FINAL PROJECT

CL 341 Introduction to GIS (Geographic Information Systems) (1 credit course)
Alverno College, Milwaukee, WI
Spring 2006

Class Assessment

As the Director of Business Development it is my job to locate new locations for my chain of Chinese eateries. I am coming to you for help, I am unfamiliar with GIS so I need you to provide me with three locations in Milwaukee County that will give me the greatest return on my investment.

I will provide you with all the data I have necessary to locate properties that fit the following criteria. The location must:

A. Be in a neighborhood that is safe

B. Be in a neighborhood that is not over saturated with my competition

C. Be in a community that has the financial resources to support my restaurant.

D. Have land that is available for development that fits my zoning and acreage requirements.

Deliverables
A completed standard site analysis form is supplied by me, and it is accompanied by a map with you and your partners' names on it (if you work in pairs) for the best site of the three in electronic format. ***Note***: Not everyone will pick the same site.

List of Data
MuniBoundaries
Census Tracts
CrimeData
Competition
Parcel Information

Directions
Place the data on your personal Directory on the network. Your work over the next three weeks will all be saved to this directory and from here on, we will refer to this document in this location as the project directory. ***Note:*** If you save the data and your work on the desktop it will be erased when you log out!

Use the book, your notes, each other, these directions and the teacher to fulfill the client's needs.

1. What does GIS stand for?_____

2. Did I give you Shapefiles or Coverages?_____

3. Open ArcMap, and add the Municipal Boundaries and CrimeData files from your project directory

   The Crime Data are compiled of several different types of crimes. Our client is only interested in two types of crimes: "Armed Robbery" and "Property Damage". Use a "Definition Query" to display only these two crimes. In the table these crimes are in the "CrimeType" field and are categorized as a number; the key for those numbers is listed below.

   Armed Robbery = 1
   Property Damage= 2

   Hint: You did a "Definition Query" in Chapter 10 exercise B

   Save your Map

4. With the CrimeData file do a "Select By Attribute" to select only those crimes that have occurred in the years 2003, 2004, and 2005. ***Hint***: We did a "Select By Attribute" in Chapter 8

5. What Five Municipalities have these types of crimes not been committed in the last three years?

   _____
   _____
   _____
   _____
   _____

   We will only be looking in these Municipalities for sites to recommend.

6. Add the Competition data and the MuniKey table from the project directory.

   Do a "Join" on the Competition data. Join the MuniKey table to it, using the "PHONE" fields for the join. ***Hint***: The class explored "Joins" in exercise 9a and when we add a table to ArcMAP; the table does not appear in the "Table of Contents" but it has been added.

   Then do a "Definition Query" so that only those five municipalities' restaurants are shown.

   Save your Map

7. What Community has the "Least Amount" of Restaurants in it?

   _____

8. What Community has the "Most" Restaurants?

   _____

9. Determine which restaurants do the most Average Monthly Business in the Attribute table in the Competition layer. To do this use the "Field Calculator" tool in the

ProfAVG field to average the last two years' annual profits and then divide by two and then by twelve. ***Hint***: In chapter 12 exercise C you used the field Calculator.

In the Attribute table sort the results in the ProfAVG field. What are the name of the three top Restaurants and there Municipalities?

Name	Municipalities
_____	_____
_____	_____
_____	_____

Save your Map

Class Assessment

PART 2

10. Next we need to determine which communities out of the five we have selected have the financial base to support our restaurant. To do this we will examine the census data for House Hold Income, Population, and the number of times the household goes out to eat in a week.

    Start by adding the "Census" file form your project folder.

    Do a "Definition Query" so that only the five municipalities you are interested are shown on the map.

    Open the Census Attribute table, do a "Field Calculation" on the "HHIperPOP" field; the goal for this field is to get a dollar per person number. ***Hint:*** *Use the "Population" and "HHincome" field*s.

    Next we are going to do a Summarization in the attribute table. Start by right clicking on the "MCD_NAME" field and choose "Summarize" -- a small wizard should open. For part 1 make sure MCD_NAME is in the drop down box, in part two look for "HHIperPOP" left mouse click the plus sign next to it. A variety of math options should appear.

    In the summarization tool we are trying to create a new file that adds up all the dollars per person in a municipality. This tool will look through the "MCD_NAME" field and for all the similar values will do an equation on another field. In this case we want to know the average income per person in a municipality. We have already calculated the dollars per person in a census tract, now we just need to add up all the tracts in a municipality and divide by the number of tracts. So Under "HHIperPOP" in the summarization wizard, what type of calculation do we want to do?_____

    Make sure the box next to your answer is checked

    Find the EatOUT field in the list and check the box next to "Average"

In part three of this wizard makes sure your project directory is specified and click "OK".

It will ask you if you want to add this table to your map, click "Yes".

Save your Map

11. The table will be added to you map. Open the attributes for that table.

12. What are the top two Municipalities for income and how often do they go out to eat? ***Hint****: Do a sort on the "Average_HHIperPOP"*

    _____

    _____

13. We started by doing a crime analysis to select the top five safest Municipalities for our restaurant. Then we looked at those five municipalities to determine how much competition was there and how well they are doing. Now we have just determined how much money is in those municipalities and how often they go out for dinner. Looking over those statistics which community would be the best fit in your opinion for my restaurant? _____

14. You have done a great job so far in recommending this community to me, now I need you to find a good location in that community as well. Load the "Parcel" data from your project directory. Due to shipping costs, we as a company are only interested in Wauwatosa, West Milwaukee, South Milwaukee, and Glendale. If your City suggestion is not one of these that is okay, but for the rest of the assignment chose one of these communities.

    Do a "Definition Query" for only parcels in the municipality you chose and that are Zoned Commercial.

15. Pay Close attention to the location of the Competition do a "Select by Location". ***Hint:*** *We did a "Select by Location" in chapter 10a*

    Your selection should read:
    I want to select features from "Parcels" that are within a distance of the features in this layer "Competition".

    Make sure you have a check mark next to "Apply a buffer to the features in Competition".

    And set the buffer to .75 Miles

    Click Apply.

    Right click on Parcels in the Table of Contents move your mouse over where it says selection. In the menu that opens chose "Switch Selection" this will change the selection to those parcels that are not within .25 miles of competition.

On your screen are highlighted parcels that have the right zoning, safety, lack of competition, and income surrounding them to support them.

16. Any of these highlighted parcels will work for the Restaurant. Now you need to choose one, and create a map of that property. ***Hint****: Remember to build your map in the Layout View, and feel free to look in the project folder to find new layers to add to your map.*

    The Map Needs
    Text Labeling the Property
    North Arrows
    Legend
    Title
    Scale Bar

    Export a copy of the Map to your project directory and email it to me at paulvepraskas@hotmail.com

CRITERIA/LEARNING OUTCOMES:

1. Accurately explain the differences between the vector and raster data models and choose the appropriate model to address their spatial questions.
2. At a beginning level, define and conceptualize goals for a GIS project, including the spatial extent of the study area, the data needed, accessibility of data, and the approaches to analysis.
3. Evaluate the accuracy of spatial data and locate sources of error.
4. Visualize and present the results of spatial analysis using GIS.
5. Describe important ethical issues in spatial analysis.