UT Dallas GIS Workshop

Market Research Analysis

You are a market research analyst working with a real estate investment firm that is exploring opportunities in Dallas market. As an analyst, your job is to explore and analyze highly valued census tracts and rank them using Maptitude GIS Software. Some of the factors that have been proven to be driving factors for the growth:

House Characteristics

Median Home value

Demographic Characteristics

- Percentage of population with higher degree
- Population Growth from 2010 to 2017(Present)

Method:

Download the data from the webpage (<u>http://www.exploregis.spatialfiltering.com/download.html</u>) >> Theme: Real Estate Application, then extract the data in the desired file location.

Step 1: Adding the study area to the base map and changing the visualization

Step 1a: Open Maptitude	Step 1b: Goto File > Open and select both	Step 1c: Open with Ctrl-L or Map
and select option None	compact *.cdf files. Make sure Add to map is	Layers the layers tool. Highlight
from the Quick Start	selected in order for both layers being added to	Study Area and change in Style
menu	Maptitude's standard map.	the border line color and width, so it
		shows better in the map. You may
		also want to hide layer or change the
		drawing order.

Quick Start ? X	👷 File Open	×	Layers	? ×
Startup Action O Map my own data O Open a map or workspace	 ← → ~ ↑	P P Type	Layers in Order of Display Sample Status 5-Digit ZIP Code Hidden 3-Digit ZIP Code Hidden County Subdivision Hidden	Close Hide Layer
Create a new map Restore the previous session Display the Initial Map Open the Map Librarian None Use startup action without Quick Start	MRT052000 (F) MetroNorthTracts.cdf 3/26/2018 10:23 PM Open as read-only Open for exclusive access File name: "MetroNorthTracts.cdf" "MetroNo ✓ Geographic File (".cdf,".dbd)	Caliper Co	Country Filiaden State Image: State MSA Image: State Building Footprint Hidden Time Zone Image: State Study Area Image: State Country Area Image: Style Style Labels Geographic File FilmptitudeWorkshop\Dinesh\MetroNorth\I	Add Layer Drop Layer Move Up Move Down Metadata MetroNorth.CDF
OK Cancel				

Your Map should look something like this. The **Study Area Tract** layer is now drawn before the **Water Area** layer. If you get stuck just open with **File ► Open** the map **BaseMap.map**.



Step 2: Preparing the DataView of the study area census tracts

Step 2a: In the Display Manager , right click on the Study Area Tracts ► select New Dataview .	Step 2b: Click on Show/Hide Fields.	Step 2c: Click Clear , Select the following from the <i>Available Fields</i> and press Add .
		 Tract Population 2010_Population 25+_% bachelor's degree or higher Median value

				Click OK		
Display Manager	× Res B			Show/Hide Fields		
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				Filter		[

Let's start the analysis...

1) What census tracts have a concentration of highly valued homes?

a) In the dataview, right click on the Column [Median Value] >> Sort Decreasing. Click on the selection next to that row and right click on the row >> Zoom.

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<u>nj</u>	[median value]	125+ % bachelor's dedree o		Census_mactiv	vorun.uvw - 3	[Median valu	e] [25+_% bachelor's de
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c) From the working layer dropdown, Choose **Study Area Tracts:1** as the new working layer. Then Click on the **Color Theme MapWizard** next to the *Find* button.



d) Select [Median Value] as the Field and click OK.

Working Layer

Color Theme (Layer: Study Area Tracts:1)	? ×
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Options Ignore values below or above	
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Treat zeros as missing values	
Round off the values in each class	
Include counts in legend	
OK Cancel Apply Remov	ve Customize

- e) Zoom out to the study area and can observe the spatial patterns/ spatial clustering.
- f) Let's rank the census tracts from 1 to 100. Click on the Dataview > Formula Field
- g) In the formula tab, Type " (" in the formula box >> Choose [Median value] from the Field List drop-down list in Formula Builder >> choose " / " from Operator List drop-down list >> Type 1718800 (Maximum Home Value) and ") " " * " >> then multiply with 100, or copy & paste the formula ([Median value] / 1718800) * 100 in the box as shown in the figure below.

Median HomeValue Rank =
$$\frac{H_i}{max(H_i)} * 100$$

Where H_i is the Median Home value at *i* census tract.

Formula (Dataview: Study Area T	racts:1)	?	>	<
([Median value] / 1718800) * 100	þ		OK	
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Values ~				

h) Give a name as **Median HomeValue Rank** in the Formula Fields as highlighted in the figure above and Click **OK**.

2) Which census tracts have a High percentage of population with higher degrees?

a) In the dataview, right click on the column [25+_% bachelor's degree or higher] >> Sort Decreasing. Click on the selection next to that row and right click on the row >> Zoom.

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b) Select [25+_% bachelor's degree or higher] as the Field and click OK.

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Options Ignore values below or above Std. Dev. per class Break at Treat zeros as missing values Round off the values in each class Include counts in legend		
✓ Include counts in legend		
OK Cancel Apply Remov	e Cus	stomize

- c) Zoom out to the study area and then, you can visualize the spatial patterns/ Clustering.
- d) Let's rank the census tracts from 1 to 100. Click on the **Dataview > Formula Field** fx

e) In the formula tab, Type " (" in the formula box >> Choose [25+_% bachelor's degree or higher] from the *Field List* drop-down list in Formula Builder >> choose " / " from *Operator List* drop-down list >> Type 91.8796 (Maximum % population with Bachelor's degree or Higher) and ") " " * " >> then multiply with 100, or copy and paste the formula ([25+_% bachelor's degree or higher] / 91.8796) * 100 in the box as shown in the figure below.

$$Education Rank = \frac{E_i}{max(E_i)} * 100$$

Where E_i is the percentage of the population who age is greater than 25 years and holds bachelor's degree or higher at *i* census tract.

Formula (Dataview: Census Tract:1)	?		×	
([25+_% bachelor's degree or higher] / 91.8796) * 100		OK		
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f) Give a name as **Education Rank** in the Formula Fields as highlighted in the figure above and Click **OK**.

3) What census tracts have high population growth rate from 2010 to 2017?

- a) Click on the Dataview > Formula Field
- b) In the Formula tab, Type ((Population [2010_Population]) / [2010_Population] *100) and name as Population Growth Rate in the Formula Fields as shown in the figure below.

$$PopulationGrowthRate = \frac{X_{t+1} - X_t}{X_t}$$

Where X_{t+1} is the population of census tract at t+1 year and X_t is the population of respective census tract at t year.

Formula (Dataview: Census Tract:1)	? ×
((Population - [2010_Population]) / [2010_Population]) * 100	ОК
	Cancel
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Formula Builder Formula Fields	
Field List V Population Growth Rate	Save
Operator List Previous Formulas	Load
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Values ~	

- c) Click **OK**.
- d) Highlight the **Population Growth Rate** column and Click **Compute Statistics** $\Sigma \overline{x}$. Note down Minimum and Maximum for [Population Growth].
- e) Click the Formula Field fx and type ([Population Growth] (-100))/(521.3333 (-100)), where Maximum value of population Growth is 521.3333 and Minimum value is -100.

 $PopulationGrowthRank = \frac{X - X_{Min}}{X_{Max} - X_{Min}}$

Where *X* is population growth rate of the current census; X_{Min} is the minimum value of population growth rate of all census tracts and X_{Max} is the maximum value of population growth rate of all census tracts.

f) Give a name as **Population Growth Rank** in the Formula Fields as shown in the figure below.

Formula (Dataview: Census Tract:	1)	? ×
([Population Growth] - (-100))/(5	i21.3333 - (-100)) * 100	ОК
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Function List ~	(521.3333 - (- 🗸	
Values ~		

- g) Click **OK**.
- 4) What census tracts scored the highest rank out of all?
 - a) Click on the **Dataview > Formula Field** $\frac{fx}{fx}$
 - b) In the Formula tab, Type ([Median HomeValue Rank] + [Education Rank] + [Pop Growth Rate Rank]) / 3 and name as Final Score in the Formula Fields as shown in the figure below

Formula (Dataview: Study Area Tra	? ×		
([Median HomeValue Rank] + [Education Rank] + [Pop Growth		ОК	
Kate Kankj) / 3		Cancel	
		Delete Clear	
		Sum Fields	
		Formula Builder	Formula Fields
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Operator List ~	Previous Formulas	Load	
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Values of [Pop Growth Rat $$			

- c) Click **OK**.
- d) In the dataview, right click on the Column Final Score >> Sort Decreasing. Click on the selection next to that row and right click on the row >> Zoom.
- e) To explore spatially, click on the MapView frame and activate Color Theme MapWizard
 Image: I
- f) Select [Final Score] as the Field and click OK.

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Break at						
✓ Treat zeros as missing values						
Round off the values in each class						
Include counts in legend						
OK C	ancel	Apply	Remov	e Cu	stomize	

Now, you can explore which census tracts are highly valued out of all three counties.