Adding a field to a table and using the Field Calculator

Written by Barbara Parmenter, Updated October 25, 2011

Overview
You may frequently need to add a field to an existing GIS data table in order to calculate some value (e.g., adding up census fields, or calculating a ratio between two other numeric fields, or adding text to a number of records at once. Or sometimes you may need to convert a text field with numbers to a real numeric field for mapping or analysis.

In this tip sheet, we show you how to add a new field, and then we provide two examples of using the field calculator.

See the ArcGIS 10 Help pages for Field Calculations.

Adding a new field to a table
Attribute fields can be added easily to GIS data layers. However, to add a field (or make any other changes to table structure or values) the data must be stored in an area you have write-access to (your own computer or, in the Tufts GIS lab, your H: drive, because you don’t have write permission to the Tufts M: drive. So copy the data to your own space beforehand (right click on the data layer in the Table of Contents, and then click on Data – Export).

Assuming you have write access to the table:

1. Open the layer’s attribute table

2. Click on Table Options ( ) in the upper left hand corner of the table
3. Choose **Add Field**

4. Name the new field and specify the type of data that you want it to hold (text, date, or one of the numeric types), then press OK. The new field should be located at the end of the table (far right). For an overview of field types, see [ArcGIS 10 Help – Geodatabase Field Types](ArcGIS 10 Help – Geodatabase Field Types).

**Example of Using the Field Calculator to add Census Data Columns**

Let’s say we want to know the population of census blocks that is over 75. For the 2000 Census, MassGIS has census block polygons and a census table `CEN2K_B_POP_AGE_GEN.dbf`. In this table, here are fields for female population by age cohort and male population by age cohort. We want to add a new field that will contain the total population over 75 for each block.

1. To do this first make sure you have your own copy of the data file (on your H: drive or local computer) – you can download it from [MassGIS 2000 Census Blocks](MassGIS 2000 Census Blocks) page or from the Tufts M: drive under State/MA/MassGIS/Census

2. Start an ArcMap session

3. Add the polygon layer and the table to an ArcMap session

4. Right-click on the table to open it for viewing

5. Next you need to join the census table to the census polygons using the LOGRECNO field as the join field. To do this, right-click on the `Census2000Blocks_poly` layer and choose **Joins and Relates – Join** as shown below:
6. Fill out the dialog box as in the following graphic:

![Join Data dialog box](image)

- **Choose the field in this layer that the join will be based on:** LOGRECID
- **Choose the table to join to this layer, or load the table from disk:** cen2k_b_pop_age_gen
- **Choose the field in the table to base the join on:** LOGRECID

**Join Options**
- **Keep all records**
  - All records in the target table are shown in the resulting table. Unmatched records will contain null values for all fields being appended into the target table from the join table.
- **Keep only matching records**
  - If a record in the target table doesn’t have a match in the join table, that record is removed from the resulting target table.

7. Click OK

8. Open the **attribute table of the Census2000Blocks_poly** – the age and gender data should be added to it now (off to the right)

9. Next, add a new field called **Pop_gte75** (for population greater than or equal to 75) by clicking on the **Table Options** button and choosing **Add Field**
10. Fill out the dialog box like this – for shape files, field names must be 10 characters or less, cannot contain space or symbols, and cannot start with a number:

```
Name: Pop_gte75
Type: Long Integer
Field Properties
Precision: 0
```

11. Click **OK**

12. The new field will be at the far right end of the table – scroll over to see it.

13. Right-click on the field name (**POP_gte75**) and choose **Field Calculator**

14. You’ll see the Field Calculator dialog box ready to take your expression – you’ll see that it says “Pop_gte75 =” already written in, and you need to add in the expression to sum the census data fields – as in the graphic on the next page:
15. Press OK when finished. The process will take a couple of minutes

You can now make a map with your new information.

**Using the Field Calculator to calculate land value per square foot for Somerville parcels**

In this example, we will add a new field and then use the Field Calculator in the Somerville Parcels data layer to calculate the land value per square foot as assessed by the city assessor.

Before we do this, make sure you have your own copy of one of the Parcels from M:\City\Somerville\Assessor - you are going to add to the attribute table so you will need write access.

1. Add the Somerville parcel data to an ArcMap session
2. Open the parcel attribute table
3. Note that near the very end there are fields for assessed land value and building value, and earlier in the table there is a LAND_SQFT column:

<table>
<thead>
<tr>
<th>LAND_VAL</th>
<th>BLDG_VAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>411700</td>
<td>320900</td>
</tr>
<tr>
<td>342100</td>
<td>208000</td>
</tr>
<tr>
<td>488000</td>
<td>353100</td>
</tr>
<tr>
<td>361900</td>
<td>247600</td>
</tr>
</tbody>
</table>

4. Add a new field called LandV_ft and make it a Double type field:

5. We want to use the Field Calculator function to divide Land_Val by Land_SqFt, but if we do this, we will get an error telling us we can’t divide by 0 (some of the land square feet values are zero). So before we do that, we have to select all our parcels where the land square feet is greater than zero.

6. Still in the table, click on the Table Options button and choose Select by Attribute:
7. Fill out the *Select by Attributes* dialog box as follows and click *Apply*:

![Select by Attributes dialog box](image)

8. Now with the parcels selected where the building value is greater than zero, we can use the *Field Calculator* function (the Field Calculator by default works only on selected records). Right click on the *LandV_Ft* field and choose *Field Calculator*:

![Field Calculator dialog box](image)
Fill out the dialog box as follows and press OK when done:

Now you have a building to land ratio field which you can map. Here is a map of this new data – you can see that around Davis Square, the land value per square foot is higher.