Introduction to Human Geography Using ArcGIS Online

Chapter 8 Exercises

Exercise 8.1: Central place theory: Where can I buy a Ferrari?

Introduction

According to central place theory, businesses clusters in cities of different sizes according to their threshold and range requirements. In this exercise, you will analyze the type of urban area in which Ferrari sports car dealerships locate.

Objectives

- Describe the likely threshold and range requirements of a Ferrari dealership.

- Analyze the types of urban areas in which Ferrari dealerships are found.

- Compare urban areas with dealerships with others without.

- Discuss other location factors that can influence placement of a Ferrari dealership.

1. **Open the Chapter 8 Ferrari Dealerships map and sign in to your account:**

   https://arcg.is/14PnXS

The map contains the following layers:

- Ferrari Dealerships. This shows the location of Ferrari dealerships in the United States as identified in Esri's Business Analyst Online.

- Metropolitan Statistical Areas 2015. This shows US census metropolitan and micropolitan regions. Metropolitan regions are relatively dense urban areas of at least 50,000 people with substantial intra-area commuting patterns. Micropolitan regions are smaller urban areas.

Question 8.1.1

Describe the likely threshold and range requirements for a Ferrari dealership. State whether the dealership is large, medium, or small and the type of city in which you would expect to find a dealership.

You'll begin by determining the average population size for metropolitan and micropolitan regions.

2. **Hover your cursor over the Metropolitan Statistical Areas 2015 layer and select the Filter icon.**

3. **In the Filter window, set the expression so that MSA is Metropolitan, then click Apply Filter.**

Filter: Metropolitan Statistica Areas_2015

Create

+ Add another expression   ☐ Add a set

Display features in the layer that match the following expression

MSA ▾	is ▾	Metropolitan ▾

○ Value   ○ Field   ◉ Unique

☐ Ask for values ▾

APPLY FILTER   APPLY FILTER AND ZOOM TO   CLOSE

4. **Hover your cursor over the Metropolitan Statistical Areas 2015 layer and select Show Table.**

5. **In the table, click on the Pop2015 field header and select Statistics.**

6. **Write down the Average in the table below (Question 8.1.2).**

7. **Repeat the preceding steps but edit the filter so that MSA is Micropolitan.**

8. **Write down the Average in the table below.**

9. **Click one last time on the filter icon and select Remove Filters.**

Next, you'll identify the urban areas that contain a Ferrari dealership.

10. **Hover your cursor over the Metropolitan Statistical Areas 2015 layer and select Perform Analysis.**

11. **In the Perform Analysis window, select Find Locations, then Find Existing Locations.**

12. **In step 2, click Add Expression.**

13. **In the Add Expression window, set the expression so that Metropolitan Statistical Areas 2015 completely contains Ferrari Dealerships. Then click Add.**

Add Expression

| Metropolitan Statistical Areas 2015 | ▼ | completely contains | ▼ |
| Ferrari Dealerships | ▼ | | |

ADD   CLOSE

14. **In step 3, give your layer a unique name.**

15. Uncheck the Use current map extent box to ensure that all Ferrari dealership points are included.

16. Click the Show credits link and make sure you are using less than one credit.

17. Run Analysis.

18. Compare the population of metropolitan areas with Ferrari dealerships to the population of all metropolitan areas.

- Hover your cursor over the name of your new Find Locations layer and Show Table.

- In the table, click on the Pop2015 field header and select Statistics.

- Write down the Average in the following table.

Question 8.1.2

	Metropolitan Areas	**Micropolitan Areas**	**Your Find Locations layer**
Average Population			

Question 8.1.3

Do Ferrari dealerships appear to be in high, medium, or low order urban areas? Explain why companies such as Ferrari locate in those types of areas.

Question 8.1.4

In addition to metropolitan population size, what other socioeconomic factors could influence location? Consider the average income, median age, and other cultural and lifestyle characteristics of urban areas.

Question 8.1.5

Where would a Ford, Toyota, or Hyundai dealership locate, in a high, medium, or low order urban area? Explain why.

Conclusion

The central place theory helps explain where many types of service establishments locate and the spatial patterns of their distributions. As you can see in the case of automobiles, different threshold and range requirements for different types of cars will determine the type of market in which they locate.

Exercise 8.2: Consumer services site selection: Where should I put my store?

Introduction

The demographic characteristics of a community, as expressed in tapestry segmentation data, are essential to understand when searching for the best location for a consumer services-oriented business. In this exercise you will think of a type of business, then search for the best location within a US city of your choice.

Objectives

- Identify a tapestry segment that best matches your selected business.

- Filter the map to show just your chosen segment.

- Explain the distance and mode of transportation your customers will use to visit your business.

- Compare sites based on tapestry segment characteristics.

You'll begin by thinking of a consumer-oriented business that you would like to locate within a US city of your choice.

Question 8.2.1

Describe your business and explain why it is a consumer service.

Next, you'll identify the tapestry segment that best matches the consumer profile of your selected business.

1. **Open this link to find tapestry segmentation descriptions:**

- **https://doc.arcgis.com/en/esri-demographics/data/tapestry-segmentation.htm**

2. **Scroll down until you see the Life Mode descriptions. Look over the Life Modes and determine the best match for your business.**

3. **Once you have selected the Life Mode, narrow your focus to one segment with the Life Mode. The segment descriptions are listed to the right of each Life Mode.**

4. **Click each segment within your Life Mode. Read the descriptions and choose the most appropriate for your business.**

Question 8.2.2

Describe the segment and explain why it relates to your selected business.

5. **Open the Chapter 8 Consumer Service Site Selection map and sign in to your account: https://arcg.is/1qSKSr**

The map contains the USA Tapestry Segmentation layer, which shows the dominant tapestry Life Mode for each polygon.

6. **Zoom to the US city where you plan to locate your selected consumer services business.**

7. **Expand the USA Tapestry Segmentation layer by clicking the small arrow to its left.**

You will see that the unit of analysis changes as you zoom in and out.

8. **Zoom to a level where Tract is highlighted.**

If you zoom in too far, the Tract layer will disappear, and you will only see the underlying image basemap.

9. **In the expanded USA Tapestry Segmentation layer, hover your cursor over Tract and select Filter.**
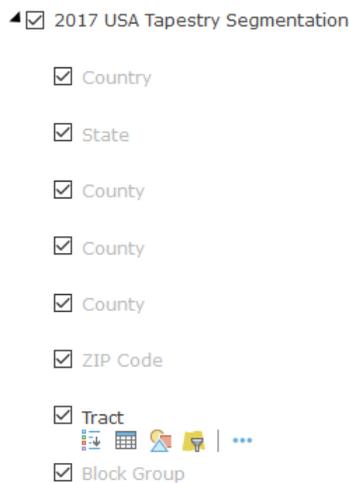
10. **In the window for Filter: USA Tapestry Segmentation – Tract, set the expression so that 2017 Dominant Tapestry Segment Name (Esri) is <your chosen segment>.**

11. **Click the Unique radio button and wait a few seconds before using the drop-down arrow to select your segment.**

Filter: 2017 USA Tapestry Segmentation - Tract

Create

+ Add another expression   ☐ Add a set

Display features in the layer that match the following expression

| 2017 Dominant Tape ▼ | is ▼ | American Dreamers ▼ |

○ Value   ○ Field   ⦿ Unique

☐ Ask for values ▼

12. **Click Apply Filter.**

You can now see just the tracts where your chosen segment is dominant. Next, you will want to find two candidate locations.

13. **Looking at your filtered tracts, zoom in to them and search for areas that appear to have commercial space. (Do this by turning off all layers except the imagery basemap.)**

14. **Add a Map Note to your two candidate locations.**

- **Click the Add button near the top of your screen, then Add Map Notes.**

- **In the Add Map Notes window, give your site a name, such as Site 1, then click Create.**

- **In the Add Features window, select the Pushpin, then click the location on your map where you want to site your business. Click Close.**

- **Repeat these steps to add a Site 2 Map Note.**

- **Close Add Features by clicking the small arrow at the top of the window.**

Next, you'll enrich your Map Notes to determine which site has the most people in your selected segment nearby.

15. **Hover your cursor over the Site 1 Map Note layer and select Perform Analysis.**

16. **In the Perform Analysis window, select Data Enrichment, then Enrich Layer.**

17. **In step 2 of the Enrich Layer window, click Select Variables.**

18. **In the Data Browser window, select Tapestry, then click the Show all Tapestry Variables link.**

19. **Expand Tapestry Market Segmentation (Households), then scroll down and select your chosen segment. Click Apply.**
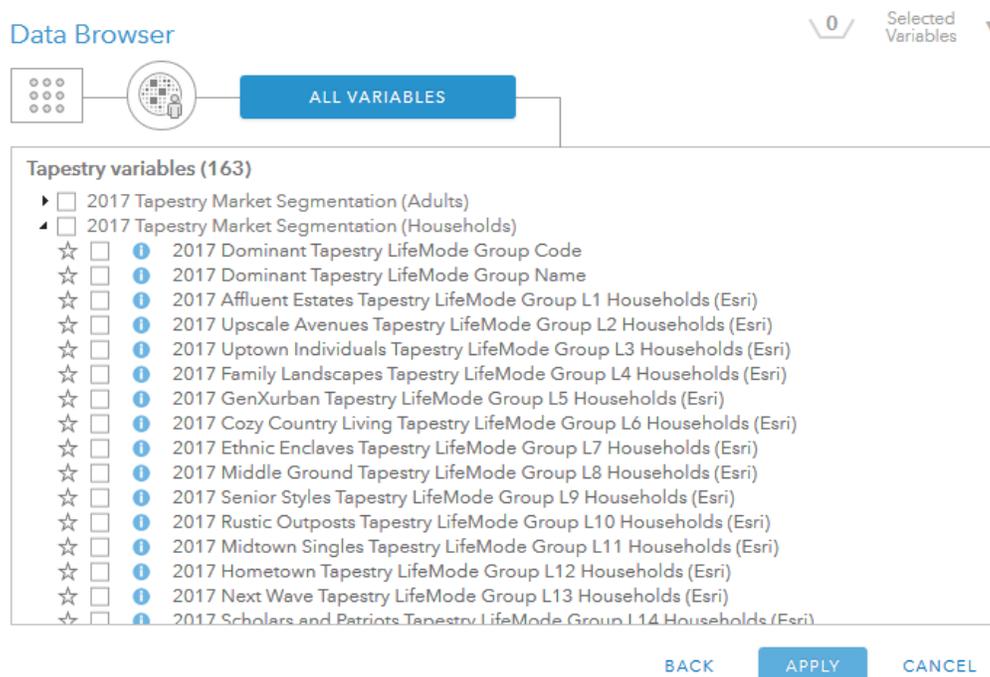
20. **In step 3 of the Enrich Layer window, set the area to enrich.**

You can select time or distance, walking or driving, whichever best suits how people will visit your establishment.

21. **In step 3, check Return result as bounding areas.**

    This will show your search area on the map.

22. **In step 4 of the Enrich Layer window, give your layer a unique name.**

23. **Click Show credits and make sure you are using less than 1 credit.**

24. **You may need to uncheck Use current map extent to not cut off your area to enrich.**

25. **Click Run Analysis.**

26. **Repeat the process for your Site 2 Map Note.**

Question 8.2.3

Describe the settings you chose for distance/time and why they are the best choice for your selected business.

Now, you'll compare the number of households of your selected segment within the enriched area of each site.

27. **Hover your mouse over the Enriched Site 1 layer and Show Table.**

28. **In the table, scroll to the far-right column and write the number of households from your segment.**

29. Repeat for your Enriched Site 2 layer.

This will show you the site with the most households that match your selected Tapestry

Segment. This may be the best location for your business.

Question 8.2.3

	Site 1 area	Site 2 area
Number of Households:		

Question 8.2.4

Print or take a screenshot of your map that shows both sites and the bounding areas of your

enriched layers.

Conclusion

In this exercise, you used tapestry segment data to find the best location for your

business. Additional research would require checking zoning restrictions, government

incentives, traffic flows, and the availability of space to rent or purchase.

Exercise 8.3: Service employment growth: What should I study and where can I find a job?

Introduction

You are probably studying in hopes of obtaining a satisfying job with a decent salary. But

as you are seeing in this book, geography is often an important variable to consider. Where you

plan to work can be just as important as what field you plan to work in. In this exercise, you will

view occupation forecast data by state to see where the best opportunities lie in your chosen

area of work by the year 2024. Conversely, if you are set on staying within your current state, you will see which occupations are likely to grow the most by the time you graduate.

Objectives

- Identify places with projected high growth rates in an occupation of your choice.

- Identify places with projected high numbers of jobs in an occupation of your choice.

- Identify occupations in your state that are projected to be the largest in 2024.

- Evaluate the costs and benefits of interstate migration.

1. **Open the Chapter 8 Occupation Projections map and sign in to your account: https://arcg.is/15rPra**

   The map contains 10 layers broken down by Standard Occupational Classification System groups. Only occupations that typically require a bachelor's degree or greater are included. The fields list specific occupations within each group by the projected number of jobs by 2024 and the projected percentage change between 2014 and 2024. First, you'll identify the occupation you plan to work in.

2. **To do this, review occupations on the Bureau of Labor Statistics SOC webpage and find the group that most closely fits your occupation:**

- **https://www.bls.gov/soc/2018/major_groups.htm**

3. **Click the group link and search for the specific occupation. You can click each occupation for a description.**

4. **Once you have identified your specific occupation and the group it falls under, return to the ArcGIS Online map.**

Remember that not all occupations are included in the map. Only those that typically require a bachelor's degree or higher are included.

5. **Find the state where job prospects for your occupation are projected to be best.**

You will look at both the percent change to see where your occupation is growing the most quickly, and the total projected number of jobs in your occupation to see where there may be existing clusters or agglomerations. Next, you'll identify the top three states by percentage growth between 2014 and 2014.

6. **Turn on the Group layer that corresponds with your selected occupation and turn off all other layers.**

7. **Hover your cursor over the layer name and select Change Style.**

8. **In the Change Style window, click the dropdown arrow in step one.**

9. **Select your occupation by percent change (in some cases it may be abbreviated as Pct Change).**

A choropleth map now shows the state where the most growth is projected. If you want, in step two of the Change Style window you can click Options and classify your map. Otherwise, just leave the default classification.

10. **Click Done.**

The map shows top states for growth, but you want just the top three, which you can get from the map table.

11. **Hover your cursor over the layer name and Show Table.**

12. **In the table, scroll to the right until you see the field with your chosen occupation, click the field name, and select Sort Descending.**

13. **Make sure you are sorting the percent change field, not the number of jobs projection.**

The percent change values show two decimal points.

14. **In the following table, write down the top three states for projected percent change growth in your occupation.**

Sometimes a state may have a high percent change growth rate, but a very small number of jobs. For instance, going from one job to two is a 100 percent growth rate, a nice increase but not encouraging from the employment perspective of a new college graduate. Therefore, next you'll see which states have many projected jobs in your selected occupation.

15. **Again, hover your cursor over the layer name and select Change Style.**

16. **In the Change Style window, click the drop-down arrow in step 1.**

17. **Select your occupation by Projection. (This value is the projected number of jobs in that occupation in 2024.)**

The map now shows the states with the largest projected number of jobs in your occupation.

18. **To find just the top three, Show Table again.**

19. **Click the field name for your selected occupation's projected number of jobs. (Make sure you click the field for values without two decimal points.)**

20. **Write the state names and values in the following table.**

Question 8.3.1

	States with Largest Percent Change	States with Largest Projected Number of Jobs
Name of your selected occupation: _____	1. 2. 3.	1. 2. 3.

Question 8.3.2

Based on the projected number of jobs and the percent change, would you consider looking for work in one of those states? Explain why or why not.

Some people are set on living in a certain state. To increase your chances of finding a job in a specific state, you'll find the top three occupations based on the number of projected jobs in 2024.

21. **Turn on all ten map layers.**

22. **Click your selected state and a pop-up window opens.**

The top of the pop-up window says (1 of 10), followed by a small arrow. By clicking the arrow, you can flip through all the occupation groups.

23. **Look through all ten layers and find the three occupations with the largest projected number of jobs in 2024.**

24. **Write the name of the occupations and the projected 2024 numbers in the table.**

Question 8.3.3

State Name:	Projected 2024 Number of Jobs:
Occupation:	
Occupation:	
Occupation:	

Question 8.3.4

Discuss the costs and benefits of relocating to a new state for job opportunities. Consider what drives people to move, as well as reasons why people often prefer to stay where they are, even when economic opportunity is lower.

Conclusion

Geography matters in many ways. Where you live can have an immense impact on your job prospects. Many economic geographers point out that unemployment rates could be reduced if people were more willing to relocate to places with more jobs that fit their skills. Of

course, that ignores complex social ties that people have with their current places of residence, so relocation is often easier said than done.

Exercise 8.4: Minimum wage and unemployment

Introduction

Most Americans now work in the service sector, and service jobs will continue to grow at substantial rates in the future. However, many of the fastest growing jobs are in low-wage services. Because of this, labor groups often push for higher minimum wages. But opponents of minimum wage increases argue that government-mandated wage increases reduce employers' abilities to hire more workers. When this is the case, fewer jobs are available for low-skilled workers, making their situation worse, not better. In this exercise, you will examine state-level minimum wages and unemployment rates. After that, you will study how increases in Washington DC's minimum wage may have affected the unemployment rate.

Objectives

- Relate state unemployment rates to state minimum wages.

- Calculate change in unemployment rates for a local area.

- Compare different solutions to income inequality in the service sector.

1. **Open the Chapter 8 Minimum Wage and Unemployment map and sign in to your account: https://arcg.is/1XajC**

   The map contains the following layers:

a. **State Minimum Wage and Unemployment. This layer has data on the average unemployment rate for 2017 and the state minimum wage as of 2017. The style is set to unemployment quantiles.**

b. **County Unemployment 2013 and 2016. This layer contains the average unemployment rate for each county during 2013 and 2016.**

You'll evaluate the relationship between the minimum wage and unemployment at the state level.

2. **Hover your cursor over the State Minimum Wage and Unemployment layer and select Filter.**

3. **In the Filter window, set the expression so that Avg_Unempl_2017 is at least 5.**

This will select the top quintile of states with the highest unemployment.

Filter: State Minimum Wage_and_Unemployment

Create

＋Add another expression   ☐ Add a set

Display features in the layer that match the following expression

Avg_Unempl_2017 ▼ is at least ▼ [5]
◉ Value ○ Field ○ Unique
☐ Ask for values ▼

4. **Click Apply Filter.**

5. Hover your cursor over the State Minimum Wage and Unemployment layer and Show Table.

6. In the table, click the Min_Wage_2017 field heading and select Statistics.

7. Write down the Average Value in the table (question 8.4.1).

This is the average minimum wage in the states with the highest 2017 unemployment rate.

8. Hover your cursor over the State Minimum Wage and Unemployment layer and select Filter.

9. Edit the filter so that Avg_Unempl_2017 is at most 3.3.

This will filter for the states with the lowest unemployment rates in 2017.

10. In the table, click the Min_Wage_2017 field heading and select Statistics.

11. Write down the Average Value in the table.

This is the average minimum wage in the states with the lowest 2017 unemployment rate.

Question 8.4.1

	Highest Unemployment Quintile	Lowest Unemployment Quintile
Average Value of Minimum Wage		

Question 8.4.2

At a state level, is there a strong relationship between minimum wage and unemployment for the year 2017? What is the hourly difference?

Question 8.4.3

What other factors besides the minimum wage could influence the unemployment rate?

Next, you'll compare changes in the unemployment rate between Washington, DC, and adjacent counties in Maryland. In the social sciences it is difficult to conduct controlled experiments as one can do in a laboratory. However, sometimes policy changes create "natural experiments" that somewhat mimic controlled changes in one variable. Washington DC and adjacent counties in Maryland should see unemployment rates rise and fall in tandem based on broader regional economic conditions. However, in 2014 Washington, DC, raised its minimum wage to $9.50 from $8.25, while Maryland kept its minimum wage at $7.25. If opponents of the minimum wage are correct, then changes in Washington, DC's unemployment rate should have been worse than those in Maryland. According to critics, an increase in the minimum wage will be a disincentive for employers to hire new workers. By comparing spatially adjacent places, this theory can be tested.

12. **Turn off the State Minimum Wage and Unemployment layer and turn on the County Unemployment 2013 and 2016 layer.**

The map shows the average unemployment rate in 2016 for each county of the United States.

13. Zoom to Washington DC. (The quickest way to do this is to type Washington DC in the Find address or place box near the top right of the screen.) Zoom out a little if needed.

14. Fill columns A and B in the next table by clicking Washington DC and the two counties to its east in Maryland.

The data is in the pop-up windows that appear when you click each place.

Question 8.4.4

	A. Unemployment 2013	B. Unemployment 2016	C. Percent Change 2013 to 2016.
Washington, DC			
Montgomery County, MD			
Prince George's County, MD			

You now have unemployment data before and after the 2014 minimum wage increase in Washington, DC.

15. Calculate the percent change between 2013 and 2016 to see how the unemployment changed during this time. To do so, use this formula:

Percent Change = (B – A) / A

16. Write your answers in column C of the table.

Question 8.4.5

Which of the three had a higher minimum wage and which had higher unemployment in 2013? In 2016?

Question 8.4.6

Which of the three saw the weakest decline in unemployment between 2013 and 2016? Does this provide evidence for or against opponents of the minimum wage?

Question 8.4.7

Based on the textbook, what other solutions can help reduce inequality for service sector workers?

Conclusion

Many factors besides the minimum wage can influence the unemployment rate, so additional research beyond this exercise is needed to obtain more reliable conclusions. Nevertheless, research such as this can be an important part of the ongoing debate as to how to improve wages for the lowest paid in the United States.