

GEOG 432/832: Programming, Scripting, and Automation for GIS

Unit 06.02: Cursors, cursors, cursors

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Today's schedule

- Open discussion
- Slides, discussion and exercises
- For next class

Open discussion

How's lab 2 going?

Using SQL

- SQL: "Structured query language"

Three main components:

1. SELECT: What attributes (columns) you are selecting
2. FROM: The table you're selecting from
3. WHERE: The condition you impose on the records (rows)

A simple example

```
SELECT * FROM 'my_table' WHERE "Tot_pop < 54254"
```

Let's try it

Open your project from last class

Make sure your workspace and objects (feature classes) are loaded into memory

Here's a SQL example

Let's break it down

```
with arcpy.da.SearchCursor(fc, ["NAME10", "Total"], ' "Total" > 256465 ') as cursor:  
    for row in cursor:  
        print(row[0], row[1])
```

What happened?

See your textbook (Chapter 8) for more SQL examples and fancier syntax

Update cursors

Let's pose a problem:

Given our dataset, how would we calculate the population density (people/unit area)?

To the whiteboard!

One way of accomplishing our tasks

Break it down - what does the code do and why?

```
arcpy.management.AddField(fc, "pop_den", "Double")  
  
with arcpy.da.UpdateCursor(fc, ["ALAND10", "TOTAL", "pop_den"]) as cursor:  
    for row in cursor:  
        row[2] = row[0] / row[1]  
        cursor.updateRow(row) # You need to tell the cursor to update the row
```

What happened?

We can delete records too

First, let's make a copy we can "play" with

```
arcpy.management.CopyFeatures(fc, "mycopy_to_delete_later.shp")
```

Then, let's selectively delete rows <- what does the below code do?

```
with arcpy.da.UpdateCursor("mycopy_to_delete_later.shp", ["NAME10"]) as cursor:  
    for row in cursor:  
        if(row[0] == "Lancaster"):  
            cursor.deleteRow()  
cursor.reset()
```

Did it work? Check it in your map

(if the view didn't update, click the "refresh" button in the bottom-right)

Let's do one more

Breakdown the code:

```
with arcpy.da.UpdateCursor("mycopy_to_delete_later.shp", ["NAME10", "Total"]) as cursor:
    for row in cursor:
        if(row[1] < 20000):
            cursor.deleteRow()
    cursor.reset()
```

On your own:

1. Make another copy of our original dataset
2. only *retain* records where there are *more Females in their 50s than Females in their 20s*
3. Print the county names

For next class

- Lab 2 is due Thursday
- Read Chapter 8 this week