**GEOGRAPHIC INFORMATION SYSTEM (GIS)**

Geographic Information System (GIS) is a computer system build to capture, store, manipulate, analyze, manage and display all kinds of spatial or geographical data. GIS application are tools that allow end users to perform spatial query, analysis, edit spatial data and create hard copy maps. In simple way GIS can be define as an image that is referenced to the earth or has x and y coordinate and its attribute values are stored in the table. These x and y coordinates are based on different projection system and there are various types of projection system. Most of the time GIS is used to create maps and to print. To perform the basic task in GIS, layers are combined, edited and designed.

GIS means Geographic Information System. It lets us visualize, question, analyze, and interpret data to understand relationships, patterns, and trends.

GIS is a technological field that incorporates geographical features with tabular data in order to map, analyze, and assess real-world problems.

How GIS Works

* Visualizing Data: The geographic data that is stored in the databases are displayed in the GIS software.
* Combining Data: Layers are combined to form a map of desire.
* The Query: To search the value in the layer or making a geographic query.

### Component of GIS:

**Hardware:** Hardware is the physical component of the computer and GIS runs on it. Hardware may be hard disk, processor, motherboard and so on. All these hardware work together to function as a computer. GIS software run on this hardware. Computer can be standalone called desktop or server based. GIS can run on both of them.

**Software:**GIS Software provides tools and functions to input and store spatial data or geographic data. It provides tool to perform geographic query, run analysis model and display geographic data in the map form. GIS software uses Relation Database Management System (RDBMS) to store the geographic data. Software talks with the database to perform geographic query.

**Data:** Data are the fuel for the GIS and the most important and expensive component. Geographic data are the combination of physical features and its information which is stored in the tables. These tables are maintained by the RDBMS. The process of capturing the geographic data are called digitization which is the most tedious job. It is the process of converting scanned hardcopy maps into the digital format. Digitization is done by tracing the lines along the geographic features for example to capture a building you will trace around the building on the image.

**People:**People are the user of the GIS system.  
People use all above three components to run a GIS system. Today’s computer is fast and user friendly which makes it easy to perform geographic queries, analysis and displaying maps. Today everybody uses GIS to perform their daily job.

Advantages of GIS (Generally)

* Better decision made by government people
* Improve decision making with the help of layered information
* Citizen engagement due to better system
* Help to identify communities that is under risk or lacking infrastructure
* Helps in identifying criminology matters
* Better management of natural resources

Applications of Hydrology

* It can be used in Organization of the survey
* It can be used in the production of Digital elevation models (DEM).
* It can be used in the analyzation of water resource development areas. As a tool, GIS is very powerful for addressing different water resources issues such as water quality, ground water movement, ground water contamination, river restoration, flood prediction and management, and etc.
* It can be applied in Rainfall-Runoff modeling

Tools of GIS

* [ArcGIS Online](https://uchicago.maps.arcgis.com/home/signin.html?returnUrl=https%3A%2F%2Fuchicago.maps.arcgis.com%2Fhome%2Findex.html)

Use your browser to find, explore, and analyze spatial data. Use the Enterprise login. When prompted for the URL enter uchicago.

* [Carto](https://carto.com/)

Create stunning interactive or static maps. Formerly Carto DB.

* [Scribble Maps](https://www.scribblemaps.com/)

Like MS Paint for maps. Easy to make a simple map and export as an image.

* [Google My Maps](https://support.google.com/mymaps/answer/3024396?hl=en)

A fun tool for getting started with web mapping.

* [StoryMap JS](https://storymap.knightlab.com/)

From the creators of the popular timelines, present a timeline on a map.

* [OpenStreetMap](http://www.openstreetmap.org/#map=11/41.0796/29.1038)

The world's leading map made from crowd-sourced, local knowledge. Sign up to start editing your hometown, or get involved with [humanitarian mapping](http://tasks.hotosm.org/).