GIS(Geographical Information System)

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Introduction

- Geographical Information System is
  - Computerized mapping software
  - a computerized database management system for capture, storage, retrieval, manipulation, analysis and display of spatial (i.e. locationally defined) data

Components of GIS

► Consists of five components

  ► Hardware

  ► Software

  ► Data

  ► People

  ► Methods

How GIS work

- Input of data
  - Before geographic data can be used in a GIS, the data must be converted into a suitable digital format
  - data from paper maps or aerial photographs are converted into computer files (digitizing)
  - Modern GIS technology can automate this process fully for large projects using scanning technology
  - smaller jobs may require some manual digitizing which requires the use of a digitizing table

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- Map Making
  - Database is created
  - The GIS-based cartographic database can be both continuous and scale free.
  - Map products are created centered on any location, at any scale, and showing selected information symbolized effectively to highlight specific characteristics
  - The characteristics of atlases and map series can be encoded in computer programs and compared with the database at final production time

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▶ Manipulation of data

  ▶ data types required for a particular GIS project will need to be transformed or manipulated to make them compatible with your system

  ▶ GIS technology offers many tools for manipulating spatial data and for weeding out unnecessary data

▶ File Management

  ▶ when data volumes become large and the number of data users becomes more than a few, that it is best to use a database management system (DBMS) to help store, organize, and manage data

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▶ Query and Analysis

  ▶ Once you have a functioning GIS containing your geographic information, you can begin to ask simple questions such as

  ▶ How far is it between two places?

  ▶ GIS provides both simple point-and-click query capabilities and sophisticated analysis tools to provide timely information to managers and analysts alike

▶ Visualization

  ▶ For many types of geographic operations, the end result is best visualized as a map or graph

Importance of GIS

- It can be invaluable during a decision-making process
- The information can be presented clearly in the form of a map and accompanying report, allowing decision makers to focus on the real issues rather than trying to understand the data
- Government
  - 80% of local government activities estimated to be geographically based
    - natural resource management
    - highways and transportation
- Businesses
  - retail site selection & customer analysis
- Military and Defense
  - Battlefield management ,Satellite imagery interpretation
- Research

References

- https://library.nd.edu/cds/events/documents/MLS_Demo_GIS-1.pdf
- http://www.westminster.edu/staff/athrock/GIS/GIS.pdf

Thank you