Geography 377 Study Questions For Lectures 02-12

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Lecture 02:

1. Explain the four different aspects of geographic information.

2. Discuss the important issues associated with geographic information

3. What is GIS? What are the four wares of GIS?

4. What are the differences among GISystems, GIScience and GISStudies

5. What are the different views of GIS?

Lecture 03:

1. What is a geographic coordinate system? What is the main difference between geographic coordinate system and project geographic coordinate system?

2. What is a plane coordinate system? What is the major difference between a plane coordinate system and a Cartesian coordinate system?

3. What is the major difference between a local Cartesian coordinate system and a projected geographic coordinate system?

4. Describe the design of the UTM coordinate system. Compute the UTM for Madison.

5. What is a discrete coordinate system?

Lecture 04:

1. What is the main difference between a categorical attribute and an ordinal attribute? What is the main difference between an ordinal attribute and an interval attribute?

2. What is spatial topology? How is it captured in GIS?

3. What is a linear time model and what is a cyclical time model?
4. How does a computer represent 11?

5. Why can I read some files using MS notepad but not other files?

**Lecture 05:**

1. What is the dichotomy in perceiving the world? How is spatial variation of geographic information perceived under this dichotomy?

2. What are the spatial data models for representing spatial data under the above dichotomy?

3. What is a relational data model? What are the key data structure elements for such a model?

4. What is binary search? How is it different from exhaustive search in terms of its requirements on the table to be searched?

5. What is the difference between join and relate as operations on relational data model?

**Lecture 06:**

1. How does a raster data model represent spatial data? How does it represent a point feature, a linear feature, and an area feature?

2. What are the advantages and disadvantages of the raster data model?

3. What are the ways to compress raster data? You should complete the home work and show the results to your TA or the instructor.

4. What is the contribution of Quadtree? What is the problem with this data model?

**Lecture 07:**

1. How does a vector data model represent spatial data? How does it represent a point feature, a linear feature, and an area feature?

2. What are the advantages and disadvantages of the vector data model?

3. What is an arc and what is a node? Can any point be a node?
what is the difference between arc and a polyline (a line made of multiple straight segments)?

4. How are the three basic geometric elements are used to capture spatial topology in a topological data model?

5. What is the main difference the simple list data model and the point directory data model? Why don’t we consider them to be topological data models?

Lecture 08:

1. What is a topologic data model? What is a topological triangle?

2. What are the advantages and disadvantages of a topological data model?

3. You should be able to code a simple map using a topological model with the needed topology given in a topological triangle.

4. Describe the DIME data model of US. Census Bureau and describe the DLG data model from USGS.

Lecture 09:

1. Given a TIN diagram, please construct the Triangle-Node table. Where would one store the elevation data and the x-y coordinates for each node?

2. Compare and contrast the representation of digital elevation data using a raster data model and that using a TIN model

3. Compare and contrast the three basic spatial data models (raster, vector and TIN).

Lecture 10:

1. How can spatial topology be used to answer spatial queries?

2. What is the difference between vector data model and raster data model in representing attributes?

3. What is advantage for using object oriented data models?

4. What are the different type of evolution of geographic features? How can each type be represented?

Lecture 11:
1. What are the different methods in converting analogue data into their digital form? Compare and contrast digitizing with raster scanning?

2. What are the major agencies in U.S. for producing spatial data and what does each specialize in?

3. Why is human expertise in the application domain considered data?

**Lecture 12:**

1. What is a dangling node? What is an undershoot and what is an overshoot?

2. Describe the Douglas-Peucker’s algorithm for line generalization?

3. What is edgematching? Why do we need it? What are steps involved in edgematching?

4. What is conflation? Why do we need it? How it is different from edgematching? What are the steps for conflation?