Northfield Housing Assignment

Economists love prices. Unfortunately, many environmental amenities are not traded in markets the way that coffee, oil, or automobiles are traded every day. Does that mean we cannot find ways to estimate how much people value these environmental amenities? No! Instead of looking to markets for the environmental amenities themselves, we can examine markets related to the environmental goods. For example, if people prefer cleaner air to more polluted air, all other things equal, people would prefer to live in neighborhoods with less air pollution. This increased demand for housing in cleaner neighborhoods will lead to higher prices in neighborhoods with cleaner air. Thus, by looking at the differences in prices across neighborhoods of differing air qualities, we can begin to estimate the value consumers place on clean air. In fact, one such paper, "Hedonic Housing Prices and Demand for Clean-Air," by Harrison and Rubinfeld in the *Journal of Environmental Economics and Management* (Vol. 5(1) 81-102, 1978) is one of the most cited environmental economics papers of all time.

Your assignment is to bring a poster to class on _____ addressing the following, "How much do parks influence the price of housing in Northfield?"

Aside from providing evidence using the data described below, you should also consider the questions...

- How do your results compare to other researchers' results?
- What would you have done if you had more time?
- What additional data would you like to have?
- What additional research methodologies would you like to try?

Grading:
Your team's grade will be determined out of 40 possible points as follows:

Well-constructed argument (8)
Evidence to support your argument (8)
Good use of graphics (8)
Overall Organization (6)
Visual Appeal/Intangibles/Creativity (5)
Question and Answers during class Discussion (5)

Data:

- Copy the "**... \Course Materials\Housing**" folder from the "GIS" drive to the scratch disk on your machine.
- The ArcGIS "Northfield.mxd" file is available at "**Housing\Northfield.mxd**". This file contains an overview of the Northfield area, as well as locational data for many area amenities (including parks).
- You will want to "add" the northfield housing parcel-level data from "**Housing\Parcels\Parcel_2009Oct.shp**" This contains some basic information for nearly every land parcel in Rice County.
- Additional tabular data are available in the "**Housing\tables**" folder ("Northfield_housedata.dbf" contains structural characteristics for many of the houses, while "Northfield_housesaledata.dbf" contains recent sales information for houses in the Northfield area).
- Here is some information from the city of Northfield regarding the "**Housing\tables**" data for the City of Northfield, City of Dundas, and Bridgewater and Northfield Townships
    - Northfield_housedata - GISNUM (parcel number), COUNTRES (number of residential structures - I only included 1 res structure for each parcel although there may have been multiple because it is hard to get the correct data if multiple are exported), YEARBUILT (year structure was built), TLA (total living area), TTLRMS_ABO (total rooms above ground), BEDRMS_ABO (bedrooms above ground), BEDRMS_BEL (bedrooms below ground), OCCTYPE (number representation of occupancy code), OCCUPANCY_CODE (occupancy codes for our valuations), STYLECODE (number representation of building style), BLDG_STYLE (building style), FULL_BATH (# of full bathrooms), SHOWER_BATH (# of shower stall bathrooms), WHIRLPOOL_BATH (# of whirlpool bathrooms)

      Northfield_housesaledata - (the most recent sale that is in our system has been exported, previous sales were excluded) - GISNUM (parcel number), SLSDATE (sales date), SLSAMT (sales amount), VCSVAL (value at the time of the sale), NUTC (number representation of the nut code), NUT_CODE (the NUT code for the sale), DOVCRV (certificate of real estate number), BUYER, SELLER, TTLPRICE (adjusted sale price), MPCODE (M - means that multiple parcels were involved in the sale), REJECTCODE (G - Good Sale, R -Rejected for the state sales study - good sales are the sales that we are allowed to use to determine values), REJECTREAS (number representation for the reason the sale was rejected), REJECT_REASON (the reject reason), AUDITDATE (the date the sale was recorded)
    - NOTE: The variable "GISchar" (the last variable in the tables) will allow you to "join" these data to the parcel data (you should choose to join it to the "PARCELID" variable (in the middle of the data table) in the parcel data.

Tools:

The following tools and commands may be of use to you. (You should make sure you have turned on the ArcGIS toolbox, the little red "toolbox"-looking icon in the main toolbar)

- **"Buffer" (Analysis Toolbox)** - This tool creates buffer polygons to a specified distance around the data set.
  http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=Buffer_(Analysis)
- **"Near" (Analysis Toolbox)** - This tool determines the distance from each point in one data set to the nearest point or polyline in another dataset.
  http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=Near%20(Analysis)
  - NOTE: The "near" tool says that a "search radius" is optional, but I have had better success when including a maximum search radius (for instance, 10000 feet)
- **SELECTION > Select by Attribute** - The Select By Attributes dialog box allows you to select features on a given layer using a Structured Query Language (SQL) expression. SQL is a powerful language you use to define one or more criteria that can consist of attributes, operators, and calculations. For example, imagine you have a map of customers and want to find those who spent more than $50,000 with you last year and whose business type is a restaurant. You would select the customers with this expression: Sales > 50000 AND Business_type = 'Restaurant'.
  http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=Using_Select_By_Attributes
- **SELECTION > Statistics** - Once you've selected features, you can zoom to them or display their attributes or statistics. You can also create a report or create a graph of them.

  http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?id=256&pid=248&topicname=Displaying_information_about_selected_features
- **"Statistics Toolset" (Analysis Toolbox) -** Statistics tools provide ways to analyze the results of your analysis after performing buffers, overlays, and other geoprocessing tasks.
  http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=An_overview_of_the_Statistics_toolset
- **"Add Join" (Data Management Toolbox)** - Joins a table view to a layer (or a table view to a table view) based on a common field. The records in the input layer or table view are matched to the record in the join table view based on the join field and the Input Field when the values are equal.
  http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?id=1595&pid=1594&topicname=Add_Join_(Data_Management)

- **"Spatial Join" (Analysis Toolbox)** - Creates a table join in which fields from one layer's attribute table are appended to another layer's attribute table based on the relative locations of the features in the two layers. http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?id=1100&pid=1096&topicname=Spatial_Join_(Analysis)
- **"Ordinary Least Squares Regression" (Spatial Statistics Toolbox)** - Performs global Ordinary Least Squares linear regression to generate predictions or to model a dependent variable in terms of its relationships to a set of explanatory variables. Learn more about how Ordinary Least Squares regression works.http://webhelp.esri.com/arcgisdesktop/9.3/index.cfm?id=2173&pid=2169&topicname=Ordinary_Least_Squares_(Spatial_Statistics)
- **"Add Field" (Data Management > Fields)** - Allows you to add a new field to your data layer... which will than allow you to...
- **"Calculate Field" (Data Management > Fields)** - Allows you to calculate new field values (for instance the EMV/per acre)