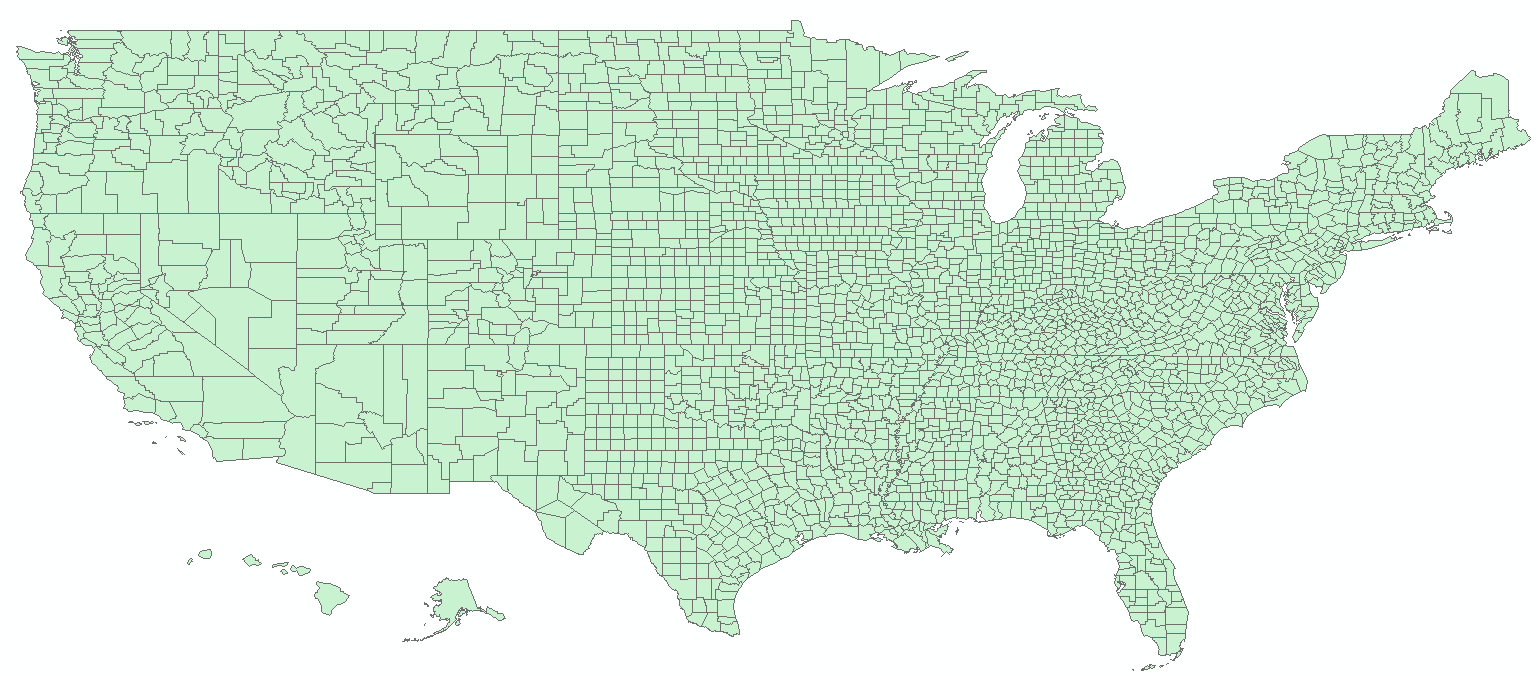
Homework 3: Spatial data management – JOE BREW (UFID: 0402-8902)

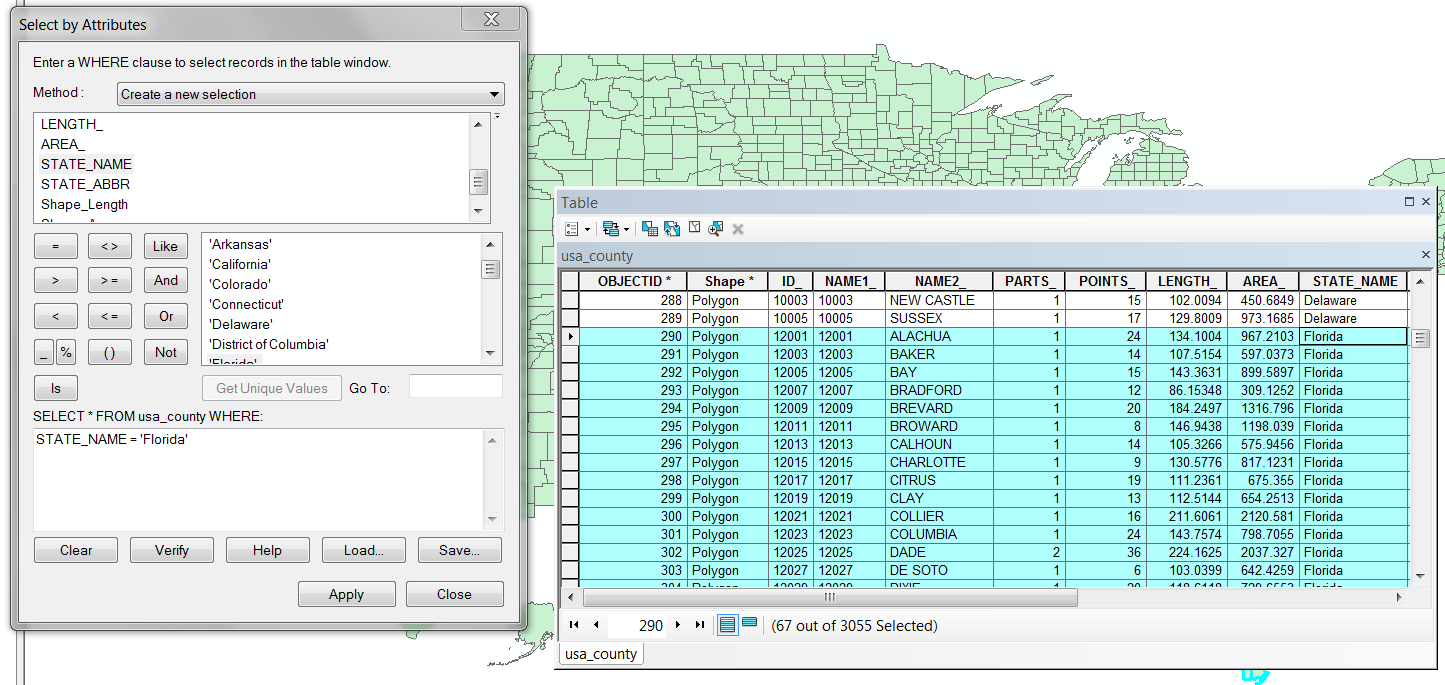
PHC 6937: Spatial Epidemiology

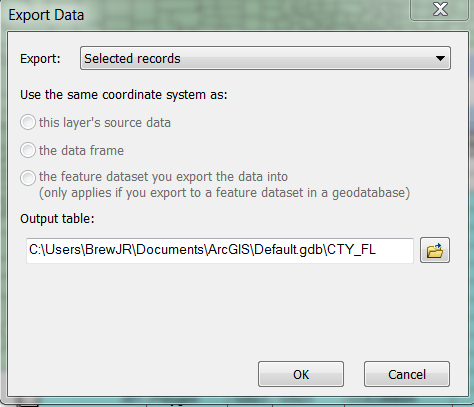
**Part 1 Working with attribute table**

Background: The Florida Department of Health plans to create a county-level map of cancer mortality rates. They ask you for assistance. They provide you a shapefile of U.S counties and a excel file with the county level crude and age adjusted cancer mortality rate in Florida. You are asked to create a new shapefile of counties in Florida by subsetting the U.S county map, then to join the excel data with the created shapefile and finally to export the joined file to create another new shapefile that is ready for disease mapping. By the way, they also want to learn what the five top counties with the highest cancer mortality rate are. To complete the work, please perform the following steps:

1. Add the shapefile of “usa\_county” into ArcMap; Open the attribute table and select all records in FL (Please refer to “selecting records in a table” in the handout); Then export the selected record to create a new feature (i.e. Shapefile) of “CTY\_FL”.

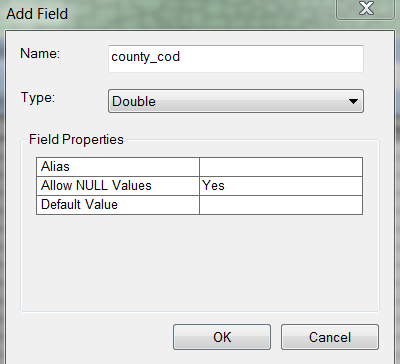
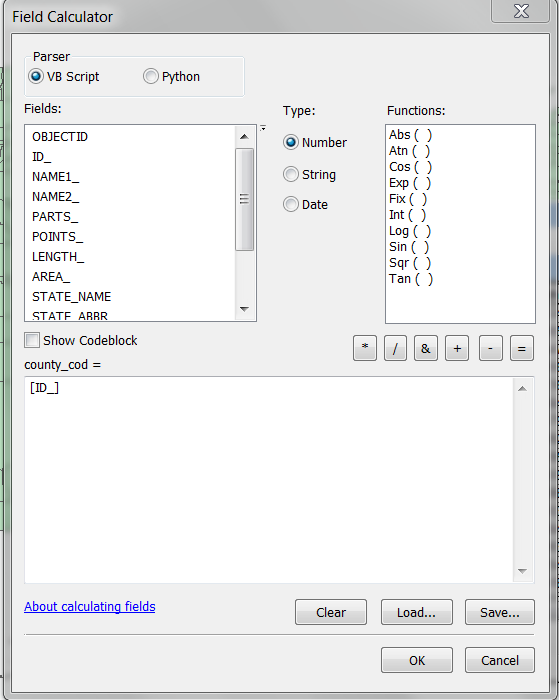




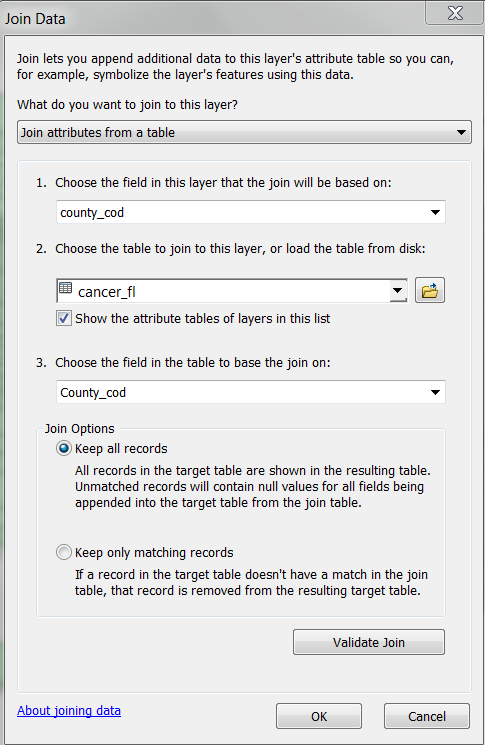


1. The dataset of “cancer\_fl.dbf” have the crude and age adjusted mortality rate in all counties in FL.

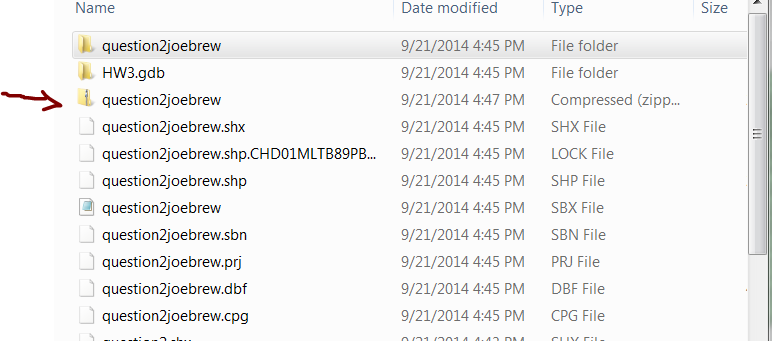
The data of map (ID\_) and table (county\_cod) have different variable formats: “ID\_” is a string and “county\_cod” is a double. To solve the problem, you need to open the attribute table of the map after you select Florida. Then add a new field to the table with a format of “double” and use the “field calculator” to assign the values from “ID” to this created field.

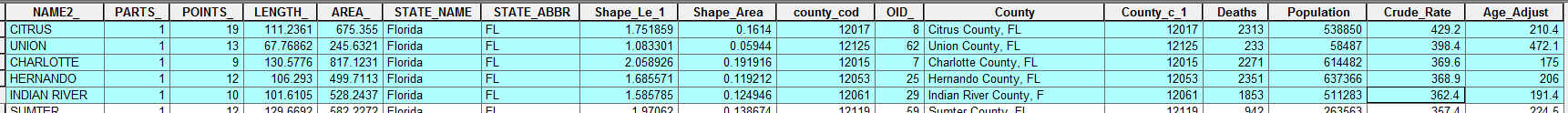
Please join the cancer mortality data with the new shapefile of “CTY\_FL” that you create at step 1.



Then, use the joined information to create a new shapefile with the cancer mortality information attached. (*Note: please zip the Shapefile and submit it together with this word document for evaluation*)

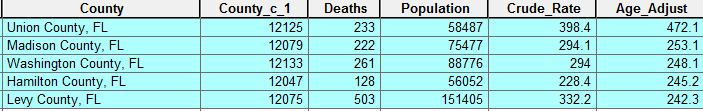


1. Using the shapefile created in step 2, please answer the following questions (Hint: Selection by attribute):
   1. Please find five top counties with the highest crude cancer mortality rate in Florida and list the information of county name and their rates below.



|  |  |
| --- | --- |
| Citrus | 429.2 |
| Union | 398.4 |
| Charlotte | 369.6 |
| Hernando | 368.9 |
| Indian River | 362.4 |

* 1. Please find five top counties with the highest age-adjusted cancer mortality rates in Florida and also list the information of county name and their rates;



|  |  |
| --- | --- |
| Union | 472.1 |
| Madison | 253.1 |
| Washington | 248.1 |
| Hamilton | 245.2 |
| Levy | 242.3 |

* 1. Please check if the selected five counties with highest crude and age-adjusted rates are same or different. If they are different, please explain why it is.

With the exception of Union County (which has a top-5 crude *and* age-adjusted mortality rate), the counties at the top of the two lists are *different*. The reason for this is that cancer mortality is very subject to the age of a population – older populations, even if healthy, have high mortality from cancer, and younger populations, even if unhealthy, have lower mortality.

So, it should be no surprise that the *crude* rates largely reflect how old a population is, whereas the age-adjusted rates largely reflect a different indicator – how *unhealthy* the population is.

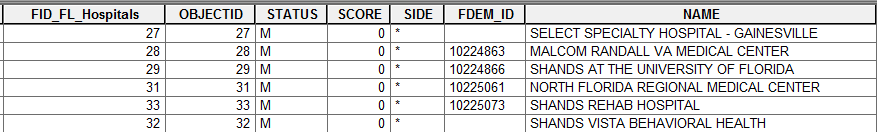
**Part 2: Prepare spatial data**

Data:

1. FL\_Hospitals: This dataset contains 2011 Hospital Facility Information for the State of Florida. It is a combination of hospital facility addresses from seven different sources. The data contains selected fields denoting the name, physical address, and other facility information for hospitals located in Florida.
2. Alachua\_boundary: A polygon is to show the boundary of Alachua County, FL.
3. NED01: This dataset contains the U.S. Geological Survey National Elevation Dataset (NED) for Alachua County. This is a Grid data.
4. Alachua\_CT\_POP: A polygon includes the population information at the census tract level in Alachua County. (The variable of Population number is “pop”).

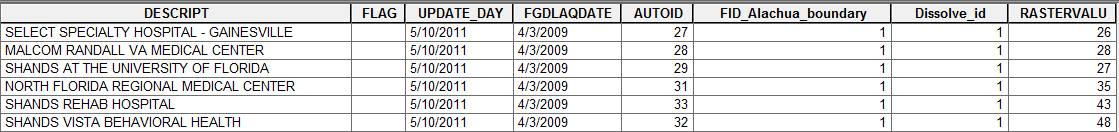
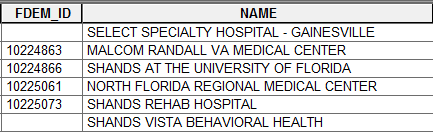
**Task 1**. From the feature class of “FL\_Hospitals”, please select all hospitals within Alachua County. (Hint: Using Alachua\_boundary and “Intersect” tool).

**List the ID (FID\_FL\_Hospitals) and the names of the selected hospitals below for evaluation**.



|  |  |
| --- | --- |
| 27 | Select Specialty Hospital |
| 28 | Malcom Randall |
| 29 | Shands at UF |
| 31 | NFRMC |
| 33 | Shands Rehab |
| 32 | Shands Vista |

**Task 2.** Find the elevation information for the selected hospitals in Alachua County using the data of “NED01”. **List the ID (FID\_FL\_Hospitals) of the hospitals and their elevations for evaluation.**



|  |  |
| --- | --- |
| ID | Elevation |
| 27 | 26 |
| 28 | 28 |
| 29 | 27 |
| 31 | 35 |
| 33 | 43 |
| 32 | 48 |

**Task 3.** Find the serving population within 5km distance of each hospital using census tract population in Alachua. **List the ID (FID\_FL\_Hospitals) of the hospitals and the number of the serving population within 5 km distance for evaluation**.

(Hint: Creating a buffer of 5 km for each hospital and then spatial join the census population using Spatial Join tool. Figure 1 shows how to assess the tool. In addition, in spatial join tool, right click the variables and you can select the statistics as shown in the second figure)

