

Assignment Sheet for Lab 5: Spatial Analyses

Information and Questions for Lab 5, Part 1: Module 8

Directions:

- 1) Create a folder on the desktop of your lab computer called "Lab5."
- 2) From Canvas, download the zipped file called "Lab5Data.zip" to your new Lab5 folder. **NOTE: This Lab 5 zipped folder contains the data for two chapters (Module 8 AND Module 9).**
- 3) After it's downloaded, right-click on the file and "Extract All..." . Make sure it is going into your Lab4 folder! You should have two folders of data (Module8 and Module9).
- 4) Within Canvas, access the textbook (Instant Access – Vital Source) and find **Module 8**.
- 5) Begin ArcGIS Pro and name your project **Lab5**.
- 6) Proceed through the software instructional steps for Module 8.
 - a. Name the map you create "**Ohio – Module 8**" (instead of just "Ohio" as the instructions say).

Question 1. What is the geodesic distance between Fulton County Airport and Toledo Express Airport? What is the planar distance? Why are they different, and why is the geodesic distance more "accurate" with these data?

The geodesic distance between these two airports is 16.93 miles. The planar distance is 22.60 miles. The reason why these distances are different is because planar distance is straight-line in the 2D Cartesian coordinate system while the geodesic distance is calculated in a 3D spherical space – using the distance across the curved surface of the world. This means that the planar distance is going to be longer because of stretching out a sphere in 2D will increase the distance between two points.

Question 2: What two Ohio counties have the most airports? What percent of Ohio counties have zero (0) airports?

The two Ohio counties that have the most airports are Cuyahoga and Franklin. The percent of Ohio Counties that have zero airports is $(32/88) = 36\%$

Question 3: After you run the Spatial Join process to see the distance of "places" polygons to their nearest airport, some of the places return a distance of zero. How many have a distance of 0? Why do you think that is happening? Hint: select the places with a "disttoairport" field of zero, then zoom in to those on the map. What do you notice?

There are 17 shapes that have a distance to airport as zero. This is because the airport is within the area.

Question 4. How many places are within the boundaries of a county with more than 50,000 people? There are 520 places within boundaries that make up more than 50,000 people.

Question 5. How many places are within an Ohio county with more than 50,000 people AND are also within 0.25 miles of a major road?

484 places are within an Ohio county with more than 50,000 people AND are also within 0.25 miles of a major road.

Question 6. How many places meet all 3 criteria (in places with > 50K people, within 0.25 miles of a major road, and NOT within 35 miles of an existing airport)? What are their names, and are they cities or villages?

The places are New Waterford, Port Washington, Coolville, East Palestine, and Rogers.

Question 7. If the final decision were based on which one of the places (identified in Question 6) had the highest population in 2010, where would the new airport be located?

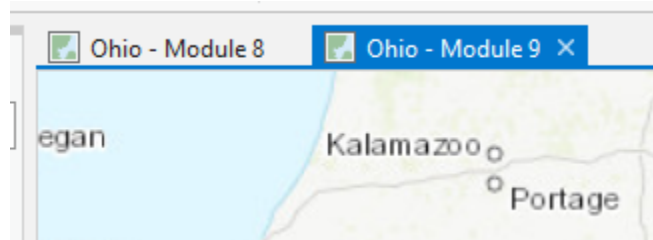
The airport would be located in East Palestine as they had the highest population in 2010.

STOP when you reach the end of Step 8.5 (you will have the final “places” identified by then). You do NOT need to do any more Steps in this Module.

- 7) When you have worked **through Step 8.5 and finished all 7 questions above, save your project.**
- 8) Stand up and walk around for a few minutes. THEN, open up **Module 9** of your textbook.

Information for Lab 5, Part 2: Module 9

- 9) **Do NOT** create a new project, etc. in ArcGIS Pro.
- 10) Instead, **in the existing Lab5 project** that you have already been using, **Insert a New Map**. Call it **“Ohio– Module 9”**, and then continue on in your textbook with the Module 9 instructions.



Question 8: How many schools in the four-county region are within ½ a mile of a major road? How many are outside of that buffer area?

265 schools are within that region. Therefore, there are 35 schools that are outside the buffer area.

Question 9. How many schools are within both half a mile of a major road AND also within the boundaries of a place, and how many are outside that area?

146 are within both constraints. From the 265 schools in ½ mile of a major road, 119 are not within a boundary of a place. Having a total of 154 schools not within both constraints.

THE END.

IF you have not completed your lab exercise by the end of the lab period, then save your project and **upload a Project Package (.ppkx) to your ArcGIS Online Account.** Reference Smartbox 1.10 if you need a reminder for how to do this.