCOLUMNHEADING
DISPLAYWITHCOLUMNS
THEME
TABLE
RANGE
CHOICES
DEFAULT
REMEMBER_LAST
ATTRIBUTE_EQUATION
TRANSFER
END
```

Table 1
List of Available Keywords

```
NLINES     20
SECONDS    1
SECONDS    ALL
RANGE 1 99999
TRANSFER towns 1.5 County
```

Table 2
Examples of Certain Keywords

```
CHOICES
CAP-BNK\\CAPACITY-BANK
FUS-CUT\\FUSED-CUTOUT
LIN-FUS\\LINE-FUSE
END
```

Table 3
Example of the CHOICES Keyword

c.   Table 3 contains a sample of the CEDRA-DataEditor CHOICES keyword. This sample demonstrates how the user is able to display an alias for a value that is actually stored in the database. That is to say, the drop-down list will display the strings: CAPACITY-BANK, FUSED-CUTOUT and LINE-FUSE but will store in the database: CAP-BNK, FUS-CUT or LIN-FUS depending upon the selected item.

```
DEFAULT 100.0
DEFAULT ADDONE
DEFAULT CURRENT_DATE
DEFAULT CURRENT_DATE_d/m/yyyy
DEFAULT CURRENT_DATE_mm/dd/yyyy
DEFAULT CURRENT_DATE_mmmm_d_yyyy
DEFAULT CURRENT_DATE_dddd,_mmmm_yyyy
DEFAULT CURRENT_DATE_dddd,_d_mmmm_yyyy
DEFAULT RETURN_LENGTH
DEFAULT RETURN_AREA
DEFAULT RETURN_AREA_UNITS
DEFAULT RETURN_X
DEFAULT RETURN_Y
DEFAULT RETURN_X_DD
DEFAULT RETURN_Y_DD
DEFAULT RETURN_X_DMS
DEFAULT RETURN_Y_DMS
DEFAULT RETURN_X_LONG
DEFAULT RETURN_Y_LAT
DEFAULT RETURN_XS
DEFAULT RETURN_YS
DEFAULT RETURN_XS_DD
DEFAULT RETURN_YS_DD
DEFAULT RETURN_XS_DMS
DEFAULT RETURN_YS_DMS
DEFAULT RETURN_XS_LONG
DEFAULT RETURN_YS_LAT
DEFAULT RETURN_XM
DEFAULT RETURN_YM
DEFAULT RETURN_XM_DD
DEFAULT RETURN_YM_DD
DEFAULT RETURN_XM_DMS
DEFAULT RETURN_YM_DMS
DEFAULT RETURN_XM_LONG
DEFAULT RETURN_YM_LAT
DEFAULT RETURN_XE
DEFAULT RETURN_YE
DEFAULT RETURN_XE_DD
DEFAULT RETURN_YE_DD
DEFAULT RETURN_XE_DMS
DEFAULT RETURN_YE_DMS
DEFAULT RETURN_XE_LONG
DEFAULT RETURN_YE_LAT
```
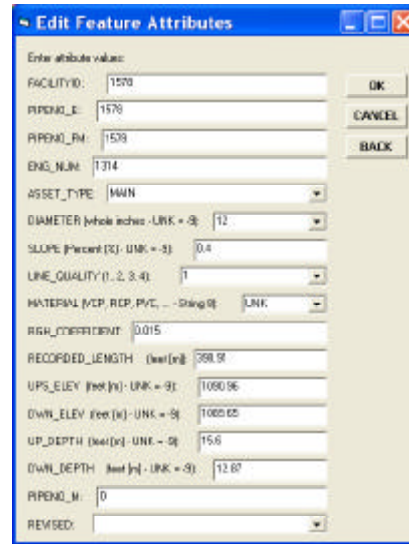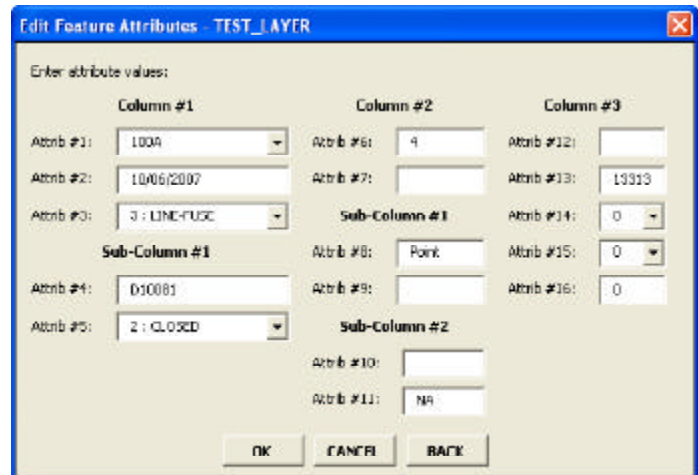
Table 4
Examples of the DEFAULT Keyword

```
NCOLUMNS 3
COLUMNWIDTH       1 150
COLUMNITEMS       1 5
COLUMNHEADING     1 Column #1
SUBCOLUMNS        1 1
SUBCOLUMNSTART    1 1 4
SUBCOLUMNHEADING 1 1 Sub-Column #1
DISPLAYWITHCOLUMNS LAYER_1
```

Table 5
Example of the Multi-Column Keywords

Figure 2
Single Column Dialog Box

Figure 3
The CEDRA-DataEditor Multi-column Dialog Box

d.   Table 4 contains samples of the CEDRA-DataEditor DEFAULT keyword.

e.   Table 5 contains samples of the CEDRA-DataEditor multi-column keywords.

f.   Shown in Figure 2 is a sample single column dialog box, while Figure 3 contains a sample multi-column dialog box. Reference is made to Table 5 which contains the various multi-column keywords.

```
J2-K2
29.8*P2*R2*Q2^2*SQRT(M2)
((J2-20)/L2)^0.54*N2
IF(Q2=2.5,0.9,IF(Q2=4.5,0.78,IF(Q2=2.5,(Q2^-0.092*1.0808),4.0)))
DEG2RAD(ACOS(0.5))
SIN(30)
ROUND(4.75)
TRUNCATE(4.75)
IF(MAP=SLN,"TRUE_CONDITION","FALSE_CONDITION")
IF(BLDNUM<>" ",(TRIM(HOUSENUM)+TRIM(ST_DIR)+TRIM(STREET)),BLDNUM)
IF(KVAR_RATIN="NA","-9",IF(KVAR_RATIN="400",450,KVAR_RATIN))
IF(CONTROL="MANUAL","MAN",IF(CONTROL="REMOTE","REM",CONTROL))
IF(CAPACITY="NA","-9",IF(CAPACITY="EMPTY","-6",TRIMR1(CAPACITY)))
IF(STATUS="OPEN",0,IF(STATUS="CLOSED",1))
IF(LAYER="FUSED-CUTOUT",1,IF(LAYER="LINE-FUSE",2))
IF(LST = 1, ("PROJ" + LEFTPAD06(FID)), ("PROJ" + RIGHTPAD06(FID)))
```

Table 6
Examples of the ATTRIBUTE_EQUATION Keyword

```
ABS        =   absolute value of a number,
ACOS       =   arc cosine of a number expressed in radians,
ASIN       =   arc sine of a number expressed in radians,
ATAN       =   arc tangent of a number expressed in radians,
CHR        =   returns the character that is associated with
               the ASCII character code,
COS        =   cosine of a number in terms of decimal degrees,
DEG2RAD    =   conversion of degrees to radians,
LEFTPADxx  =   returns a string of xx characters with leading
               zeroes to pad the string,
LEN        =   returns the number of characters in a string,
RAD2DEG    =   conversion of radians to degrees,
RIGHTPADxx =   returns a string of xx characters with
               trailing zeroes to pad the string,
ROUND      =   round up number to the nearest whole number,
SIN        =   sine of a number in terms of decimal degrees,
SQRT       =   square root of a number greater than zero,
TAN        =   tangent of a number expressed in decimal
               degrees,
TRUNCATE   =   truncation of a number,
STRING     =   treat the value as a string, not as a numeric
               value,
TRIM       =   remove leading and trailing blanks from the
               value,
TRIML1     =   remove the first character in a string,
TRIML2     =   remove the first two characters in a string,
TRIML3     =   remove the first three characters in a string,
TRIML4     =   remove the first four characters in a string,
TRIML5     =   remove the first five characters in a string,
TRIML6     =   remove the first six characters in a string,
TRIMR1     =   remove the last character in a string,
TRIMR2     =   remove the last two characters in a string,
TRIMR3     =   remove the last three characters in a string,
TRIMR4     =   remove the last four characters in a string,
TRIMR5     =   remove the last five characters in a string,
TRIMR6     =   remove the last six characters in a string.
```

Table 7
The ATTRIBUTE_EQUATION Keyword Supported Functions

```
^  Exponentiation
/  Division
*  Multiplication
+  Addition
-  Subtraction
```

Table 8
**The ATTRIBUTE_EQUATION Keyword
Supported Mathematical Operators**

```
=  Equality
<  Less than
>  Greater than
<= Less than or equal to
>= Greater than or equal to
<> Not equal to
```

Table 9
**The ATTRIBUTE_EQUATION Keyword
Supported Boolean Operators**

g. Tables 6 through 9 pertain to the use of the CEDRA-DataEditor ATTRIBUTE_EQUATION keyword.

h. The sample equations shown in Table 6 could be used as the transfer equation argument for the TRANSFER keyword. As such, the transfer equation can be very simple or complex. It should be pointed out that the exact same code is used to evaluate the transfer equation and the attribute equation.

Summary

The ability to transfer an attribute value from a feature in one layer to another is very useful, particularly if one is involved in processing features on a one-by-one basis. The fact that one can define a complex transfer equation only enhances the power that is offered.

If many features are to be processed in a single operation, the [Transfer Attribute] command within the {CEDRA-Skeletonization-Tools} toolbar is recommended. This command is discussed in the May 2007 issue of Command of the Month.

The implementation of the TRANSFER keyword is a recent enhancement to the CEDRA-DataEditor software and is a result of a need we required during a project we were involved with.

Users with a software support agreement should check with The CEDRA Corporation on how to obtain a software update so as to be able to utilize this new functionality.

As always, users who have a need for functionality that is not presently available in CEDRA software should feel free to forward these requests to CEDRA, as well as, any other comments or suggestion you may have.

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