This week, we will focus on the use of geographic information systems (GIS) software. GIS software are tools used to collect, analyze and visualize geographic data. In this course, popular GIS software, their interfaces and basic features, data loading and editing processes, and basic analysis methods will be discussed.

1. Popular GIS Software

GIS software allows users to effectively manage and analyze geographic data. Some of the most commonly used GIS software include:

ArcGIS

Developer: Esri

Features: Advanced analysis tools, data management, map generation, 3D analyses.

Areas of Use: Local governments, environmental analysis, urban planning, natural disaster management.

QGIS

Developer: QGIS Project (open source)

Features: Support for numerous plugins, user-friendly interface, powerful analysis tools.

Areas of Use: Education, research, non-governmental organizations, small businesses.

MapInfo

Developer: Pitney Bowes Software Inc.

Features: Easy-to-use interface, business intelligence integration, geographic data analysis.

Uses: Marketing analysis, business planning, property management, logistics.

2. Interfaces and Basic Features of GIS Software

Each GIS software has its own unique interface and basic features. The interfaces of these software generally contain similar basic components:

Main Interface Components

Map Window: The main area where geographic data is viewed and interacted with.

Data Layer Management: The section where data layers are added, sorted and managed.

Toolbars and Menus: Toolbars and menus used for various analysis tools and operations.

Key Features

Data Display: Displaying geographical data on the map.

Data Editing: Changing existing data on the map or adding new data.

Data Analysis: Analyzing geographic data and visualizing the results.

Map Production: Presentation of analysis results and geographical data as printable or digital maps.

3. Basic Operations in GIS Software

It is important to know some basic operations for effective use of GIS software. These operations include steps such as loading, viewing and editing data.

Data Loading

Data formats: Shapefile, GeoJSON, KML, raster data (tiff, jpeg).

Data sources: Loading data from local disk, retrieving data from web services (WMS, WFS).

Practical Application: Students will upload sample data sets to GIS software and display them on the map.

Data Display

Layer management: Sorting and visualizing data layers.

Symbology: Expressing data with symbols, color and shape settings.

Practical Application: Students will experience different visualization methods by changing the symbology of the data sets they upload.

Data Editing

Geometric arrangements: Editing point, line and polygon data.

Attribute edits: Adding or updating attribute information in the data table.

Practical Application: Students will practice editing geometric and attribute data on the map.

4. Fundamental Analysis in GIS Software

Basic analyzes performed in GIS software are critical in terms of making sense of the data and contributing to decision support systems. These analyzes include querying and filtering operations.

Inquiries

Attribute query: Querying data based on specific attribute values ​​(for example, finding all schools in a specific city).

Spatial query: Querying data based on their geographic location (for example, finding points within a specific area).

Practical Application: Students will conduct various queries on sample data sets and examine the results.

Filtering

Data filtering: Filtering datasets based on specific criteria (for example, showing only points within a certain elevation range).

Layer filtering: Controlling data visibility by layer.

Practical Application: Students will view different data sets by filtering the data sets.

Course Content and Activities

Theoretical Explanation and Presentation

Detailed presentation about popular GIS software, their interfaces and basic features.

Theoretical knowledge about data loading, viewing, editing and analysis methods.

Practical Applications

Students will load, view and edit data in GIS software.

They will work on basic analysis (queries and filtering).

Case Studies

How GIS software is used and what analyzes are performed will be examined through real-world examples.