

# Modifying and Creating Attribute Data

Working with GIS files

1

This video will demonstrate how to modify an existing GIS dataset or create a new GIS dataset using cursors.

## Modifying data in a row object

- Row object must be retrieved with an update cursor if it is to be modified.

```
rows = arcpy.UpdateCursor("towns.shp")  
row = rows.next()
```

- Specify new value(s) for row...

```
row.setValue("Pop", 45000)
```

name of field

new value



2

To modify a feature class or a table, the UpdateCursor must be used. The row object must be retrieved for the feature or table row that will be modified.

The row object's **setValue** method can be used to specify a new value for a field that exists in the dataset's attribute table.

## Applying changes with the update cursor



- Update the file with changes...

```
rows.updateRow(row)
```

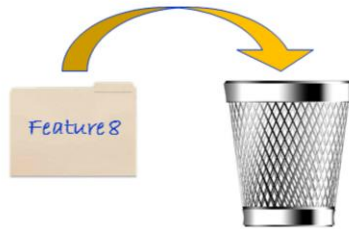
update cursor                  row to be update

3

Although the field values set for a feature or row, the changes do not take effect until the cursor object is updated. We need to replace the original row object with its revised version in the cursor object.

The cursor object's **updateRow** method will apply any changes that had been made previously to the row object.

## Deleting row objects with the update cursor



- Get row object to be deleted. Delete with...

```
rows.deleteRow(row)
```

update cursor                  row object to be deleted

– Note: deletions cannot be undone!

4

Features or table rows can be deleted when using the update cursor.

To delete a feature, get the feature's corresponding row object.

Then use the cursor object's **deleteRow** method and specify the row object to be deleted.

Note that deletions cannot be undone so it is a good idea to make a copy of the dataset before modifying it.

## Example script: editing data

```
# create update cursor...
rows = arcpy.UpdateCursor("towns.shp")

# for each row object...
for row in rows:

    # get area from field...
    area = row.getValue("Area")

    # set new value for field...
    row.setValue("Area_ha", area/10000)

    # apply changes...
    rows.updateRow(row)

# delete cursor and row objects...
del rows, row
```

5

This slide shows an example of a script that modifies a shapefile. An update cursor is created for the “towns.shp”. A for loop is used to iterate through each feature in the shapefile. For each feature, the area is calculated and converted from meters to hectares (1 ha = 10,000 sq meters). The feature area is written to the “Area\_ha” field and the cursor is updated for the feature’s row object. After the loop completes, the cursor and row objects are deleted to ensure that the file lock is removed.

## Example script: deleting features/records

```
# create update cursor...
rows = arcpy.UpdateCursor("towns.shp")

# for each row object...
for row in rows:

    # get area from geometry object...
    area = row.getValue("Shape").area

    # if area < 50000...
    if area < 50000:

        # delete row...
        rows.deleteRow(row)

# delete cursor and row objects...
del rows, row
```

6

This slide shows an example of a script in which an update cursor is used to delete features in a shapefile. For each feature in the “towns.shp”, the area is calculated. If the area is less than 50,000, then the feature is deleted using the cursor’s deleteRow method. After the loop completes, the cursor and row objects are deleted.

## Working with an insert cursor

- Create the basic insert cursor with...

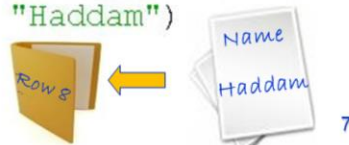
```
rows = arcpy.InsertCursor("table.dbf")
```

- Insert cursors only work with new row objects.  
Create new row with...

```
newRow = rows.newRow()
```

- Specify value(s) for new row...

```
newRow.setValue("Name", "Haddam")
```

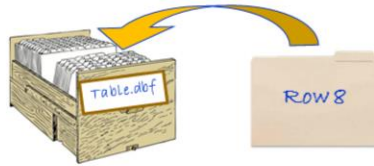


An insert cursor is used to create entirely new features or table rows. The cursor works with any type of feature class or GIS table (i.e. .dbf, info). Arcpy's **InsertCursor** method is used to create the cursor object.

The cursor object's **newRow** method is used to create a new row object.

The row object's **setValue** method is used to assign a value for a specified field.

## Applying changes with the insert cursor



- Update the file with changes...

```
rows.insertRow(newRow)
```

insert cursor

new row to be added

After creating a new row object and setting field values, the row object can be inserted into the cursor object.

The cursor object's **insertRow** method is used to add the new row object to the dataset.



## Example script: creating records in a table

```
dataLst = [{"Hartford", 100000, 18.4}, {"Hebron", 8000, 37.5}]

# create insert cursor...
rows = arcpy.InsertCursor("table.dbf")

# create new row for cursor...
newRow = rows.newRow()

# for data in list...
for name, pop, area in dataLst:

    # set field values for new row...
    newRow.setValue("Name", name)
    newRow.setValue("Population", pop)
    newRow.setValue("area", area)

    # insert new row into file...
    rows.insertRow(newRow)

del rows, newRow
```

9

Let's look at an example of a script that creates new rows in an existing table. In this example, we have a list that contains the attribute values that we want to use for each feature – the values for a single feature are contained within a nested list.

Arcpy's `InsertCursor` method is used to create the cursor object.

The cursor object's `newRow` method is used to create a new row object.

A for loop is used to iterate through each sublist in the `dataLst`. Note that in the loop headerline, 3 variables are assigned – there is one variable for each item in a given sublist from `dataLst`.

For each table row, values are set for the "Name", "Population", and "area" fields.

The cursor object's `insertRow` method is used to add the new row object to the table.

After the loop, the cursor and row objects are deleted.

## Additional info on cursors

- Data in all fields can be read...
- But certain fields cannot be modified...
  - FID, OID, Shape\_length, Shape\_area, Value (rasters)
- Rows in raster files cannot be deleted.
- Use only one type of cursor on a file at a given time.
- In ArcGIS Help, search for “Cursor” to find more information on all 3 cursors.
- We’ll work more with cursors next week...

10

The search and update cursors allow data to be read from any field.

Certain fields in a feature class or raster attribute table cannot be modified.

Rows cannot be deleted from a raster attribute table.

Only one cursor should be used on a given dataset at a time. Iterating through the features or rows in a dataset is a relatively slow operation so avoid reading through the same dataset more than once in a script.

Cursors have additional capabilities that we did not discuss in this video – refer to ArcGIS’s help documentation for further information.

Next week, we’ll use cursors to work with the spatial aspects of features.