Exercises 7-8 Supplement: GeoDa Tips

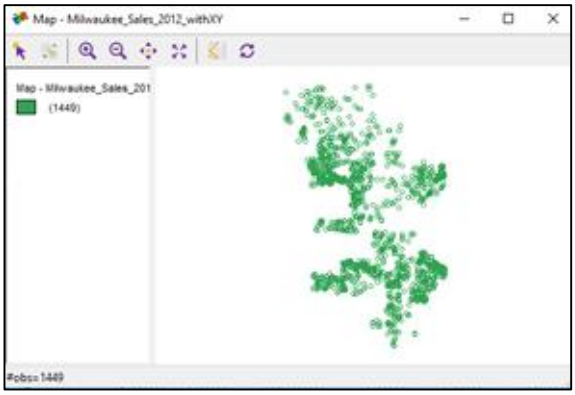
1. Installation:

Go to http://spatial.uchicago.edu/software, click first link for GeoDa, then click Download, and finally choose one of options (GeoDa for Windows or Mac) for GeoDa 1.14. Several tutorial documents are already posted in Canvas – it would be a good idea to tour chapters 1, 2, 3, 7, and 8 in the GeoDa workbook (found under "Tutorials (old)" section) just to get a feel for the way GeoDa works. However, be aware this workbook is for version 0.9 and the interface looks different; rather than a full screen program GeoDa 1.14 just opens to this toolbar ribbon:

2. Starting Work:

There are several ways you can start work depending on the type of data file you have. These instructions walk you through the two most common approaches that are needed for exercises:

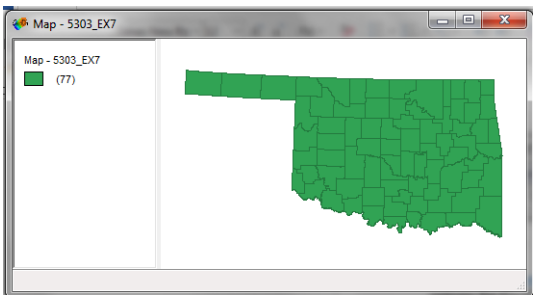
From an Excel (97-2003) file (*.xls): Click "File", beside "Input" click the drop-down and select "MS Excel (*.xls)", and choose a file (Milwaukee_Sales_2012_withXY.xls is used for demonstration here). Note that GeoDa cannot (yet) open the newer Excel files that end in .xlsx.



Since this is not yet a spatial database, you have a bit more work to do. Click "Tools", "Shape", and "Points from Table", assign X to "First Variable (X)" and Y to "Second Variable (Y)" and you will get a base map:

At this point you have created a map and imported the Excel file for use, but you have not yet created a geographic database. In order to avoid having to go through these steps every time you want to work with the dataset, I recommend you go to "File", "Save as", and create a shape file (choose ESRI Shapefile (*.shp) as the data type). You will also notice other options that resemble GIS in terms of creating geodatabases and the like. Explore!

From an ESRI shapefile (*.shp): After extracting all files from the ZIP archive **5303_EX7**, click "File", "New Project From", and "ESRI Shapefile (*.shp)", choose 5303_EX7.shp, and you will get the standard default map like this:



You can always close the base map; as long as the command ribbon is open, GeoDa is running and you can always close output windows (maps, charts, etc.) that you don't need. You'll also notice now that all windows that open have the shapefile name (here, 5303_EX7) which also now appears in the command ribbon to remind you what file is currently open.

If you click on the "Open Table" icon in the GeoDa ribbon you can see the contents of the database file, though if it came as a shape file as above you have to scroll right past all the geo-graphic information that comes with shapefiles before getting to the variables that interest you.

3. "Joining" tables in GeoDA:

At times you might need to "join" data to an existing GeoDa shapefile, either information derived internally to GeoDa (text file output) or other information. Generally, it is easiest to have your data to be joined in Excel format (*.xls only, not *.xlsx). GeoDa is not quite as robust in the options for performing these joins, and I have had little success with the "Merge by key values" method – I get the warning that "Chosen merge key field <field name> contains duplicate values. Key fields must contain all unique values." even though I've tried using FIPS and county names and I know that every county has a unique FIPS and/or name. The other option is "Merge by record order" in the attributes table and/or Excel file. This requires ensuring that all observations are ordered the same way (by FIPS or by name, for example). I typically transfer from the "Exclude" box to the "Include" box not only the attributes I want to study, but also the observation (county or station) name so I can do a quick inspection ensure a correct join.

4. "Capturing" GeoDa output:

When you have a graphic on screen you want to include in your Word file, you have several options. If you right-click on the image, you can:

a. "Save image as" and then have a choice of BMP (bitmaps, a raster graphics image file format used to store bitmap digital images), PNG (portable networks graphic, a raster graphics file format that supports lossless data compression), or SVG (scalable vector graphics, an XML-based vector image format for two-dimensional graphics) files.
b. "Copy image to clipboard," and paste it in Word. You have to do this separate for maps and their legends.☹
c. Screen capture and paste to keep the map and legend together, and then trim the edges of the image accordingly.

5. "Saving" GeoDa results:

When you create SAC maps (for example, Moran's I_i or Getis-Ord's G_i), the information is displayed on screen but is not automatically added to your worksheet (similar to SPSS saving factor scores or cluster membership only if you instruct it to). However, if you want to actually see/work with the individual values for each observation (for example, to export back to ArcMAP for better map preparation/display), you can right click on a map and then choose "Save results" and, depending on the information displayed on the map, add these as new fields to your data file.

For Local Moran's I, you can save the actual I_i values, p-values, and cluster membership (nominal; five classes), and for Getis-Ord's G_i you can save similar information. Then, you can open the shapefile back in ArcMAP and work within a GIS environment.

This task is not actually assigned one these exercises and you can simply copy images directly from GeoDa for your write-ups, but I have found that exporting results back to GIS provides a better platform for producing journal-ready JPG or TIFF image files of maps, as well as having better control over the appearance of legends, than is possible in GeoDa. While you can change the color schemes in GeoDa on all maps from their defaults, it is clunky compared to ArcMAP and you have fewer options in GeoDa as well.