

Personal Geodatabase 101

There are a variety of file formats that can be used within the ArcGIS software. Two file formats, the shape file and the personal geodatabase were designed to hold geographic data (data that has both geometry and attributes associated with each record). The personal geodatabase is the native data structure for ArcGIS. (There is another type of geodatabase, the enterprise geodatabase that will not be addressed in this document. In an enterprise geodatabase, the data is stored in an enterprise database such as Oracle or SQL Server.)

In this document any references to geodatabase refer to a personal geodatabase.

The geodatabase is actually a collection of data sets and acts as a container for data. There are several advantages to storing data within a personal geodatabase rather than using shape files and dBase (DBF) files:

- All files relating to a project can be stored into the geodatabase file, making it easier to organize and transfer data if necessary. Both the geographic files and the tabular data can reside within a single geodatabase.
- The personal geodatabase uses the Microsoft Access database as its underlying structure, making it easier for Access users to work with the data within the tables outside the ArcGIS environment.
- When converting labels to annotation, the annotation can be stored in a geodatabase, rather than within an ArcMap project. This allows the annotation to be re-used in other ArcMap sessions.
- The geodatabase has more flexibility in the length of field names as compared to a standalone DBF file.
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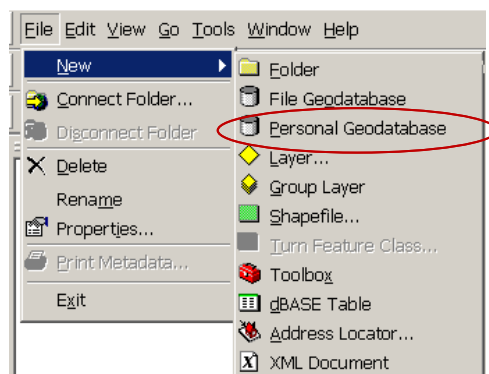
Geographic data stored within a geodatabase is referred to as a feature class. You can equate a feature class with the term layer.

There are some restrictions on a personal geodatabase:

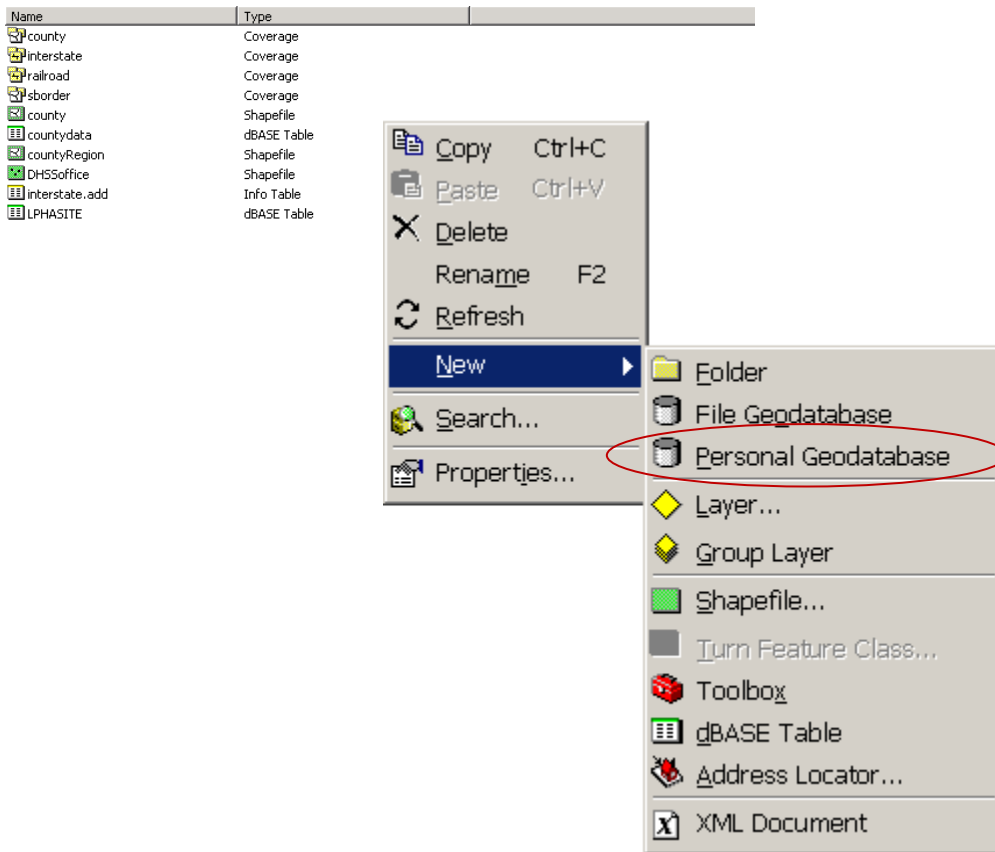
- They are designed for a single user to be accessing them at a time. (Hence the term personal.) They are not appropriate to be placed in a common shared folder for multiple users.
- There is a size limitation of 250 MB for each geodatabase.


Creating a New Geodatabase

Geodatabases are created within ArcCatalog. You can create a new geodatabase from the File > New menu option.



Optionally, you can right click in the right pane and select New.



Once the geodatabase is created, it will appear in ArcCatalog with the icon .

By default, this file will be called New Personal Geodatabase.mdb.

BEST PRACTICES

As soon as you create it, you should see that this name is highlighted in blue, ready for you to change it to something more descriptive. It is recommended that you give the geodatabase a name that is relevant for the data you intend to put in it; in other words, something to do with the project you are working on. Examples: regionFeature.mdb, registryFeatures.mdb. Following best practices, the file name should contain no blanks and only use the punctuation underscore (_). Commonly, multiple words are all run together, with the start of each new word distinguished by a capital letter, likeThis.

If you click off the name and forget to rename it immediately after it is created, you can always rename it by right clicking the name and selecting Rename from the menu choices. Alternately, a rather slow double click on the name will also active the ability to rename the file.

Examples – Getting Data Into a Geodatabase

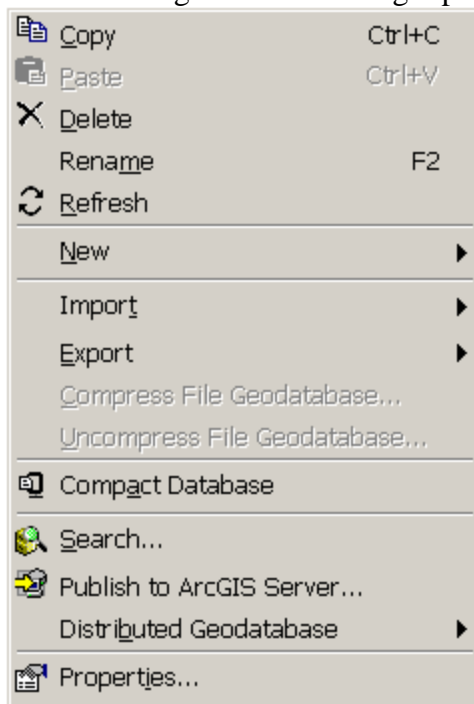
Since this is a new geodatabase, it is empty. The most common reason for creating a geodatabase is to have an output location for some command you plan to execute from with ArcMap or ArcCatalog.

Example #1 - Importing a shape file into the geodatabase.

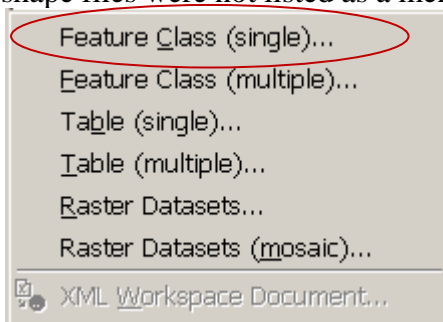
If you plan to populate your geodatabase with copies of existing layers, you can either open the geodatabase and import a shape file or select the shape file and export to the geodatabase.

After you create the new geodatabase, rename it to something more descriptive, for example countyRegionDissolve.mdb.

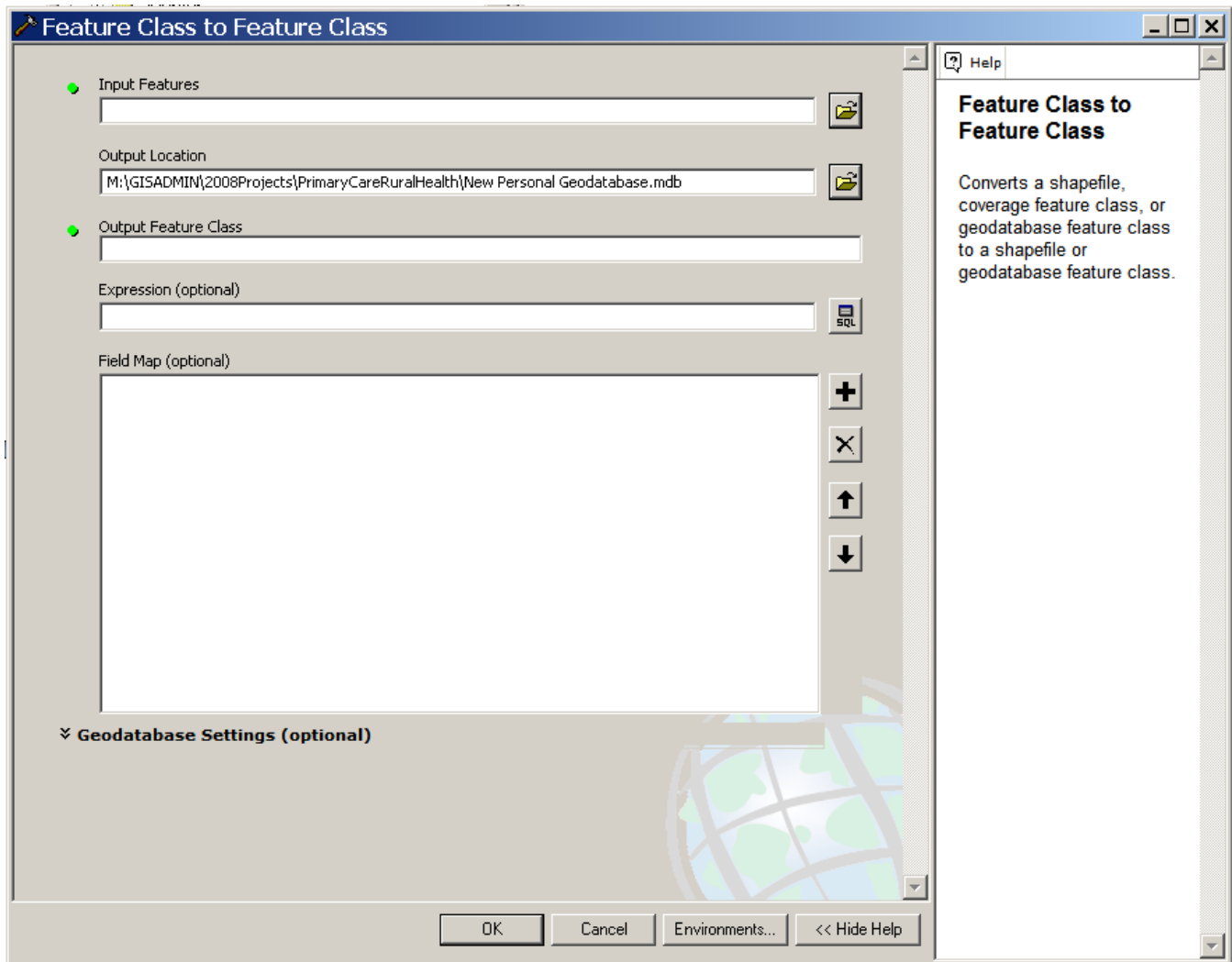
- 1) Open the geodatabase by clicking on the geodatabase file name.
- 2) In this example, this is a new empty geodatabase, so you won't see any features within the container. Right click in the right pane to activate the commands



- 3) Select Import. This activates the menu choices. Select Feature Class (single) ... Notice that shape files were not listed as a menu choice. Instead, select Feature Class (single).



- 4) This activates the Feature Class to Feature Class dialog. (Note: Your Output Location will NOT match this example.)



- 5) Notice the help dialog along the right side. The help will tell you, “Converts a shape file, coverage feature class, or geodatabase feature class to a shape file or geodatabase feature class.”
- 6) The green dots in the dialog indicate the fields that are required. Work from the top of the dialog to populate the form.
- 7) For Input Features, select the folder icon to the right of that field.



- 8) This activates a File Browser. Navigate to a folder that contains shape files. (Note: If you are connected to the GIS data library at DHSS, the county boundary is located under M:\GISDATA\District_bounds.) Select the shape file you want to import and click Add.

Alternately, In the LEFT HAND PANE of ArcCatalog, you can expand the directory tree, browsing to the folder containing the shape file, and click and drag this shape file name into the Input Features input field. This also populates this field.

- 9) The green dot next to the Input Features field will be removed and the location of the input file will appear in the dialog. (Note: Your Input Features may or may not match this example.)



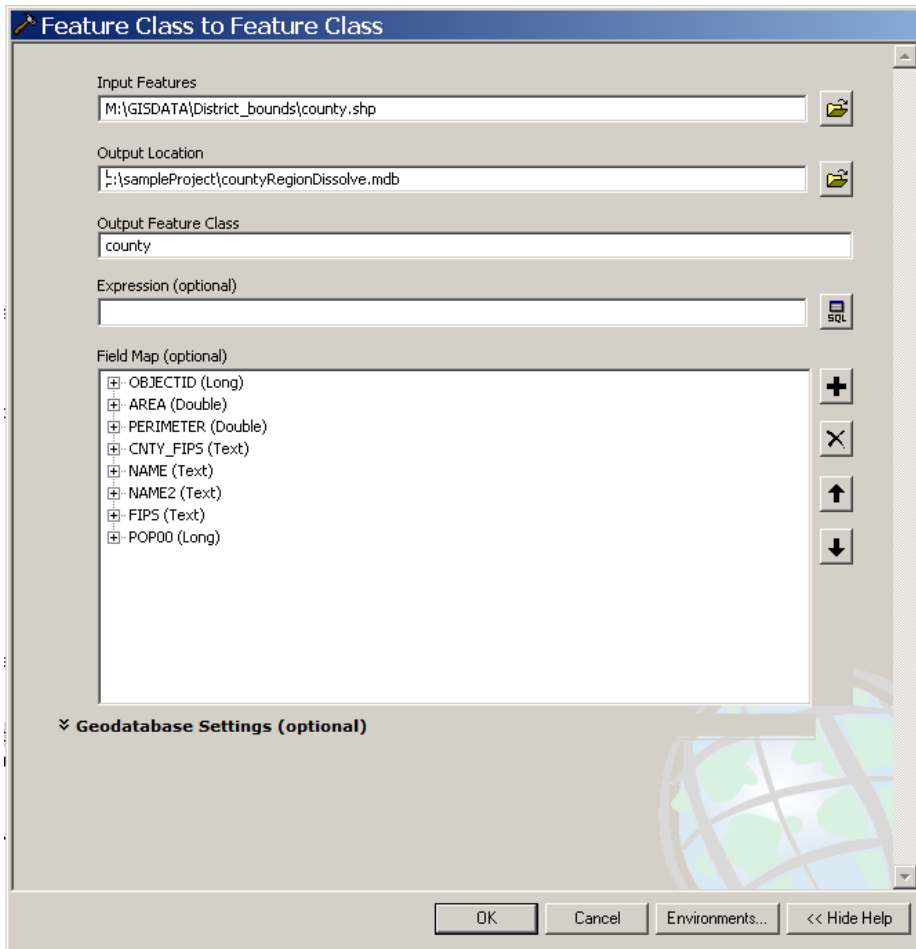
A screenshot of a dialog box showing the 'Input Features' field. The text 'M:\GISDATA\District_bounds\county.shp' is entered in the text box. To the right of the text box is a small icon of a folder with a green dot.

- 10) Next you must specify a name for the output feature class. You can give it a similar name as the original input feature, such as county.



A screenshot of a dialog box showing the 'Output Feature Class' field. The text 'county' is entered in the text box.

- 11) This is all the information you need to import this shape file. Click OK to finish. (Note: The field values in your completed dialog will not match this example.)




A screenshot of the 'Feature Class to Feature Class' dialog box. The dialog has a title bar with a blue background and a globe icon. It contains several fields and sections:

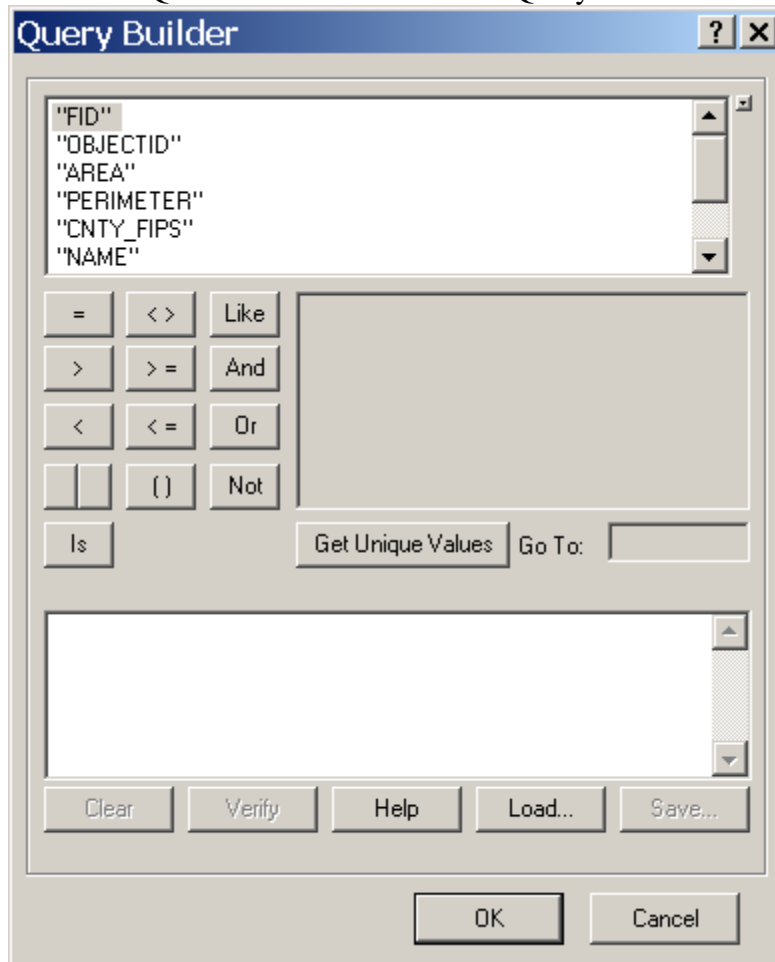
- Input Features:** A text box containing 'M:\GISDATA\District_bounds\county.shp' and a folder icon.
- Output Location:** A text box containing 'I:\sampleProject\countyRegionDissolve.mdb' and a folder icon.
- Output Feature Class:** A text box containing 'county'.
- Expression (optional):** An empty text box with an SQL icon to its right.
- Field Map (optional):** A list box containing several fields with expand/collapse icons to their left and navigation icons (+, -, up, down) to their right:
 - OBJECTID (Long)
 - AREA (Double)
 - PERIMETER (Double)
 - CNTY_FIPS (Text)
 - NAME (Text)
 - NAME2 (Text)
 - FIPS (Text)
 - POP00 (Long)
- Geodatabase Settings (optional):** A section with a collapsed arrow icon.

At the bottom of the dialog are four buttons: 'OK', 'Cancel', 'Environments...', and '<< Hide Help'.

A Note About the Optional Expression

This section of the dialog allows you to use a logical expression to limit the incoming records. For example, you might want to import only one or a few counties into the new feature class, rather than every county.

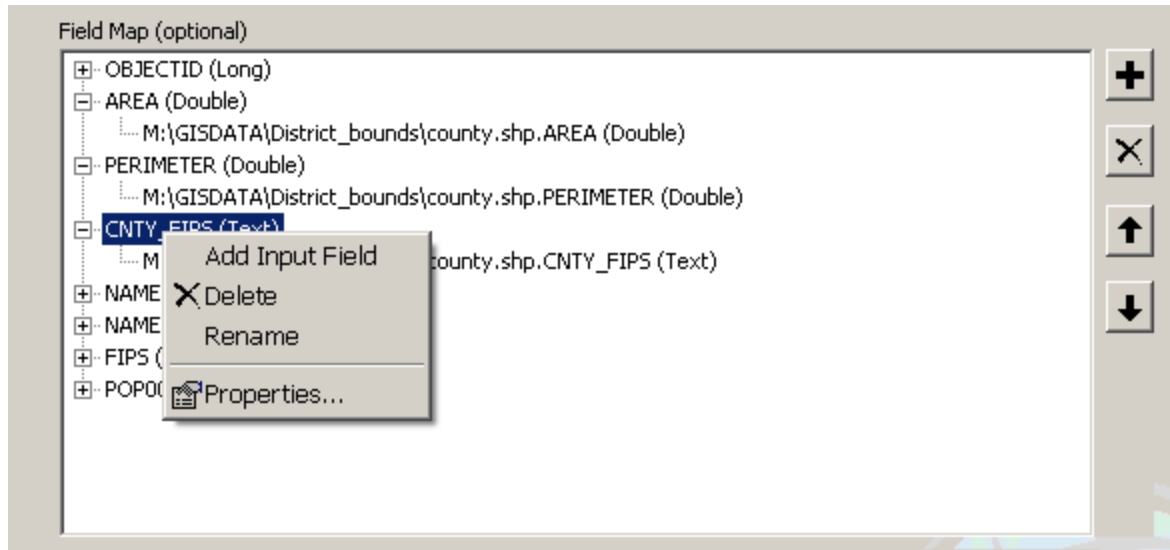
Click the SQL icon  to activate the Query Builder.



Once you have built a valid SQL statement (i.e. "NAME" = 'Cole'), click OK. Only Cole County will be included in the output file. (Note: The fields and available values will change depending on the input file selected and will not match this example.)

A Note About the Optional Field Map

This section of the dialog allows you to limit which fields are imported into the feature class you are creating. You can also use this section of the dialog to rename the fields as they are brought in. There are also up and down arrows that indicate that the field order can be changed, but this has not been working (as of version 9.2). (*Note: The fields shown in your dialog will not match this example.*)



12) Results - The geodatabase should no longer be empty. It should contain the newly created feature class.

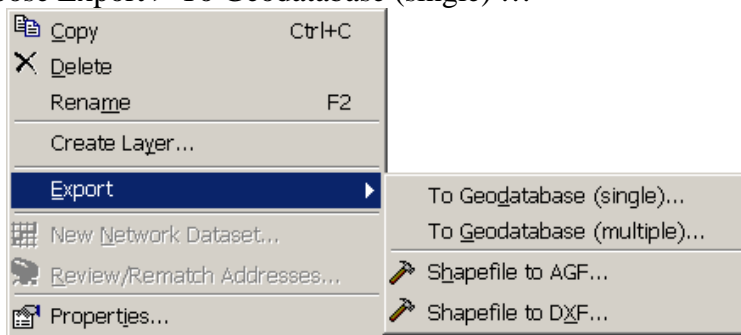
Example #2 – Exporting a shape file into a geodatabase

The other method of adding a shape file to a geodatabase is the select the shape file from ArcCatalog and exporting the shape file into the geodatabase.

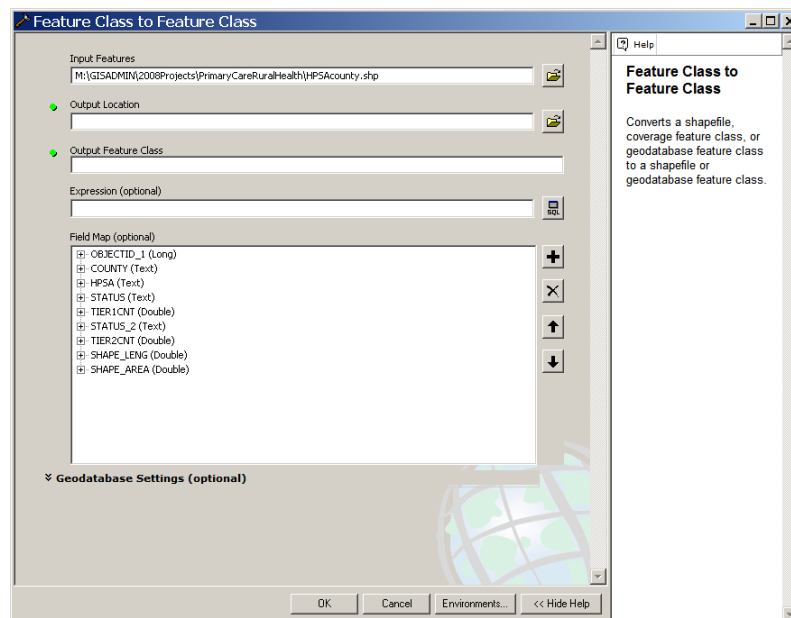
- 1) Select the shape file from its current location in a folder and right click on it.

Name	Type
county	Coverage
interstate	Coverage
railroad	Coverage
sborder	Coverage
county	Shapefile
countydata	dBASE Table
countyRegion	Shapefile
DHSSoffice	Shapefile
interstate.add	Info Table
LPHASITE	dBASE Table

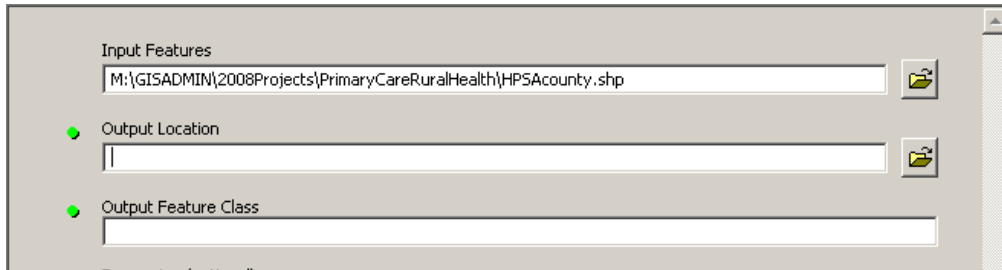
- 2) Choose Export > To Geodatabase (single) ...




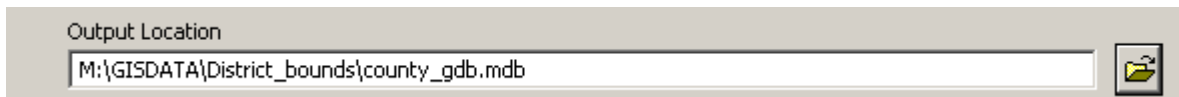
- 3) This activates the Feature Class to Feature Class dialog. This will look very similar to Example #1.



- 4) Since you have already selected the file you wish to transfer to the geodatabase, they Input Features field is already populated.
- 5) The other required fields are Output Location and Output Feature Class. (*Note: Your Input Features will not match this example.*)



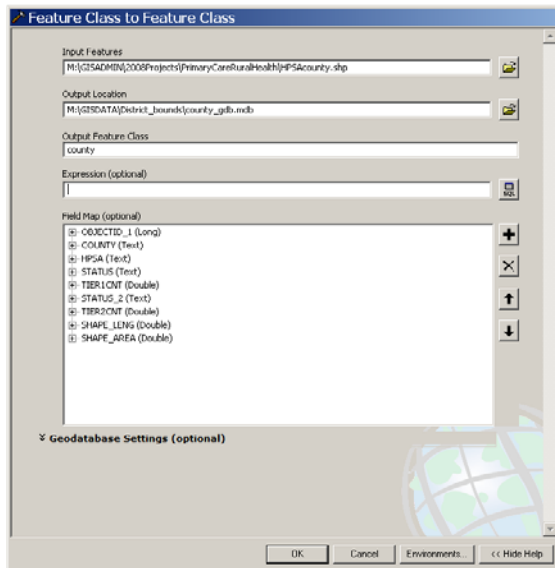
- 6) The Output Location will be the full file name of the geodatabase. Select the folder icon  to browse to the location of the geodatabase. Once you have selected an output file location, it will be populated in the Output Location field. (Your output location will be different.) *Alternately, In the LEFT HAND PANE of ArcCatalog, you can expand the directory tree, browsing to the folder containing the geodatabase, and click and drag this geodatabase file name into the Output Location input field. This also populates this field.*



- 7) Now that you have specified the name and location of the geodatabase, you must still specify a new name for the feature class you are creating. Enter a name of the feature class you are putting into the geodatabase; it can have a similar name to the original shape file.



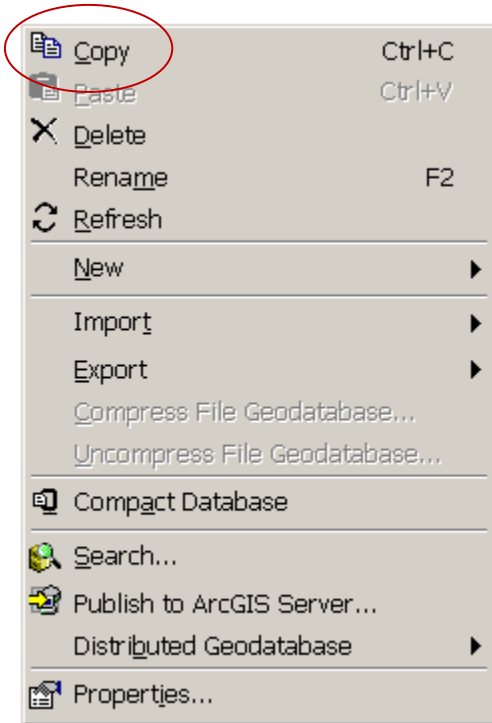
- 8) This is all the information you need to export the shape file. Click OK to finish.



- 9) In ArcCatalog, navigate to the geodatabase you used as the output location to see the newly added feature class.

Example #3 – Copying Between Two Different Geodatabases

If you have more than one personal geodatabase, you can use a simple Copy and Paste to transfer feature classes between geodatabases.

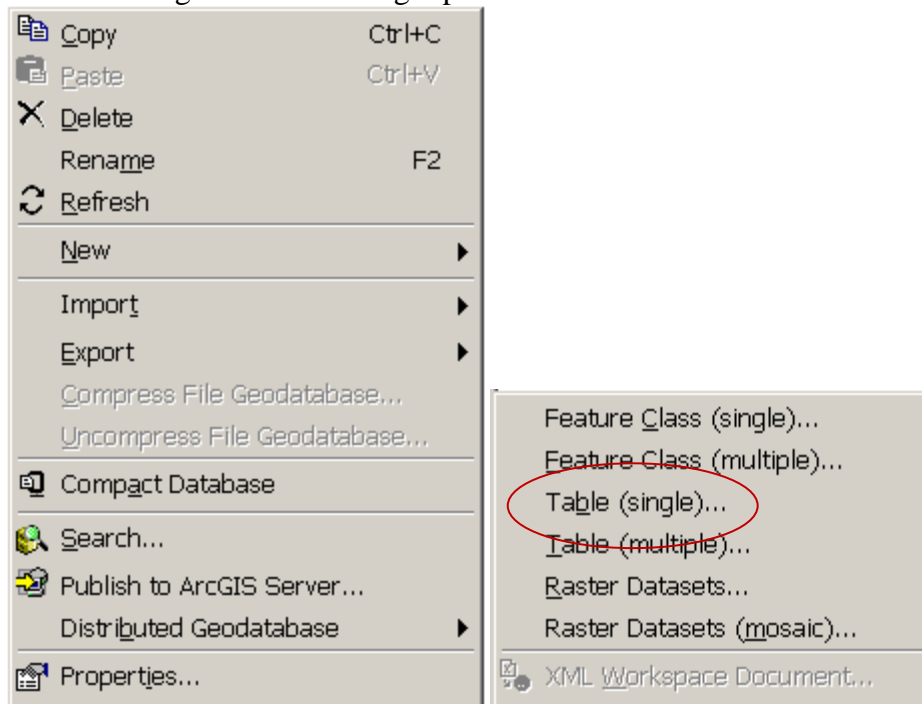


Example #4 - Importing an Excel File or dBase File Into a Geodatabase

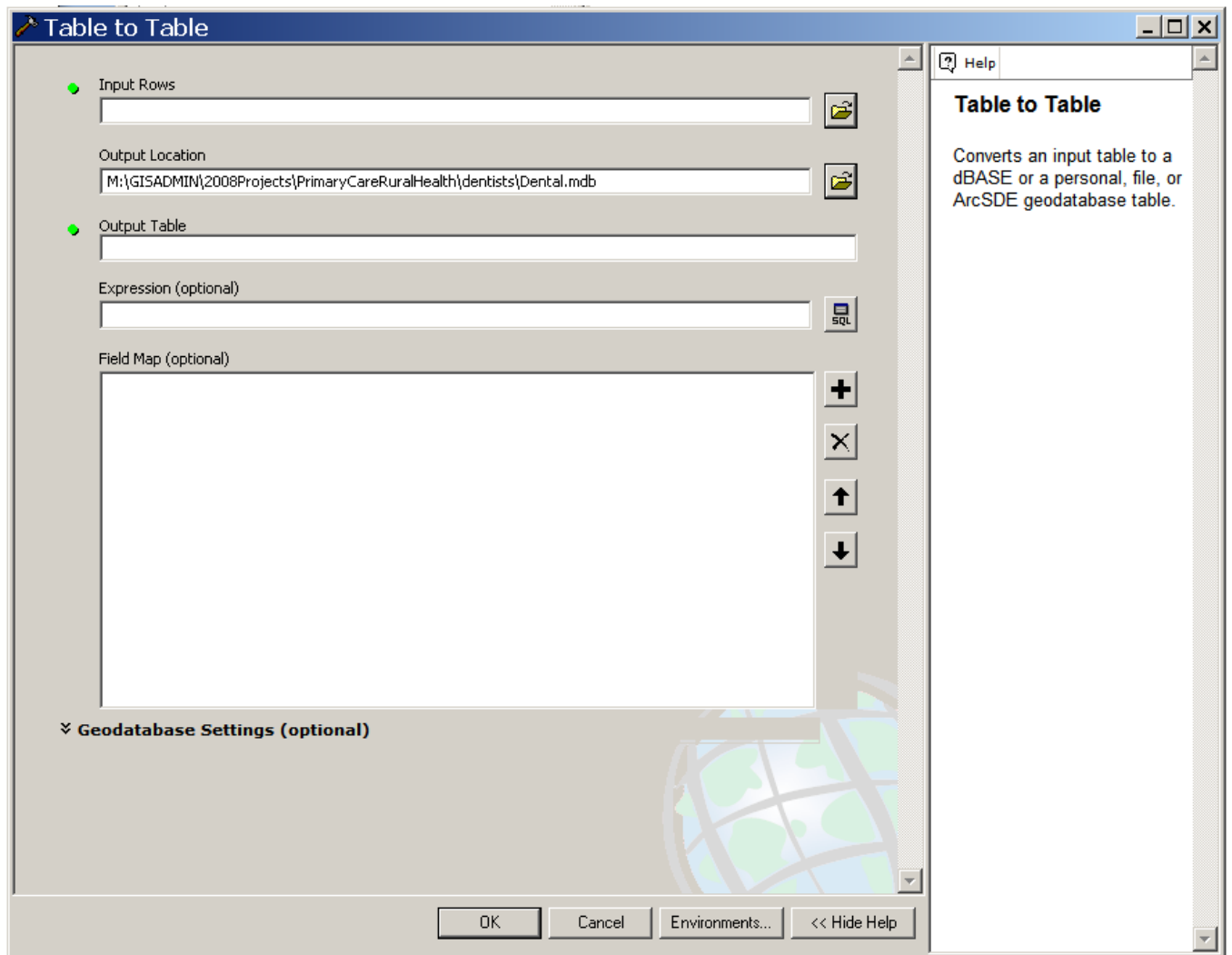
If you need to import a table into a geodatabase, the process is very similar to a geographic file. You can either open the geodatabase and import the table into it or select the table in ArcCatalog and export it to the geodatabase. The file formats dBase (DBF) and Excel are supported with this tool.

If you wish to import an Excel file, remember you can only work with one worksheet at a time; you must open the XLS file in order to see the individual worksheets. *(NOTE: ArcGIS version 9.2 only supports Office 2003 and lower, the XLSX file extension for Office 2007 is not supported. You must open your Excel file with the Microsoft software and save it to the earlier version, Excel 97-2003 Workbook.)*

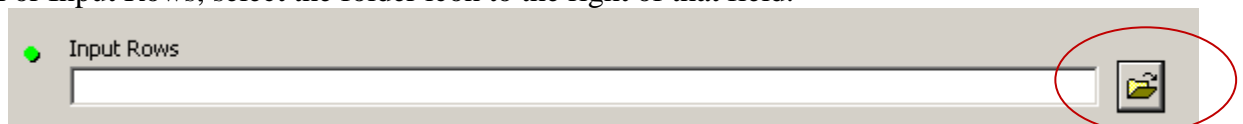
- 1) Open the geodatabase by clicking on the geodatabase file name.
- 2) In this example, this is a new empty geodatabase, so you won't see any features within the container. Right click in the right pane to activate the commands.



- 3) Select Table (single) ... This activates the Table to Table dialog. The two required fields will be highlighted with a green dot.

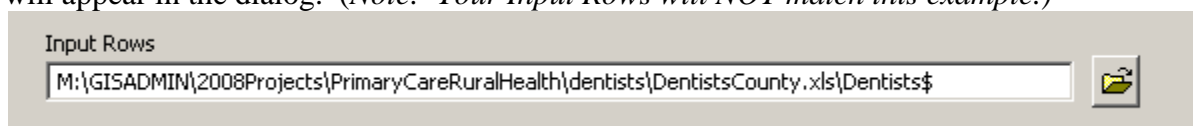


- 4) For Input Rows, select the folder icon to the right of that field.



- 5) This activates a File Browser. Navigate to a folder that contains Excel or dBase file. Select the file you want to import and click Add.
Alternately, In the LEFT HAND PANE of ArcCatalog, you can expand the directory tree, browsing to the folder containing the file, and click and drag this shape file name into the Input Features input field. This also populates this field.

- 6) The green dot next to the Input Rows field will be removed and the location of the input rows will appear in the dialog. (Note: Your Input Rows will NOT match this example.)



- 7) Next you must specify a name for the output table. You can give it a similar name as the original input rows file name.

Output Table
sampleExample

- 8) This is all the information you need to import this file. (*Note: The field values in your completed dialog will not match this example.*)
9) Click OK to finish.

10) **Table to Table**

Input Rows
M:\GISADMIN\2008Projects\PrimaryCareRuralHealth\dentists\DentistsCounty.xls\Dentists\$

Output Location
M:\GISADMIN\2008Projects\PrimaryCareRuralHealth\dentists\Dental.mdb

Output Table
sampleExample

Expression (optional)

Field Map (optional)

- County (Text)
- Dentists (Double)
- F3 (Text)
- F4 (Text)
- F5 (Text)
- F6 (Text)
- F7 (Text)
- F8 (Text)

Field Map (optional)

The fields and field contents chosen from the inputs. Each of the unique input fields will be listed on the Field Map window and when expanded, you will see a list of all the input field occurrences (sub fields). New fields can also be added.

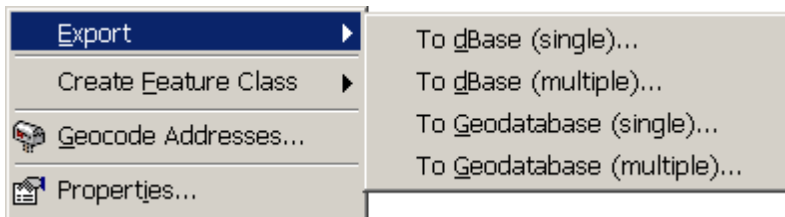
For each Field Map, you can add, rename, or delete output fields as well as set properties such as data type and merge rule. You can also delete an output field's sub fields, and you can format any output field's values if the data type is text.

Geodatabase Settings (optional)

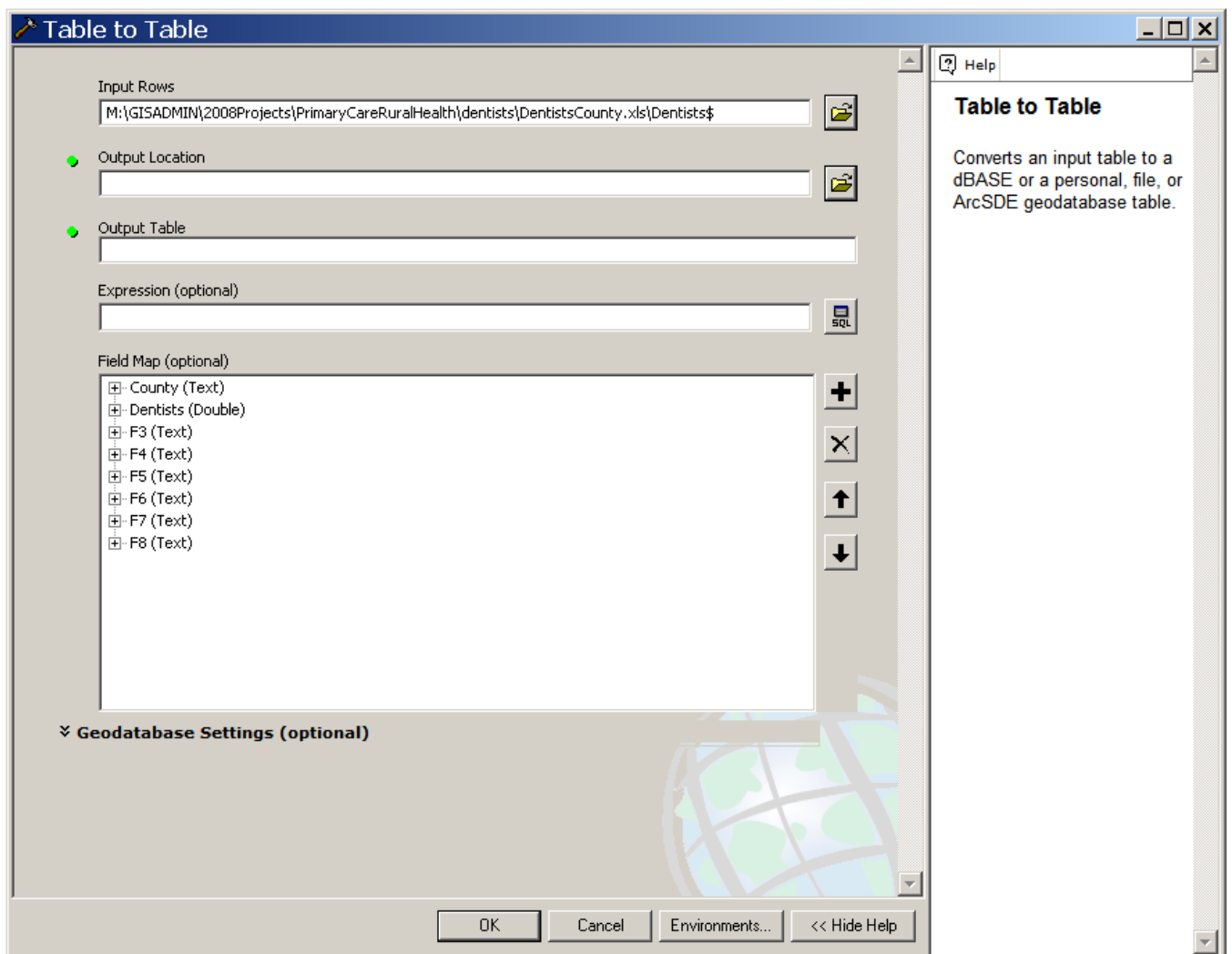
OK Cancel Environments... << Hide Help

Example #5 – Exporting an Excel Worksheet or dBase (DBF) file to a Geodatabase


- 1) Navigate to the folder that contains the Excel or DBF file you wish to add to the geodatabase.
- 2) Select the file you wish to copy to the geodatabase. Right click on the file name and select Export > To Geodatabase (single)...



- 3) This activates the Table to Table dialog.



- 4) The required fields are highlighted with a green dot.

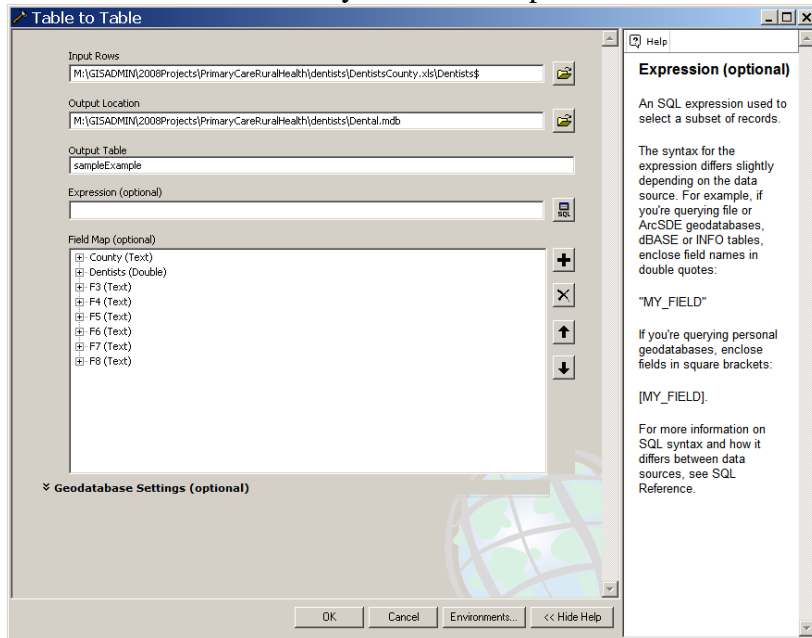
- 5) The Output Location will be the full file name of the geodatabase. Select the folder icon  to browse to the location of the geodatabase. Once you have selected an output file location, it will be populated in the Output Location field. (Your output location will be different.)
Alternately, In the LEFT HAND PANE of ArcCatalog, you can expand the directory tree, browsing to the folder containing the geodatabase, and click and drag this geodatabase file name into the Output Location input field. This also populates this field.



- 6) Now that you have specified the name and location of the geodatabase, you must still specify a new name for the table you are creating. Enter a name of the table you are putting into the geodatabase; it can have a similar name to the original input file.



- 7) This is all the information you need to export the Excel or DBF file. Click OK to finish.



- 8) The geodatabase will now contain a new table.

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