

GEOGRAPHY 176B MID-TERM TEST

February 8, 2011

1. What is critical spatial thinking?
 - a. What goes on in the mind of an experienced user of GIS
 - b. A set of principles that are independent of the current state of GIS technology
 - c. The ability to reason logically about geographic problems
 - d. All of the above
2. If a cursor on an application like Google Earth currently measures 10km on the Earth's surface, how many decimal places of latitude or longitude should be reported on the screen for the cursor's current position, according to the scientific principle that the precision of a measurement should reflect its accuracy?
 - a. 1
 - b. 3
 - c. 5
 - d. 7
3. What is geographic information science?
 - a. The science behind GIS
 - b. What a demanding and skeptical user of GIS thinks about
 - c. The fundamental issues raised by GIS
 - d. All of the above
4. A model of Notre Dame Cathedral in Paris constructed from paper at a scale of 1:200 is what kind of representation?
 - a. Binary
 - b. Digital
 - c. Analog
 - d. Geotypical
5. What are the advantages of binary representation over analog?
 - a. Very accurate representations can be created in very small spaces
 - b. The same technology can be used to communicate and store any binary representation
 - c. There are massive economies of scale in the production of digital technology
 - d. All of the above
6. Digital elevation models from the US Geological Survey round elevations to the nearest meter.

What would be the most economical coding scheme for this attribute in ArcGIS?

- a. Short integer
- b. Long integer
- c. Single precision real
- d. Double precision real

7. In (6), how many bits would be needed to store each elevation?

- a. 8
- b. 16
- c. 32
- d. 64

8. You are given a latitude and longitude for a point in Santa Barbara. What else might you need to know to make sense of these coordinates?

- a. The Universal Transverse Mercator zone number
- b. The projection used
- c. The State Plane Coordinate zone number
- d. The datum or ellipsoid used

9. You are hired to prepare a database of the locations of all grocery stores in Brooklyn, NY, as part of a project to identify “food deserts”. What conceptualization would you use?

- a. Discrete object
- b. Continuous field
- c. Spatially intensive
- d. Spatially extensive

10. The table you create in (9) contains the latitude and longitude of each grocery store, along with its name, the price of a standard basket of groceries, and its floor area. You wish to compare the total floor area of grocery stores in each Census Tract of Brooklyn to the population of each tract, which you obtain from the Census as a second table, along with the representation of each tract’s boundary as a polygon. What operation will you need to perform first in your analysis?

- a. A relational join
- b. A spatial join
- c. A scatter plot
- d. Moran’s I

11. What is the basic unit of the coverage model as originally implemented by ESRI in the early 1980s?

- a. The point
- b. The node

- c. The arc
 - d. The polygon
12. Which is a topological property of a polygon?
- a. Its dimensions (2)
 - b. Its area
 - c. Its perimeter length
 - d. Its bounding box (the max and min values of its coordinates)
13. Which is a property of shapefiles?
- a. They implement a discrete-object view of the world
 - b. Objects can overlap in space
 - c. The space between objects is potentially empty
 - d. All of the above
14. What distinguishes object-oriented from relational data modeling?
- a. There can be multiple classes of objects in a database
 - b. Objects in different classes can be linked
 - c. Classes can inherit the properties of other classes
 - d. The objects in a class need not be of the same topological dimension
15. How many types of relationships can exist between classes in object-oriented data modeling?
- a. 1
 - b. 2
 - c. 3
 - d. 4
16. In (10) the two variables of interest are the population of each tract, and the total floor area of grocery stores in the tract. What type of attributes are these?
- a. Both spatially extensive
 - b. Both spatially intensive
 - c. One spatially extensive and one spatially intensive
 - d. None of the above
17. In UML, what appears in the lowest of the three parts of the box representing a class?
- a. The name of the class
 - b. The attributes of the class
 - c. The methods associated with the class
 - d. The records that describe each object in the class

18. What symbol is used in UML to denote an inheritance relationship?
- a. An open diamond
 - b. A filled diamond
 - c. An open triangle
 - d. A filled triangle
19. A county must belong to one state, and a state can have many counties. What would be shown at the state end of the association between the state and county classes, to denote its multiplicity?
- a. *
 - b. 0...*
 - c. 1...*
 - d. 1
20. If a city block runs from longitude 92.353 West to 92.352 West, along latitude 40 North, and spans the address range 1 to 99 on its left and 2 to 100 on its right, where is house number 77 most likely to be located if it exists, approximately?
- a. Left side longitude 92.3523
 - b. Right side longitude 92.3523
 - c. Left side longitude 92.3527
 - d. Right side longitude 92.3527
21. Where would you store turn restrictions in a transportation database?
- a. As attributes of streets
 - b. As attributes of intersections
 - c. As attributes of an association class linking intersections
 - d. As attributes of an association class linking streets
22. Why are Thiessen polygons not a good way to create a contour map of rainfall based on sample observations?
- a. Because interpolated rainfall would change sharply across each polygon boundary
 - b. Because rainfall tends to follow topography, being usually higher at higher elevations
 - c. Because sharp breaks across polygon boundaries would violate Tobler's First Law
 - d. All of the above
23. How would you measure Tobler's First Law for rainfall measurements?
- a. Using Moran's I
 - b. Using the semivariogram
 - c. Using the average distance between measurement sites

- d. Using the average elevation of measurement sites
24. What is meant by “vertical context” of a phenomenon at a point?
- a. The same phenomenon at nearby points
 - b. Different phenomena at nearby points
 - c. The same phenomenon at the same point
 - d. Different phenomena at the same point
25. Which datum is now standard in the US?
- a. NAD83
 - b. NAD27
 - c. The Clarke Ellipsoid of 1880
 - d. The Clarke Ellipsoid of 1866
26. What is the key assumption of place-based analysis?
- a. That the results of analysis depend on where the study is undertaken
 - b. That the Earth’s surface exhibits spatial heterogeneity
 - c. That the Earth’s surface is statistically non-stationary
 - d. All of the above
27. What was the key contribution of Lewis Fry Richardson to GIS?
- a. Rivers, roads, and coastlines get longer at finer spatial resolutions
 - b. Rivers, roads, and coastlines get shorter at finer spatial resolutions
 - c. The lengths of lines are almost always underestimated by GIS
 - d. The effects of scale on properties such as length can be usefully predicted
28. At how many locations in the US do four states come together?
- a. 0
 - b. 1
 - c. 2
 - d. 3
29. If Tobler’s First Law is true for a given data set, what kind of value would you expect for Moran’s I?
- a. <0
 - b. 0
 - c. >0
 - d. Cannot tell from this information
30. You create a database of contours (this could be done by downloading a USGS Digital Line

Graph, or by using the contour function in ArcGIS, or by digitizing from a paper map). You decide that the contours need editing, and start the ArcGIS editor. You grab one contour and attempt to move it so that it crosses another contour representing a different elevation. What happens?

- a. Nothing, the contour is repositioned
- b. ArcGIS refuses to do this, because contours of different elevations cannot cross
- c. ArcGIS refuses to do this because a continuous field cannot have two elevations at the same point