## Geographical Information Systems

GIS is a collection of computer hardware, software, and geographic data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

**Functionality of GIS**

GIS functionality embedded in GIS tools like (ArcGis and QGIS software tool) help finding the closest bank, hospital and restaurant to get the direction to it from their locations and many such applications. GIS provides the following function over the data.

- Data Capture

- Data Storage

- Data Manipulation

- Query and Analysis

- Visualization

**Types of GIS**

There are a number of Geographical Information Systems (GIS) (or GIS software) available today. They range from high-powered analytical software to visual web applications, and each of those are used for a different purpose.

GIS cover three groups:

- Web-based GIS

- Geobrowser: Google Earth

- Desktop GIS: QGIS

**Data Types:**

There are two types of data supported by GIS.

**(A)** Raster Data  **(B)** Vector Data

**Raster Data**:

Representation of the world as a surface divided into the **Cell, Pixels, and Elements** is called raster data. Example: Air and water temperature, Direction and Distance, Reflectance **(photography/imagery) etc.**

**Vector Data:**

Representation of the world using **Point, Lines and Polygon** is called vector data.

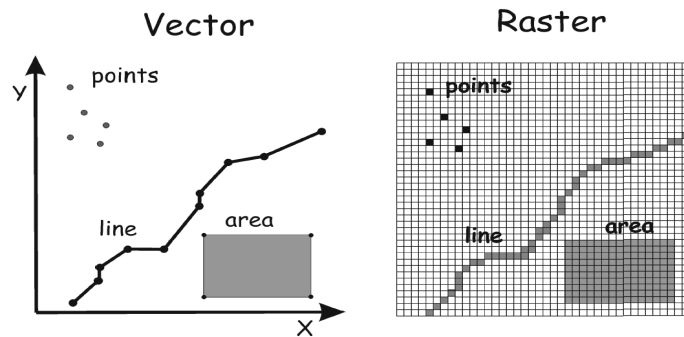Example: Roads, Rivers, Land, Street, Country Boundary etc.



**Figure 2-8**: Vector and raster data models.

Image Courtesy: Indiana University Bloomington

**File Format**

There are 4 type of file format with the extension supported by GIS

- Myfile.shp(shape file)

- Myfile.shx (XML file)

- Myfile.dbf (database file)

- Myfile .prj(projection file)