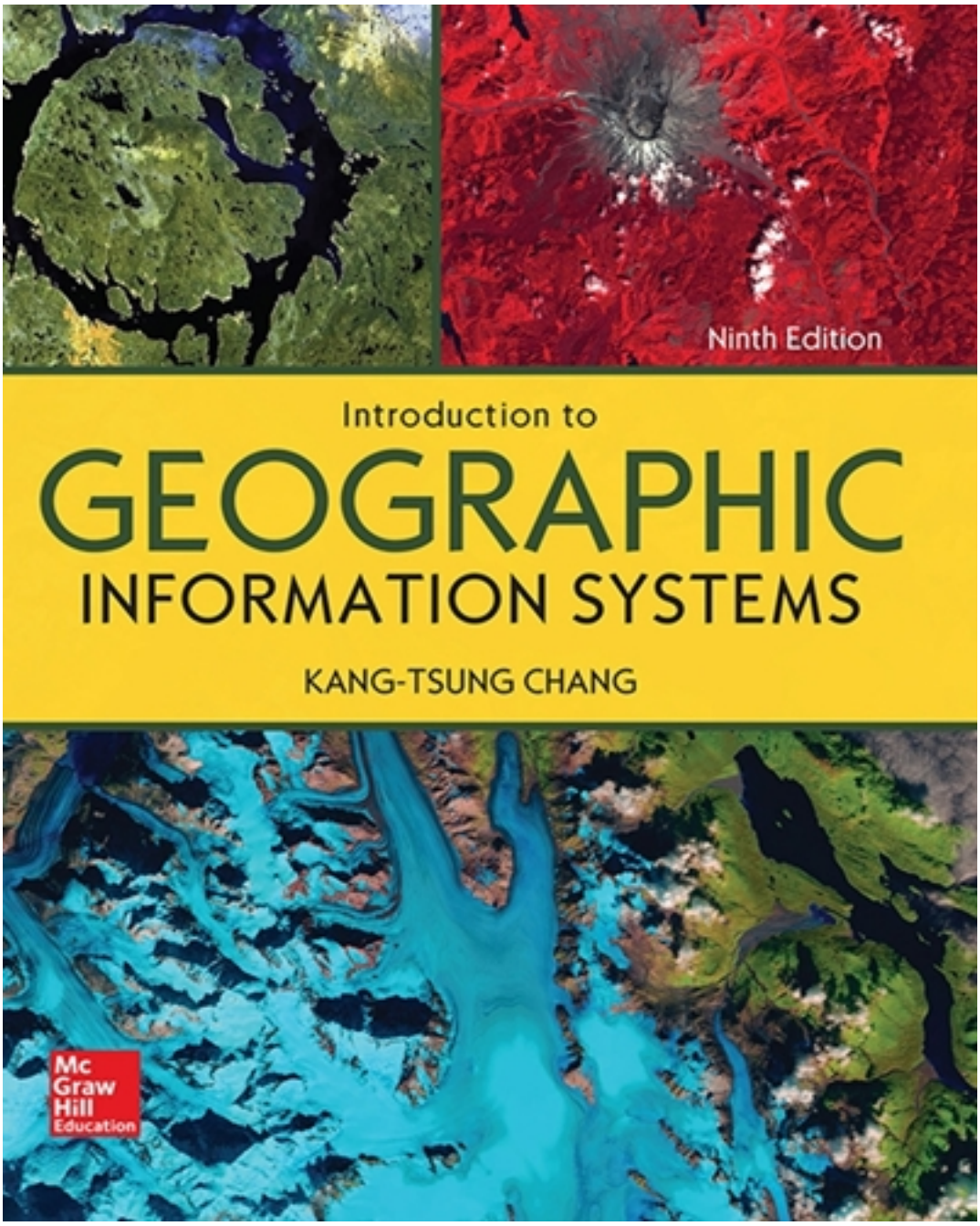
Solutions for Introduction to Geographic Information Systems 9th Edition by Chang



Solutions

Chang, GIS, 9e
Chapter 1 Review Questions

1. Define geospatial data.
Geospatial data are data that describe both the locations and characteristics of spatial features such as roads, land parcels, and vegetation stands on the Earth's surface.

2. Describe an example of GIS application from your discipline.
[Refer to Section 1.2 and describe an example of GIS application from geography, forestry, geology, environmental studies, business, public health, etc.]

3. Go to the USGS National Map website (http://nationalmap.gov/viewer.html) and see what kinds of geospatial data are available for download.
[Go to the above website, follow the instructions at the website, and check for geospatial data available for download.]

4. Go to the National Institute of Justice website (http://www.ojp.usdoj.gov/nij/maps/) and read how GIS is used for crime analysis.
[Go to the above website. "Learn about Crime Mapping" is included in the lower right corner. It lists three topics: What is GIS; Mapping Crime: Principle and Practice; and Understanding Hot Spots.]

5. Location-based services are probably the most commercialized GIS-related field. Search for "location-based service" in Wikipedia (http://www.wikipedia.org/) and read what has been posted on the topic.
Accessed on August 9, 2010, Wikipedia defines a location-based service as "an information and entertainment service, accessible with mobile devices through the mobile network and utilizing the ability to make use of the geographical position of the mobile device."

6. What types of software and hardware are you currently using for GIS classes and projects?
[Name the software package (e.g., ArcGIS 10.2) and the hardware (e.g., PC Windows 7) for the GIS class.]

7. Try the map locators offered by Microsoft Virtual Earth, Yahoo Maps, and Google Maps, respectively. State the major differences among these three systems.
[Go to each website, try the map locator, and summarize, in your opinion, the major differences between the map locators.]

8. Define geometries and attributes as the two components of GIS data.
Geometries describe the locations of spatial features, which may be discrete or continuous. Attributes describe the characteristics of spatial features.

9. Explain the difference between vector data and raster data.
Vector data use points and their *x*-, *y*-coordinates to represent spatial features of points, lines, and areas. Raster data use a grid and grid cells to represent the spatial variation of a feature.

10. Explain the difference between the georelational data model and the object-based data model.
The georelational data model stores geometries and attributes of spatial features in separate systems, whereas the object-based model stores them in a single system.

11. Provide an example of mashup mapping.
[We can superimpose a map showing state parks on Google Earth. We can even attach a short description to each of the parks.]

12. Why is "volunteered geographic information" useful for disaster management?
VGI is useful for disaster management because it can provide near real-time data with images and descriptions to decision makers.

13. The following link, http://www.openstreetmap.org/#map=12/52.1977/0.1507, shows a map of Cambridge, England based on OpenStreetMap data. Use the map to compare the quality of OpenStreetMap data with Google Maps.
[You can place OpenStreetMap and Google Maps side by side for comparison. The highways and streets seem to match well. It would require superimposition of the two maps to make an accurate comparison, which is not possible for this question.]

14. Suppose you are required to do a GIS project for a class. What kinds of activities or operations do you have to perform to complete the project?
[The project will most likely involve data input, data management, data display, data exploration, data analysis, and, in some cases, GIS models and modeling.]

15. Name *two* examples for vector data analysis.
Examples for vector data analysis include buffering, overlay, distance measurement, spatial statistics, and map manipulation.

16. Name *two* examples of raster data analysis.
Examples of raster data analysis includes local, neighborhood, zonal, and global operations.

17. Describe an example from your discipline, in which a GIS can provide useful tools for building a model.
[A GIS can be used for building simple models. For more complex models such as environmental models, a GIS is typically used for data visualization, database management, and data exploration.]